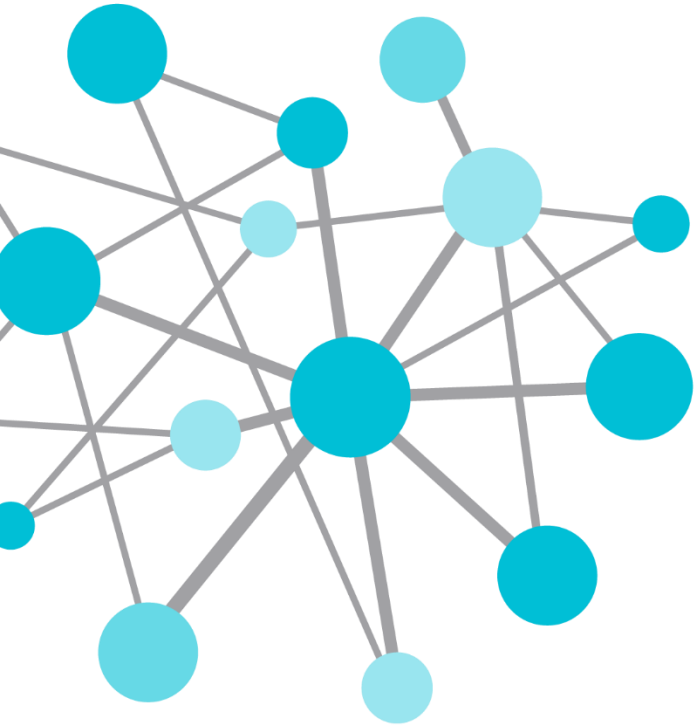
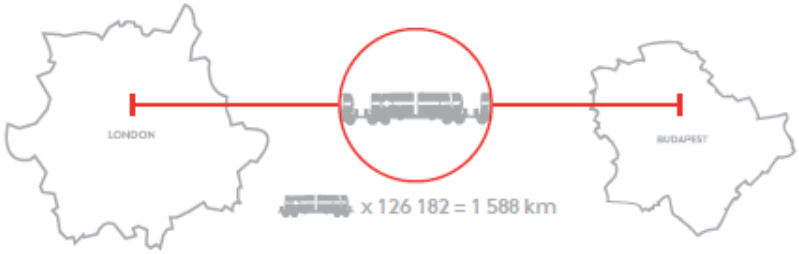


Value Now – Value Over Time

Presented by **Tibor Komróczki MOL Plc**

MOL Group in numbers

50 million barrels
of oil-equivalent hydrocarbons
produced annually



1 million
retail customer transactions/day.
Every year, we serve the equivalent
of the entire population
of South America.

FORTUNE GLOBAL 500

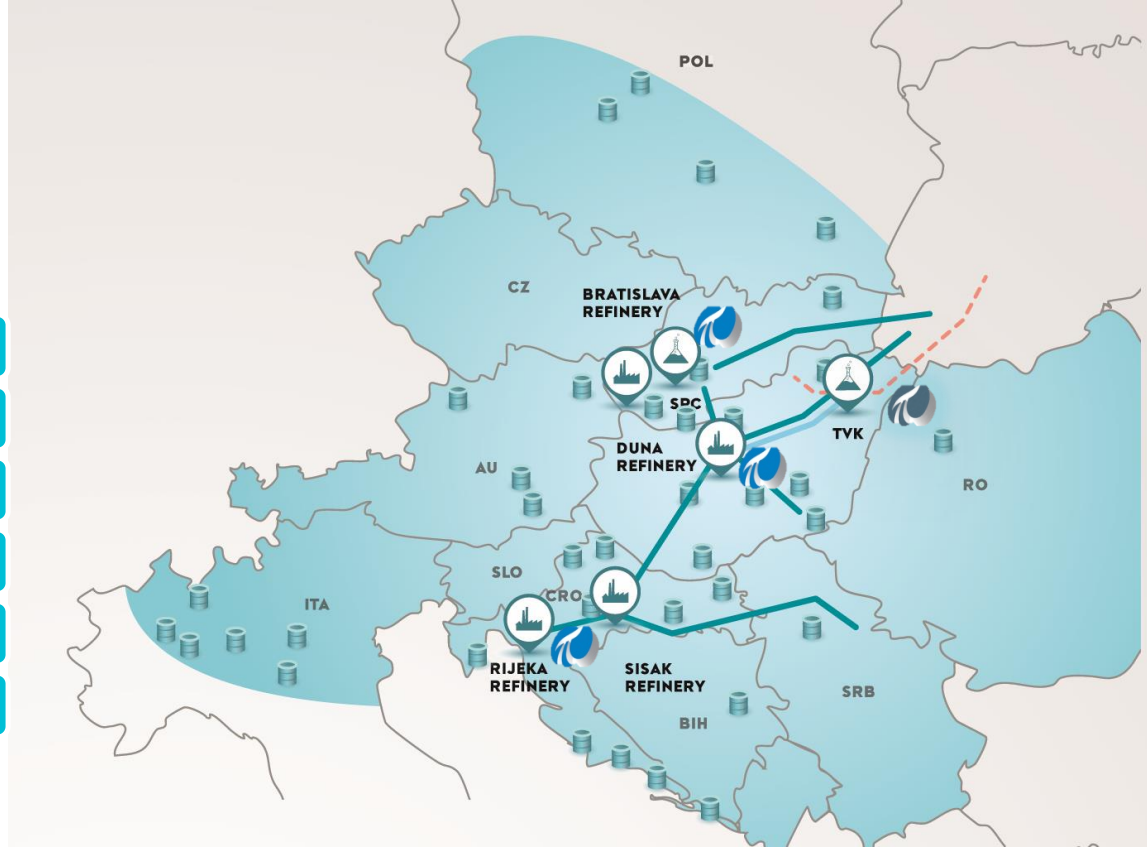
- [410] McDONALD'S
- [411] DANONE
- [412] MOL
- [445] BRITISH AMERICAN TOBACCO
- [467] HEINEKEN

32 000 employees
employed worldwide

could be seated on
1.45 Boeing 787 Dreamliners.

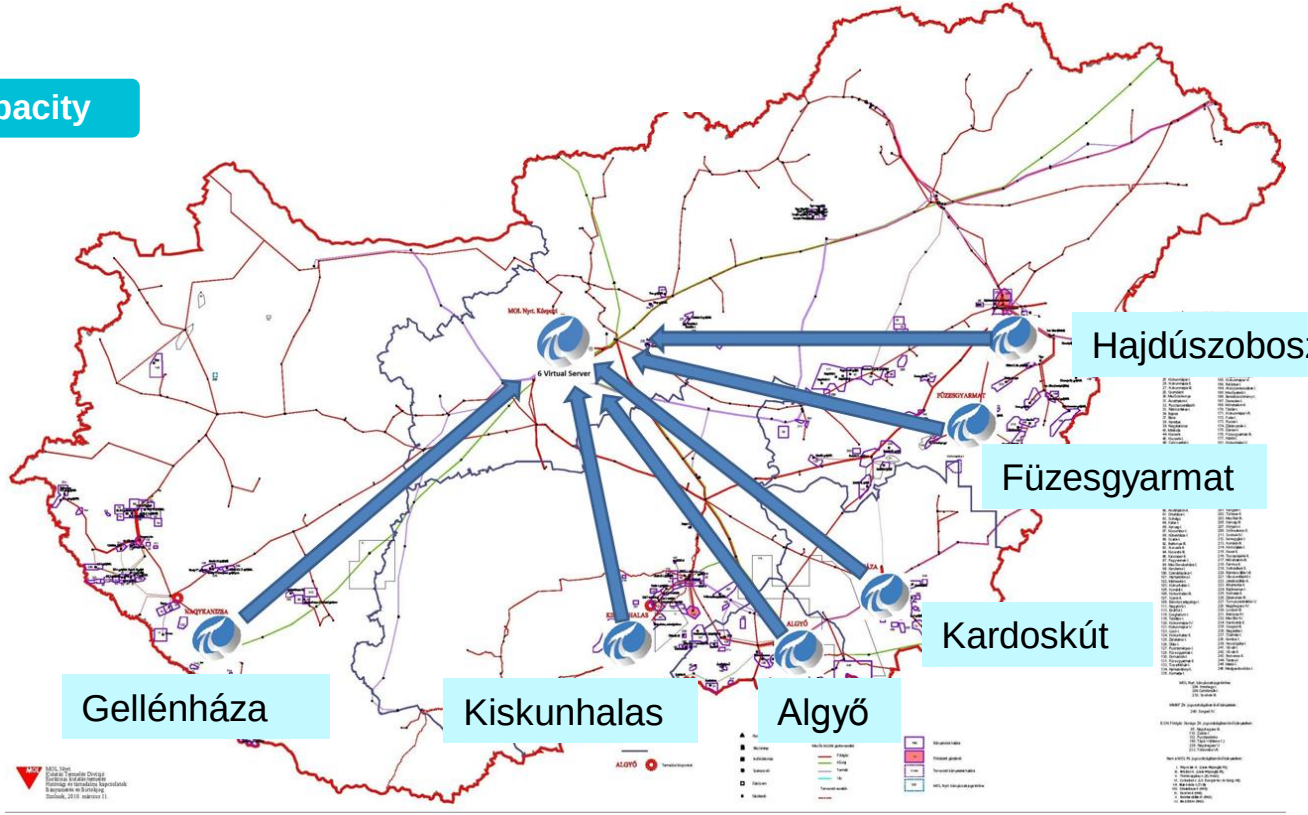
MOL Group Downstream

- 6 production units
- 23.5 mtpa refining capacity
- 2.1 mtpa petrochemicals capacity
- >1,700 filling stations
- under 8 brands in 11 CEE
- **370 000 PI Tag capacity**



