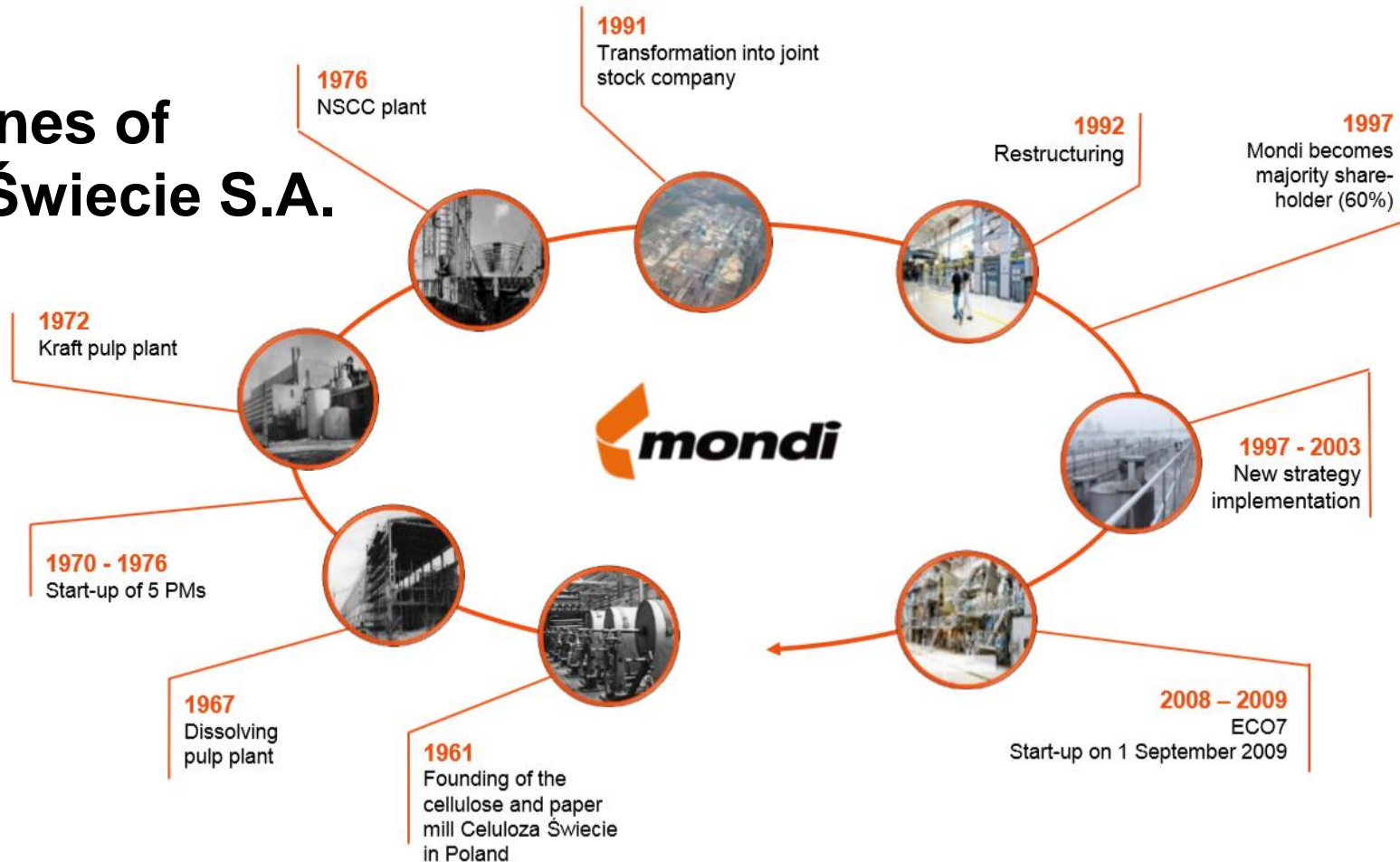# PI System Implementation: From Mill-wide to Enterprise-wide Data Infrastructure
