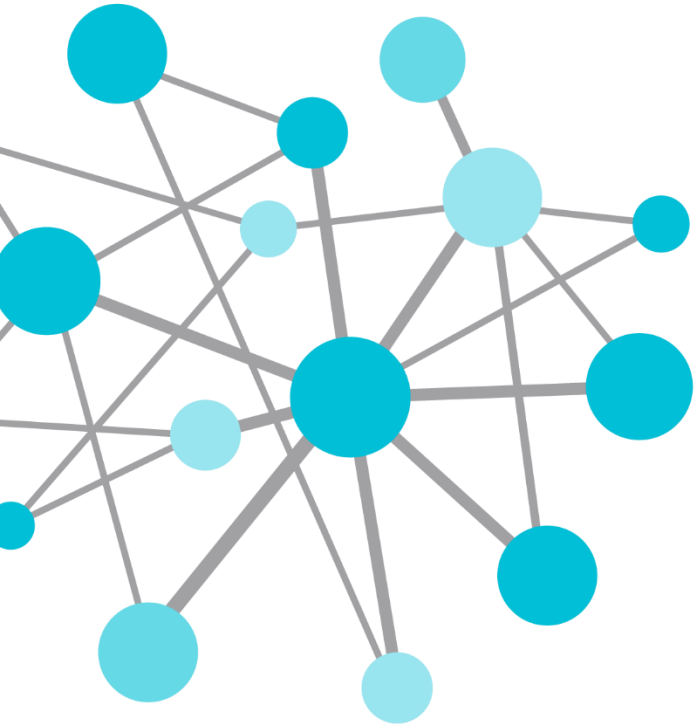


Added value initiatives on top of ENEL PI System Infrastructure

Presented by **Gianfranco Necci and Raffaele Di Biasi**

About Enel SpA

Enel is Italy's largest power company, and the second listed utility in Europe by installed capacity. It is one of the leading integrated operators in the electricity and gas in Europe and Latin America.

About Enel SpA

2005

Presence
11 countries

Net installed capacity
46 GW

Customers
~34 million

Employees
51,778

EBITDA
~8 €bn[2]

Investment Plan 2006-2010
~18 €bn

2013

Presence
40 countries

Net installed capacity
99 GW

Customers
~61 million

Employees
71,394

EBITDA
~16 €bn[2]

Investment Plan 2014-2018
~26 €bn

Enel has been transformed into a fully integrated multinational player

1. Data as of December 31st
2. Recurring EBITDA

Business Challenges

In order to optimize business processes, improve operational efficiency, do business insights, the real-time data help the analysts to :

- monitor the health status of the plant
- monitor and analyze performance indicators at the highest level and on consolidated data
- improve plants availability
- improve production capacity planning
- provide environmental data to external authorities
- do "advanced" and “self-service BI” analysis on real time and historical data (compare actual vs budget data)

Background

In 2012 Enel S.p.A. stipulated an Enterprise Agreement with OSIsoft that enabled us to work on the update of the PI Server infrastructure and in some cases, to upgrade that infrastructure, bringing it to the latest version of PI Server.

During this phase , supported by OSIsoft, we chose to implement new OSIsoft solutions to make the infrastructure more reliable and efficient.

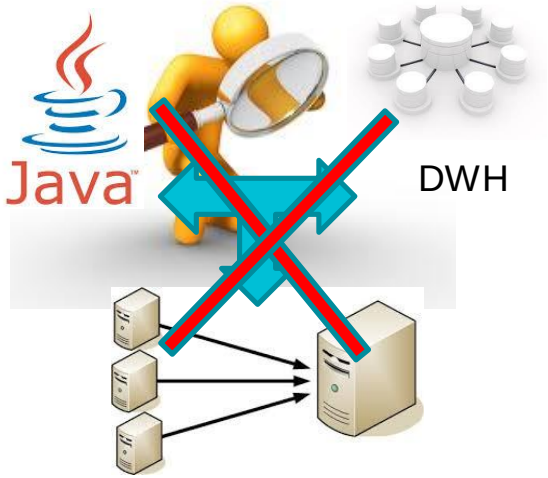
This choice results in :

