

# INTEGRATION OF THE INFORMATION SYSTEM AS A SUPPORT TO DISTRIBUTION

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## Summary:

*In the report we describe the architecture and integration of the information system (IS) as the basic support of the BPR in Iberdrola, a Spanish utility currently involved in business process reengineering.*

*The role of the IS will be described, as included in the general scope of the company, its Transformation Project and for the distribution development process.*

*Integration of the IS is a fundamental part of the BPR, together with Personnel, Communication, Organisation and Training in order to identify the new areas of improvement and to quantify earnings.*

## 1 GENERAL DESCRIPTION OF IBERDROLA

Iberdrola caters to over 8 million customers in Spain and nearly 5 million in Latin America. Its assets are valued at 15.6 billion euros (2,600 billion pesetas. See <http://www.iberdrola.es/>).

### 1.1 Major landmarks for the company during the 1990s.

In Spain, the 1990s saw the end of the so-called "political transition". The single European market has been a reality since 1992. The electricity industry has been preparing for the liberalisation of its market and companies, no longer constrained by national borders, are seeking new horizons towards which to channel their value-creating capacity.

### 1.2 Distribution facilities

Iberdrola's distribution facilities occupy a total surface area of over 196,000 km<sup>2</sup>:

Facilities	Centre	East	North	West	Total
Low and medium voltage line (km.)	48,104	61,948	30,085	42,165	182,302
LV distribution transformers	21,647	20,640	15,943	14,755	72,985

## 2 THE TRANSFORMING PROJECT

The Distribution and Customer management area decided to implement the Transforming Project in order to prepare in advance for coming changes. The project consisted of identifying the fundamental processes, and establishing the steps to be performed in each one and the activities involved in each step. The resources used in each process and the average times for completion of the process were calculated. Processes where there was potential for great improvement were identified and reengineering began on the first process, supplies, chosen because of its diagnostic profile:

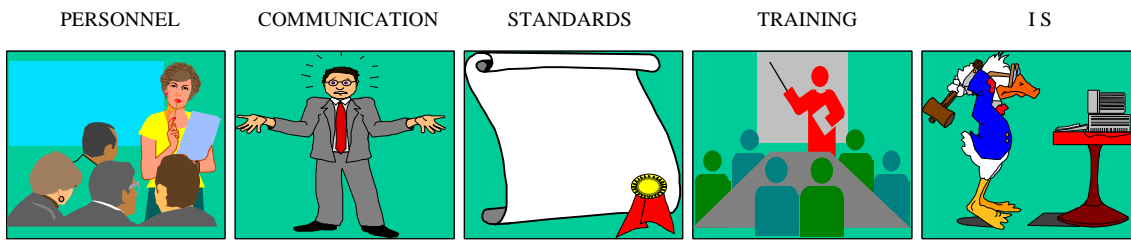
- long and complex process with involvement of various Iberdrola units.
- responsibilities for the integrated process were unclear.
- coordination of the units involved in the various steps in the process were inefficient.
- conflicts arose between those responsible for parts of the process.

The team's work led first to a series of short-term actions, which were implemented without waiting for design of the other arrangements. The remaining results consisted of improvements which needed to be implemented. Implementation involved work in the areas of: Personnel, Project communication, Standards and Regulations, Training and Systems.

A significant amount of resources were given over to this process.

- 1,856 FTEs (full-time equivalents) (more than 20% of the Distribution and Customers Areas).
- More than 50% of the staff of Distribution and Customers directly or indirectly involved in the process.
- 12 billion pesetas in personnel costs.
- 12 billion pesetas in investment in extension facilities in Iberdrola.
- 73,371 reports.
- 37,394 jobs.
- 700,498 new contracts, contract modifications and contract cancellations.
- 7,713,000 customers.

### 3 AREAS OF WORK

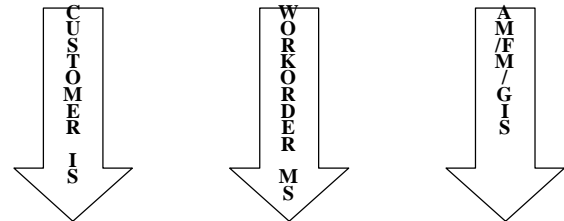


The actions carried out in each work area at the implementation phase of the project are listed below:

A short description of each of these systems is given below:

#### 3.1 Personnel

- Introduction of the new organisational structure for the process, with assignment of staff to new positions and management of process surpluses.



#### 3.2 Communication

- Information to relevant groups (operating line, personnel, other areas of Iberdrola, etc.) on key aspects of the project in order to guarantee success.
- Launch and maintenance of local implementation groups.

#### 4.1 Customer Information System

The Customer Information system gathers information on the commercial process of contract administration, such as that related to customer data, contract, points of supply as far as the general protection box, meter-reading, billing, disconnection in case of non-payment, and reconnection of disconnected supply. It also begins the process of requesting new supplies, inspection of fraud and customer attention.