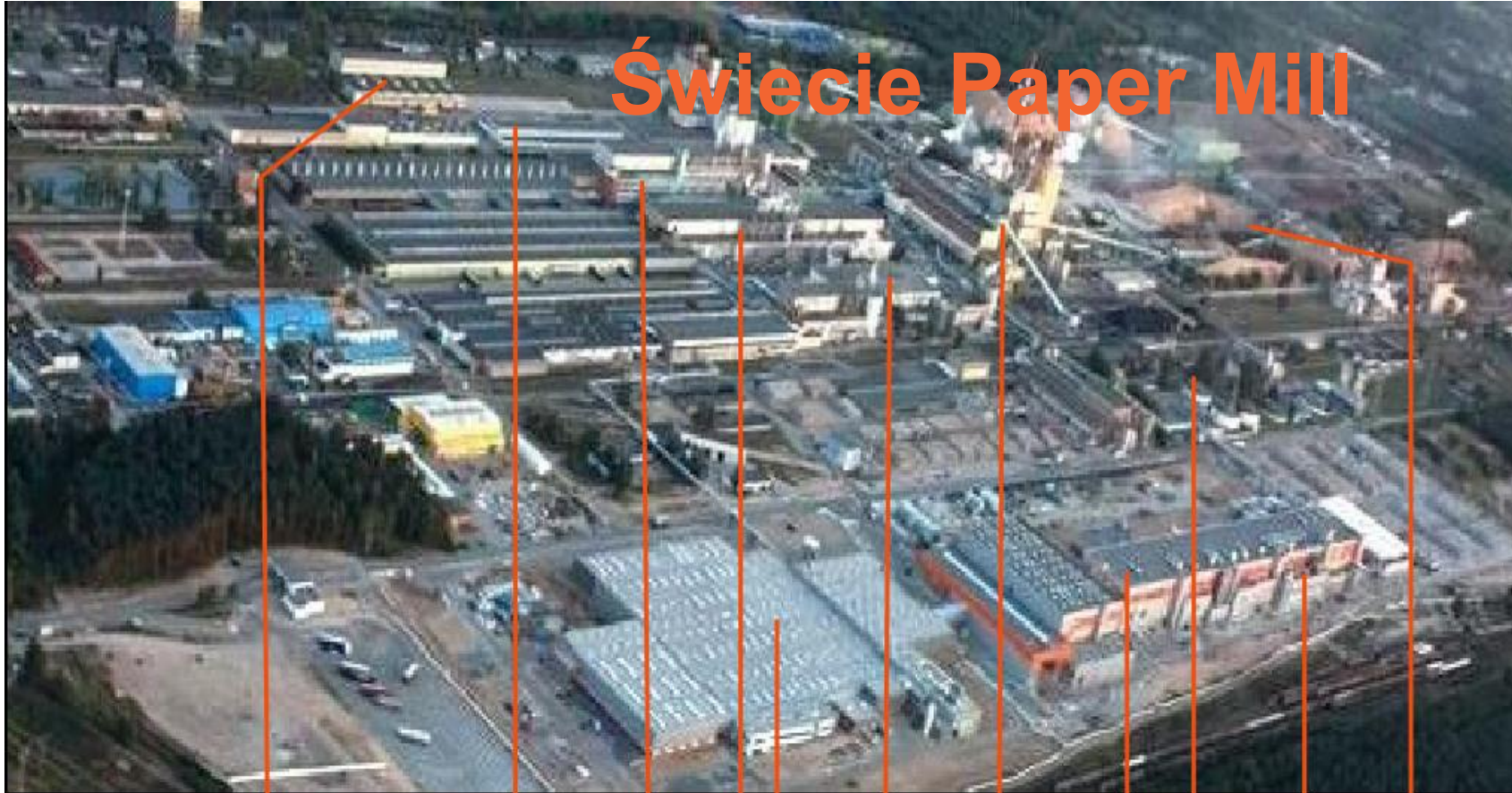
Presented by **Maciej Koszur, PMP**
Process-IT Manager, Mondi Świecie S.A.