- simplification of systems maintenance
- improvement of business analysis
- improvement of the performance

Background (cont…)

The situation as it was :

- PI Servers were in old version 3.4
- No asset based view of real time data
- Difficulties to do advanced analysis on assets
- Difficulties to compare real vs historical measurements
- Dashboards based only on PI ProcessBook
- No integration between PI Servers and Java environment
- No mobile access on real time and historical data



OSIsoft PI Server

Background (cont…)

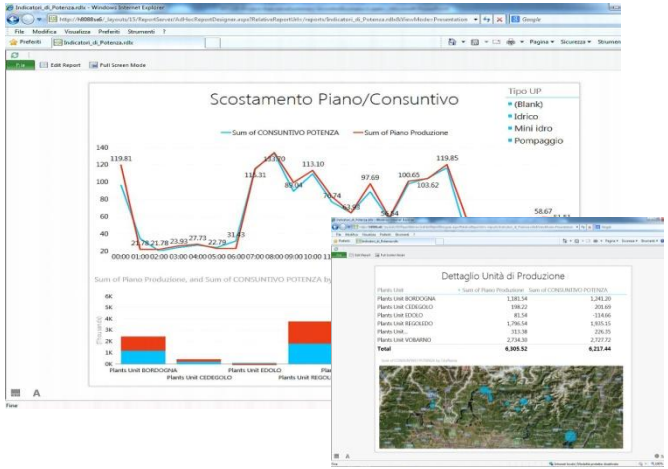
- Drill down possible only via linked static reports
- No collaborative environment
- No different view based on roles
- No aggregated view based on asset hierarchy
- Data readable only by expert users
- No unique repository for institutional process reports
- Multiple “versions of the truth”.

Plant intelligent system

The aim of these solutions is to deliver all the information to the web and mobile platform that allow the business and external authority to manage and analyze process data.

With the activation of a web user interface that contains support of dashboards with all the relevant KPIs , dynamic reports to analyze planned, real, gross and net power the business can monitor plant's performance to reduce the time to make a decision.

The portal will foster the collaboration between plant operators by using mobile platform support.



Business Challenge

- Organizing PI Server data based on asset, porting of that data to the web and mobile devices for KPI, reporting and advanced analytics

Solution

- PI Asset Framework : organization of PI Server data
- Microsoft SharePoint : web portal
- PI WebParts : visualization of data
- PI OLEDB Enterprise : access to the data

Results and Benefits

- Single point of access to the process data
- Aggregation, organization and homogenization of several data sources (PI Servers located in different countries and different databases with different coding)
- Role based access to the information

