Data Validation Module Supporting Real-time Decision-Making Process

Processes America Advisor
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Agenda

- **About CEMEX**

- **OSIsoft History at CEMEX**

- **Cement Production Model**

- **Problems and Challenges to overcome**

- **Production Data Validation (DVM)**

- **Conclusions**

About CEMEX

CEMEX is a growing global building-solutions company that produces, distributes, and markets **Cement, Ready-Mix Concrete, Aggregates**, and related building materials throughout the Americas, Europe, Africa, the Middle East, and Asia, in more than 50 countries, and maintains trade relationships in approximately 102 nations.

A global industry leader
- Annual sales of US$14.98 billion
- One of the leading cement manufacturers in the world
- World's leading supplier of ready-mix concrete, and one of the world's largest suppliers of aggregates
- One of the world's top traders of cement and clinker
- Close to 44,000 employees worldwide

OSIsoft History at CEMEX

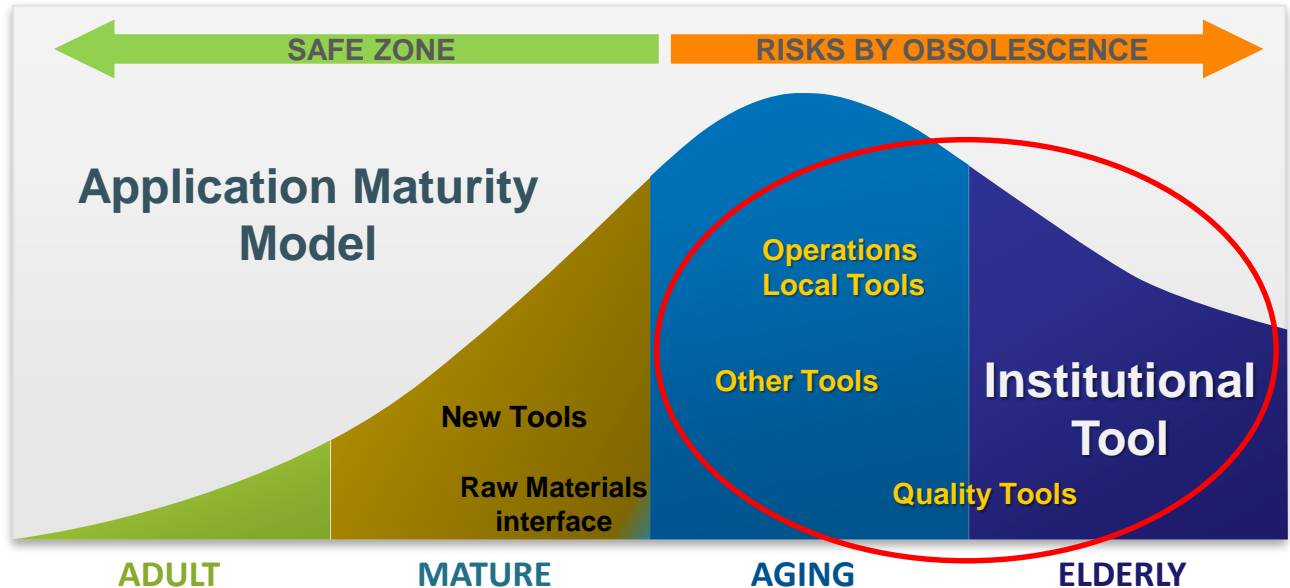| 1995	1995-2004	2005 - 2006	2007 - 2008	2009 - 2010	2011 - 2013
First PI System Installed	**Expanding PI System Installs**	**Enterprise Agreement**	**Worldwide PIMS Project**	**PI Infrastructure as Enterprise Platform**	**Cement Production Management**

Agreement – Access to Industry Principals, Center of Excellence, Software, etc.