Milestones of Mondi Świecie S.A.

1976 NSCC plant

1991 Transformation into joint stock company

1992 Restructuring

1997 Mondi becomes majority shareholder (60%)

1972 Kraft pulp plant

1997 - 2003 New strategy implementation

1970 - 1976 Start-up of 5 PMs

1967 Dissolving pulp plant

1961 Founding of the cellulose and paper mill Celuloza Świecie in Poland

2008 – 2009 ECO7 Start-up on 1 September 2009

Świecie Paper Mill

Lab — Fibre preparation — PM 3 — PM 1-2 — PM 4-5 — Corrugator — Power plant — ECO7 — RCF plant — ECO7 RCF plant — Wood yard

Key Figures
of Mondi Świecie S.A.

2012	
Revenue	€623m
EBIT	€91m
ROCE	21.64%
Employees	1,089
Paper Production	1,400mt

4

# Operational excellence – production increase

20,000,000 tonnes of paper

On 18 November 2011 Mondi Świecie reached the historic production milestone of 20 million tonnes of paper. The first 10 million tonnes took 33 years, the next 10 million tonnes were reached within 11 years.

Background of Systems Development

SAP

1999-2001

MES

2001

the PI System

WMS

2002

SAP-PM

2002

mondi
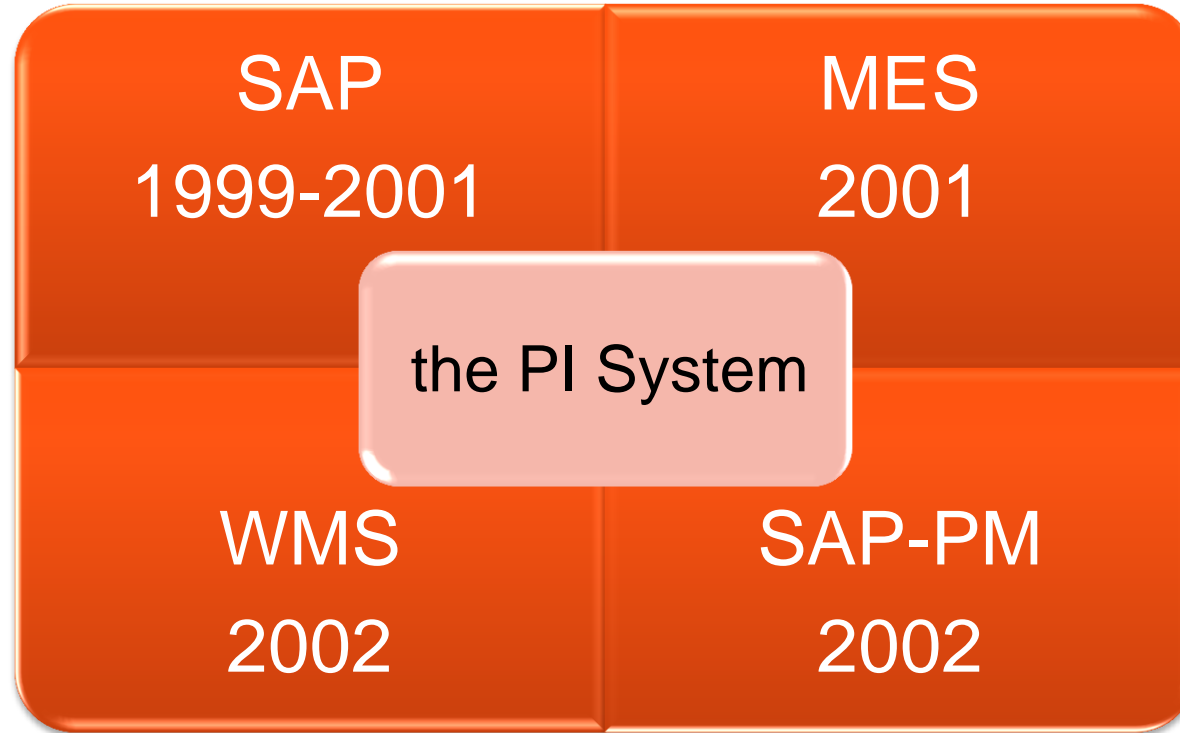
Islands of Production Systems in Świecie (2002)

