
REAL-TIME PERFORMANCE MANAGEMENT FOR THE ENTERPRISE
RtPM
SAN FRANCISCO PHILADELPHIA HOUSTON FRANKFURT
OSISOFT USER CONFERENCES 2005
REAL-TIME PERFORMANCE MANAGEMENT FOR THE ENTERPRISE
RtPM

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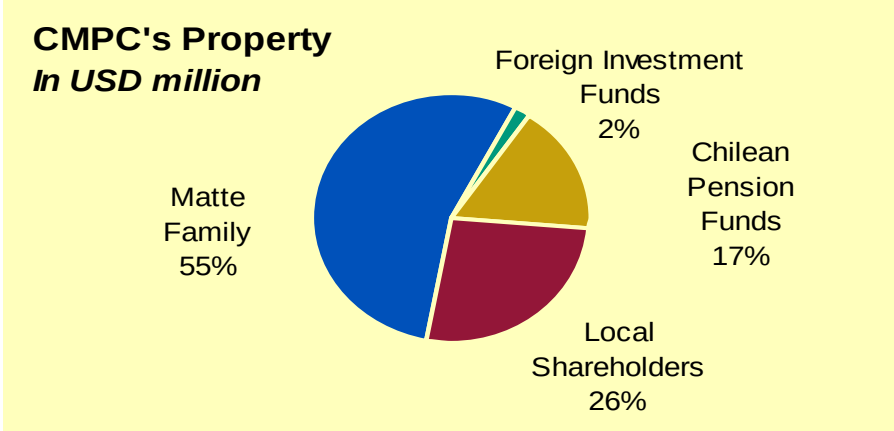
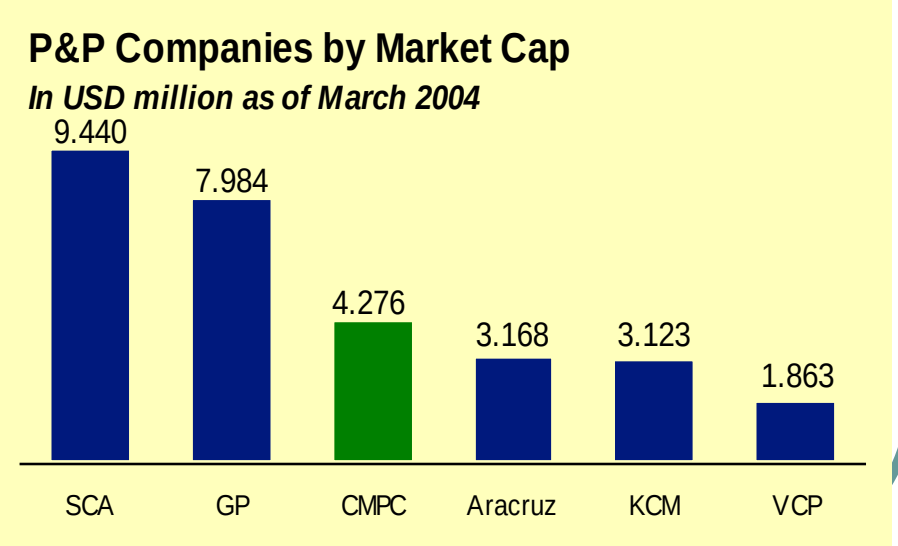
Manufacturing Execution IT Framework for Real Time Supply Chain Excellence in CMPC

CMPC is a leading P&P company, Number one by revenue in L.A. controlled by an experienced and financially strong Chilean group

- CMPC is a leading, integrated and well-diversified producer of pulp, paper and other forest products in Latin America.
- As of December 2003:
  - Assets: US$ 4,730 million
  - Net debt: US$ 530 million
  - Sales : US$ 1,670 million
- The company is controlled by the Matte family, one of the leading economic groups in Chile.
- One of the largest companies in the Chilean Stock Exchange with a market capitalization of US$4.3 billion as of March 2004.





CMPC: a market leader in the southern cone of South America

EMPRESAS cmpc

Forestry and Wood Products	Pulp	Tissue	Paper, Boxboard and Newsprint	Converted Paper Products
615 Th Ha of land 427 Th Ha planted 3 sawmills (900,000 m³/y) 1 remanufacturing plant (90,000 m³/y)	3 mills: Laja (pine) Pacifico (pine) Santa Fe (eucalyptus)	2 mills (87,000 tons/y): Puente Alto Talagante	Boxboard: Maule, Valdivia Packaging paper: Puente Alto Newsprint: Inforsa P&W paper: Puente Alto Laja	188,000 tons/y and 102 million units per year Corrugated boxes Paper bags Office products
94 Th Ha of land 60 Th Ha planted		2 Mills (95,000 tons/y)		75 million units/y Paper bags
		Protisa mill (25,000 tons/y)		95 million units/y Paper bags
		Ipusa mill (16,000 tons/y)		
709 Th Ha (487Th planted) 4.0 MM m³/y	**1.2 MM tons/y**	**223,000 tons/y**	**710,000 tons/y**	**188,000 tons/y 272 MM units/y**

Forestry Division

Main Subsidiaries:	**Forestal Mininco** **CMPC Maderas**
Facilities:	**3 Sawmills** **1 Remanufactirung plant** **2 Nurseries**
Products:	**Pulpwood, lumber, m&b, chops, blanks and others.**
Total Capacity*:	**990.000 m3/y**
Total Assets*:	**US$ 1,969 million**
Total Sales:**	**14%**
Strenghts:	**- ISO 14001 Certifications** **- Commercial thinning & prunning** **- Faster growth cycle than northern species** **- Proximity of the forests to facilities and ports**

PEFC

CERTFOR

FSC

SGS International Certification Services, Inc.

