MOUNTAIN INFORMATION SYSTEM: A DISTRIBUTED E-GOVERNMENT OFFICE

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Abstract   The "Mountain Information System" is an e-government service system that provides really needed and full services to mountain community in Italy. The system has to intermediate local and central public services: if a service requires the beginning of many procedures, in charge to different public administration, we call this service an "inter-administrative service". An "inter-administrative service system" has to coordinate and certify this flow of administrative procedures, linked logically and in time, involving different offices of public administration ("certify the service as a whole").

The "Mountain Information System" achieves these goals using an architectural component, the "certification and security overlay" that provides basic services, available outside the application layer, assuring the separation between the management of services and their control (monitor, supervision and action in case of emergency) on synchronization processes done to set all procedures in an inter-administrative service.

In 2001 the "Mountain Information System" satisfied more than 4 millions service requests, including economic and administrative services.

Keywords: digital government services, unified access to inter-administrative services, distributed information systems

1.   INTRODUCTION

The "Mountain Information System" provides e-government services to mountain community in Italy. To provide really needed and full services to citizens, the system has to intermediate local and central public services.

To explain the difficulties related to the implementation of the "Mountain Information System" we have to remember some data concerning the mountain environment in Italy:

- Communication and transport difficulties

- 10 millions of citizens (15% of Italian population) on 54% of Italian area

- 361 mountain communities (a mountain community is a group of mountain municipalities)

- more than 4200 municipalities (average population: less than 2.400 citizens each)

- Millions of little farms

- Millions of little companies (craftwork, tourism, industry, commerce...)

Mountain needs services for citizens more than other regions: improving mountain quality of life means to avoid depopulation and to preserve forest, water and food resources.

Public administration services for mountain communities must be easily reachable because of streets and transport difficulties.

It is therefore necessary that all the services, provided by central and local public administrations, should be available even in little and isolated villages.

This important aspect, always underlined by UNCEM has to be taken into account by all mountain public administrations. Providing public administration services to citizens and enterprises gives the objective possibility to increase economical development, also linked to the Information Society and to avoid that people, in particular young people, are obliged to leave mountain regions.

The great difficulties to provide services in mountain regions are evident. But also the necessity to provide services is obvious.

Exploiting technological opportunities to let all services available by an unified municipal front-office (and via Internet) means improving citizen quality of life and reducing costs for small and medium sized enterprises.

2.   WHAT IS A SERVICE FOR THE CITIZEN?

The first step is to describe exactly what is a service and how we can provide services to citizens: these aspects are fundamental if we want to create a good and usable system.

Usually we define a *service* as the set of administrative procedures required to obtain the final service requested by a citizen/user, such as a driving license, an authorization, etc.

At this point its important to define what we mean for an administrative procedure: an administrative procedure involves different processes, in charge to different employees of the same office.

Nearly always we need to end more than a procedure to provide the final service.

The problem is that these procedures are *often under the responsibility of different offices of public administration (both local and central administration)*.

As a result, the actions necessary to provide a complete answer to a service requested by a citizen/user are not only a simple set of procedures: they develop into a flow of administrative procedures linked logically and in time, involving different offices of public administration.

Summarizing:

- A service is the set of administrative procedures required to obtain the final service requested by a citizen/user.

- An *administrative procedure* involves different processes, in charge to different employees of the same office.

- A *process* is a basic action (by basic we near that its completion does not require the conclusion of other processes and does not involve the initiation of further processes).

A service requires one or more administrative procedures:

- Sometimes the service ends in only one procedure;

- Often the service requires several procedures carried out by the same public administration;

- More frequently the service requires the beginning of many procedures under the responsibility of different public administration. In this case the final service is an *"inter-administrative service": it requires the co-ordination of all the procedures*.

An example of a SIM service, which requires the initiation of several administrative procedures in charge to several public administrations, is represented by the request for financial aid for agriculture made to European Union (> $5 billions every year). The application for financial aid from the E.U. requires the initiation of many procedures each involving several processes. Here in the following we remember only some of the most important procedures and offices:

   1 Cadastral Certificate (Land Registry);

2 Ownership Certificate (Public Housing Records Office);

3 A certificate which states that the holder is a farmer (Chamber of Commerce);

4 Submission of application to the office of competence (Ministry of Agriculture and Forestry).

Usually the farmer (or his delegate) carries all the procedures necessary to obtain the documents required to make the application for financial aid. The farmer himself is responsible for the coordination of the procedures.