DCS, QCS:
Honeywell,
ABB,
Emerson,
Metso,

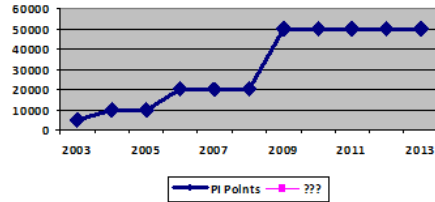ORACLE,
SQL
(MES, EMS)
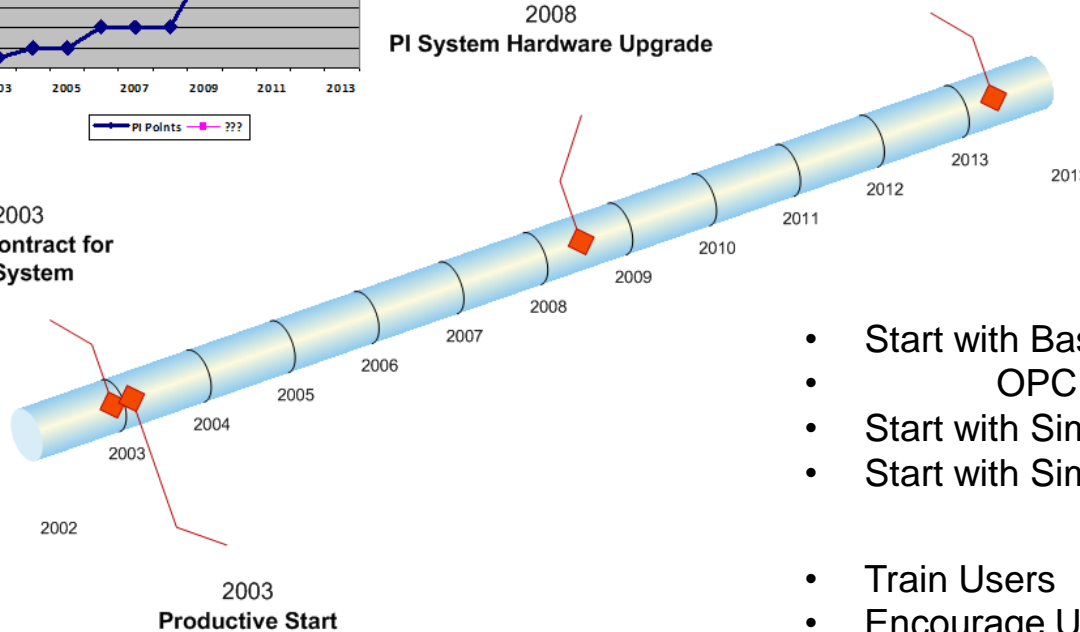
Manual Data:
Shift Log
Book