Certificado emitido por SGS International Certification Services, Inc.

Certificado Número: US2002/2763

Este certificado avala el Sistema de Gestión Ambiental de:

FORESTAL MININCO S.A.
Los canelos 79, Villa San Pedro
Concepción - Chile

el cual fue auditado y registrado de conformidad con los requisitos de ISO 14001: 1996.

Este certificado se aplica a:

PRODUCCIÓN DE MADERA, PROVENIENTE DE BOSQUES CULTIVADOS, PROPIOS O ADMINISTRADOS, MANEJADOS BAJO LOS PRINCIPIOS DE DESARROLLO SUSTENTABLE.

La certificación comprende la siguiente: Incorporación de predios y bosques; Mejoramiento genético; Producción de plantas; Establecimiento de plantaciones; Manejo silvícola; Protección de bosques contra incendios, plagas y enfermedades; Construcción y mantención de caminos; Cosecha de plantaciones; Cargado, transporte y acopio de madera rolliza, desde bosques propios, hasta su arribo a fábricas y puertos.

Autorizado por:

Director

Por:
SGS International Certification Services, Inc.
Meadows Office Complex
301 Route 17 North
Rutherford, New Jersey 07070

Emitido No.: 1, January 17, 2002
Válido hasta Enero de 2005

ISO 14001

ANSI-RAB QMS REGISTERED

Member of the SGS Group (Société Générale de Surveillance)

Copia del original

Pulp Division

Main Subsidiaries:	**CMPC Celulosa**
Facilities:	**2 Softwood mills (Laja – Pacífico)** **1 Hardwood mill (Santa Fe)**
Products:	**BSKP, BEKP, UKP & Fluff pulp.**
Total Capacity*:	**1.165.000 tons/y**
Total Assets*:	**US$ 880 million**
Total Sales:**	**30%**
Strenghts:	**- Strategic locations** **- World lowest cost producer of softwood** **- First class assets** **- Sales diversification** **- ISO Certificated**


SGS

SGS International Certification Services E.E.S.V.

Quality system certificate

QBE 95068

We state that the quality system of

CMPC Celulosa S.A. - Pacífico Mill
Chile

is in compliance with the quality system standard

ISO 9001 : 2000

This certificate is applicable to

The Manufacture and Supply of Bleached Kraft Radiata Pine Pulp.

Period of validity:

31/10/2001-31/10/2004

Initially certified since: 08/1995

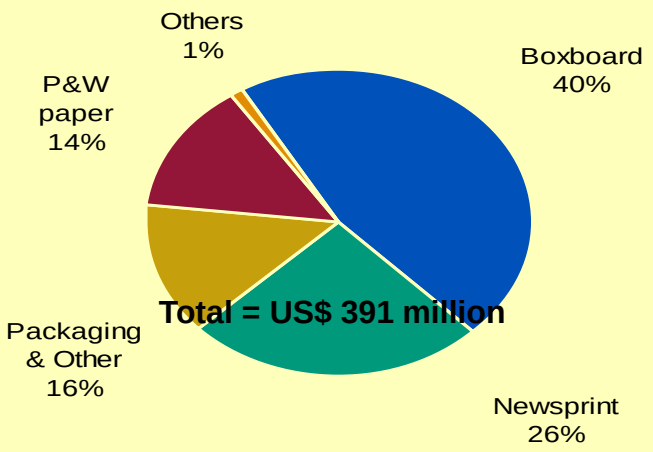
ISO 9001 SGS

BEL CERT

Paper Division

Subsidiaries:	**Cartulinas CMPC** **Inforsa** **Papeles Cordillera** **Edipac** **Sorepa**
Facilities:	**2 Boxboard mills** **1 Newsprint mill** **1 Packaging paper mill** **1 P&W paper mill**
Products:	**Boxboard, newsprint, liner medium, sack kraft, and others**
Total Capacity*:	**80,000 tons/y (P & W)** **230,000 tons/y (Packaging)** **190,000 tons/y (Newsprint)** **210,000 tons/y (Boxboard)**
Total Assets*:	**US$ 729 million**
Total Sales:**	**23%**

Paper Sales Breakdown



Tissue Division

Main Subsidiaries:	**CMPC Tissue Chile** **LPP Argentina** **Protisa Peru** **Ipusa Uruguay**
Facilities:	**2 Tissue mills - Chile** **2 Tissue mills - Argentina** **1 Tissue mills - Peru** **1 Tissue mills - Uruguay**
Products:	**Napkins, toilet paper, kitchen towels, diapers and others**
Total Capacity*:	**223.000 tons**
Total Assets*:	**US$ 623 million**
Total Sales:**	**22%**

Strenghts:

- **Largest tissue company in LA**
- **Extensive distribution network**
- **Broad market segmentation**
- **Strong brand recognition**

IT complexity

- Similar business and operational process but in several different configurations
- Heterogeneous process control environment
- Many sites in different countries
- Heterogeneous market, i.e: products and order size.