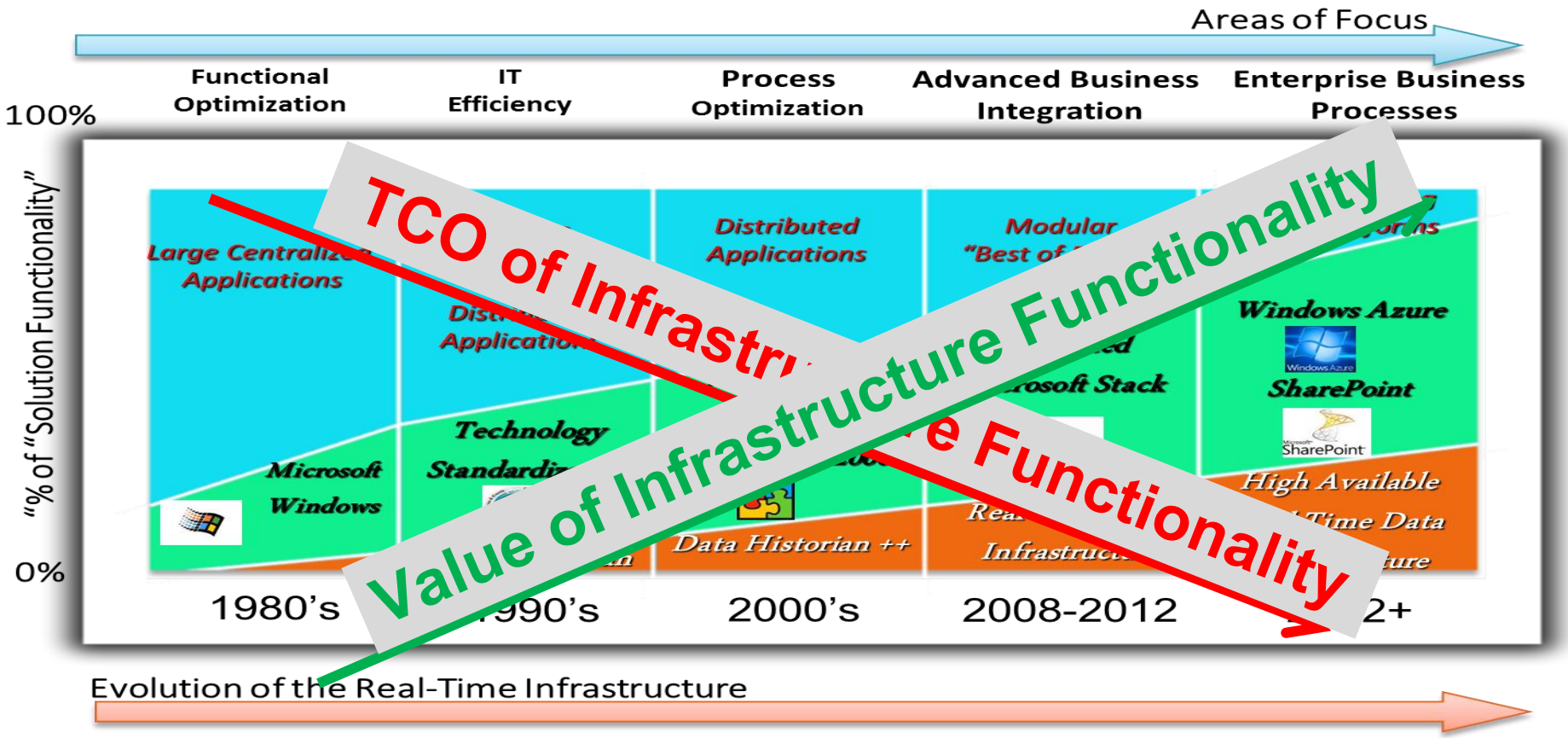
MOL Upstream

72 000 PI Tag capacity



MOL GROUP
PI
PORTFOLIO & HISTORY

Evolution of the Real-Time Infrastructure



PI portfolio in MOL 2014

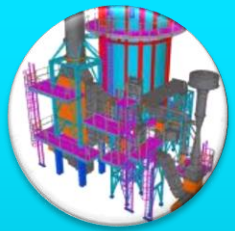
Clients

Publish data via
PI ProcessBook
PI DataLink
PI Coresight
PI WebParts

PI SDK

PI API

Developed applications to support refinery functions



PI Asset Framework

Collect data from the field and create unified asset hierarchy

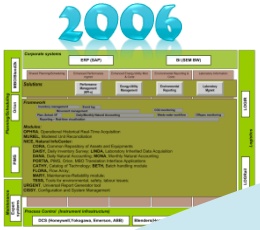
PI Notifications

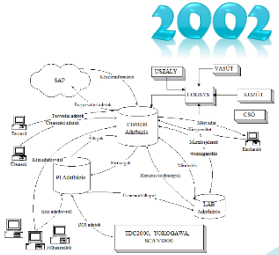
Alerting platform based upon the PI System AF architecture