Cement Production Model

The problem to overcome

SAFE ZONE

RISKS BY OBSOLESCENCE
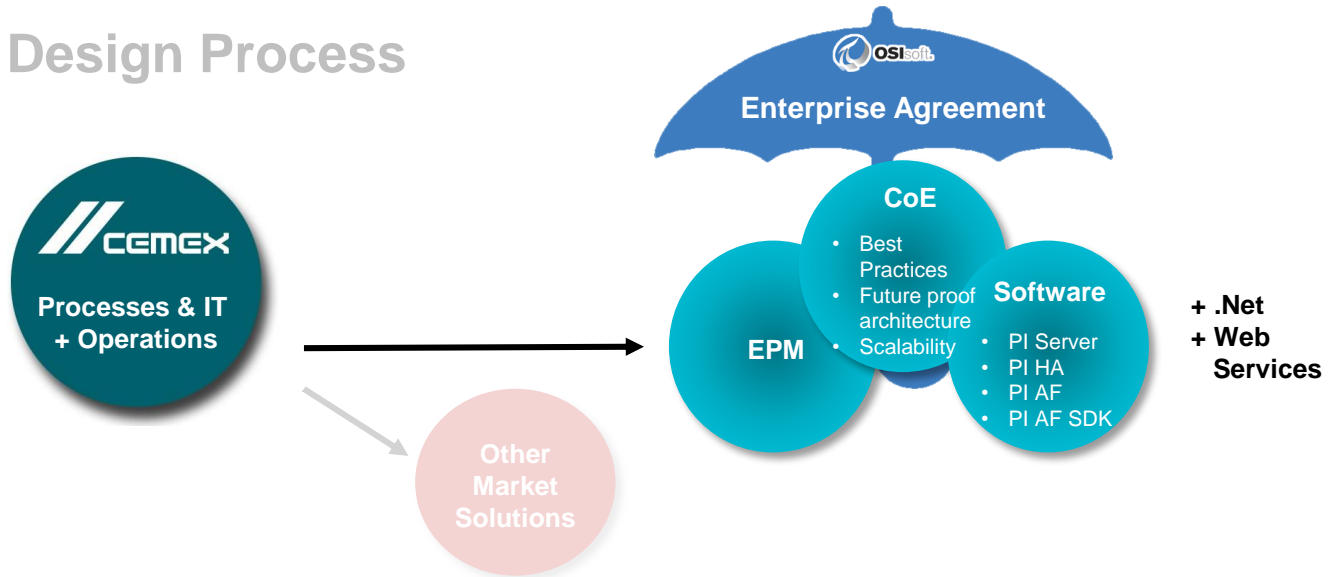
Application Maturity Model