Requirements for a RTSC Framework

- Increase profits
  - Enabling mills to produce more cost-effectively and wise use of mill resources.
- Empower operations workforce
  - Leverage their expertise by providing consistent, relevant, on-time and role based information
- Short Cycle Time
  - The speed at which products move through a mill also dictates how rapidly transactions must be processed to enable the feedback actions to assure the operational performance.

Requirements for a RTSC Framework

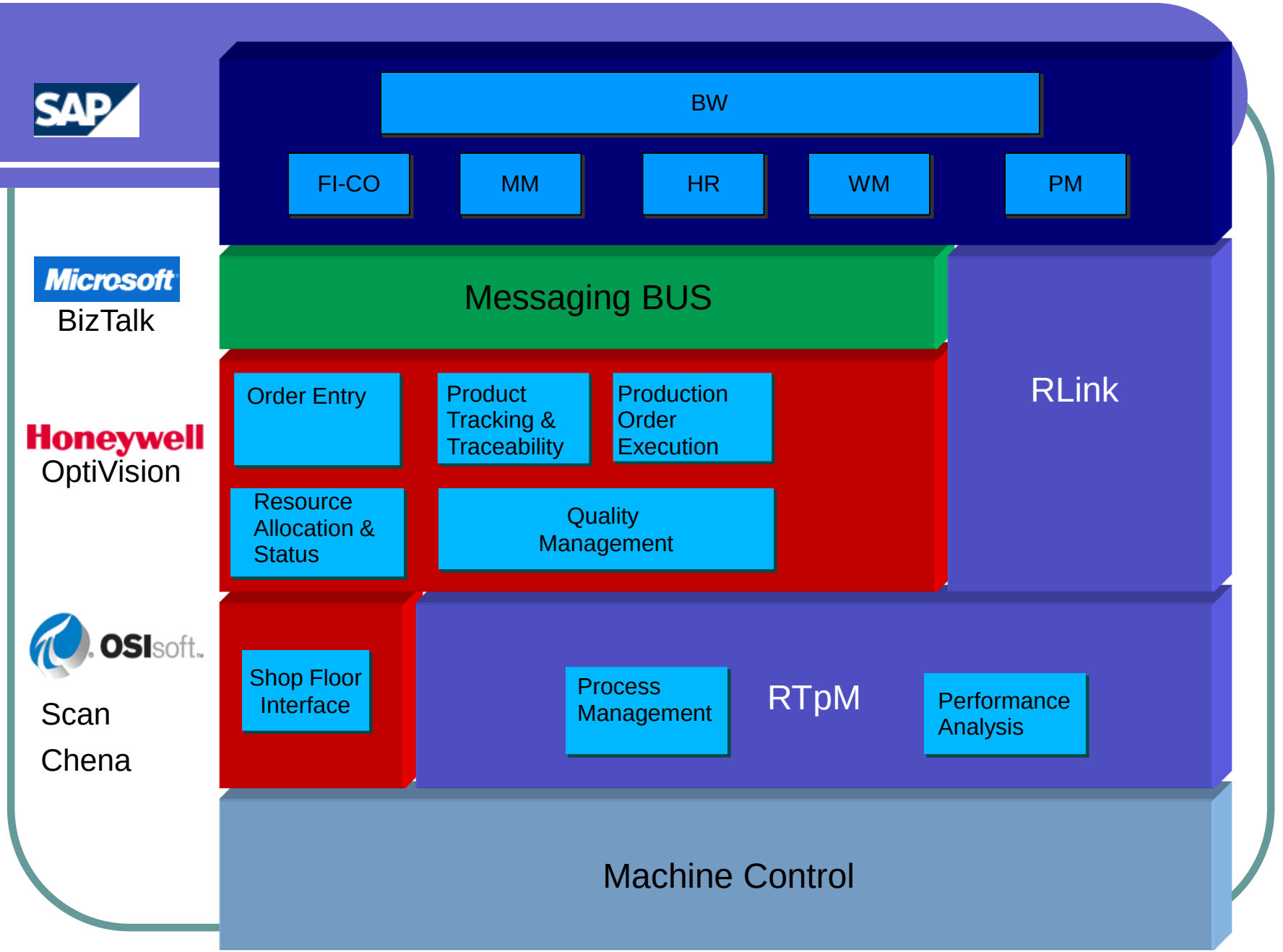
- An integrated set of functions and technologies that provides a smooth information path from the order entry down to operational execution.
- Functions and technologies focused in operational excellence, leveraging the contribution of people, assets and resources

Requirements for a RTSC Framework

- After an evaluation process a set of key infrastructure technologies was selected for the mission critical functions:
  - SAP R3 Suite, transactional backoffice backbone, including financials, materials.
  - PI RtPM and PI-Rlink, integration of Real Time data, RT information infrastructure, Operation Excellence applications support.
  - Microsoft, integration middleware
  - Honeywell OptiVision, MES: order entry, order scheduling, Quality and order tracking.