Solutions

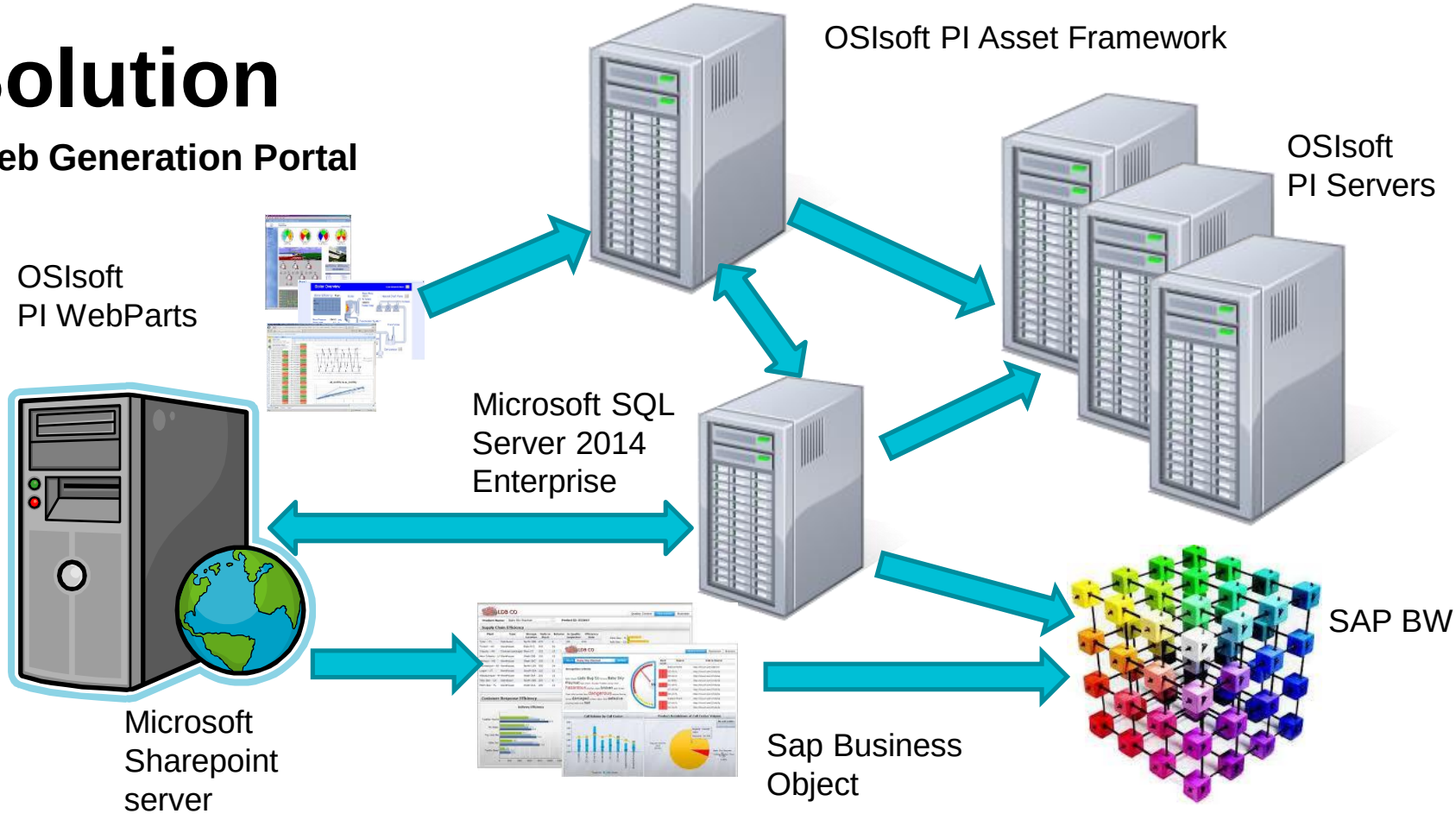
Requirements:
• bring the PI ProcessBook displays into the web portal
• integrate PI Servers and other systems with Web Portal by leveraging the PI Asset Framework
• deliver historical data coming from data warehouse to the web.

Web Generation Portal

- Use of Sharepoint as web portal and for collaboration
- Use of PI Asset Framework as integration layer between portal and PI Server and other systems.
- Use of OSIsoft PI WebParts to navigate on PI Asset Framework assets and deliver PI System data and information to the users.
- Use of OSIsoft PI OLEDB Enterprise as relational database (DB) adapter to PI Servers
- Use of Microsoft Power BI and SQL Server BI to implement advanced analytics and standard reports
- Upgrade of Sap BW to Hana platform to have better performance and to open to predictive maintenance

Solution

Web Generation Portal



Solution (cont…)

