Annex 4: The italian "services to enterprises" project

1. Introduction

The main goal of several ongoing e-Government projects is the improvement of the relationship between government agencies and the business world, as well as between agencies and citizens, through the use of information and communication technologies. This ambitious goal is articulated in the following agenda:

1. The complete automation of those government administrative processes that deliver services to citizens and businesses, and that involve the exchange of documents and data between internal offices of the government agencies;
2. The creation of a cooperative architecture that, by connecting the different agencies, enables them to fulfill their administrative processes with no additional burden for the citizens and the businesses that benefit from them;
3. The creation of portals that simplify the access to general and specialized services by authorized citizens and businesses.

With these strategic items in mind, in 1999 the Italian Public Administration undertook a pilot project, called *Services to Businesses*, which involves extensive data reconciliation and cleaning, as well as business process reengineering, aimed at enhancing the relationship between citizens, businesses and the government agencies. The project leverages the cooperative architecture that was then beginning to connect government agencies to each other, in order to drastically improve services provided to businesses. The initial focus was on simplifying the large number of transactions required for a business to register itself with various agencies, as well as to update their existing registry entries. Complicating the project is the fact that similar information about one business is likely to appear in multiple databases, each autonomously managed by different agencies that, historically, have never been able to share their data about the businesses. The problem is aggravated by the many errors contained in those databases, that cause mismatches among different records that refer to the same business. One major consequence of having multiple disconnected views for the same information, is that businesses experience severe service degradation during their interaction with the agencies.

Because of these complications, the comprehensive approach chosen for the project followed two main strategies, aimed at improving the state of existing business data and at maintaining correct record alignment for all future data:

1. Extensive record matching and data cleaning was performed on the existing business information, resulting in the reconciliation of a large amount of business registry entries;
2. A "one stop shop" approach was followed to simplify the life of a business and to ensure the correct propagation of its data. In this approach, one single agency is selected as a front-end for all communication with the businesses. Once the information received by a business is certified, it is made available to other interested agencies through a publish/subscribe mechanism.

2. Relationship between Agencies and Businesses in Italy

2.1 Competences of central and local agencies with respect to businesses

The structure of the Public Administration (PA) in Italy consists of central and local agencies that together offer a suite of services designed to help businesses fulfill their obligations towards the PA. In this document, we focus on three central agencies, namely the Social Security agency called *INPS* in the following, the Accident Insurance agency, called *INAIL*, and the Chambers of Commerce, called *CoC*. Typically, businesses must provide information to the three agencies when well-defined events occur during their lifetime, and they must be able to submit enquiries to the agencies regarding various administrative issues.

Front office *application services* are provided with reference to main types of business events. Examples of such events are: *(i)* Starting a new business or closing down a business. This involves registering the business with the CoC; *(ii)* Evolving a business. This includes variations in legal status, board composition and senior management, number of employees, as well as opening a new location, filing for a patent, etc.

Additionally, both *security services* (issuance of smart cards for service access, authentication and authorization) and *general enquiry services* are available to businesses.

Whereas the traditional interaction between agencies and businesses involved multiple transactions against the agencies' proprietary interfaces, the main goal of the *Services to Businesses* project is to enable central and local agencies to offer the front office services just mentioned through a common infrastructure, thus providing a coherent view of the agencies and a single point of access to their business functions. A back office infrastructure is introduced in the architecture, to hide the heterogeneity of the proprietary interfaces as well as their distribution.

2.2 Common set of data managed by the three agencies

INPS, INAIL and CoC manage both agency-specific information about businesses, such as employees social insurance taxes, tax reports, and balance sheets, and information that is common to all of them. Common items include the following:

- Attributes that characterize the business, including one or more identifiers, HQ and branches addresses, legal form, main economic activity, number of employees and contractors, information about the owners or partners.
- Milestone dates, including for example date of business start-up and date of cessation.

It is important to note that each agency makes a different use of different pieces of the common information. As a consequence, each agency enforces different types of quality control that are deemed adequate for the local use of the information. Because every business reports the common data independently to each agency, the copies may have different levels of data accuracy and correctness.

2.3 Previous burdens and costs

In the traditional, non-integrated setting, the burden of business transactions is shared between businesses and the PA. Businesses are estimated to spend about €175 million a year just to notify various agencies of their inception and variation events. This cumulative cost corresponds to communicating business identification data relative to 2 million events, using about 3 person/hour for each event. Every process involves a separate transaction with multiple agencies, each carrying very similar data. On the Administration side, the cost of handling one single

transaction is about €5, equivalent to 20-25 person/minutes devoted to the internal bookeeping associated to a single business event. Overall, the cost to a single agency for handling the inefficiency is no less than €10 million/year. Assuming that each business's data appear in the archives of at least 10 agencies, this brings the total cost to €100 million or more. Adding to this estimate, is the infrastructure maintenance cost due to multiple point-to-point proprietary interfaces between the businesses and each agency (front office) and between agencies (back office), as well as to the automation of the agencies' administrative processes.
A further consequence of the autonomy and heterogeneity among the agencies is an estimated 20% to 25% of misalignment between business records maintained in multiple registries. This misalignment brings about two additional costs. First, agencies must spend an estimated €20 million to reconcile records using clerical review, e.g. to manually trace businesses that cannot be correctly and unequivocally identified within the PA. Second, because most tax fraud prevention techniques rely on cross-referencing records over different agencies, misalignment may result in undetected tax fraud (of currently unknown proportions).