LIMS:
AutoLine 300
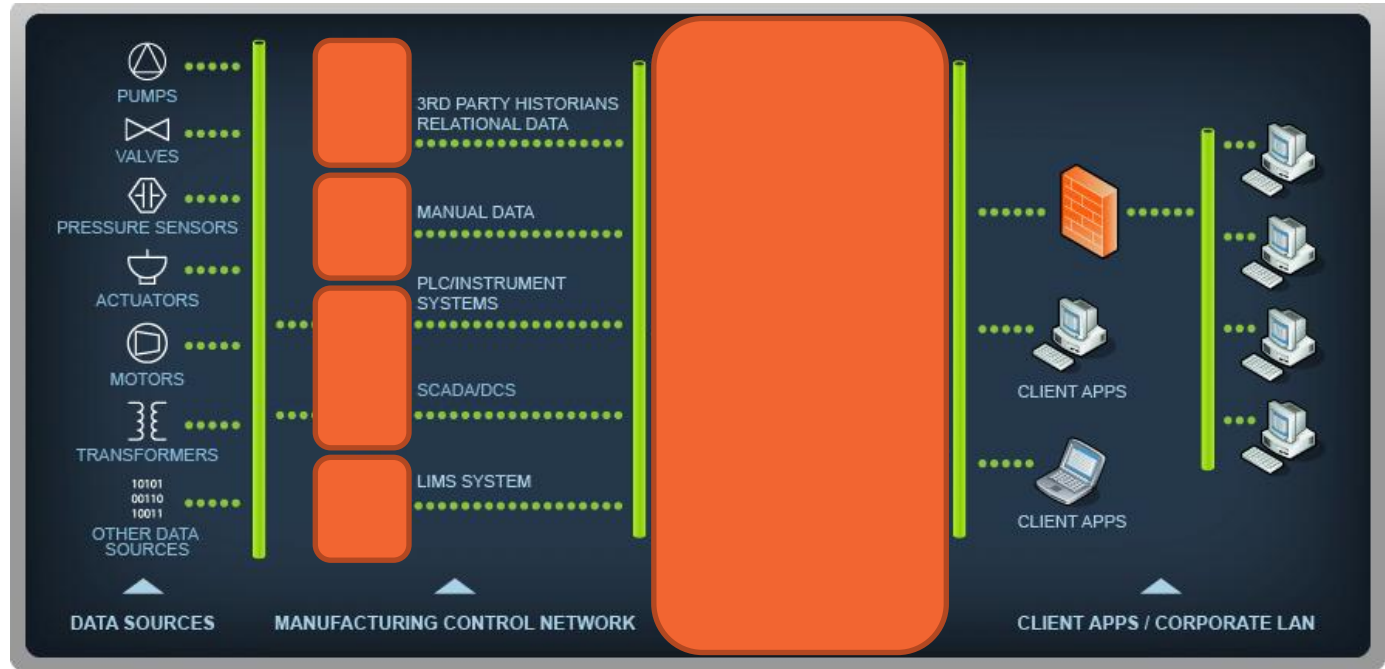
PUMPS

VALVES

PRESSURE SENSORS

ACTUATORS

MOTORS

TRANSFORMERS

10101
00110
10011
OTHER DATA
SOURCES

3RD PARTY HISTORIANS
RELATIONAL DATA

MANUAL DATA

PLC/INSTRUMENT
SYSTEMS

SCADA/DCS

LIMS SYSTEM

CLIENT APPS

CLIENT APPS

DATA SOURCES

MANUFACTURING CONTROL NETWORK

CLIENT APPS / CORPORATE LAN

Implementation of the PI System in Mondi Świecie

- Start with Basic Interfaces
-        OPC, RDBMS
- Start with Simple Operator Screens
- Start with Simple Reports

- Train Users
- Encourage Users to Develop …

Implementation of the PI System in Świecie

- Scope of Implementation with Plantsoft in 2003

- PI System – MS Cluster installation of PI Server with 5.000 Data Streams (now 50.000 Data Streams)

- Interfaces – PI OPC, PI UFL, PI RDBMS

- Clients – Professional (25), PI ProcessBook & PI DataLink(30), PI DataLink (20)

- PI ICE – 5 Licenses (now evolved into PI WebParts)

- Engineering – Software Installation, Laboratory Applications, Quality Certificate Report, and Paper Machine 3 Process Visualization and Profiles View

The PI System in Mondi Świecie S.A. over 10 years of experience

COLLECT	HISTORIZE	FIND	ANALYZE	DELIVER	VISUALIZE
Laboratory Applications, Operators LogBooks,			Energy Monitoring, Operators Quality Overview,	SMS notifications received on mobile, Paper Quality Certificates	Process Control Screens, Profiles Views, Reports,
PI Interfaces,	PI Server, PI AF Server, PI Module Database,		PI ACE (Advanced Computing Engine), PI MCN Health Monitor,	PI Notification,	PI ProcessBook PI DataLink, PI WebParts (formerly RtWebParts), PI Profile View, PI Control Monitor,

Mondi Świecie S.A. - Mill Overview

WPC-PD Poprzednia doba

Wydajność

Zach

Brzoza 34002 m3 2377 m3/d 12019 m3
Sosna 31255 m3 5010 m3/d 79533 m3

Wsch

WPC Poprzednia zmiana

	L1	L2		Wydajność	Obroty ślimaka dozującego
L. Kappa	84,50	85,90	L1 Kraft 519 t/d	47,83	
Smarn.	12,00	12,00	L1 WW 0 t/d		
Str. Alk.	14,50	11,50	L2 WW 576 t/d	49,05	
St. Ł. Cz.	16,50	16,50	WMPCh 378 t/d		

Poz.ługu czer. MPCh

Prz.do wyparki
985,19
l/min

Razem cel.:
1622 t

	1	2	3	4	5				
	103	91	71	91	77		42	66	81
	136	107	154	457	768 t				170 t

WM

Frakcja	długa	krótka
Smarność (lab)	25	38
Stężenie (lab)	6,00	6,30
Stężenie (online)	5,62	6,27
Przepływ	2281	7127