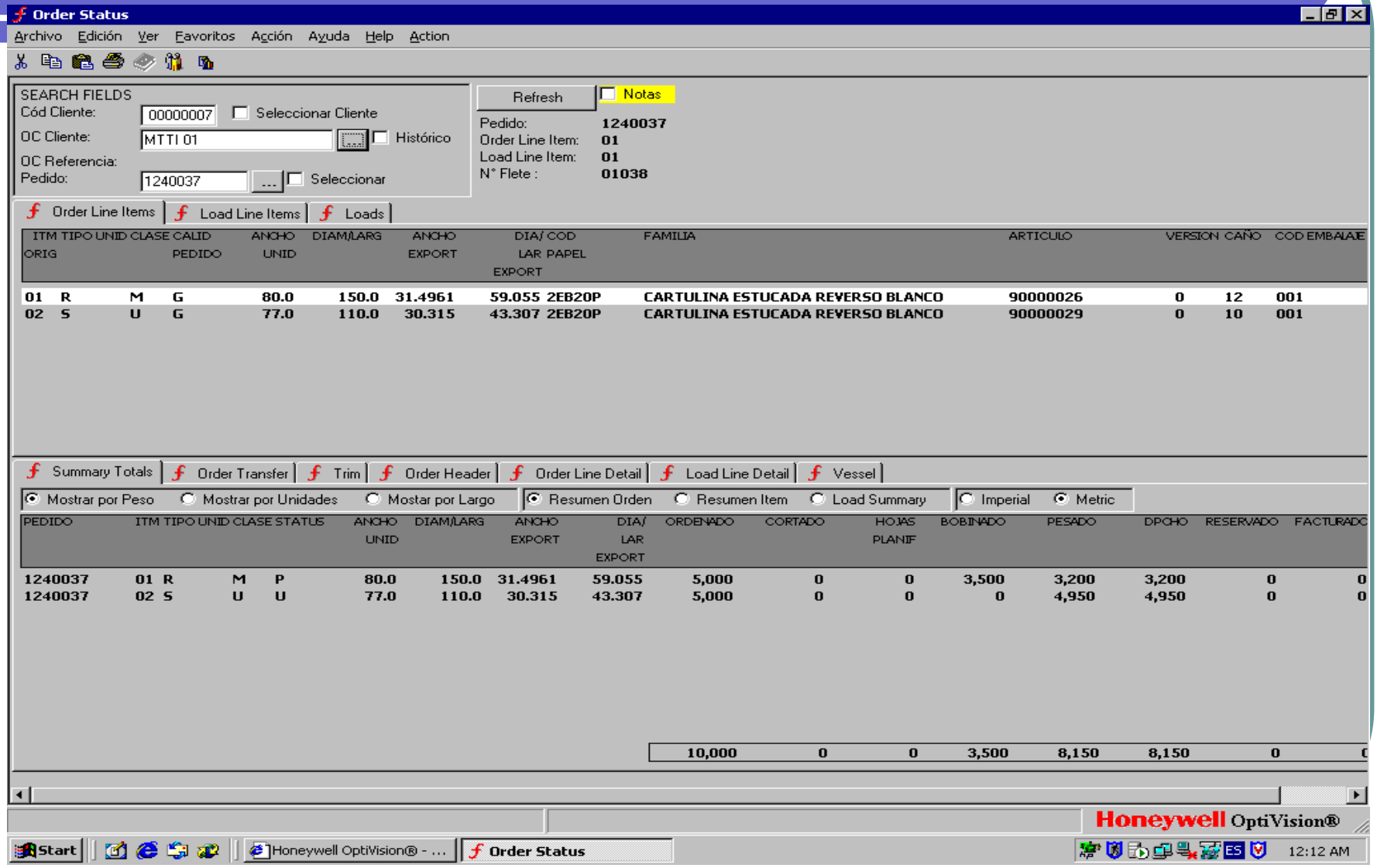
Requirements for a RTSC Framework

- Also, use the PI RtPM infrastructure to support advanced analytical applications towards operational excellence:
  - **Chena**, On Line analysis of the pulp, model based online evaluation indexes of the operations
  - **SCAN**, off line & on line advanced statistics for process analysis and characterization