3. The Cooperative architecture used in the *Services to Businesses* Project

The *Services to Businesses* project, currently under development as part of the Italian e-Government initiative, aims at offering businesses a way to interact efficiently with central and local agencies in the PA, starting with INPS, INAIL and CoC. Agencies operate autonomously and they usually require accessing each other's data and services in order to fulfill business goals. Although this calls for inter-agency cooperation, the complexity of their organization and of their legacy information systems makes the migration to new and open systems impractical.
The approach to cooperation among agencies followed in Italy to address this problem is based on the concept of Cooperative Information Systems (CIS) (0, 0), i.e., systems capable of interacting by exchanging services with each other. The general cooperative architecture for the Nationwide CIS network of the Italian P.A (details can be found in 0), is specialized to the *Services to Businesses* project in Figure 1.

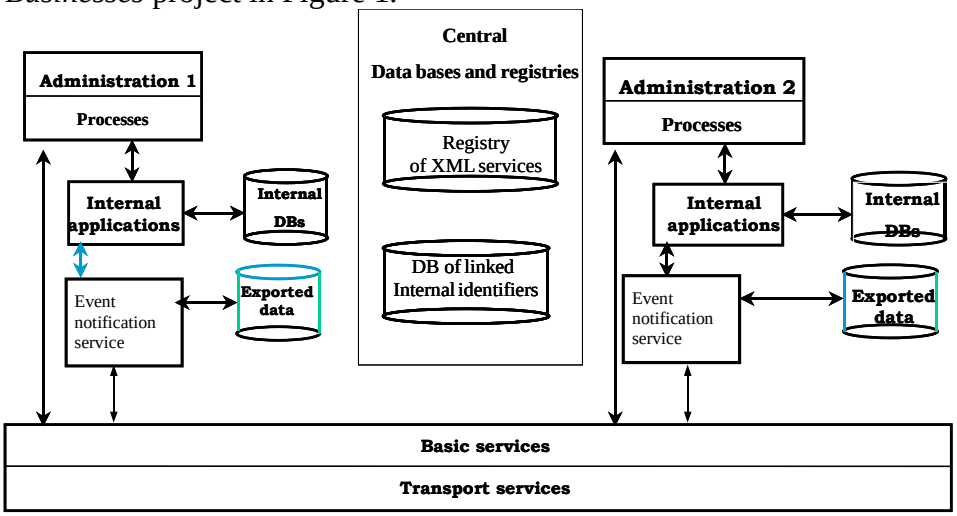

Figure 1: A cooperative architecture for the *Services to Businesses* project

Besides transport and basic services, a cooperative services layer is shown, including application protocols, repositories, gateways, etc.. The main idea is to define a *domain* as the collection of all

the computing resources, networks, applications and data that belong to a specific administration. Each domain defines the set of cooperative interfaces that include data and application services available to other systems. The general architecture supports cross-administration applications that are assembled using those interfaces. In addition, for the purpose of the project, two specific features have been implemented. First, a central database (DB) has been created to manage all the records resulting from linking the identifiers of independent business records that pertain to individual agencies. This new repository provides agencies with a unified view of Italian businesses. The process of creating this new repository from the existing databases is described in detail in the upcoming sections. Second, an event notification service has been deployed in order to guarantee synchronization between the new unified view and the independent views that each administration still maintains. The event notification service has been implemented according to a Publish&Subscribe (P&S) communication paradigm. The combination of these two extensions results in a clean base of business data whose high quality can be sustained over time.

A number of administrative processes were re-engineered in order to take advantage of this architecture, following the main criteria of moving away from multiple front end transactions (business-to-agency), and towards a single front end transaction plus a number of back end transactions (agency-to-agency) that are supported by the cooperative architecture. In particular, specific agencies have been selected as front end entry points to businesses. Once these selected agencies accept and certify the quality of the incoming information, the messaging service (e.g., notification) is used to propagate it to other interested domains. Results have been achieved in terms of reduction of per-transaction cost, reduction in the total number of transactions, and increased quality of the information acquired by the agencies.

4. Achieved improvements on the business processes

Improvements have been made both to businesses and to the agencies. With reference to the problems previously mentioned, the implementation of the one-stop shop approach resulted in a simplification of the business-agencies interactions, reducing their time burden.

Concerning cost savings we recall that, in the original systems configuration, three front-office transactions were required for each business-originated update (e.g. change of address), one for each of the three agencies involved in the project, for a total cost of €5x3= €15. After re-engineering, the new update process involves only one front-office transaction (€5), plus two new *back-office* transactions to propagate the change. Presently, the cost of one back-office transaction is €2, estimated as the sum of fixed costs amortized over the current lifetime of the new system, plus variable costs, considering that still only one third of the business events currently benefit from the new system. Hence, the total cost to the business has gone from €15 to €9, and is expected to decrease further to €6 as more events are included in the system. Furthermore, as more agencies join the cooperative system, fixed costs will be distributed even further.

Finally, provisions are being made to reduce the front-office costs, by moving to an entirely paperless and certified submission process for the businesses, with improved upfront validation of the input data. This will bring the €5 down significantly.