Parametry do maszyn	1	2	3	4	5
Smarność (lab)	40	39	37	45	41
Stężenie (lab)	5,2	5,3	4,6	4,8	4,9
Stężenie (online)	3,0	5,4	3,0	4,6	5,0	5,1

WM Poprzednia doba

Zużycie

Poziomy w wieżach

			C	D	102	103	104	105
OCC	5807 t	0 t/d						
MIX	0 t	0 t/d						

Razem mak.:

Postój L400 181 t

| | 71 | 79 | 70 | 68 | 71 | 69 % |
| | 12 | 13 | 31 | 31 | 32 | 62 t |

MP#1 OEE/mc 89,69
Asortyment 230060 Advantage
Prędkość 770,6 m/min Typ. 770
Wydajność 15,4 t/h 369,7 t/d

MP#2 OEE/mc 92,61
Asortyment 110280 Kraftliner
Prędkość 418,5 m/min Typ. 418
Wydajność 31,5 t/h 756,1 t/d

MP#3 OEE/mc 92,18
Asortyment 119186
Prędkość 329,5 m/min Typ. 327
Wydajność 16,5 t/h 396,5 t/d

MP#4 OEE/mc 97,41
Asortyment 123135 SC Fresco
Prędkość 646,7 m/min Typ. 646
Wydajność 23,9 t/h 572,8 t/d

MP#5 OEE/mc 78,04
Asortyment 112180 Vistula Topliner
Prędkość 509,0 m/min Typ. 565
Wydajność 30,4 t/h 730,5 t/d

MP#7 Zryw OEE/mc
Asortyment 122090 Vistula W/B Fluting
Prędkość 1303,0 m/min Typ. 1260
Wydajność 0,0 t/h 0,0 t/d

Temperatura
22,7 °C

Para		Turbiny	
CFB	192 t/h	TG1	29 MW
KS3	249 t/h	TG2	44 MW
KW4	0 t/h	TG3	0 MW
KW5	88 t/h	TG4	8 MW
BFB	98 t/h	Zakup	45 MW

Ciśnienie i Temperatura pary 0,6 Góra/ 0,6 Dół/ 1,3

0,62 0,62 1,19 [MPa]
194 195 251 [C]

Kompresory
1 2 3

Ciśnienie 0,61 MPa
Temp 46,7 °C
Przep 191 m3/min

MOS Cel.	MOS Pap.	BOS
Dopływ	Dopływ	Dopływ
ChZT 300,0	ChZT 1300,0	ChZT 1530,0
Zaw. 380,0	Zaw. 990,0	Zaw. 360,0
pH 10,0	pH 7,7	pH 6,0
Siarcz. 2600,0	Siarczany 420,0	
Temp. 30,4 °C	T WM 28,5 °C	Temp. 39,4 °C
	T MP1 29,2 °C	
	T MP3 48,9 °C	
	T MP4 546,6 °C	