Operations Local Tools

Other Tools

Institutional Tool

New Tools

Raw Materials interface

Quality Tools

ADULT

MATURE

AGING

ELDERLY
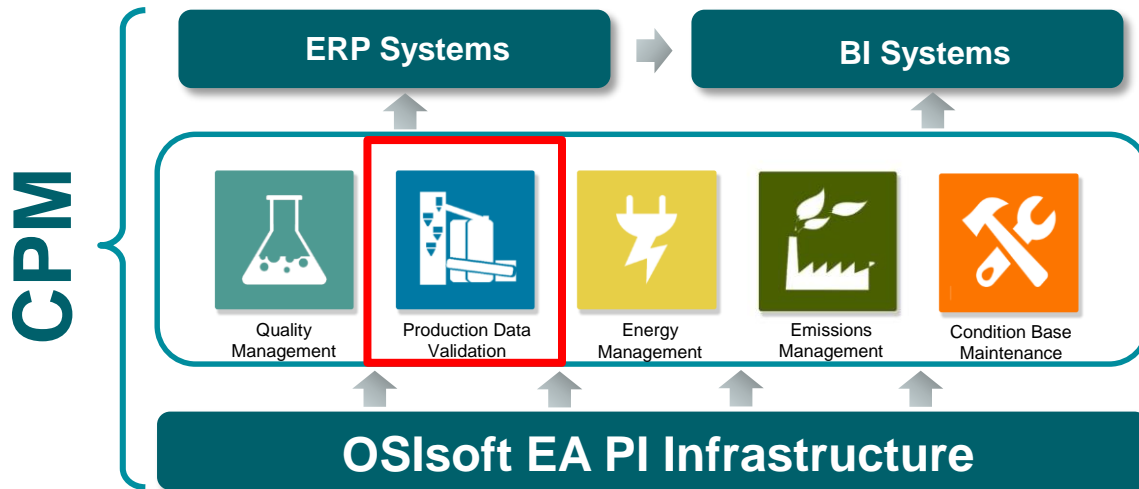
The Challenge

@ Cement Business

- **20 year old platform**
- **Manual data**
- **Non standard validation process**
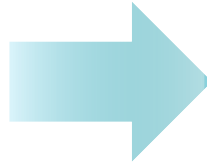
- **New reliable platform**
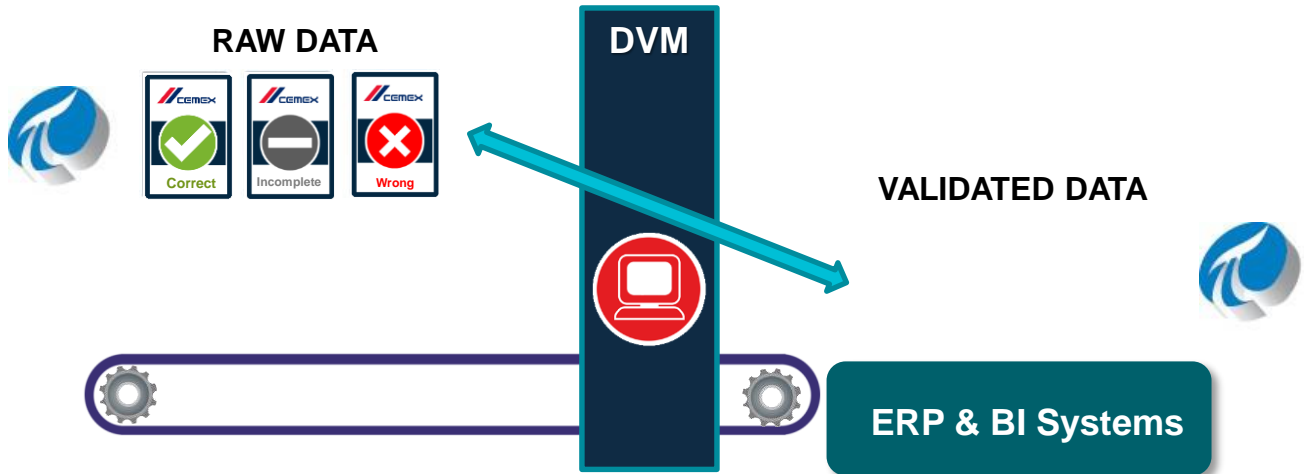- **Automatic Data in Real time**
- **Faster validation and reconciliation**

Production Data Validation (DVM)

Design Process

CEMEX
Processes & IT + Operations

Other Market Solutions

Enterprise Agreement

CoE
- Best Practices
- Future proof architecture
- Scalability

EPM

Software
- PI Server
- PI HA
- PI AF
- PI AF SDK

+ .Net
+ Web Services

Production Data Validation (DVM)

Functionality

RAW DATA

Correct
Incomplete
Wrong

DVM

VALIDATED DATA

ERP & BI Systems

Production Data Validation (DVM)

Architecture
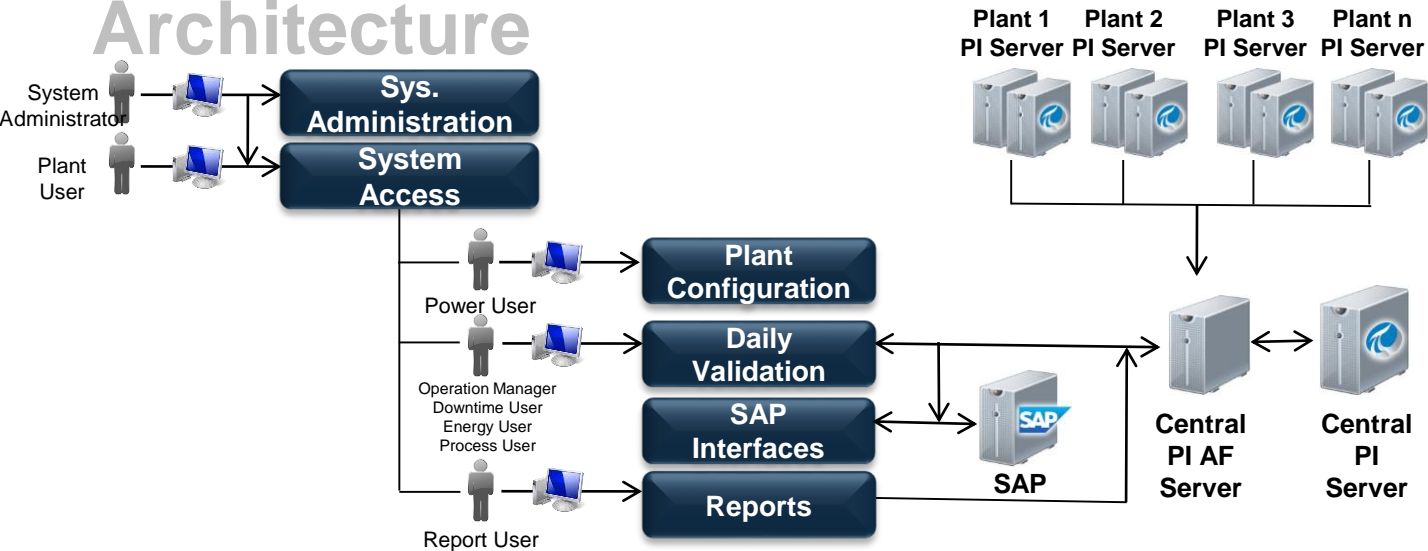
Production Data Validation (DVM)