To automate this service all the procedures must be carried out and automatically coordinated. What's more it's mandatory to assure independence & mutual trust to each Administration (mutually trusted service).

The Mountain Information System just does it for the farmer.

An *inter-administrative service system* is a system able to automate services which require procedures in charge to different public administrations.

An inter-administrative service system can provide:

- Its own services: services under the responsibility of a single administration and in particular the administration which manages the service system.

- Services of third parties: services under the responsibility of one administration but not of the administration which manages the system.

- Inter-administrative services: coordination of services with procedures in charge by different public administrations (those of the service system manager *front office* - and those of all the other public administrations *back offices*).

An inter-administrative service system must be able to coordinate all the procedures needed to complete the service. To be used efficiently the system must provide a single unified access point for users (a *one-stop shop service*).

Having a unified access point (a one stop shop service) means that the coordination of the administrative procedures is guaranteed: the user no longer has to manage the coordination of the procedures but it is the *service system which coordinates and certifies the flow* of administrative procedures, linked logically and in time, involving different offices of public administration (*"certify the service as a whole"*).

Coordination: we define coordination of procedures of different administrations all the activities necessary to:

- Guarantee that procedures initiation flow follows a logical order

- Verify that the different steps of the flow are correctly initiated

- Verify that the output received by the procedure is coherent with the admitted outputs

- Certify to back-office administrations that procedures initiated are respectful of rules and agreements among administrations.

- Certify that each step and the logical/consequential flow are correct.

- Certify that the logical composition of all information is correct.

Usually the coordination is guaranteed by the employer "physically". In an inter-administrative service system the coordination must be guaranteed *by the system architecture*.

An inter-administrative service system must be able to coordinate all procedures needed to complete the service, also procedures provided by other offices. This often requires a long and complex "service-chain" that manages the initiation and coordination of all the procedures provided by different back-offices.

Therefore there is a *problem* of coordination and interoperability of the different system involved (e.g. interoperability of digital signature systems or the trend of each public administration to provide a custom solution).

The front-office must be able to supply answers to any problem of the citizen, even problems coming from back-office procedures.

The front-office administration is therefore in charge of the service *management* and *control* (monitor, supervision and action in case of emergency) as a whole. That's why it's essential the separation of management and control.

- The service management, in charge by the front-office administration, is the flow management, the steps necessary for providing the service;

- The management of one step (an administrative procedure) is and remains in charge by the back-office administration,

- The service control, as control of the flow, of the steps, and of the service as a final result which each procedure gives the correct contribution, is in charge by the front-office.

The economic services require a high level of confidence: this forces us to strictly monitor, certify and verify the entire "service-chain" (authentication, authorization, accounting, security, non intrusion, QoS ...).

An inter-administrative service system has to provide basic instruments to:

- pick out in a secure way, within the "service-chain", problem causes in order to guarantee:

  - users,

- the administration in charge of the "front office",
- other administrations that provide "back-office" procedures.

- Assure homogeneous security, integrity and confidence levels for each step of the service flow.

- Monitor and report Quality of Service (QoS) levels provided to users during the "service-chain".

3.   WHAT IS THE MOUNTAIN INFORMATION SYSTEM?

The Mountain Information System (SIM) is an inter-administrative service system that provides a single unified access point (a one-stop shop service) to the different services available. Moreover, the Mountain Information System provides a secure data communication channel for Internet authorized users.

The access and use mode is uniform.

The services management is homogeneous.

The SIM provide a *solution* to the problem of managing the coordination of the flow of administrative procedures linked logically and in time, involving different offices of public administration.

Moreover the SIM has a *solution* to the problem of managing different telematic steps of certification of different procedures (different digital signatures, different Certification Authorities, interoperability of different signature systems).