PI ACE

Write complex equations, which are reusable for similar data sets

PI Evolution in MOL





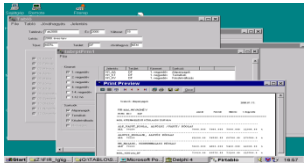
1998

Enterprise

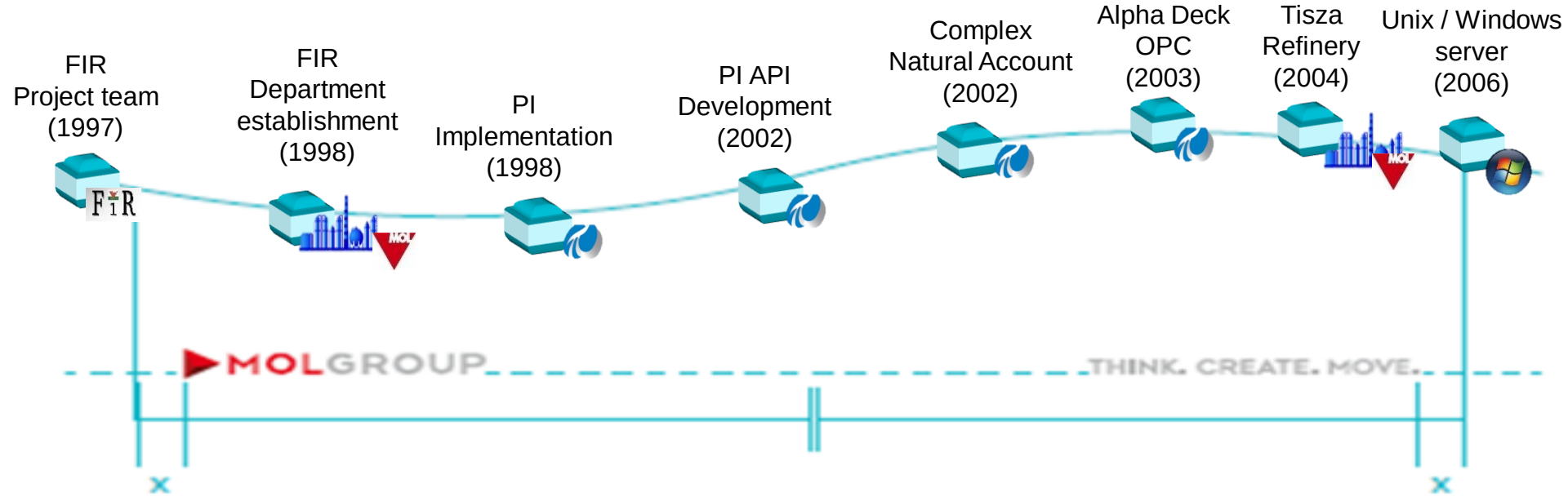
Division

Team

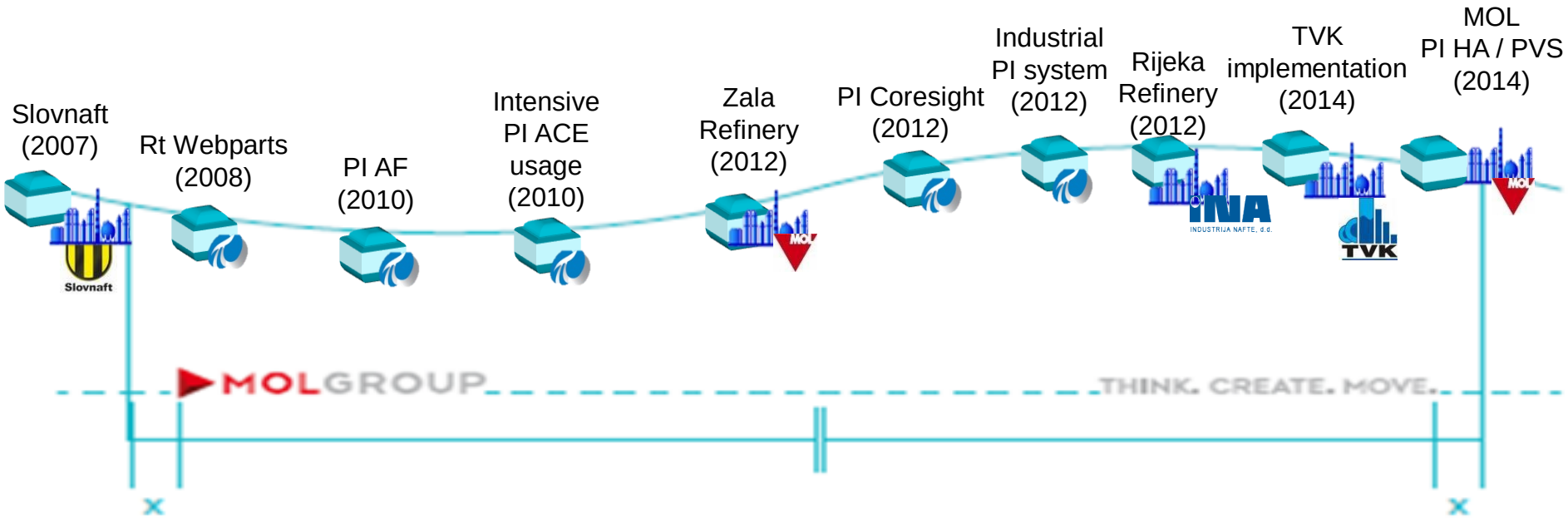
Individual



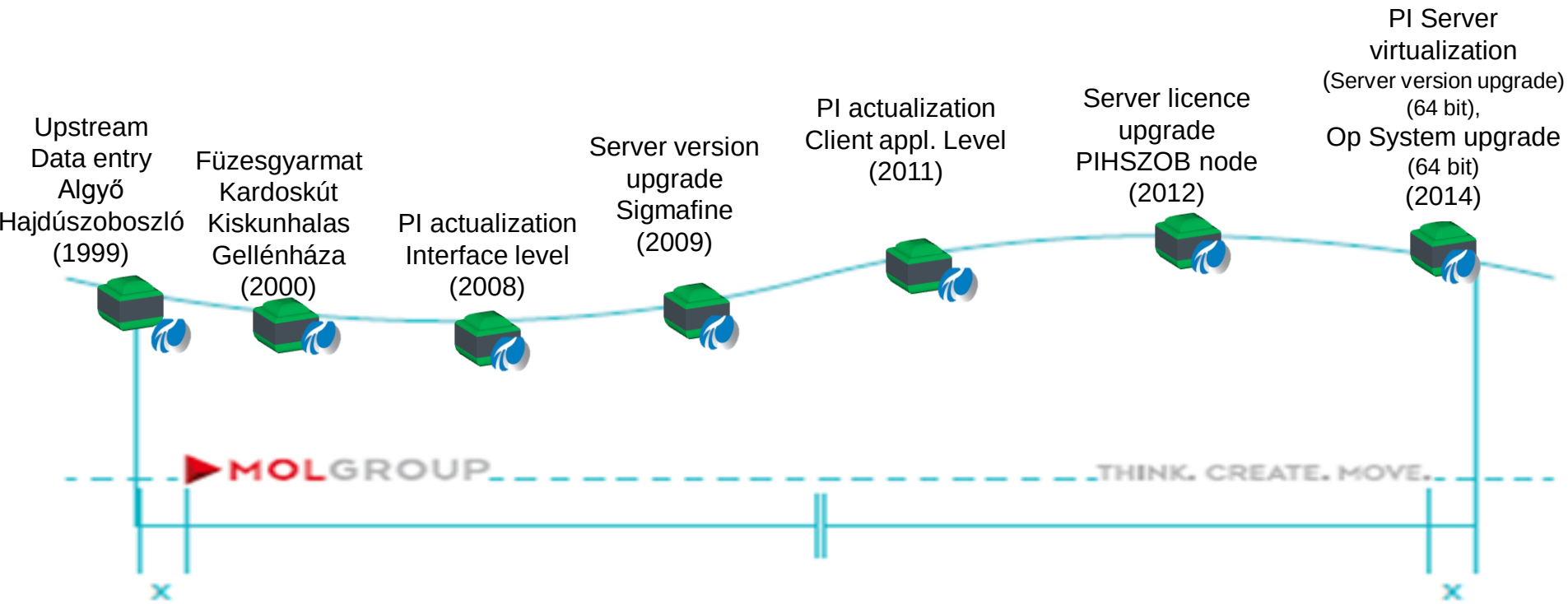
MOL Downstream / History I.



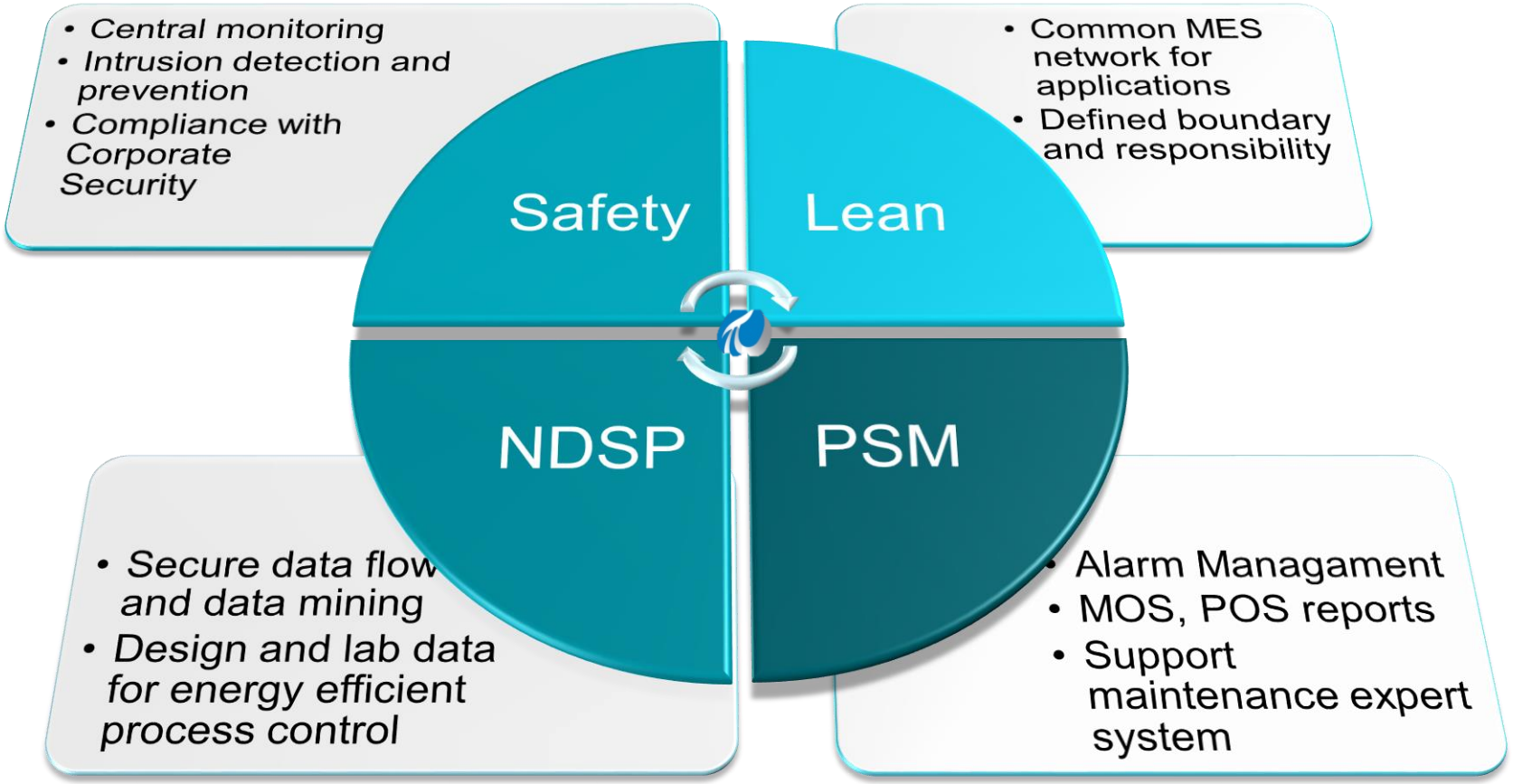
MOL Downstream / History II.