Sys. Administrator	Plant Configuration	Daily Validation	SAP Interfaces	Reports

Equipments
In this page you will be able to create and update equipments.

- PIMS-DVM enables to manage central catalogs
- This assures consistency
- The main catalogs in PIMS-DVM are:

• Users	• Equipments
• Country	• Material Family
• Plants	• Materials
• Equipment Family	

Equipments

✚ Add ⟳

	Equipment Family	Code	Equipment ▲	SAP Equipment Id
⊟ Equipment Family: 100 - Plant (1 Item)				
▢	100 - Plant	10001	Plant	PL01
⊟ Equipment Family: 150 - External Mining (1 Item)				
▢	150 - External Mining	15001	Mining 01	MI01
⊟ Equipment Family: 200 - Quarry (3 Items)				
▢	200 - Quarry	20001	Quarry 01	QR01
▢	200 - Quarry	20002	Quarry 02	QR02
▢	200 - Quarry	20003	Quarry 03	QR03
⊟ Equipment Family: 300 - Crusher (6 Items)				
▢	300 - Crusher	30001	Crusher 01	CR01
▢	300 - Crusher	30002	Crusher 02	CR02
▢	300 - Crusher	30003	Crusher 03	CR03
▢	300 - Crusher	30004	Crusher 04	CR04

Production Data Validation (DVM)

Sys. Administrator	Plant Configuration	Daily Validation	SAP Interfaces	Reports

- The Power User configures the plant site
- Selects equipment, materials and products used within the cement production line
- This process is based on the homologated catalogs
- The main plant administration processes are:

• Equipments	• Operation - Correlate Equipment with materials and products
• Materials	

- *PIMS-DVM has drag and drop capabilities*
- *The AF structure is generated automatically through AF SDK*

Production Data Validation (DVM)
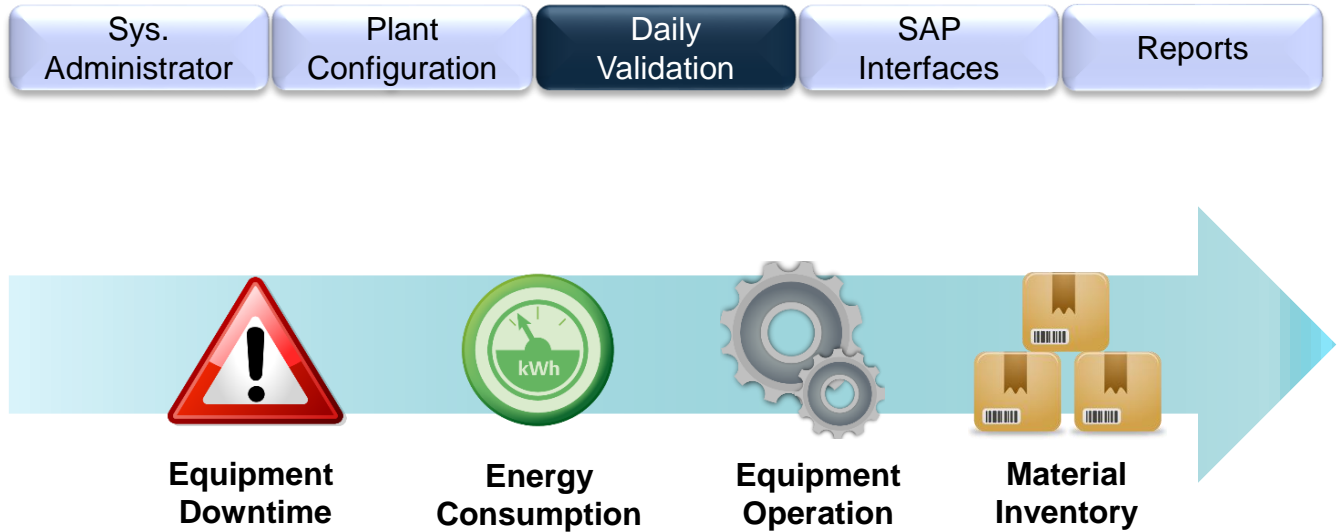
Sys. Administrator	Plant Configuration	Daily Validation	SAP Interfaces	Reports

