

INTEGRATED DESIGN AND CONTRACT MANAGEMENT APPLICATION SYSTEM

Massimo BARTOLUCCI
Enel SpA – Italy
massimo.bartolucci@enel.it

Maurizio MAZZOTTI
Enel SpA – Italy
maurizio.mazzotti@enel.it

Emilio RICCI
Enel SpA – Italy
emilio.ricci@enel.it

ABSTRACT

Article describes new Plant Design and Work Management System through process steps definition and information sharing between network owners and contractors in charge of plants realization.

INTRODUCTION

The aim to efficiency often requires separation between core competences of network owners and companies charged of plant realization.

Therefore a relevant part of efficiency is due to fast, clear and structured communications and information sharing between actors involved.

We can remark three phases in process as described below: Plant Design, Information Sharing, Database Updating.

PLANT DESIGN

In this phase, either for a new relevant plant or for light modifications to existing plants in order to satisfy customer needing, designer must draw a complete design of electrical functionalities and also provide list of activities, devices and materials, price list, information about hazards etc.

Therefore, in order to guarantee efficiency, we achieved complete integration between:

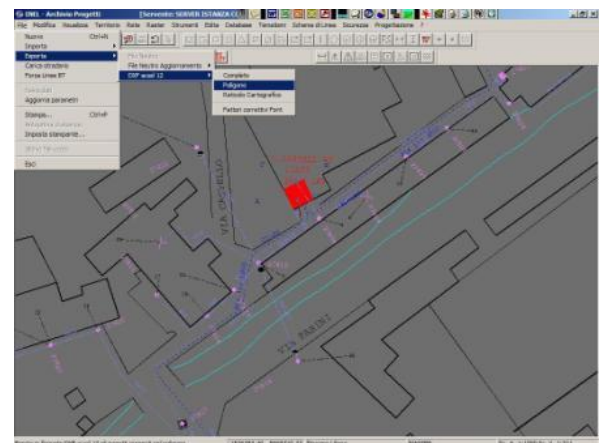
- CRM System and ERP system in order to let designer check a list of all customer requirements
- Network Management System and Plant Design System for grid maintenance or power increasing requirements
- ERP System and Plant Design System, in order to show all information required for automatic cost allocation since design creation and keep them available in the future.
- Plant Design System and Network graphic database (as different layers of the same system) in order to:
 - o position each work automatically in GIS via its geographical / grid id-number coordinates
 - o show the designer existing plants and territory state

Moreover, Plant Design System provides automatic association between graphical elements and price list or materials needed.

Internal coherence with cost allocation rules is also

provided.

Example: Graphic Design Layer



INFORMATION SHARING

In this phase, we share all the information with contractors through our company web portal, a real bi-directional gate for work management.

Complete e-management of contracts and works is allowed:

- Sending complete list of works assigned
- Fixing execution terms for each work
- Showing price list and materials of each work
- Sharing draws and maps of the area
- Informing about hazards presence in working area
- Providing up-to-date materials availability

Contractors could also request:

- changing of execution terms
- design changing in order to face unforeseen conditions
- requests for grid availability in order to schedule work plan

Contractors can also transmit work ending notice.

Example: Data Exchanging

COD. LAVORO	OPERAZIONE	PREST/PACIF	DESCRIZIONE	EST/INT	DESIONE/CT	Q.TA P/P	VALORE PAVITO	IMPORTO (€)
			INT - SOSTA CAVO INTERNO LINEE BT CAVO AER	KN	0			€ 6.704,97
EP1005			EXT - CABELLETTERO S IN STRADA ASPALT O CEMENTATA	M	90		17,90	
EP1007			EXT - SUPPL. DA SPINELI A EP1004 - 1.500 BT/100 PUG. CAVO	M	247		17,90	
EP1006			EXT - PUGA CAVO BT INTERNO 142 FINO A 30 M/0,0000	M	90		17,90	
EP1012			EXT - AGGIORNAMENTO DI PROIEZIONE O PLANIMETRIA	KN	0		17,90	
EP1003			Aggiornamento, in Autunno del Contratto, di Alimentazione	KN	0		17,90	
EP1008			CAVIO BT TRONCAZZO	M	90			
			INT - P. Cavo strad. (cavo) BT 4500 BT/100	KN	1			€ 1.974,40
EP1005			EXT - MESSA IN OPERA CABELLETTERO IN STRADA	NUM	1		17,90	
EP1001			INT - SOSTA CAVO AER BT CAVO BT	PZ	1			

- Interconnection with client server module in order to guarantee database updating and internal coherence with company cost allocation rules.

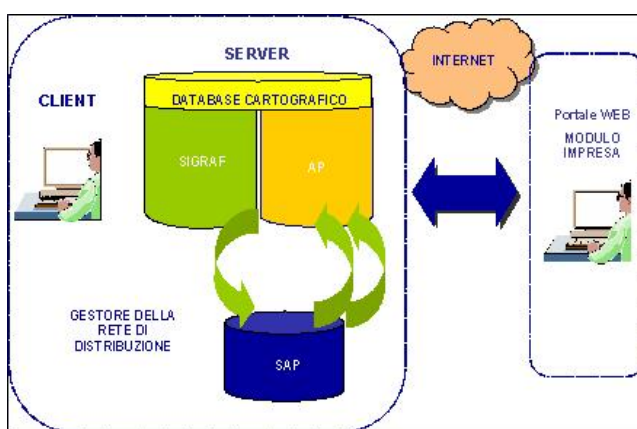
WEB Module includes advanced technology components which allow graphic and numerical data exchange.

Web application is based on JAVA technology and upgrading or adding more application servers is allowed without problems or code modifications.

Database is also managed in clusters with external disk array redundancy.

Automatic interface based on web service technology is also provided for data exchanging with local applications.

Example: System Architecture



DATABASE UPDATING

Once works are completed web application supports all operations needed for contract management:

- detailed work accounting, interconnected with ERP system, in order to clearly identify cost allocation and billing
- Redrawing of As-Built plant layout (directly by contractors) for updating GIS and grid management system
- Reporting of whole contract situation

SYSTEM ARCHITECTURE

Architecture is essentially based on two modules:

- A client-server component
- A WEB module

Client Server Module

It mainly provides three functionalities:

- access to network graphic database of whole national grid
- design application provided of design automation procedures
- interconnection to company ERP system;

Design application and ERP system interconnection is achieved through an EAI (Enterprise Application Integrator) which allows an interactive design of the work flow, data exchange and fixing of checking points for monitoring and automatic re-processing of data rejected.

Graphic Environment was developed totally by Enel using graphic libraries of large diffusion.

WEB Module

It allows information sharing:

- document exchanging for work assignment and management

CONCLUSION

Synergy between process organization and information system achieve a full real-time bi-directional communication channel gaining efficiency and adding better control and effectiveness in management of work commitment between network owners and contractors in charge of plant realization.

System is actually working (less than 1 year of activity):

- More than 5000 Enel users and 400 external users of 350 companies have been defined to the application
- More than 85.000 works assigned for external execution
- More than 158.000 k€ of cost allocation and billing