#### 3.3 Standards and Regulation

- Establishment of new procedures related to third parties involved in the process (contractors and installers) to adapt them to the redesigned process.

The architecture of the system is as follows:

#### 3.4 Training

- Training of in-house and external staff in the redesigned process.

- Client - server model
- IBM/DB2/CICS server
- Windows client

#### 3.5 Information Systems

Necessary modifications to the grid's Customer, Work Management and Management systems and distribution facilities.

#### 4.2 Distribution Grid and Facility Graphic and Alphanumerical Information System

The purpose of this system is to aid establishment and maintenance of a graphic - alphanumerical database with the information required by the distribution network. This information becomes the support not only for maintenance of data on the distribution network and facilities, but also for the resulting preventative maintenance, technical supply management – to allow the network's capacity to support new demands to be determined, performance of projects for new facilities, planning of same, etc.

### 4 INFORMATION SYSTEMS

Three main information systems had to be modified in order to implement the solutions resulting from the transformation project:

The architecture of the system is as follows:

The CUSTOMER INFORMATION SYSTEM, the ??distribution grid and facility graphic and alphanumerical information system (AM/FM/GIS)?? and the WORK ORDER MANAGEMENT SYSTEM.

- UNIX operating system
- ORACLE database software with FRAME modules from INTERGRAPH
- TCP/IP communications software

### 4.3 Work Order Management System

The Work Order Management System aids management of the activities, resources, and assets of the distribution network, covering the entire cycle of distribution work. For this purpose it has the following modules: **Applications / entries** where it gathers requests for new supplies from the customer information system and communicates with the distribution network and facilities system to validate the capacity of the existing network. **Design** of work which needs to be carried out. Maintenance of **Compatible Units** which are the standardised elements containing information on materials and labour required to perform the work, **Public procedures and licences** where all externally-enforced conditions on the work are handled (such as the need to request permission from a private individual to lay a new power line across his/her land), **Contractor Management**, where the contracting model is applied for awarding of work to service providers, **Scheduling and execution** of the work and Closure of same.

The architecture of the system is as follows:

- Client - server model.
- Advanced Case tools: FCP and Nat Star
- IBM/DB2/CICS server
- OS/2 Client

## 5 DESCRIPTION OF THE PROBLEM LEADING TO SYSTEMS INTEGRATION

Power distribution companies (and other distributors) cannot adapt to their continuously changing surroundings without the support of information systems. However, integration of these systems is of vital importance for the reasons set out below:

### 5.1 Changes in the surroundings which impose changes in the orientation of the distribution company

Depending on the specific methodology applied in each company this new orientation is reflected in changes to organisation and working methods, in one of the following variations:

- In some cases, it consists of orientation towards processes, such as the creation of organisation units, each reflecting one of the basic distribution processes.
- In other cases, it consists of adaptation to the electricity distribution market, with the creation of organisational units separated in the same way that the agents in that market are separated (fitters, builders, official bodies, etc.).

- In other cases, it consists of the continued improvement of the human resource values of the distribution company, which involves continuous re-adaptation of the organisational units, etc.

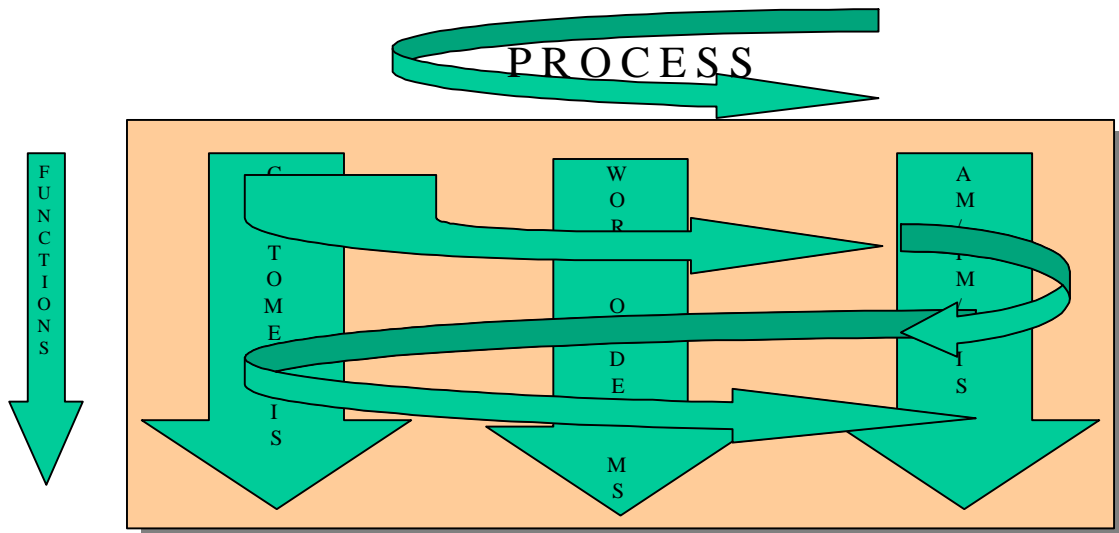
In all of the above cases, the need to maintain and increase integration of the information systems is a priority, as we shall see below:

5.1.1 Orientation towards processes: As the organisation orients itself towards processes, organisational units are created which must perform functions, resulting in systems with very different designs which become unsuited to performing their corresponding process. This problem is basically resolved in two different ways:

- by discarding the systems and introducing a new one which meets the new requirements.
- by unifying the system functionally and technologically (same technological platform).