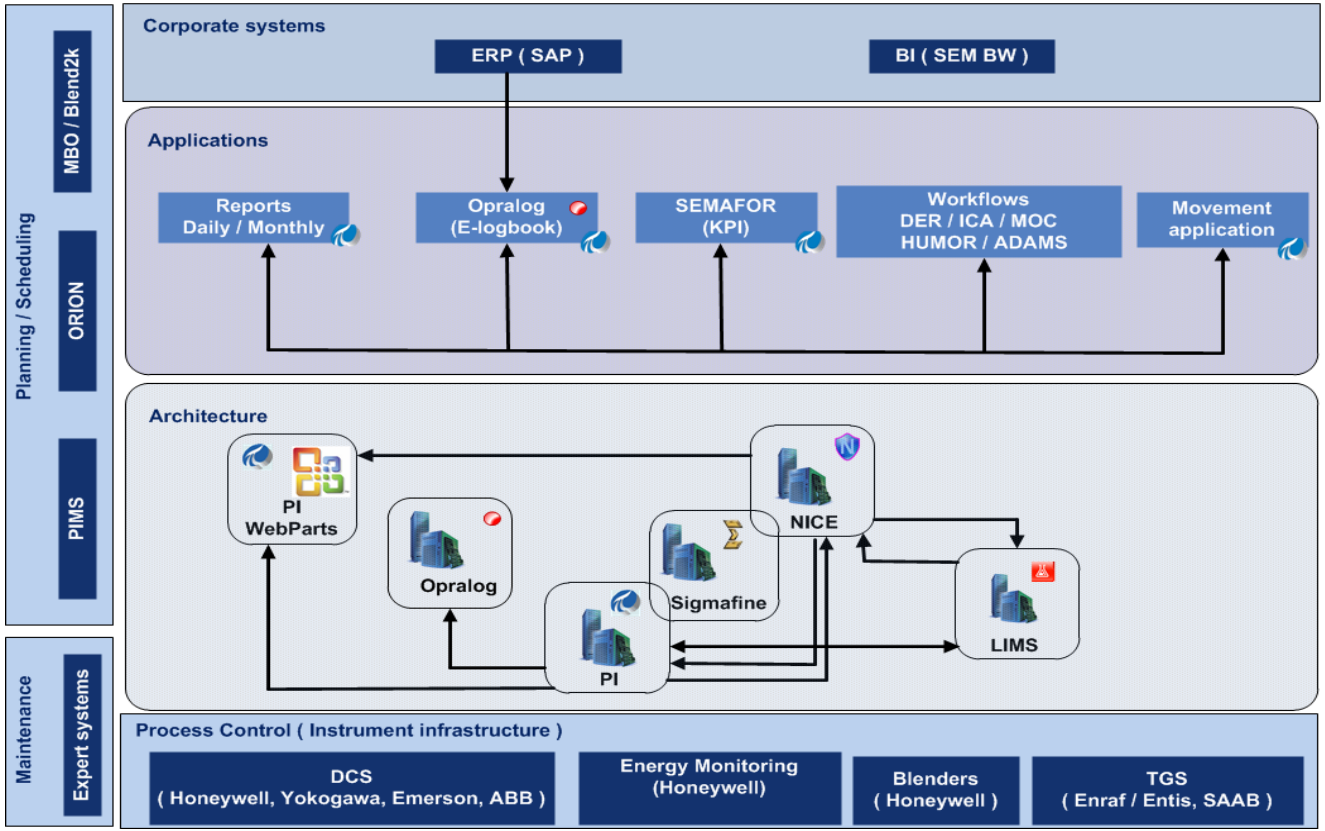
MOL Upstream / History



MOL GROUP STRATEGY SUPPORTED BY PI

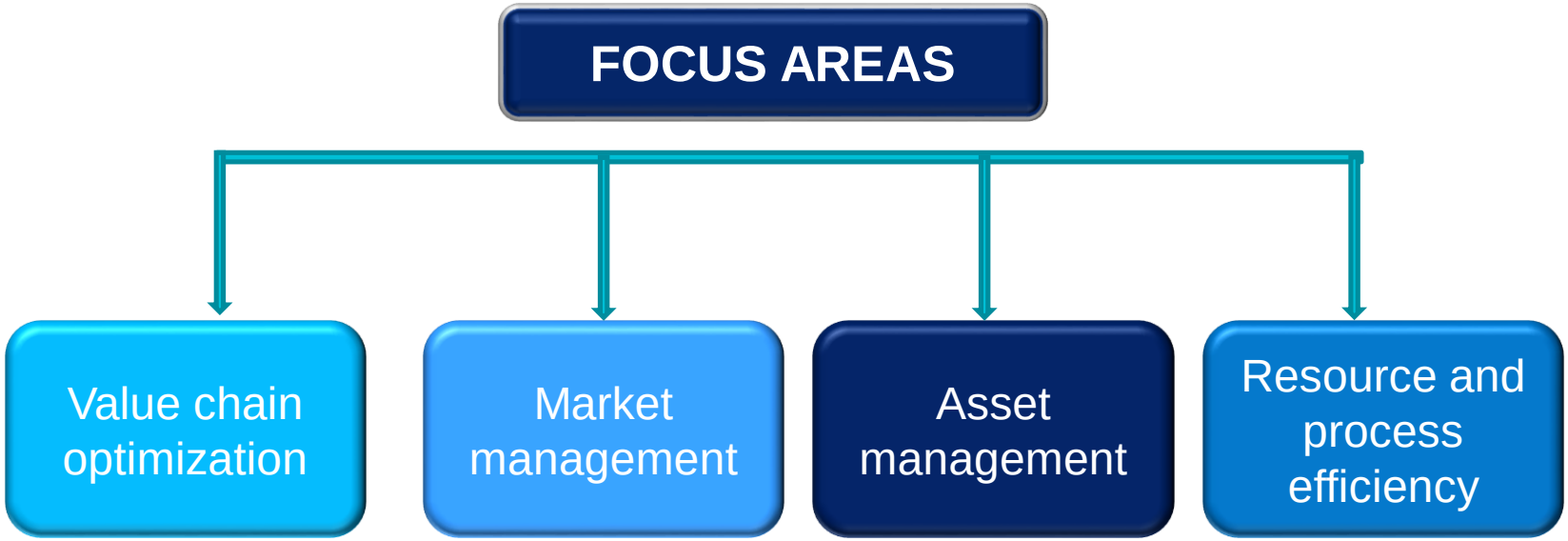


Framework



NEW DOWNSTREAM PROGRAM

New Down Stream Program (NDSP)



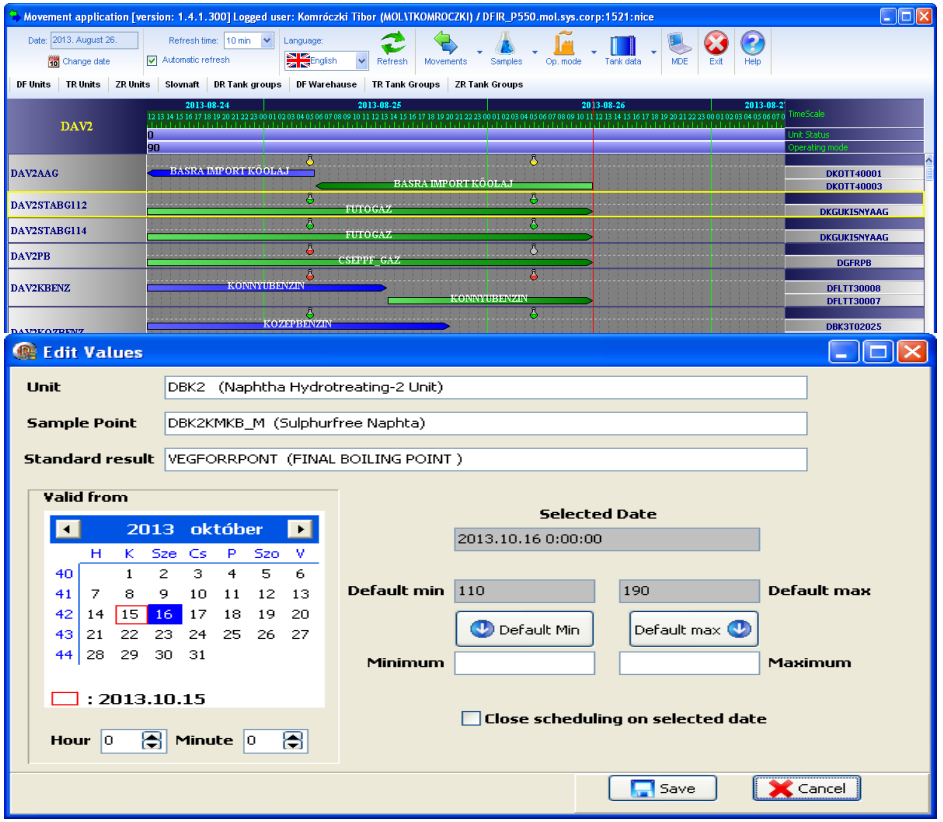
To give an effective response to the current unfavorable global economic and Downstream industry environment, with restoring MOL Plc. top position in efficiency and profitability in Europe, utilizing all synergies of the integrated Downstream operation.

Support to reduce quality give-away

Modifying the lab-PI interface to filter out off-spec qualities automatically based on registered specifications and collecting off-specs automatically