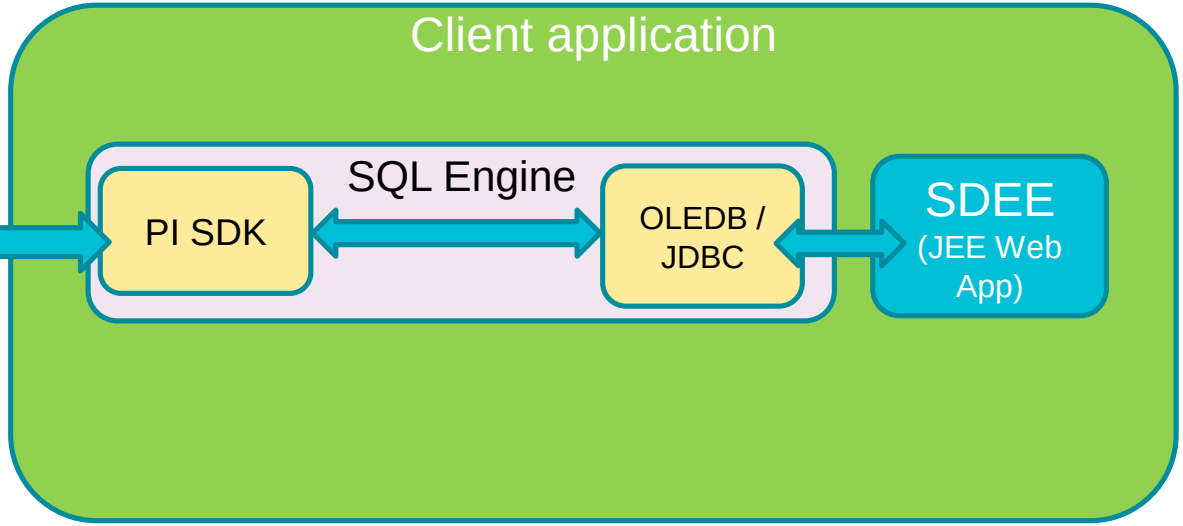
Requirements:
- deliver emission of pollution, NOX,CO,SO2 to the authority

SDEE

- Use of OSIsoft PI OLEDB Enterprise and PI JDBC Driver as relational DB adapter to PI Servers database

- Power generated
- Coal flow
- Methane flow
- NOX emissions
- SO2 emissions
- CO emissions
- Dust emissions

PI Data Archives



Solution (cont…)

Requirements:
- deliver emission of pollution, NOX,CO,SO2 to the authority

SDEE

		Time	Gruppo 1	Gruppo 2	Gruppo 3
Potenza Generata	(MW)	10/09/2014 09:02	UnDwn	2.43	494.97
Portata OCD	(t/h)	10/09/2014 09:02			0.00
Portata carbone	(t/h)	10/09/2014 09:02			199.38
Portata Metano	(Nm3/h)	10/09/2014 09:02	0.11	1.11	0.00
Emissioni NOX	(mg/Nm3)	10/09/2014 09:02	UnDwn	UnDwn	186.19
Emissioni SO2	(mg/Nm3)	10/09/2014 09:02			227.49
Emissioni CO	(mg/Nm3)	10/09/2014 09:02	UnDwn	UnDwn	25.21
Emissioni Polveri	(mg/Nm3)	10/09/2014 09:02			4.20

Solution (cont…)

