

# SMART CLIENT

## VERSATILE SOLUTIONS TO INCREASE THE PRODUCTIVITY OF PUBLIC ADMINISTRATION

Using web services in order to supply access to their data, organizations can constantly update the modality and the type of information to be shared via Internet with partners, customers and employees and inside their own Intranets, regardless of the type of data source. Recently, new and dynamic business applications have emerged. They take advantage of the client-server models in order to distribute and to make use of data through web services. A smart client is a client application designed to make use of web services and to interact with the data exposed by these services, also off-line.

The smart client architecture typically implements a service oriented architecture: the smart client consumes the functionalities of the business layer exposed as a service. The architecture proposed by Cluster Reply in the implementation of the new solution is based on smart clients using Microsoft technology. The "Case Management" system automates the procedural route of claims that citizens present at the counters of the public administration up to their resolution by the PA staff of the sector. The system is used by users of the administration in order to register the cases and to follow of their progress until at they are closed when the administrative authority resolves them.

## SCENARIO

In a highly competitive market in rapid evolution, the access to the business data at any time, anywhere and from any device represent an indisputable benefit and allow companies to take advantage of some new opportunities of business.

Moreover, using web services in order to supply access to their data, organizations can constantly update the modality and the type of information to be shared via Internet with partners, customers and employees and inside their own Intranets, regardless of the type of data source.

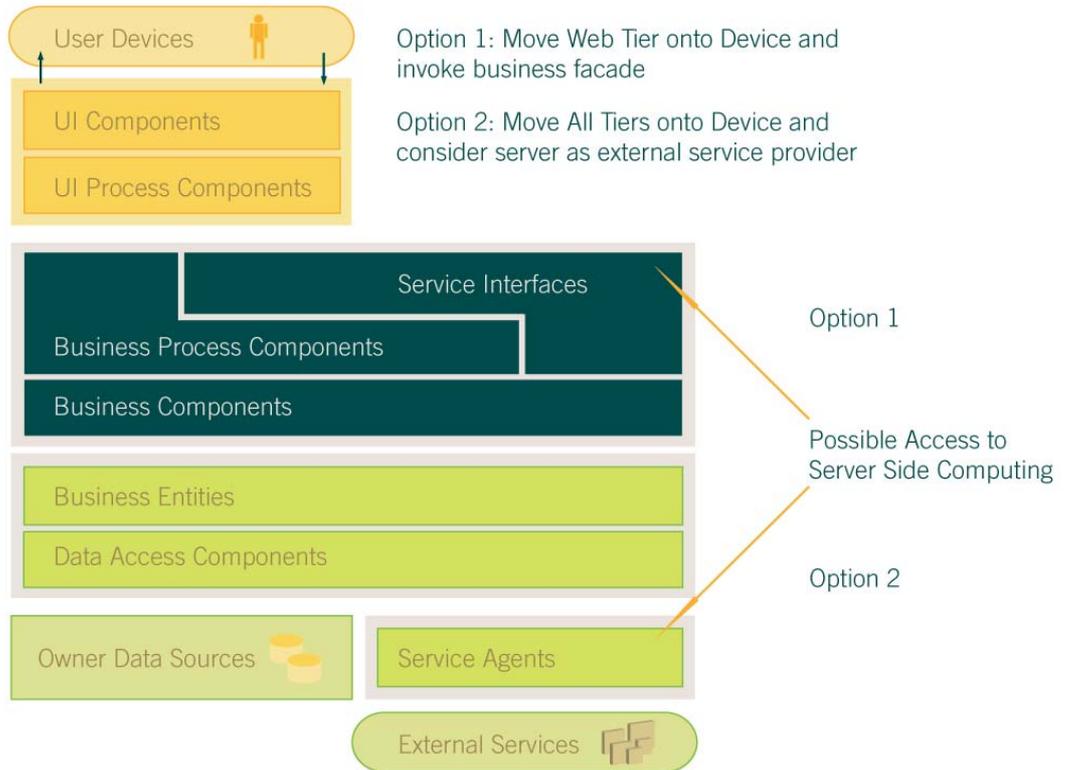
Web services allow companies to offer a wide range of business solutions, customized and integrated, facilitating programmatic access to various data sources, allowing interoperability between heterogeneous systems.

## SMART CLIENT APPLICATIONS

Until now, the exchange of data on the web has been based on two types of architectural models: on one side, rich client applications, based on proprietary client-server systems, and on the other thin client applications based on HTML and the browser. Thanks to the advent of the latest generation technologies, smart client applications are a natural evolution from the traditional architectures, combining the advantages and while exceeding the limits of both models.

