THE IMPACT OF THE IMPLEMENTATION OF TECHNICAL MANAGEMENT SYSTEMS IN AN ELECTRIC POWER DISTRIBUTION COMPANY.

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INTRODUCTION

The problem of the Technical Management within the Electric Power Distribution process, involves the need of implementing Technical Systems [l-3] (Technical Data base, Systems of Failures Reception and Control, Control and Registration of Service Quality, Telecontrol Systems, etc.) integrated at corporate level, in order to achieve a complete control of the company value chain.

Edenor is an Electric Power Distribution company that started its activities in September, 1992, with 2 million of clients. Its area of activity corresponds to the northern part of Buenos Aires city and the northern part of Gran Buenos Aires (its surroundings). Its services cover 4637 km2 in the most crowded area of the country, being the density of clients inversely proportional to the distance from Buenos Aires city..

The business consists of the distribution of electric power, acquired in the Electric Wholesale Market (MEM) of the Republic of Argentina and delivered to the clients and Large Customers of the concession area.

Edenor S.A. is a company where all these systems and works have been simultaneously implemented under a demanding regulatory frame, which has caused a strong impact on the organization, on the procedures and on the processes based on new technologies..

Such a process demands a strict management of deadlines, large assigned budgets, human resources and training in order to achieve high quality in the expected performance, document each procedure and finally achieve satisfaction of the consumer in the utilization of the implemented systems..

The present work describes, in its first part, the integral vision of Edenor Technical Project..

The project management methodology, explained hereinbelow, was used to deal with the transition while the old system was still in operation, to manage risky situations in the project launch and methodology of daily tasks. At the end the impact of said project on the organization after two years of its implementation is described

THE EDENOR TECHNICAL PROJECT (PTE)

The Edenor Technical Project started in the first semester of 1995 and was made up by the following modules:

A. Telecontrol
B. Telecommunications
C. Technological Innovation and adaptation of substations to the Telecontrol
D. Service and Product Quality
E. Technical Database and Client-Net Link
F. Failures reception and control
G. Technical and Commercial Documentation

Modules A, B and C, are planned to be finished in two years, from the date of this report.

The scope of PTE and its link to Edenor Commercial and Administrative Systems are described on figure 1

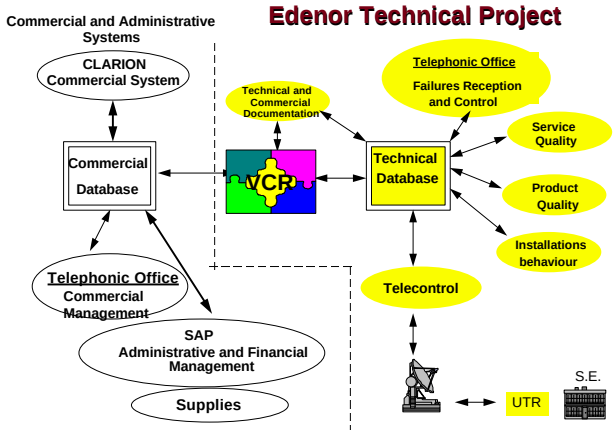

Fig 1 : The Edenor Technical Project

MANAGEMENT METHODOLOGY OF PTE [4]

Objective and necessity for correct administration

The Objective of a Management Methodology for projects is to establish the necessary steps to organize, execute, control and finish the system development projects.

The Necessity of Managing the Projects then arises and its success comes as a consequence by the achievement of the following goals:

- Fulfilment of deadlines
- Fulfilment of the assigned budgets
- High quality on performance and documentation
- User satisfaction

The implementation of PTE and its result at the end of the process has caused a deep impact in the company operations, and it was necessary to assign resources for its follow-up and control, since:

- Several efforts were posed that had to be absorbed, while the old system was still in operation
- Risky situations arose during the launch of the project
- Changes were made in the way of performing every day tasks and operations

These situations become more acute when many different problem solving methods have to be implemented simultaneously, since this process presents the following features:

- Economically complex
- Significant changes are expected to be obtained in relatively short periods in different areas
- Since implementing these problem solving methods demand, many man-hours, non-controlled deviations become extremely costly
- Operations have to be assured, since there must be a coexistence between the current systems and the ones to be implemented.
- There is a responsibility for the physical and economic control of the whole process.
- Global objectives do not have to be forgotten. All the staff have to move in that direction , and must be motivated to be part of the process.
- It involves many suppliers in services and products areas: hardware, system software, communications, applications, etc
- Multiple ways of contracting are applied with complex functional scope, interrelations and interfaces.