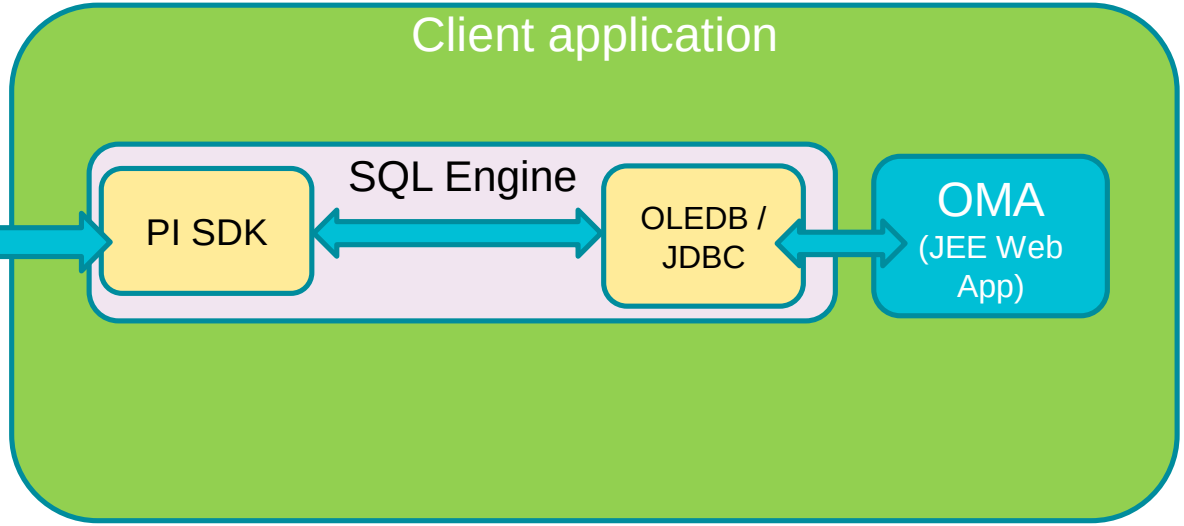
Requirements:
- deliver prevision of the production capacity for the next week

OMA

- Use of OSIsoft PI OLEDB Enterprise and PI JDBC Driver as relational DB adapter to PI Servers

- Level and Volume of reservoir
- Rivers, channels and galleries water flows
- Gross power of generation unit
- Functioning mode of generation unit (production, pumping)
- Other hydraulics measures