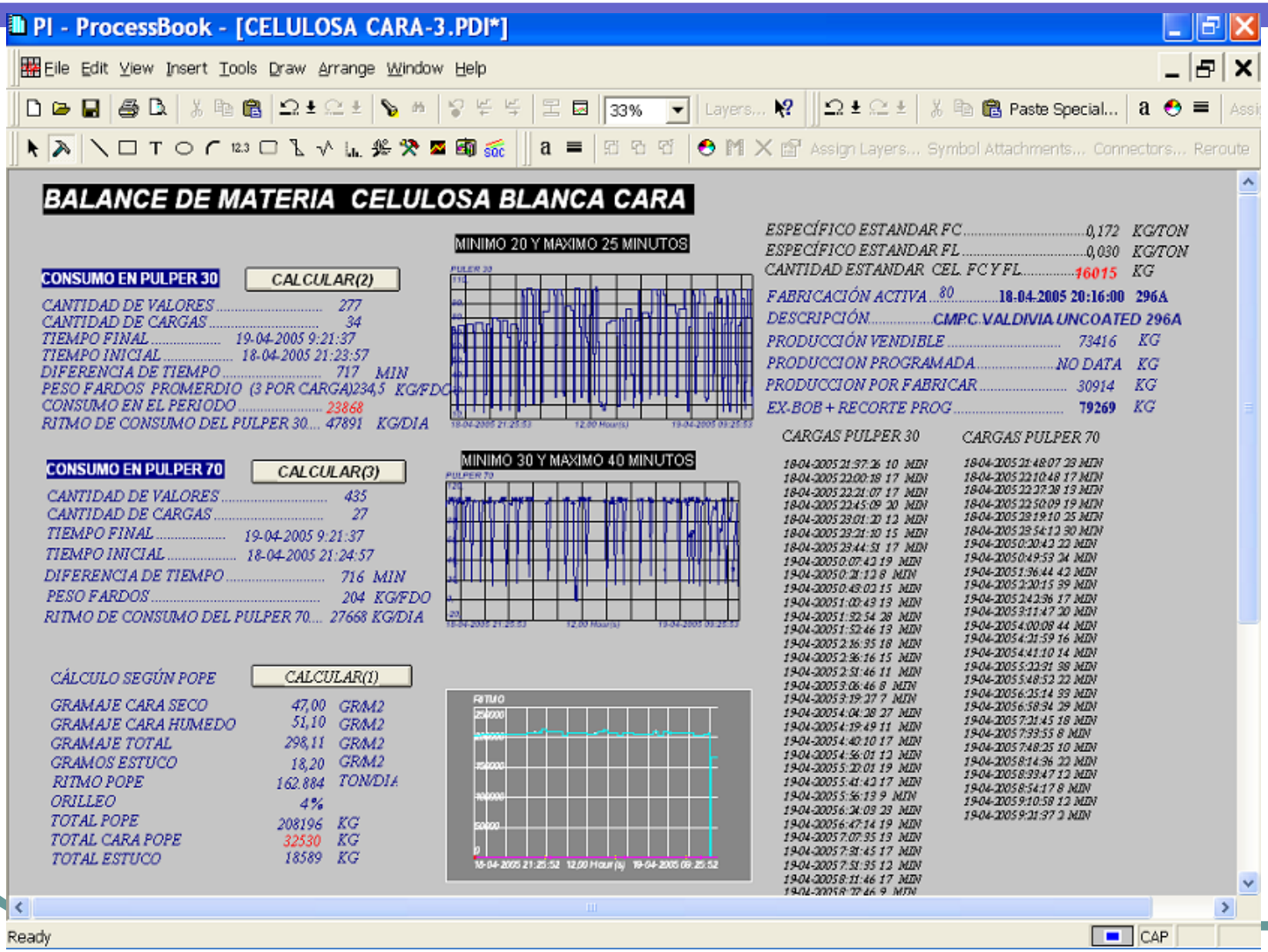

SAP
BW
FI-CO
MM
HR
WM
PM
Microsoft
BizTalk
Messaging BUS
Order Entry
Product Tracking & Traceability
Production Order Execution
RLink
Honeywell
OptiVision
Resource Allocation & Status
Quality Management
OSIsoft
Shop Floor Interface
Process Management
RTpM
Performance Analysis
Scan
Chena
Machine Control

Examples

Real Time Order Status (MES)