„Flask coloring” happened automatically

good -> green ,
off-spec ->red ,
laboratory limit ->yellow



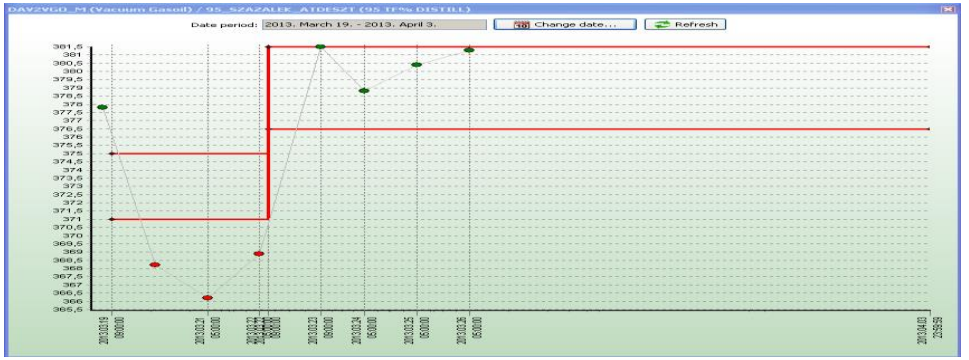
Reduce quality give-away

Lab results and product's specifications can be found in the PI database

All matched data were gathered in Asset Framework for easier examination

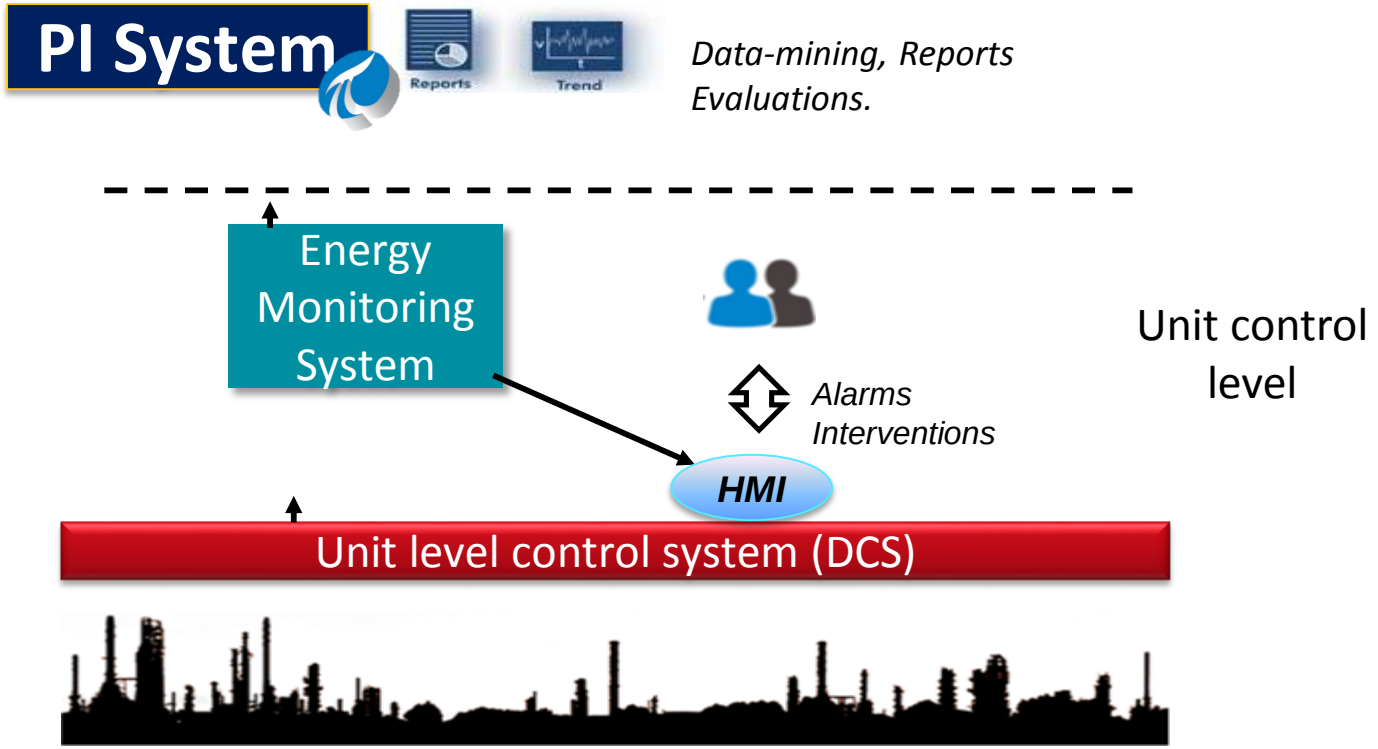
- lab result
- WPP minimum specification
- WPP maximum specification
- APC calculation (if exists)
- on-line analyzer value (if exists)

PI Coresight visualizes the measured quality regarding quality specifications



Energy Monitoring

On-line, **open loop** model based control system. Detects excess energy consumption, and advices corrective interventions to the operators.



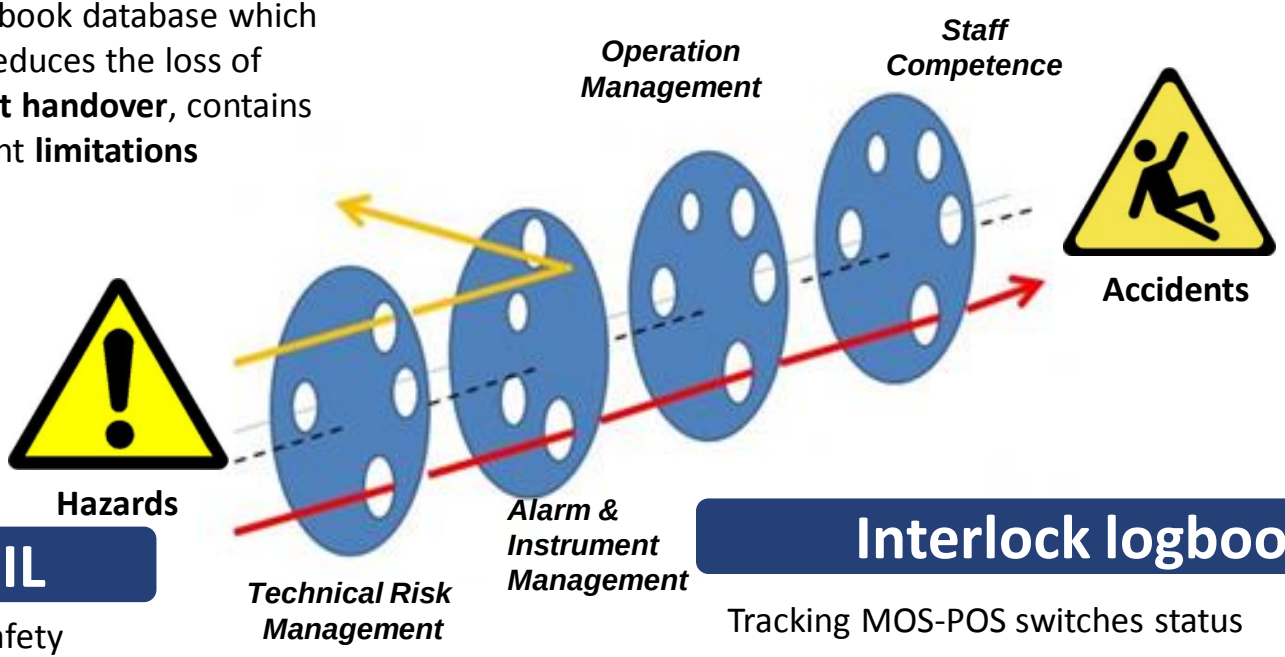
SAFETY SOLUTION

Training

Regular & ad-hoc trainings for engineers, shift leaders,operators etc.

Electronic Shift Logbook

Refinery wide central logbook database which is easily accessible, and reduces the loss of information. Handles **shift handover**, contains **condition checks** and plant **limitations**



EN 61511 SIL

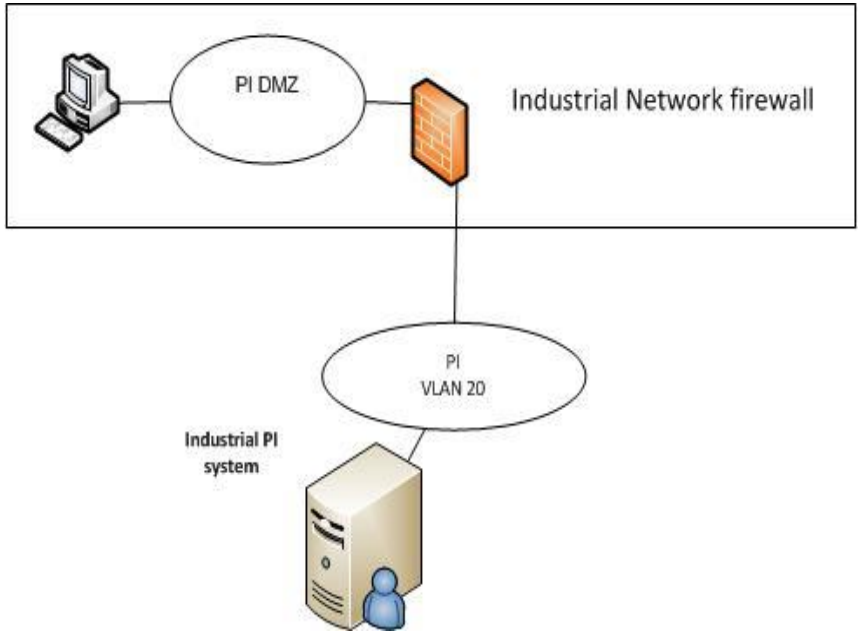
Implementation of SIL safety standard, based on the Seveso II directive.

Interlock logbook

Tracking MOS-POS switches status

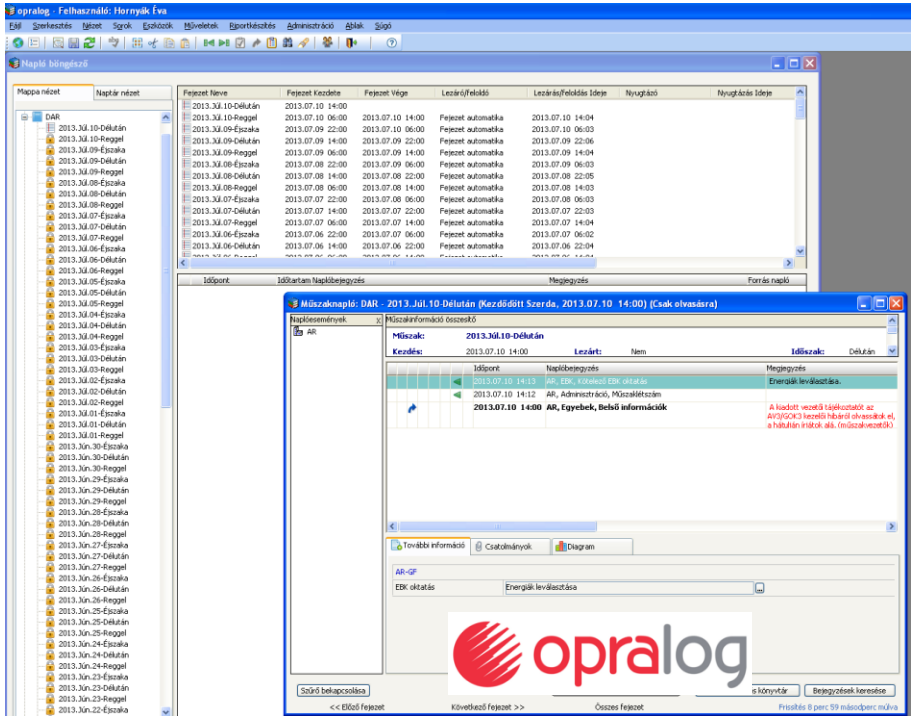
Industrial Network

- Increase the safety and security of Danube Refinery Process Control Systems
- Separate Process Control Network and MOL Business Network
- Implement an "independent Industrial Network
- Central supervision – network intrusion and virus attack detection and prevention
- Redundant servers
- Industrial PI server