The SIM provides services to different users, such as:

- Public employees,
- Citizens,
- Economic operators
- Public administrations

3.1.   THE MOUNTAIN INFORMATION SYSTEM SERVICES

In the following we expose the services available in the Mountain Information System for each category:

1 SIM own services:

- Municipal services
- Bulletin board of mountain companies
- Bulletin board to meet supply/demand of manpower

- Bulletin board of professional training courses
- Support for the planning and designing and designing of companies
- Promotion of typical mountain products
- Training courses to use public administration on-line services

2 Services of third parties: services of one administration different from the service system manager

- Information access and certificates of land registry and mortgage registry
- Citizen's fiscal status
- Fiscal status of companies
- Issue of fiscal code (tax identification number)
- Information access to international trade of animals and plants
- Consultation of library catalogues and national archives
- e-commerce services

3 Inter-administrative services: services with procedures in charge by different public administrations.

- Authorization, permits, planning permission and other building licenses for companies
- Presentation of applications for grants in agriculture
- Fire land registry
- Access to registry offices
- Access to population registry
- Issue of Electronic Identity Card (National Card of Services)
- Information access to legal documents, tenders and competitive examinations of Public Administration

In Picture 1 the distribution of the service access points available is represented.

In the Table 1 for each Administration providing SIM access points, the number of local and central offices involved are shown. We are opening other access points in the 4.200 mountain municipalities, It's planned to complete this activity in 2003.

In 2001 the Mountain Information System satisfied more than 4 millions service requests.

Figure 1   Area involved: service access points (in each access point there are several computers)

3.2.   THE SIM MODEL

The SIM is an inter-administrative service system based on the *interchange and cooperation model* (Tor Vergata University of Rome).

For this reason, in the SIM inter-administrative service system there is an architectural component (an *overlay*, that's to say a layer over the already available service layers) that provides *basic services* ("*certification and security overlay*"). These basic services, available outside the application layer, assure the separation between the *management* of the services and their *control* (monitor, supervision and action in case of emergency) on synchronization processes done to set all procedures in an inter-administrative service.

Using the "certification and security overlay", the Mountain Information System certifies that:

Management Center	1
Cabinet Office	1
Ministry of Agriculture and Forestry: Agriculture office	2
Ministry of Agriculture and Forestry: State Forestry Corps	1
State Forestry Corps: local offices	767
Municipalities	135
Mountain communities	361
National parks	20
Regions	23
National Emergency board	1
Public social insurance office	1
Ministry of the Treasury	1
Ministry of the environment conservation	1
Ministry of the environment conservation: local offices	14
UNCEM	1
Total	**1330**

Table 1   Number of access points per Administrations

- the *citizen*, at the end of the service, receives a certificate assuring that the service request has been successfully accepted. Otherwise the citizen receives a certificate that the service request has not been accepted, and why, with the necessary information on what the user has to do for resubmitting the request in the correct way.

- each *public administration*, providing the inter-administrative service, receives a certificate assuring that all procedures are carried out in a secure and certified way.

- the front-office administration receives a certificate that the inter-administrative service, as a whole, has been correctly carried out (we have to be sure!).

Only these basic services are able to guarantee an unified management of different procedures.

Only this unified management guarantees the certification of the whole service and not only of each single step. The certification of each single step is not enough, because in the set of different procedures could be introduced elements of "corruption" of the final result, and nobody can guarantee that it doesn't happen.

The architectural solution adopted by SIM is based on the following aspects, assured through the functions of the "basic services layer" of the interchange and cooperation model:

Service management. In this case the basic services (security, certification, cooperation...), available outside the application layer, assure:

- Homogeneous access mode to the system and use of inter-administrative service system.
- Homogeneous service management.
- Homogeneous users authentication and authorization modes (based also on the "Electronic Identity Card").
- The preservation of the information coherence in the different databases involved;
- Security, QoS, authentication, non intrusion, non repudiation, privacy;

Service control. In this case the basic services:

- verify and monitor the synchronization and coordination among different initiated procedures;
- verify at the architectural level the security and QoS standard;
- assure homogeneous service accounting modes;
- assure homogeneous audit methods for the monitoring, reporting and certification;
- assure reporting and certification for each subject involved (administration or user)of all procedures and processes provided;
- manage the cooperation between different administrative offices (back-offices) needed to initiate and complete the different administrative procedures involved by a flow of service. The front office has a complete control of initiation flow of different back-office procedures. The front-office has a complete control of run and output of each specific back-office procedure;
- assure a precise separation of technological and administrative/juridical responsibilities with the secure pick out of problems during the service .

