

# ***Semantic-based development for business processes Approach and results in commercial applications***

Alfonso Díez & Alberto Cortés. BET Value  
*alfonso.diez@betvalue.com & alberto.cortes@betvalue.com*  
[www.betvalue.com](http://www.betvalue.com)

## **Introduction**

Tools like Protégé and concepts like Ontology or Semantic are usually associated to the academic world, and R&D departments. Few commercial systems are in fact built based on these tools and concepts. In the commercial arena, systems and applications are still developed in the very old fashioned way: functional or object oriented programming using algorithms development. Very little work, based in semantic tools, is done in the daily activity of banks, insurance, industry or governmental agencies, to mention some.

Along the last decade we have acquired a very large experience in the area of business process modelling using semantic representations, covering most of the business areas and sectors (Finance, Health Care, Government, Industry, etc.) and with a sound success in terms of systems quality, functionality and customer satisfaction.

The system that will be demonstrated is a real application developed for an international financial company that manages the administration of the security profiles of their employees along various countries. The system started into real operation in 2000, continuing today with a high customer satisfaction. It has being upgraded from that time to encompass the company new requirements and evolving needs.

## **The Methodology for formal representations of Business Processes**

A business process has a domain that can be described by using semantic tools. For instance concepts like customer, invoice, purchase order, article, price, and so on can be the base of any structured description of a business domain. In our demonstration, processes are employees, security profiles, security administrators, profile variations, signatures, and so on.

In general, a semantic description do not usually cover the rules and restrictions used by the business to manage them, for the following reasons, that we briefly detail.

It is commonly known that daily business activities require not only a lot of definitions but also a large set of business rules that represent the policies applied by the company to their business (semantic) objects; for example, how do I add a new customer?, who does the collection of this invoice?, why an invoice is considered unpaid?, what is the procedure to calculate the credit for a new customer?, what happens if a customer has and unpaid invoice? and many more. A semantic structure (say customer) has little meaning in daily operational activities if it is not wrapped with layers of prescriptions (how to) and evaluations (what if).

Questions like those before can be answered sometimes by using procedural methods that are applied on business objects. In other cases, the evaluation and behaviour of a given business scenario can be facilitated using state-transition modelling.

In summary, the semantic descriptions, plus prescriptive actions and state calculation can compose a coherent business analysis methodology, and hence (although not trivially) a business formal metamodel. In other words, the composition of a semantic object plus its procedural and organizational behaviours turns to be a business process.

We should not forget that, in addition to the business modelling approach, the deployment of business applications has many mandatory additional requirements that have to be totally filled. For instance: security and user profile administration, data base modelling, performance and multichannel access, reliability,

easiness of maintenance and evolution, integration with other systems, friendliness and usefulness, among others. These requirements cannot be avoided when managing real business situations.

### **An example: administrate user's security in a financial company**

This system was built to manage the security administration for the internal users in an international company. The company has many application systems that are distributed around the world, that is, the computing facilities used by a given county are distributed along many countries, and not concentrated in only one. This scattering of computer systems has the natural consequence that the administration of security is similarly complex: to assign a security profile to an user, it is necessary to ask for it to the security administrator of that system in the country were it is located. Each security administrator receives demands from many places in the world.

In 2000 the Spanish subsidiary asked us as to build a system to help manage easily this situation. Since then the system controls everything related with the security administration within the company. Over one thousand employees, all the security standard profiling, two hundred managers (users) with responsibility on assigning security profiles to their employees, all security administrators involved in making the security assignments for Spanish users, whether in Spain or in any part of the globe, and all change requirements, and the information flows, signatures, controls and statistical measures.

The system operates in the global intranet, being used by many people in different countries, in a continuous base, and in a multilingual environment. In terms of structural definitions, the system was built using the following declarations:

Framework definitions (not specifically done for the customer's requirements)

Classes: 171

Procedures: 1060

Custom made definitions (specifically done for the customer needs):

Root Classes (basic semantic of the business processes): 30

Total classes, including lower layers: 103

Custom Procedures with user interface: 64

Total procedures, including internal: 347

Custom Screens: 76

State transition models: 3 with a total of 21 states

### **Our practice and approach**

At the beginning of the 90's decade we started the development of Business Process Management frameworks able to manage semantic descriptions of business objects, procedural components, and state-transition models that could be used to build commercial applications of any kind and size: from small (departmental) business solutions, to very large and sophisticated corporative business processes.

The semantic approach allows the development of business solutions using semantic prototypes, and continuous refinement. Prototype evolution leads to finished commercial systems and to new versions and releases. No technical development is needed when business rules change. In conclusion, time to market is very short, and the quality of the final solution is very high and always guaranteed.

Today, we have a very wide and proven experience in this area, with more than one hundred successful projects in execution. Our company cover areas such as customer management, insurance risk control, e-procurement, corporative knowledge management, sales and logistics, electronic patient records and clinical guides, as some examples, for large Spanish and international corporations, managing very large amounts of information, transactions and users. A consequence of our experience has been a deep understanding of the representations of business processes using formal metamodels and system frameworks.