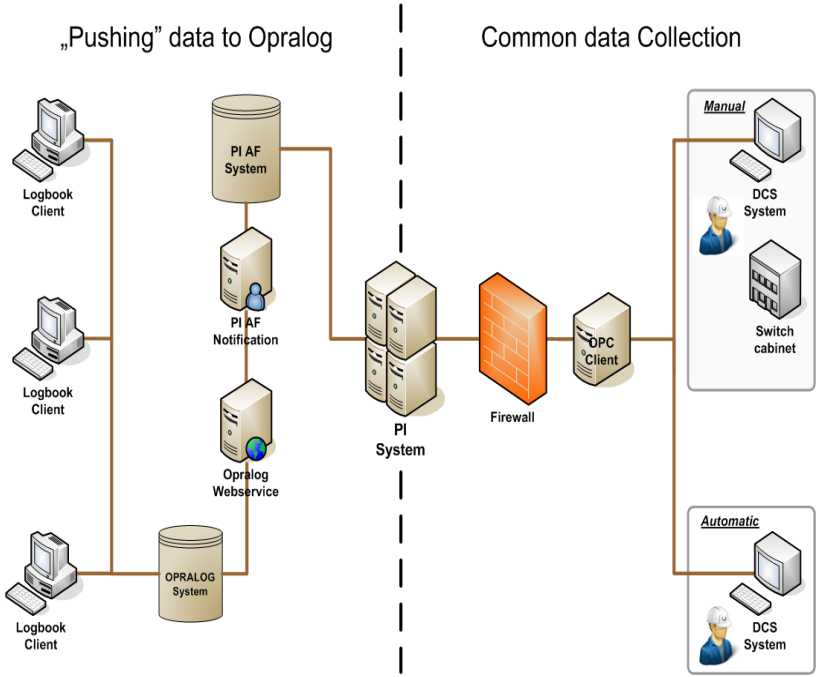
PSM SUPPORT

Electronic Shift Logbook



- Consequent, event based logging
- Information Sharing
- Support audits (PSM, Behavior, IIR, etc.)
- Easier incident investigation
- Highlights problematic fields

Interlock Logbook Migration into Opralog



- Information about the switch (name, description)
- Information about the status (new state, event time)
- Who turned on/off?
- Who permitted?
- What was the reason?

E-Flare report

Goal

- Aim of the project to reduce the losses by 5-10 % supported by a full PDCA cycle establishment