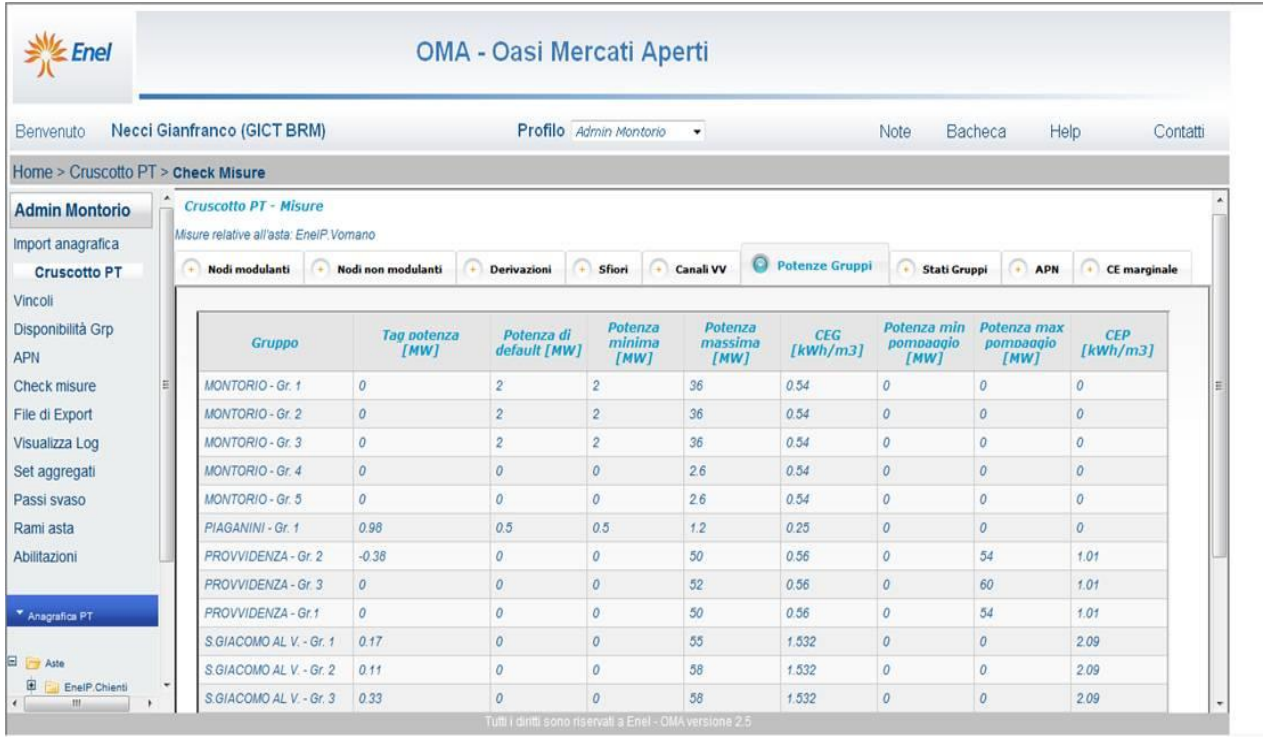
PI Data Archives



Solution (cont…)

Requirements:
- deliver prevision of the production capacity for the next week

OMA



Expected results and benefits

The expected benefit will be :

- the opportunity to access all the KPI and reports of real time and historical data from one web portal;
- the representation of PI Tags as assets to be more integrated with operations and maintenance business view;
- the availability of the main information exposed by the web portal on mobile devices;
- the possibility to access the PI Servers from java applications will make possible the creation of new features based on PI System data.

Benefits of EA Services

Relying on the Enterprise Agreement, we worked with OSIsoft's Center Of Excellence Engineer to define the solution architecture and to validate architectural and technological choices. The CoE Engineer provided expertise and best practice, so that the best of both worlds could be leveraged in our projects.

During the Proof of Concept we leveraged OSIsoft Technical Support to resolve issues which we encountered. Fortunately OSIsoft's support performs very fast and effective so that we reach the end result without problems.

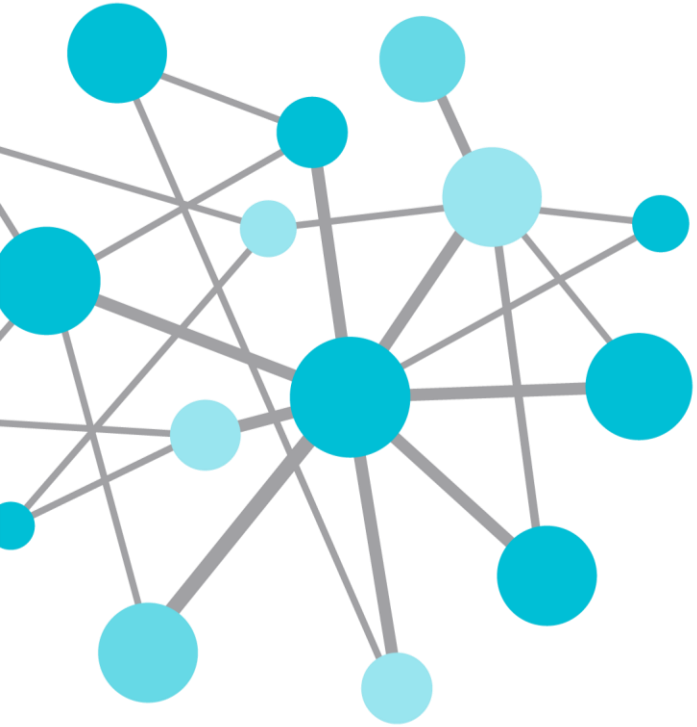
Gianfranco Necci
Raffaele Di Biasi

- gianfranco.necci@enel.com
- raffaele.dibiasi@enel.com
- Project Managers
- Enel Servizi s.r.l.

Questions

Please wait for the **microphone** before asking your questions

State your **name & company**



THANK YOU

Brought to you by OSIsoft.

Please don’t forget to…

Complete the online survey for this session

eventmobi.com/emeauc14

Share with your friends

#UC2014