In 2001 the Mountain Information System satisfied more than 4 millions service requests. In the Picture 2 the separation of the three categories of services provided is represented: own services, services of third parties, inter-administrative services. Following data are coming from monitoring and QoS services of the "certification and security overlay".
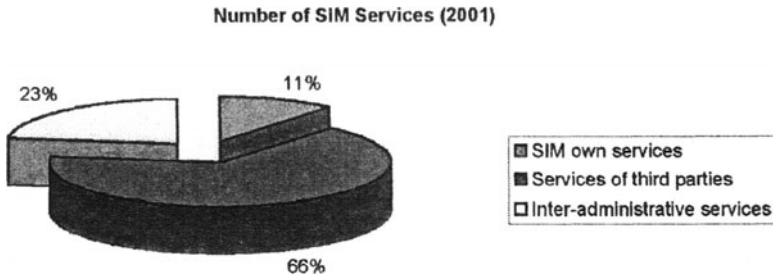
Number of SIM Services (2001)

Figure 2   Categories of services

SIM: average time to complete the service
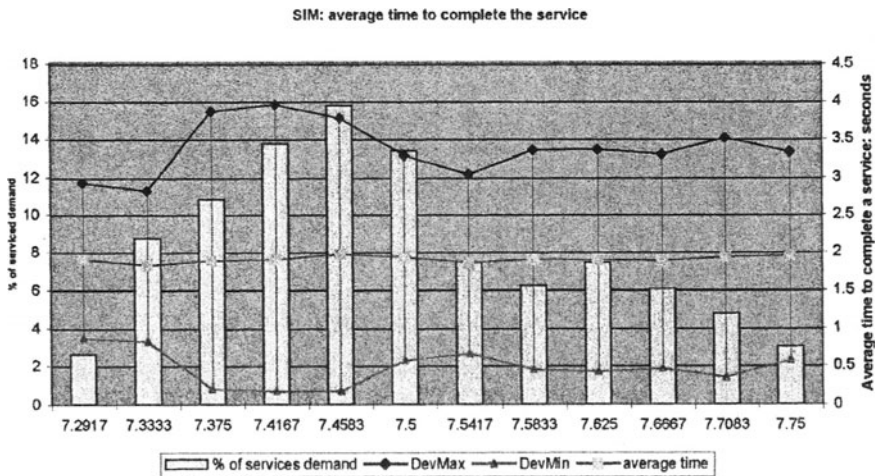

Figure 3   Average service completion time

Figure 3 summarizes data concerning the average time necessary to complete services.

The Mountain Information System for its architecture and model, is situated in the fourth and last level of Gartner Group "E-Government Model" for the following reasons:

- the public administrations provide homogeneous services,

- the system provides uniform access modes able to "let the public administration organizational model completely transparent to the users".

In addition, the model, that's to say the Mountain Information System, implements the fourth level of the user interaction level defined by the European Union for the on-line service providing, because of the "online execution of the entire procedure (service payment included)".

The Mountain Information System is an official scheme for E-government service systems in Italy.

The Mountain Information System is able to run even on the Internet. There are thousands of "authorized users" that can access the system from home through the internet. All their communication with the system are protected against any kind of attack (hackers, sniffing of sensitive personal data, theft and use of economic or administrative information, etc.). This protection is assured not only by username and password but also by a "trouble-free" software component that "signs digitally" all communication flows and encrypts all critical information. Only authorized users who install this software component can access the "protected areas" of the system and use services with economical and administrative impact. All other Internet users can access only the "public area" of the system.

3.3.   BENEFITS: ECONOMIC AND SOCIAL

The most important benefits produced by the SIM concern not only economical aspects, but also, and it's much more important, social aspects.

The SIM allows to restore trouble situations or social isolation, supporting people far from technological innovation and, last but not least, supporting environment management and preservation even from the economical point of view.

The SIM can improve mountain quality of life: this means to avoid depopulation and to preserve forest, water and food resources. These aspects are much more important than the economic benefits (such as saving time or gasoline) assured by SIM to each citizen or than the enhancement of the efficiency assured to the public administration.