Recently, new and dynamic business applications have emerged. They take advantage of the client-server models in order to distribute and to make use of data through web services. A smart client is a client application designed to make use of web services and to interact with the data exposed by these services, also off-line.

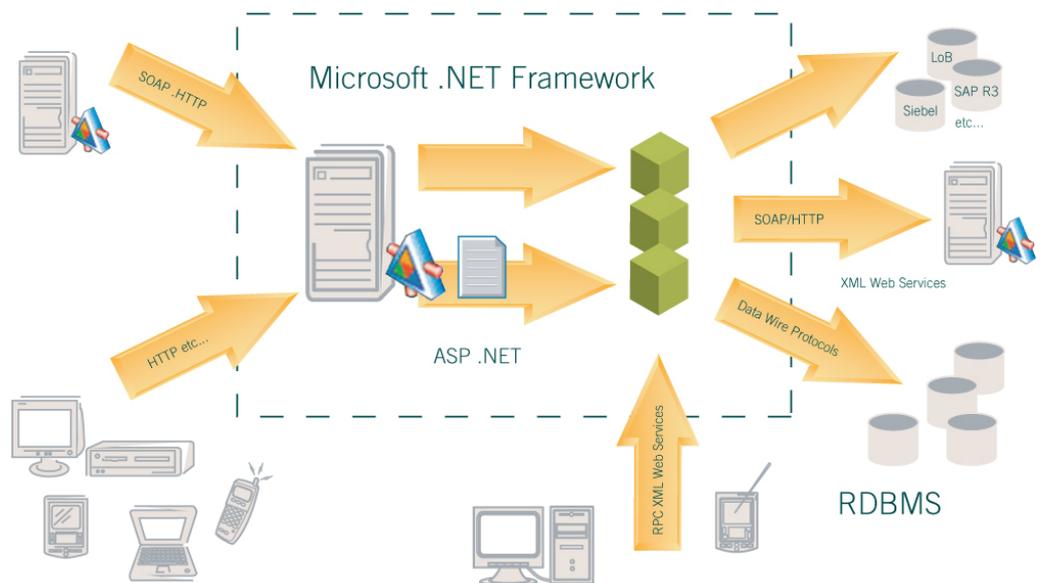
If the business data exposed by an XML web service are placed in a cache by a smart client application, an information worker can disconnect from the server while maintaining however the ability to process, analyze, save and share the data supplied by the web service. Once reconnected to the business server, the client can update the data sources intelligently based on how what is permitted by the logic of the application.



Picture 1 Logical architecture of a Smart Client application

**TECHNOLOGY**

The smart client architecture typically implements a service oriented architecture: the smart client consumes the functionalities of the business layer exposed as a service.



Picture 2 Interoperability among systems

Using web services, the service oriented architecture finds a natural implementation for services. This enables the smart client to consume functionalities in a simple and efficient way, as a result of the adoption of market standards such as HTTP, XML, SOAP, WS-Security, etc.

In addition, Cluster Reply has chosen the Microsoft .NET technology for the development of its own smart client solutions.

## PROJECT

### DESCRIPTION

The “Case Management” system automates the procedural route of claims that citizens present at the counters of the public administration up to their resolution by the PA staff of the sector. The system is used by users of the administration in order to register the cases and to follow of their progress until at they are closed when the administrative authority resolves them.

The main functional features are:

- **Functionality of insertion and querying of information relating to cases (data entry and querying)**
- **Protocolisation functionality**
- **Functionality of generation and printing of forms and reports (which constitutes approximately 80% of regular user operations)**

The previously existing system, based on a web architecture, suffered from rather poor performance with long waiting times for operators and inadequate flexibility in the maintenance of the system.

### ARCHITECTURE

The architecture proposed by Cluster Reply in the implementation of the new solution is based on smart clients using Microsoft technology.

The solution is characterized by a Windows application that implements the presentation layer of the system by means of Win Forms and consumes business logic by means of web services. The power of Win Forms results in graphical interfaces that are richer and more usable than the analogous web interfaces.