MPCh
Stężenie (lab) 29,4
Smarność (lab) 13
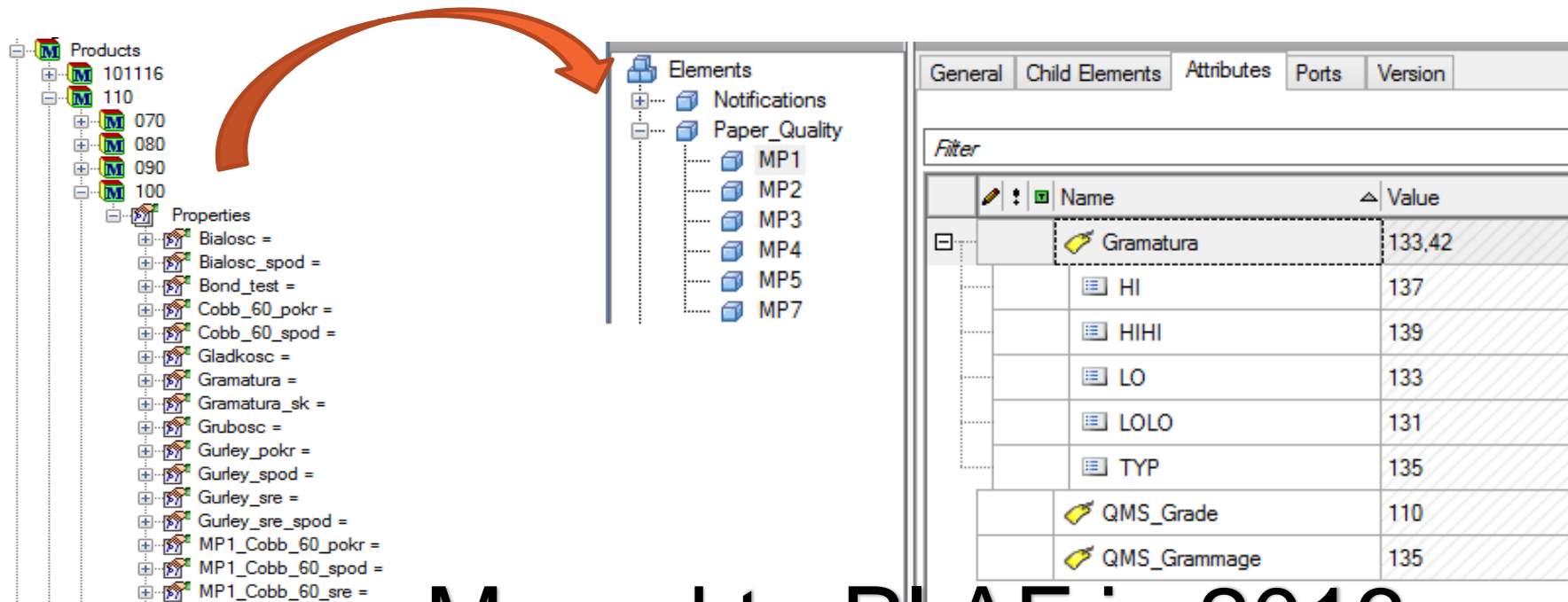
Woda Przem
Nitka nr:
1 - 21,7 °C
2 - 22,8 °C

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PI Module Database for Storing Quality Data Limits

Moved to PI AF in 2013

Paper Analysis Available Immediately after Lab Check

Sheet Break Classification

PI Notification Rules Based on Sheet Break Time
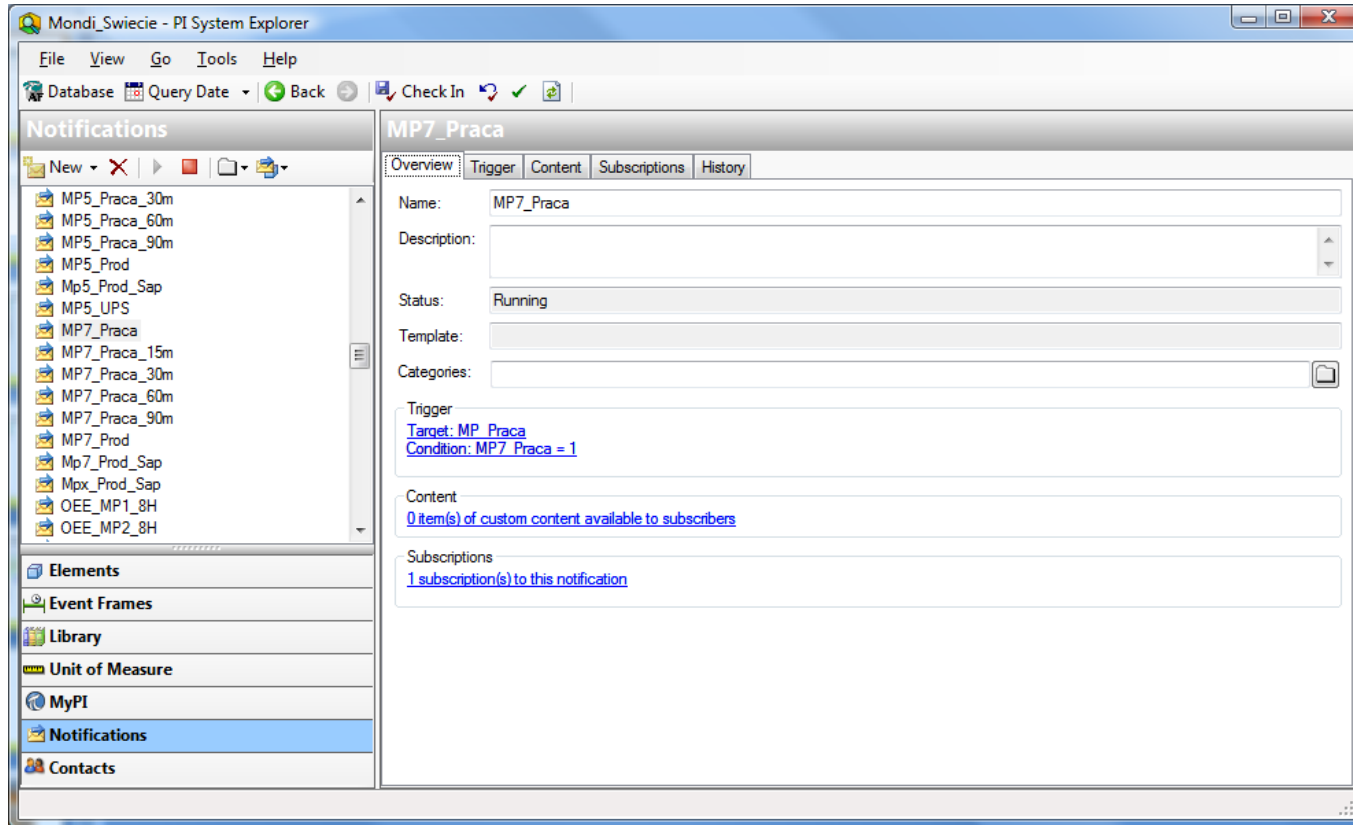
PI Notification – Notifying Vendor about CO_2 stock