In the first case, all the effort made in optimising the original systems is lost. Normally it is decided to implement a system based on a work-flow, with the problem that since it is introduced from scratch, it is often left with a superficial specific functionality, without acquiring the functional powers of the systems which it replaces (although it reports much better on the sequence of activities, times, etc.).

In the second case, the services of the systems are maintained, and if the integration is well designed, good support is provided for orienting the corresponding process. For this purpose, it is necessary to ignore the objective of integrating the systems for all possible cases which might arise in the process, since normally each system, which has a large potential for solving even difficult and exceptional cases, has such high requisites for integration into the other systems that it makes the effort involved in performing it useless. It is advisable to have a high level of integration in systems in simple cases (the majority), taking the predominant values as defaults when the preceding system lacks the datum to be sent to the next one in the process, and leaving these values to be modified in functionally complicated cases.



**5.1.2 Adaptation to the market:** in this case, systems integration should not only be internal, but also external: internal to provide previously available common information which should even be augmented if the responsibility types need to be maintained among those responsible for the organisational units of each market; external to ensure that the data on the surroundings are entered into the company's systems without problems.

**5.1.3 Continued improvement:** There is a high proportion of modifications requested by continuous improvement work groups in which the content basically consists of optimisation of functional union and data transfer between systems. This is logical given that the internal modifications in systems have traditionally been the first to be conducted. The tendency is to perform first the work that depends on oneself even if it requires greater effort than is required in integrating historically dependent systems from different organisations.

**5.2 Maintaining and even accelerating the speed of change**

In order to prevent adaptation to changing surroundings being performed divergently by the systems, thus adding to functional disintegration, it is necessary to apply a methodology which provides an overview of the change to be carried out.

- either through centralisation of solutions,
- or through decentralisation of the solutions to be applied in each system, but requiring that a minimum level of functional integration be maintained,

- or through the creation of heterogeneous teams, with specialists for each application who are required to communicate systematically.

Technical integration is also a requirement. The requirement which must be met is that they must allow operation under or over the layers (technical levels) used with the other systems. The problem in these cases is that the real situation is different to that promised by the manufacturer, and there are always faults when the versions of these layers are changed or when it is necessary to make large-scale efforts to adapt the remaining systems to these technical integration requirements.

**5.3 Globalisation of company business**

Increasingly, companies are extending onto international markets with greater ease (and greater need). In doing so, they find that they do not have data obtained using the criteria which they normally use. The main task then centres on implementing the company's working methods. To this end they can either ignore everything that had existed up to this point and start from scratch (which involves considerable time and effort) or integrate the information generated up to that point into the methods with which they were used to working. This solution requires an understanding of the data source and design of existing systems, but it allows them to add the values they previously had on the purchase market, which might otherwise easily have been lost.

## 6 ORGANISATION OF THE SYSTEMS WORK AREA

The Systems work area involves formation of the Systems Committee into a single committee made up of the component of the transforming project specialising in systems, those responsible on the user side for each of the systems, those responsible in the computer department for each of the systems, and a head of technical architecture of the systems.

The functions of this committee are as follows; Distribution or approval of distribution of modifications in packets (including modifications to the different systems together with their interfaces); Setting out and solving of problems which might delay the scheduled times; Communication to the head office of problems which the System Committee has not been able to resolve; Evaluation or approval of evaluation of all modifications to the different systems requested by those responsible for each of the transforming project's improvement solutions; Coordination and unification of inter-relatable or contradictory modifications and assignment of priorities for each one; Acceptance of the result of the tests performed on the different systems and their new interfaces, prior to introduction of the modifications in all cases; Reporting to the systems committee on the benefits attained with the transforming project, with an acknowledgement of the effort made by each one.

## 7 KEY ASPECTS

Although some of the criteria used in integrating the information systems have already been dealt with, there follows a list of the most important ones:

- integration of existing systems instead of replacement by new ones
- design of fast processes by integrating systems in which they are simple and numerous.
- use of indicators to measure correct process operation and the effectiveness of the solutions adopted with the transforming project (an unmeasured improvement is not a useful improvement).
- implementation of improvements through packets of modifications, each accompanied by the corresponding training and communication.
- coordination of the improvement achieved with the introduction of each packet with the resizing of the resources to be used.
- where there is no resizing, measurement centres on the increase in the quality of the product achieved with the redesigned and integrated process.

## FUNCTION SYSTEMS WORK FLOW INTEGRATION SYSTEME