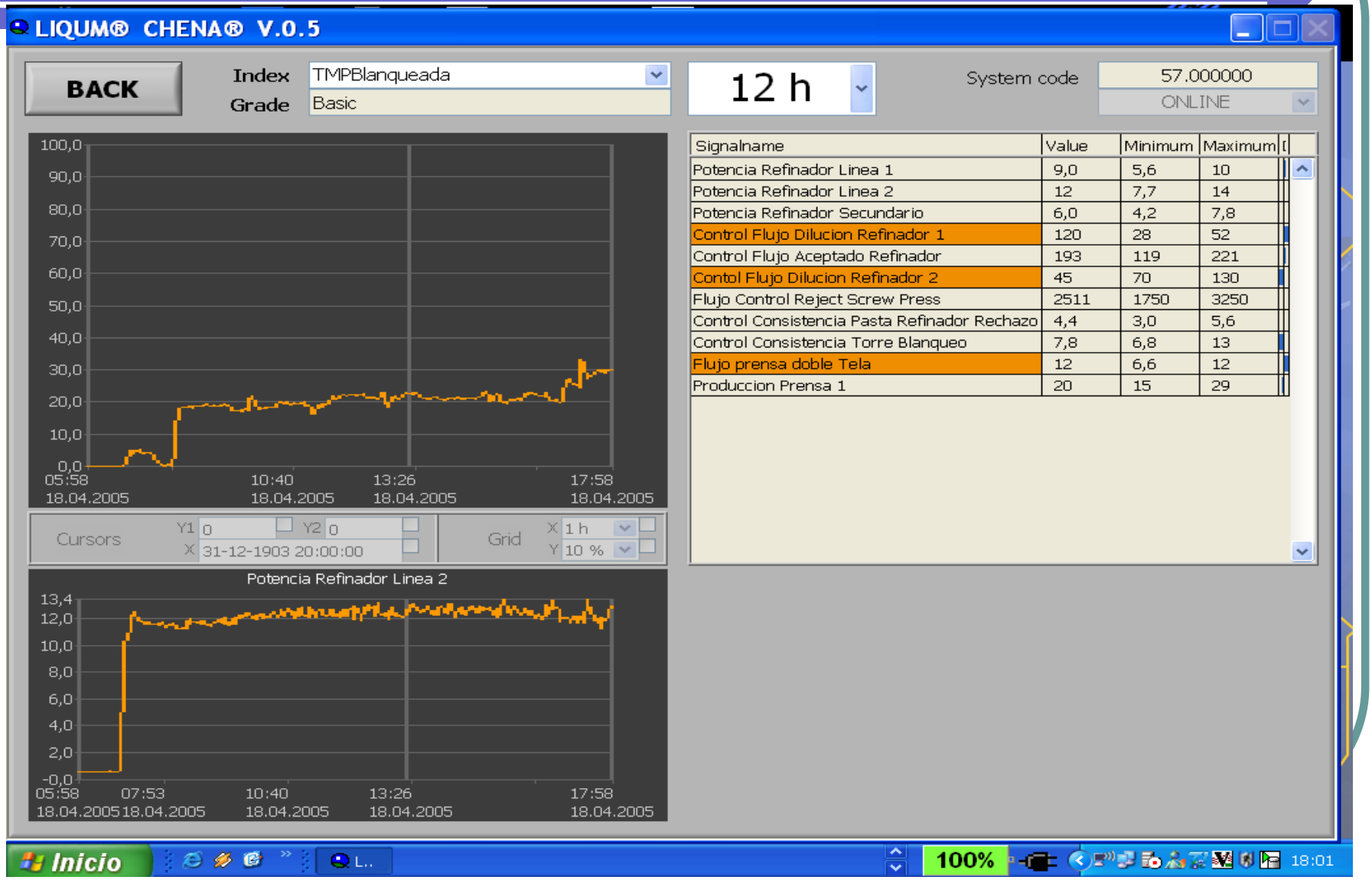
RT Raw Material Consumption



RT Process Indexes, “CHENA”

- Obtains behavioral patterns by neuronal nets, extracting PI data to generate indexes that summarizes and describes the performance of each stage of the process.
- In addition, it has two units of analysis of the electrochemical pulp conditions entering the paper machine.
- Gives a fast vision of the state of the plant.
- It provides an early alert warming of variables escaping normal patterns, with the option to correct it quickly before a fault develops.

RT Process Index



Scan

- It’s a Multivariate Analysis Software.
- Allows the correlation of data stored in PI System, generating behavioral models for data variability.
- Data Link/Excel Add In for the offline tool, PI-ACE for the online models.
- Can generate cross correlation models for large sets of variables.
- Can generate empirical models for variables allowing analysis of the deviations (residuals) from the measurements (model based process supervision).

How the SCAN system works

Pattern´s Models can be built using the historical data and the SCAN offline tool, Excel/DataLink add-in

↓

Models can be downloaded to PI-ACE

↓

Using PI ACE & MDB standard management tools, Input Tag´s and Output Tag´s can be defined for each model.

↓

Models runs in PI-ACE, reading data from PI and sending estimations, indexes, predictions back to PI