To make the implantation project of PTE run efficiently and effectively, being consistent with Edenor's objectives and minimizing the impact in the normal operation of users, it was neccesary to "manage" the job, checking regularly the progress and a daily work on resources coordination, conflicts and problems solving, matters and resolutions register, etc.

This Management process implied (and implies) the execution of the following basic activities (or functions):

- Organization and Planning of the Project
- Project Execution
- Project Control
- Project Closing and Approval.

Organization and Planning of the Project

The objective of this stage was to organize the project and to plan all the activities to be carried out.

The carried out tasks were:

- To confirm the objective and the scope of the project
- To establish the task force (Project team) determining the necessary resources, roles, skills, experience, interaction among all members (project organization chart), etc.
- To identify the tasks to be executed, according to the methodology to be adopted. Whatever supplier methodology is accepted, it has to be made compatible with Edenor methodology.
- To develop the work document and task planning
- To train the task force to use the adopted methodology so that a commom language is established during the whole project
- To assure that the development and implementation environment are available to be used by the Project team, all components being tested in operation
- To confirm the tools to be used for development and implementation
- To define project logistics to carry out the tasks: requirement of premises and office furniture, phones, faxes, office equipment, computer technology components (hardware, software and communications), etc.
- To define the project administration standards (progress meetings, progress reports, estimation guides,etc)

The obtained products were the following :

$\Rightarrow$ Project Organization Chart

For this purpose the mission and functions of the Project team members were defined.

Project Direction: The Director of the Project assumed total responsibility for the resources management and project result, and ought to be able to transmit the interest on the project to the rest of the company.

People Responsible for the Project: People Responsible for the projects had to assure the effective execution of the System and Works development and implementation process, so that the Project be completed in due term, within the assigned budget and succesfully meet business, technical and quality requirements. The Responsible had to delegate its assumed responsiblities

to a qualified group of leaders and supervisors. Likewise, he required an administrative staff as a backup for Project functions. Full-time dedication was expected from Project Responsible

Directly involved team: it had the responsibility for the supervision and took part on the start up, being in charge of maintaining a close contact between PTE and its suppliers

Leaders or supervisors of the involved areas: (Transmission Area, Operation Areas, Systems Area, Edenor Control Center, Gran Buenos Aires Area Control Center, Purchasing Area, Services Area, etc): Their function was the managing and efficient management execution of all tasks whose responsibility had been assigned to its area.

Quality Checking: This group was to determine the risk areas which had to be more carefully controlled, providing an independent view of the staff work regarding what was occurring or may occur in the project.

Special Backup: Special backup was offered by technical and functional experts, who did not belong to the work team but were well-acquainted with the Project.

⇒ Work planning

Every step to be executed, requirements of skilled personnel, estimated effort and essential dates for the work to be completed were listed. All work team members took part on this job.

⇒ Project schedules

The Final project schedule Gantt chart was made with the active participation of all members of the task force, representing in a diagram the activities to be performed, showing resources, control points, verification points, etc.

⇒ Work program

All activities to be performed by the corresponding area, every expert within a minimum planning of 120 days, the estimated effort (man/hours), dates for the start and end of the work and a graph were also listed (Gantt chart).

⇒ Trained task force

Proper training of the staff devoted to the project was anticipated.

⇒ Installed work equipment

It included project logistics, development tools, etc.

⇒ Project standards

Execution of the Project

The Objective of the Stage was to perform the activities of the phase to be executed.