Root causes

- ~22 kt gas was burned by the flares in 2013

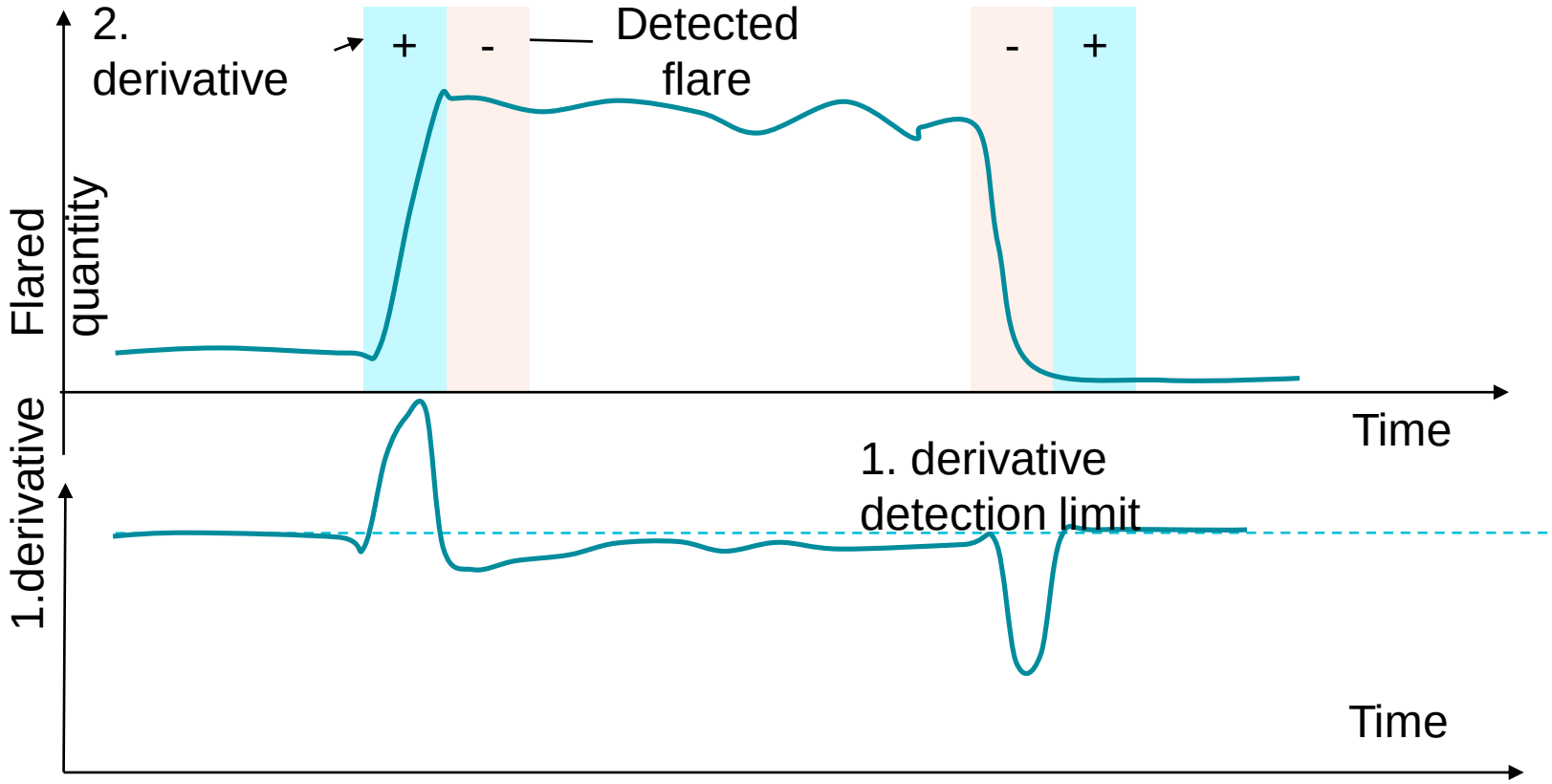
Cost effect

- ~1.4 thousand million HUF

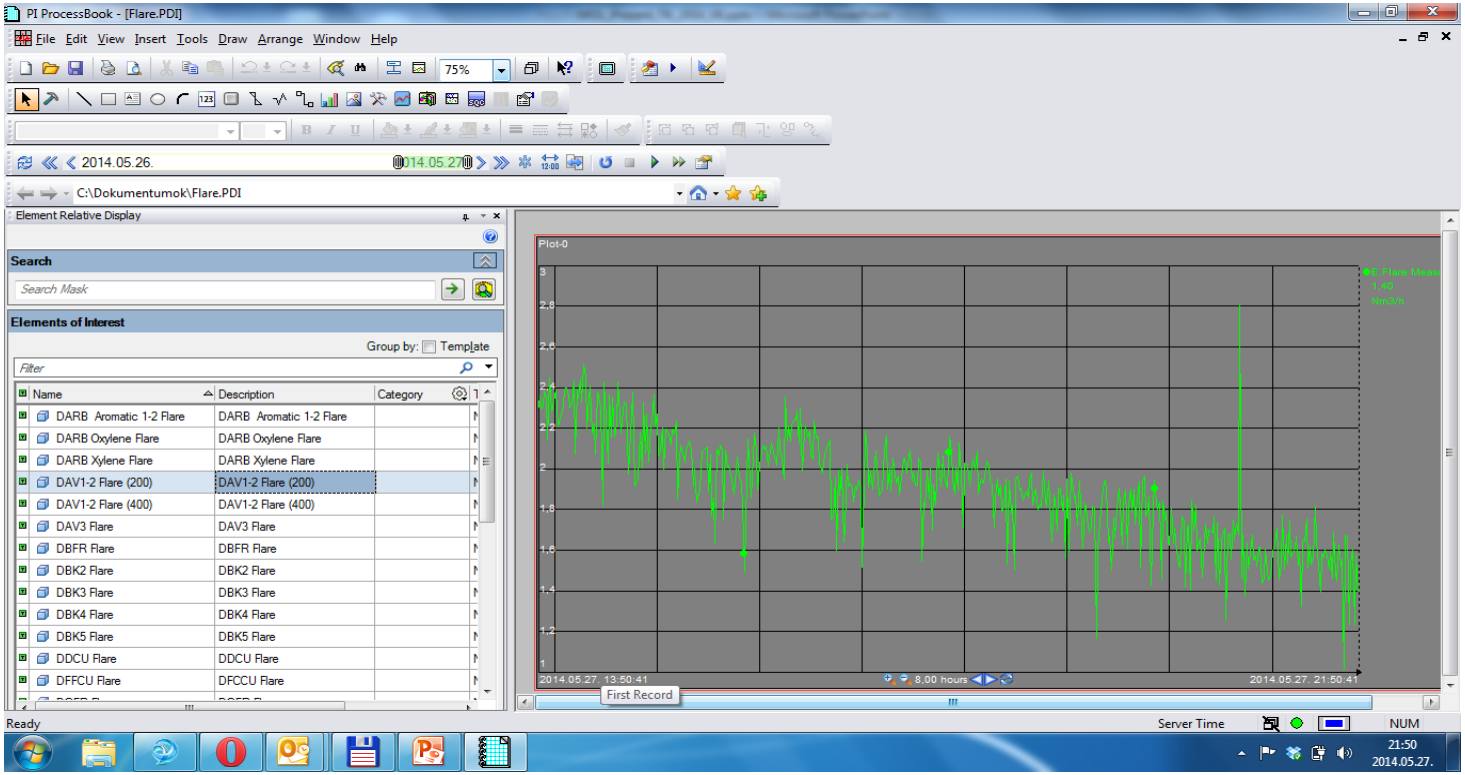
Other

- HSE obligation

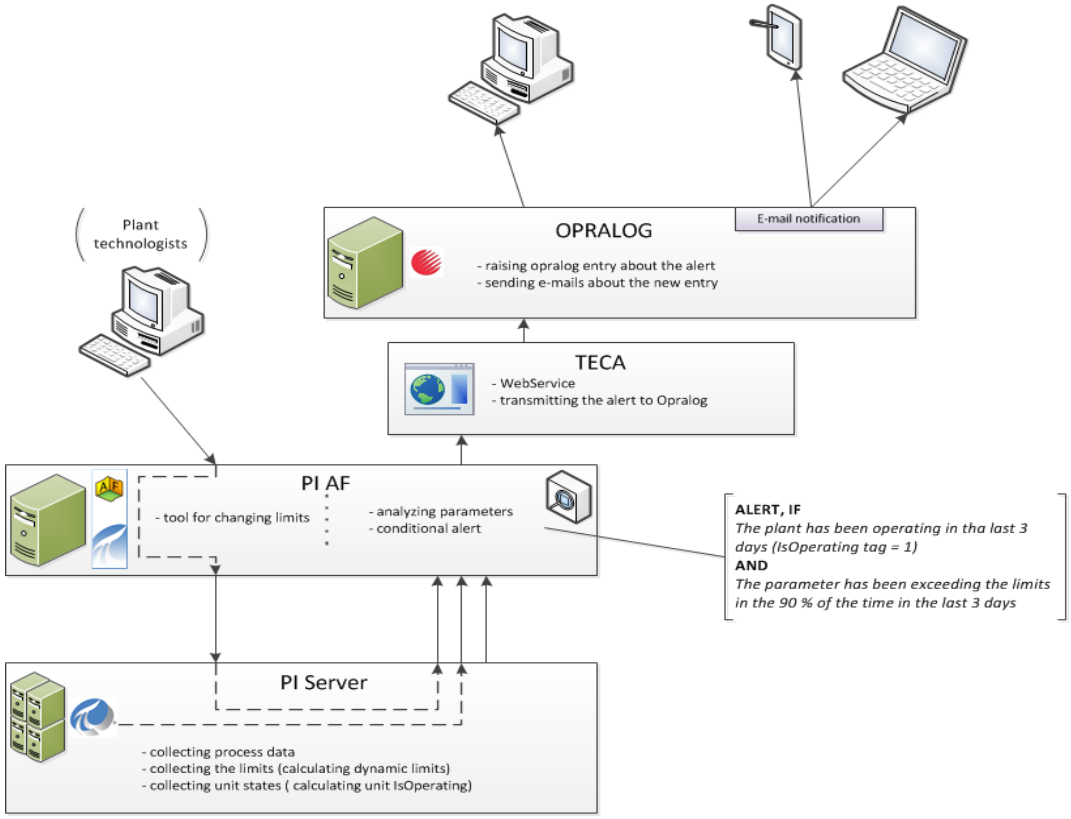
Detection principles



PI ProcessBook elements relative display



Technological card / PI AF connection



Technological card parameter definition in PI AF level

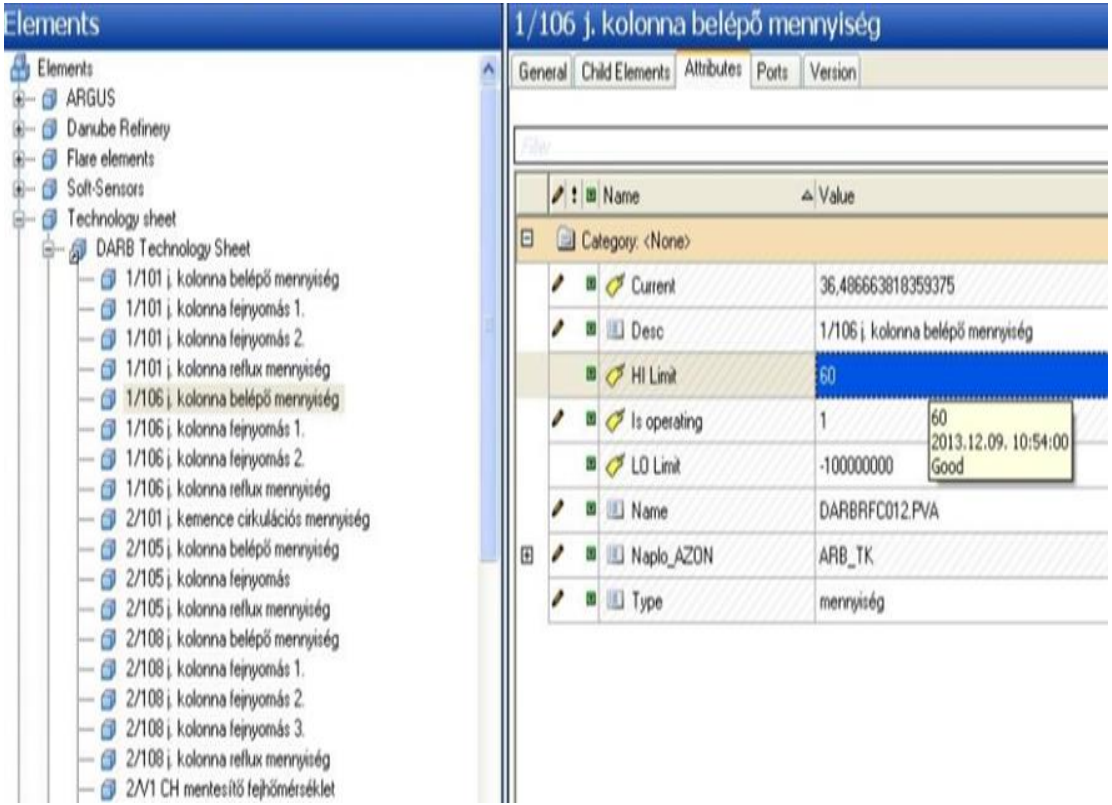
Data storage in PI server level

PI AF Technological card limit data evaluation

PI AF & Opralog connection via Web service

Opralog notification about Technological cards' entries

Technological card / PI AF



Current, actual value of the parameters

Description: Equipment name in Opralog (E.g.Column 1/106)

HI / LO Limits

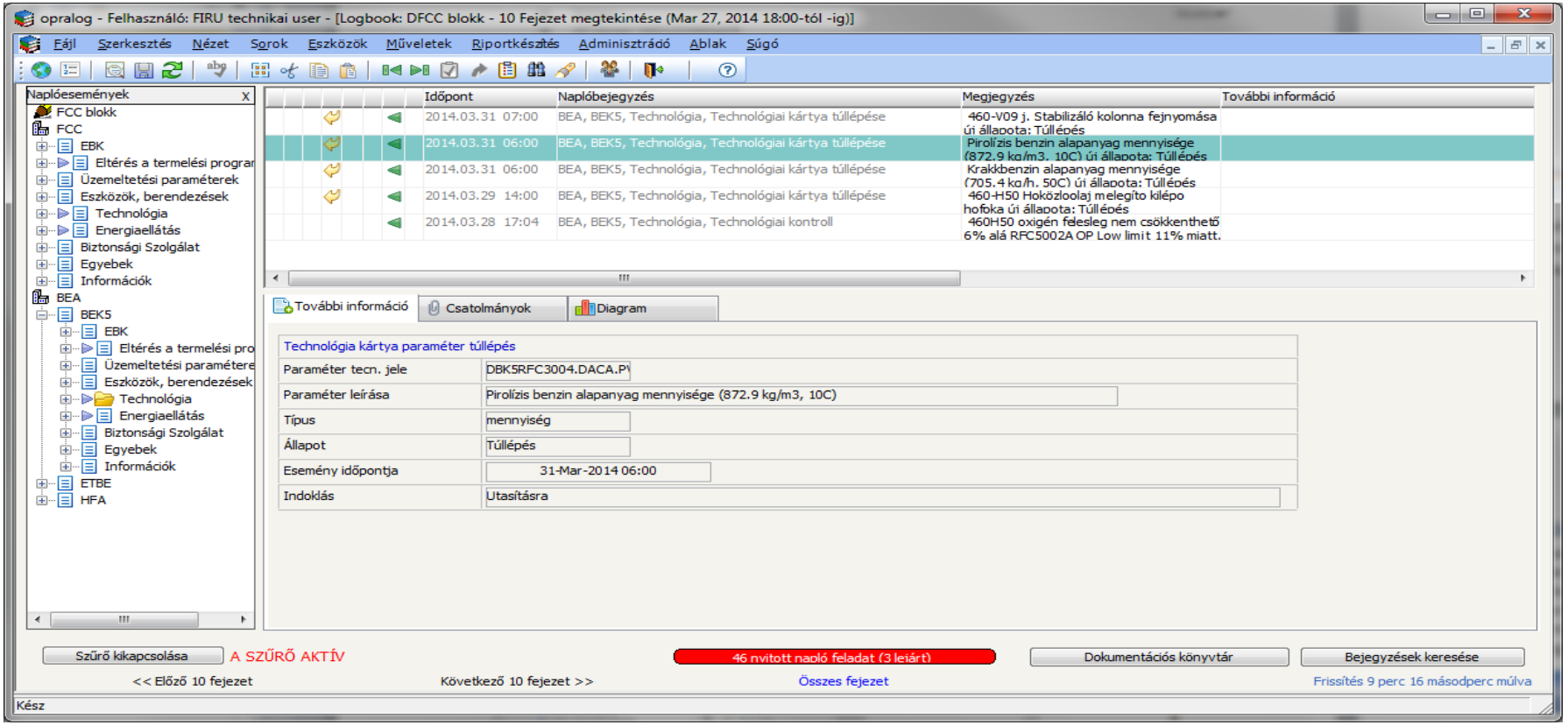
Name: PI tag (E.g.DAV2CFN1308)

Logbbook_ID : Opralog shift logbook identifier

Parameter type (E.g. :Quantity)