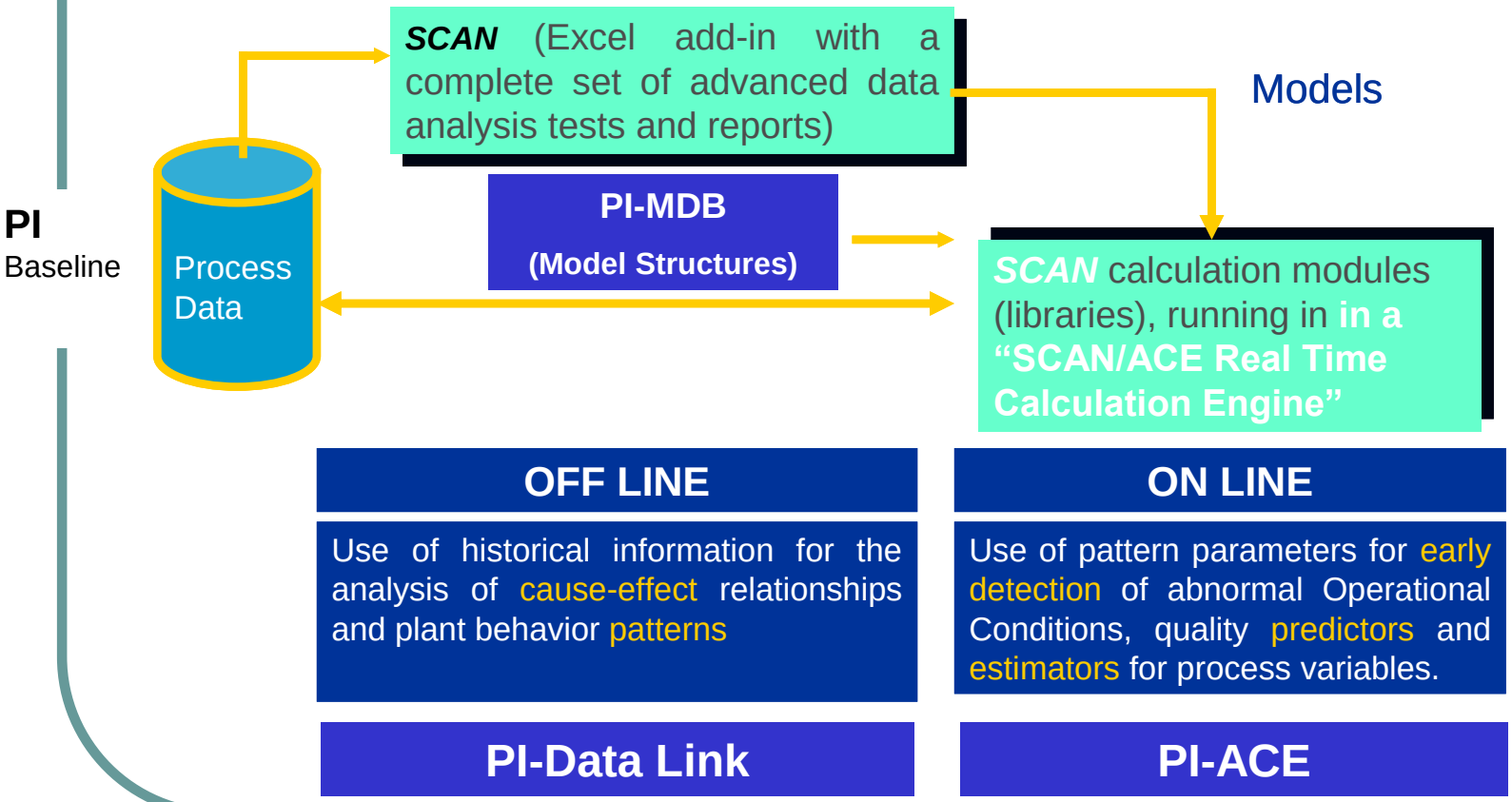
→

Since model results are sent back to PI, all the power of PI can be used for displaying, reporting, alarming, etc.

A user oriented Off Line Modeling (PI-DataLInk) and a Run Time Online tool (PI-ACE)