Equipment Downtime **Energy Consumption** **Equipment Operation** **Material Inventory**

Production Data Validation (DVM)

Equipment Downtime

- Real time downtime events are shown
- Users classify each event and time
- The result will provide the basis of uptime to calculate:
  - Performance KPIs
  - Energy Consumptions
  - Fuel Consumptions
  - Maintenance
- It is possible to schedule future downtime events

Production Data Validation (DVM)

Sys. Administrator | Plant Configuration | **Daily Validation** | SAP Interfaces | Reports

Energy Consumption

- Real time energy consumptions are displayed

- Users validate the daily information and provide insight on:

  - Month to Date consumptions

  - End of Month consumptions

Production Data Validation (DVM)

Equipment Operation

Real time operation data and calculations are shown

- Material Consumption

- Working Hours by product

- Energy consumption by product

- Fuel consumption by product

- Produced Material

- KPIs

Production Data Validation (DVM)

Sys. Administrator	Plant Configuration	Daily Validation	SAP Interfaces	Reports

Material Inventory

- Material balance is achieved in this step

- The previous day inventory from SAP are received as initial inventory

- The user compares physical inventory vs. the calculated inventory

- If all is OK the User closes day validation

Production Data Validation (DVM)

Production Data Validation (DVM)

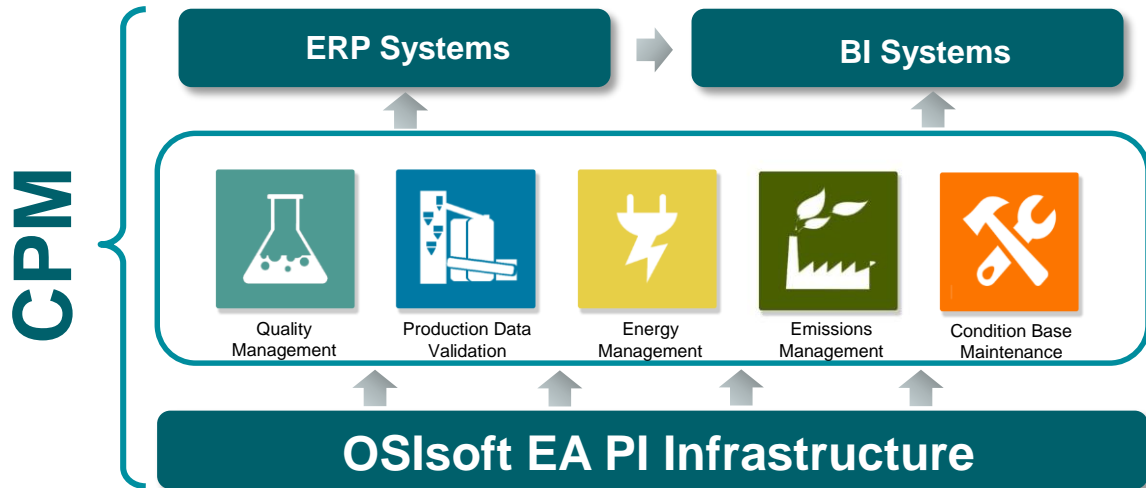| Sys. Administrator	Plant Configuration	Daily Validation	SAP Interfaces	Reports

Reports

- Equipment Operation Report

- Fuel Consumption Report

- KWH Consumption Report

Conclusions: Cement Production Model

Conclusions: Business Value Outcome

- Real time data validated for decision makers

- Easier way for plants to review operational data

- Ensures data accuracy and reliability

- Standardizes validation rules and criteria between all plants

- Maintain evidence and references for future audits

- Reduces further data corrections and inventory adjustments

- TCO reductions

Now we had started to replace old and obsolete tools, meeting the operations needs and reducing the total cost of ownership

THANK
YOU

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