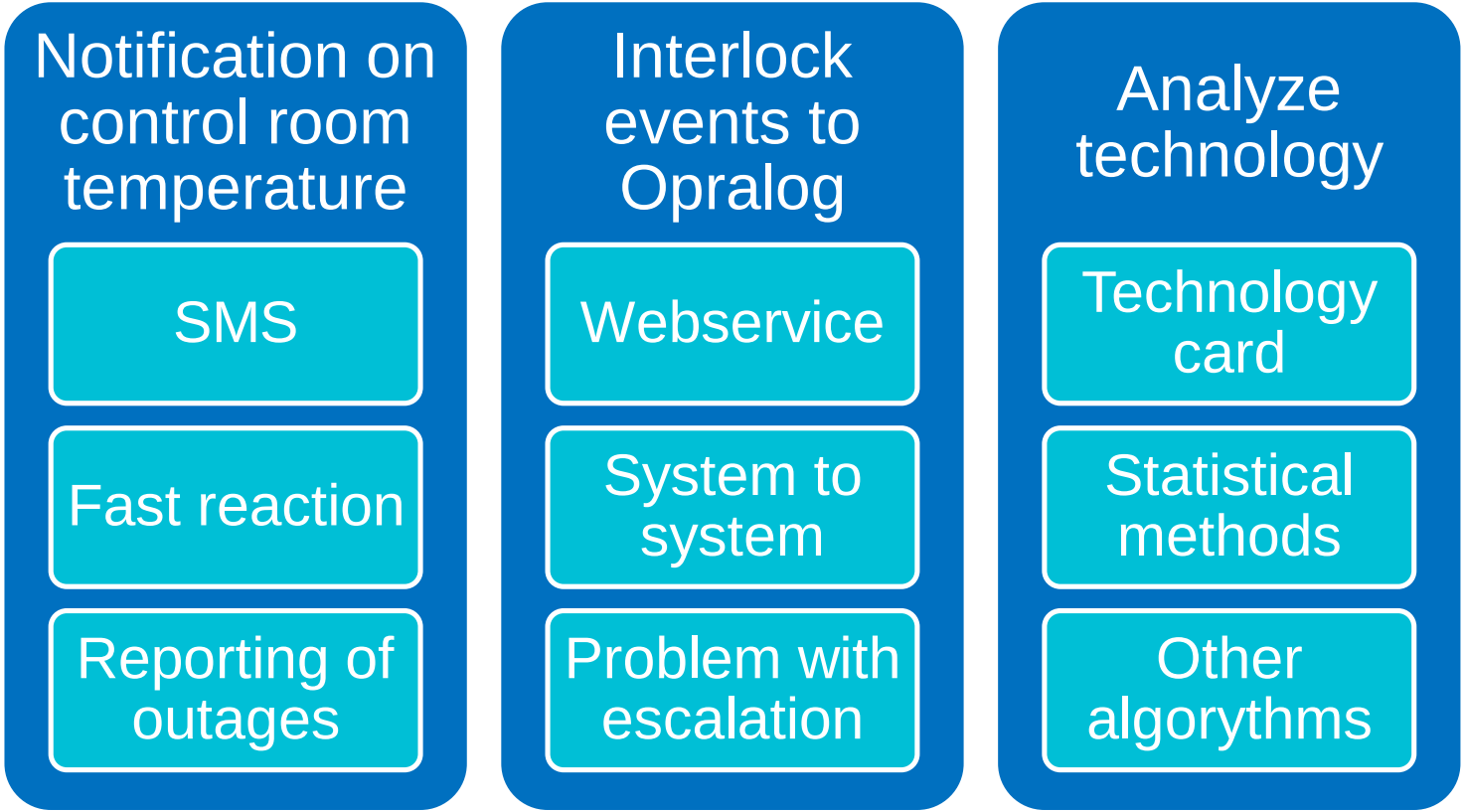
Is operating - value is 1 in case of normal operation of the unit

PI AF & Opralog Notifications



LEAN SUPPORT

PI AF Notification



PI AF – Integration and Data Abstraction

- Benchmarking
- Cloud
- New solutions
- Maintenance of PI
- Asset management
- Learning

Analysers Validity Report

Unit	Sample Point	Analysis	2013.02.28	2013.04.25	2013.05.02	2013.05.13
DARB	101FJKI	Benzene	Precise, but not Accurate	Precise, but not Accurate	Precise, but not Accurate	Precise, but not Accurate
DARB	101FJKI	Non aromatic	Valid	Precise, but not Accurate	Not enough data	Valid
DARB	101FJKI	Toluene	Valid	Precise, but not Accurate	Precise, but not Accurate	Precise, but not Accurate
DARB	OXILOLKI	C9	Precise, but not Accurate	Precise, but not Accurate	Precise, but not Accurate	Precise, but not Accurate
DARB	OXILOLKI	Cumene	Precise, but not Accurate	Precise, but not Accurate	Precise, but not Accurate	Precise, but not Accurate
DARB	OXILOLKI	Meta-xylene	Precise, but not Accurate	Precise, but not Accurate	Precise, but not Accurate	Precise, but not Accurate
DARB	OXILOLKI	Non aromatic	Valid	Valid	Valid	Valid
DARB	OXILOLKI	Ortho-xylene	Precise, but not Accurate	Precise, but not Accurate	Precise, but not Accurate	Precise, but not Accurate
DARB	TOLUOLKI	Benzene	Precise, but not Accurate	Precise, but not Accurate	Valid	Valid
DARB	TOLUOLKI	Non aromatic	Valid	Precise, but not Accurate	Valid	Precise, but not Accurate
DARB	TOLUOLKI	Toluene	Precise, but not Accurate	Precise, but not Accurate	Precise, but not Accurate	Precise, but not Accurate
DARB	XILOLKI	Etil-benzol	Valid	Precise, but not Accurate	Precise, but not Accurate	Precise, but not Accurate
DARB	XILOLKI	Meta-xylene	Precise, but not Accurate	Valid	Valid	Valid
DARB	XILOLKI	Non aromatic	Valid	Precise, but not Accurate	Precise, but not Accurate	Precise, but not Accurate
DARB	XILOLKI	Ortho-xylene	Valid	Not Valid	Not Valid	Valid
DARB	XILOLKI	Para-xylene	Precise, but not Accurate	Valid	Precise, but not Accurate	Precise, but not Accurate
DARB	XILOLKI	Toluol	Pt Created	Not enough data	Valid	Precise, but not Accurate
DBK5	COMBPROD	Sulphur content	Out of operation	Out of operation	Out of operation	Valid
DBTK	MOTBEN	Vapour pressure	Valid	Valid	Valid	Valid

- Based on PI solutions (ProcessBook and DataLink) ARGUS
- Regular report in every week
- Continuous monitoring

Comment:

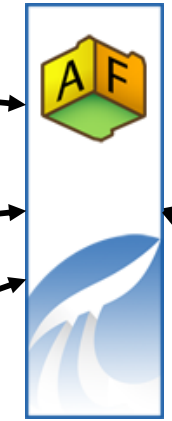
DNHT5: sulphur analyser could have helped to recognise product contamination

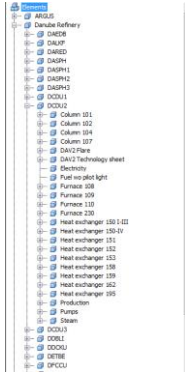
Common datasource PI AF for KPI vizualization

Current value

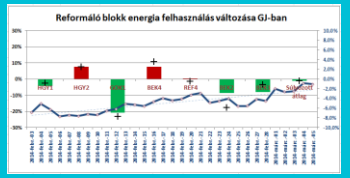
Manual Data Entry
- Business targets
- KPI targets
- KOI targets

Best Operation Target (BOT)





Block level KPI report



Unit level KPI report

SEMAFOR

Implement KPI hierarchy in PI AF
- Source of all reports and visualization
- Central register
- Changing targets directly by process engineer

„Knowledge is of no value unless you put it into practice”

A. Chekhov

Business Challenge

- Providing real-time information for tighter control
- Closing the gap between process control and daily operation
- Fulfill strategic objectives

Solution

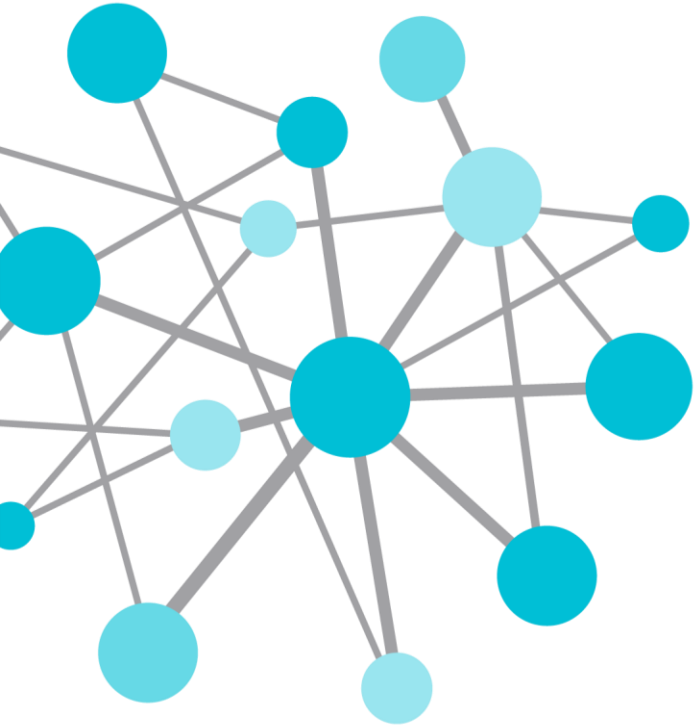
- Implement , use PI System portfolio element s in MOL Group wide
- Continuous monitoring of operation data and reporting information to users
- US - Server migration, HA infrastructure, web clients, auto report subsystem

Results and Benefits

- Visible and controllable operations
- Operation awareness, reduced downtime
- Improved information flow between different organizations

Tibor Komróczki

- tkomroczki@mol.hu
- Head of Process Information & Automation
- MOL, PLC



THANK YOU

Brought to you by OSIsoft.