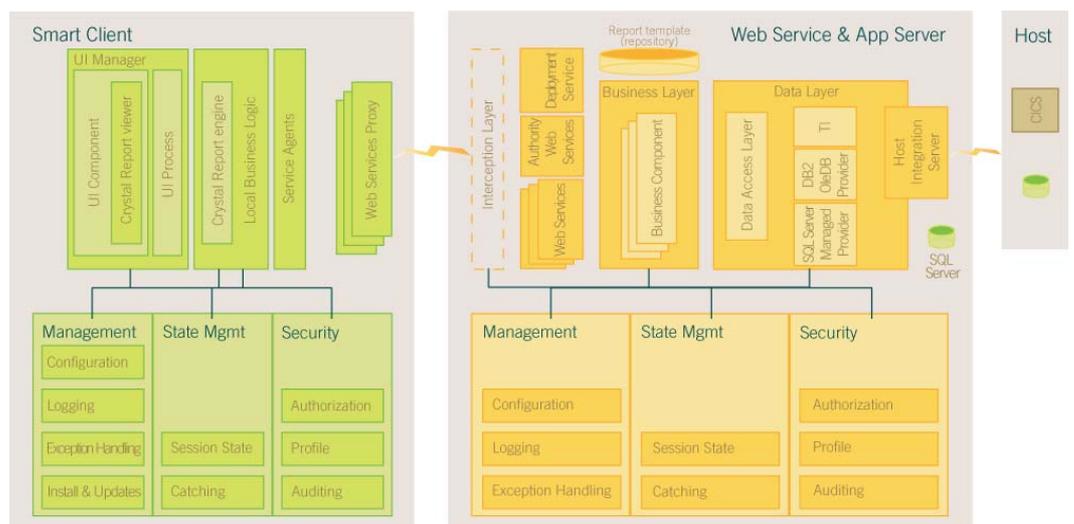
The access by the smart client to the services of the business layer is implemented by taking advantage of market standards in the web services area.

In particular, from the point of view of security, protocols of the WS-Security family are adopted so as to allow access to the services only by properly authorised users. The authentication presupposes the presence of an authority (Web Service Authority) contacted by the smart client at the moment of the authentication.

Based on the principle that smart client solutions allow full advantage to be taken of client resources, reducing the load on the back end of the architecture, it has been possible to shift reporting functionality from the server side (as in the web solution) to the client side, making the system more efficient and scalable.

The implementation of this type of model has required the use of the engine smart clients and of the Crystal Reports viewer (the version distributed with Visual Studio.Net). The creation and printing of a report is realized, therefore, directly by the smart client which populates the appropriate template (defined and distributed from the repository server), with data obtained from the business layer (via web services).

Another fundamental aspect that makes smart clients an evolution of traditional rich clients is the simplicity of updating and deployment. In addition to the classic software distribution solutions, thanks to the new features of .NET the initial deployment of smart clients is implemented in a simple way by means of a Web path: users simply click a link in a web page to start the download and installation of the smart client to their own clients. At the end of the installation, the application is executed locally.



Picture 3 *Applicative architecture of the Smart Client solution*

## ADVANTAGES AND BENEFITS OF THE SOLUTION

- **Flexible and modular Architecture**  
guaranteed by the adoption of the service-oriented model based on web services
- **Efficiency and scalability**  
exploiting the clients processing resources, it distributes to the load, lightening the servers and making the system more scalable and efficient
- **Client-side reporting**  
efficient and scalable, taking advantage of the resources of the client does not weigh down the server reducing the sizing of the server farm
- **User Interface**  
rich and functional
- **Simplicity of development**  
the implementation cost of the user interface is less than in the case of web solutions
- **Management of status, navigation and cache**  
simple and immediate
- **Optimization of bandwidth**  
reduction of the amount of data travelling across the network, with improvement in communication performance between the client and the central repository to the benefit of users
- **Possible interaction with the software present on the client**  
the typical scenario is the integration with Office applications in order to allow the user to use typical and familiar work tools
- **Greater flexibility of deployment**  
with a reduction in management costs.



Processes, technology, applications are the links in the value chain, connected to increasingly tightened meshes. To increase the effectiveness of processes, to make information always visible - to anyone or at any location - to be able to take decisions in real time, these are objectives require: business expertise, complete mastery of consolidated solutions and ability to implement them in a timely way.

Cluster Reply's value is in guiding and supporting its customers in the implementation of projects, combining excellence and innovation with a consolidated knowledge of Microsoft applications, technologies and infrastructures.

In particular, thanks to its extensive competence and experience, Cluster Reply is able to take part in all the phases of system planning: from the initial assessment, to the analysis of requirements, to the definition of architectural choices, to the drawing up of functional and technological requirements, to the development, deployment and evolution of the systems implemented.