Scan Structure, schematically

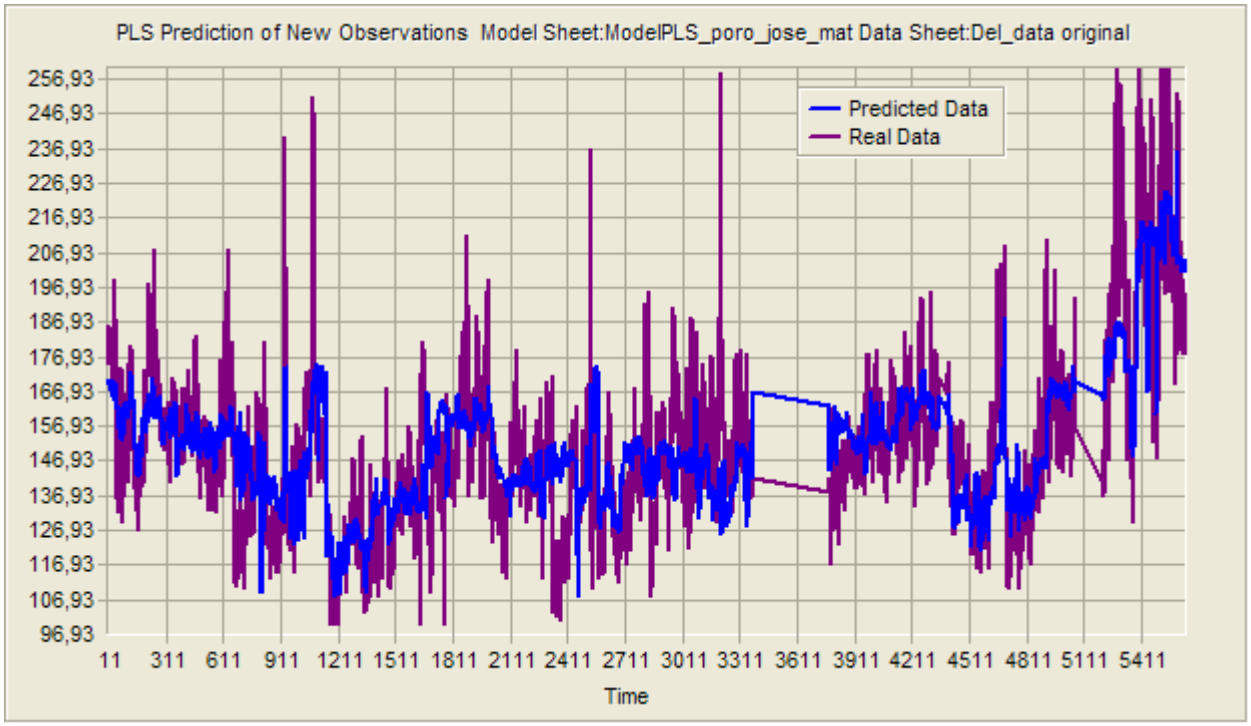
Scan Structure



SCAN project objectives:

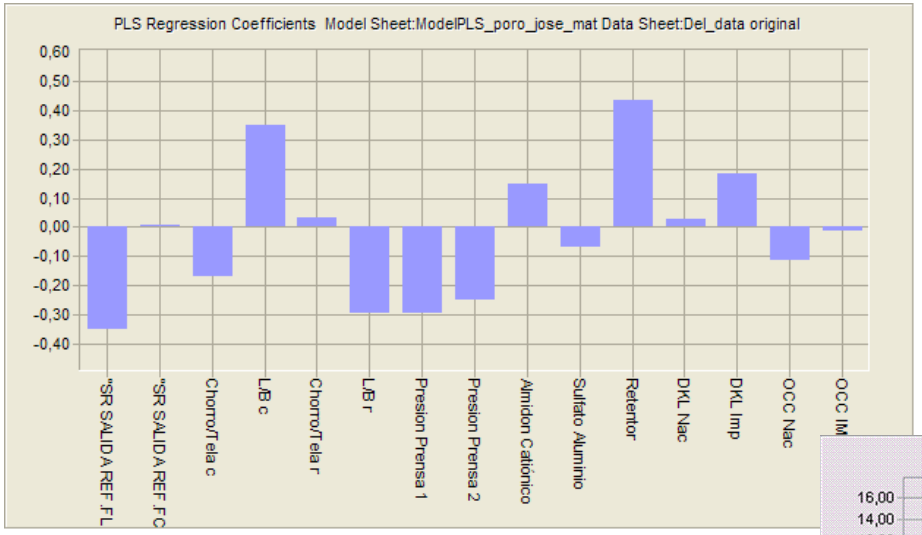
- Generate a Multivariate (off line &on line) empirical model for porosity
  - Predict its evolution and enable the operators to react before it goes out of specification.
  - Support and correlate the operator's knowledge and experience with (formal) analytical indexes .
  - To use the variability models (PCA clustering) as an indirect estimator of exogenous factors like the raw material properties.

SCAN, Porosity Control

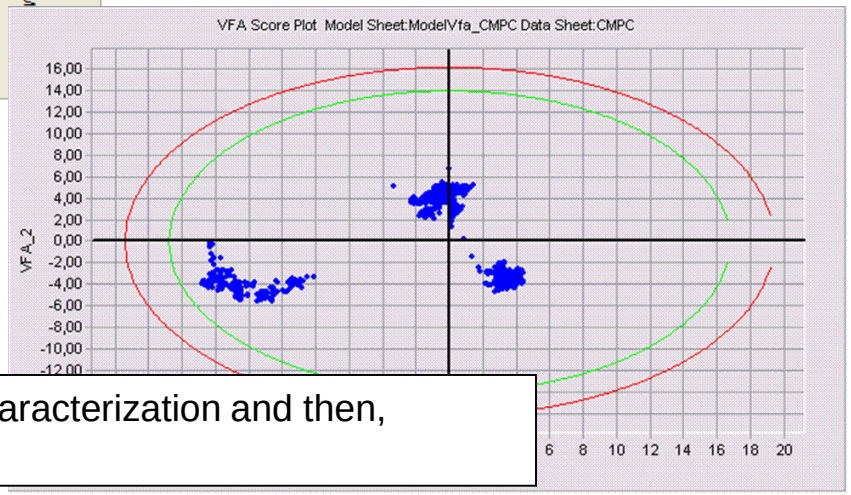


An Online (empirical) model running in **PI-ACE** allows for the prediction of the porosity.

SCAN



SCORES for each measured variable shows its relative incidence on the Porosity, Actual and predicted.



Clustering: allows for product characterization and then, deviation analysis.

Conclusions

- Flexible and extensible model for CMPC's pulp and paper business
- Provide a smooth integration of the real time information and the transactional one, providing role based windows to the relevant information
- Full business and operational process integration

Thank you