The executed activities were:

- To control the work execution, according to the methodology adopted to carry out the project.
- Based on plans of conversion, migration, testing, training, interfaces development, adaptations, development, installations and works, human resources and required materials availability were considered in advance.
- Planning of the activities to be carried out by the Change Administration of the user area, migrating to a new operational system or receiving the contribution of new technologies, administrating the coexistence and transition between already existing and new operations and systems, coordinating said effort with users training and Change Communication Plan.
- Development Planning and Interfaces Management and projecting the proper coexistence of old and new systems and installations production environment.
- Risks and contingencies management through, follow-up of every problem that might damage the success of the project.
- Follow-up of the Project Team skilled labour spending.
- Management of changes introduced in the project. For example: changes in functional and technical specifications or system and/or installation scope.
- To assure the access (in due time and form) of all project teams to an only repository with development and implementation documentation.
- To assure that communications services respond to PTE needs, carrying out a careful programming on services suppliers terms and communications net complexity.

The obtained products were:

⇒ Time reports

For PTE administration, it was necessary to regulate the way of registration for executed activities, time spent on their execution and, therefore, deviations that might exist between planning and execution.

⇒ Risk reports

The purpose of this Report was to document every factor that according to specialists criteria, might damage the success of the project and also document the actions planned to be executed to avoid (or control) possible problems anticipated to arise during the project.

⇒ Change research applications (SIN)

Their goal was to document all change research requirements presented during PTE operation.

SINs are made during the whole system or installation lifetime and may deal with problems arosen on programs or installations, on system or work documentation, procedures, interfaces or modifications to be made to the system or work to introduce a non-planned function in the PTE functional or technical description.

The above mentioned means that Change Research Applications shall only be made on situations not provided by the original objectives formulation and PTE reach or functional requirements (i.e.System or installation functional requirements; performance, safety and control requirements)

Project Control

The aim of this stage was to apply concepts of total quality (quality guarantee, control and administration) on work development, advising about possible deviations in the reach, development terms, assigned budgets and system or installation quality and to take corrective measures on appropiate time, to minimize the impact on the project

The carried out tasks were:

- To inform about project progress
- To conduct progress meetings
- To establish quality control objectives and products
- To establish revision lists and quality control points
- To verify the fulfilment of objectives, terms and products
- To assure quality product through dissemination of techniques and methods and programmed revision of intemediate products obtained on different phases/stages.

The obtained Products were:

- Progress reports
- Quality revision report
- Quality assurance checking lists

Project Closing Report

The essential purpose of this document was to register the experience acquired during the execution, thus avoiding repetition of mistakes on other projects.

⇒ Content
The Project Closing Report made at the end of the work, shall contain an analysis of :

- Deadlines fulfilment
- Assigned budget fulfilment
- User consent/conformity
- Contract terms fulfilment on the part of the supplier and on the part of EDENOR
- Management participation on the project
- User participation
- Effectively used techniques on systems development and instalations project
- Application of Development and Contract Methodology
- Acquired training
- Technology transfered by the supplier and absorption degree on part of EDENOR
- Recommendations for future projects

IMPACT OF IMPLEMENTATION

The impact of implementation is described in two components.

Quantitatively, the impact is defined, among others, for the following concepts (Period 1995/1998):

- Operation costs savings of 22.9 M$
- Reduction of interruption periods from 18 hs-client/year to 9 hs-client/year, and frequencies of 14 interr- client/year to 5 interr-client/year
- Savings for non-payment of discounts of 0.90 M$

Qualitatively, for the following concepts :

- Instalations revamping
- New Operations associated to Implemented Systems.
- Detailed integrated information and in real time.
- Functions integration of Local Control in Substations
- Improvement on decision making in Planning area
- Assistance on the negotiation with External Organisms
- Improvement on the Control process.

• CONCLUSIONS

The implementation of integrated Projects having simultaneously to deal with several fronts, implies an economically complex process, and having to make significant changes in relatively short periods in different areas, where the effort demanded by all fronts involve many hours/man, any non-controlled deviations become extremely costly.
Moreover, operations must be assured, since current systems and systems to be implemented have to coexist, and global objectives do not have to be lost from sight.

Experience obtained since implementation, points out the importance of information "big-bang", from being isolated and private to being integrated and corporate.
Information quality improves daily due to the usage of an "only datum" by many users. Integration of Commercial and Technical Systems, in a Distribution Company, reach an improbable exhaustible potentiality in the search of information treatment by the different areas. On the other hand, decision- making during "pre and post" operation and during elaboration of short and medium term plans improves sharply, technological advances impact directly on Client Attention quality service, which is reflected on cyclic satisfaction surveys, and lastly, another item to be highlighted is the operation costs reduction.

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