Carbon dioxide

Send E-mail/SMS when triggerred
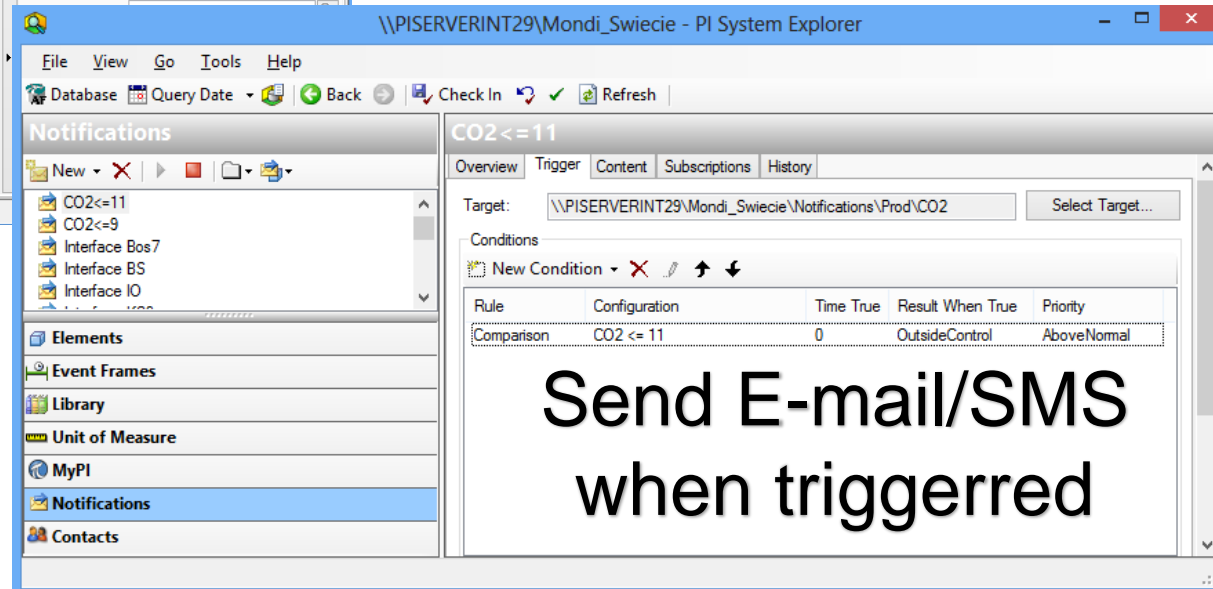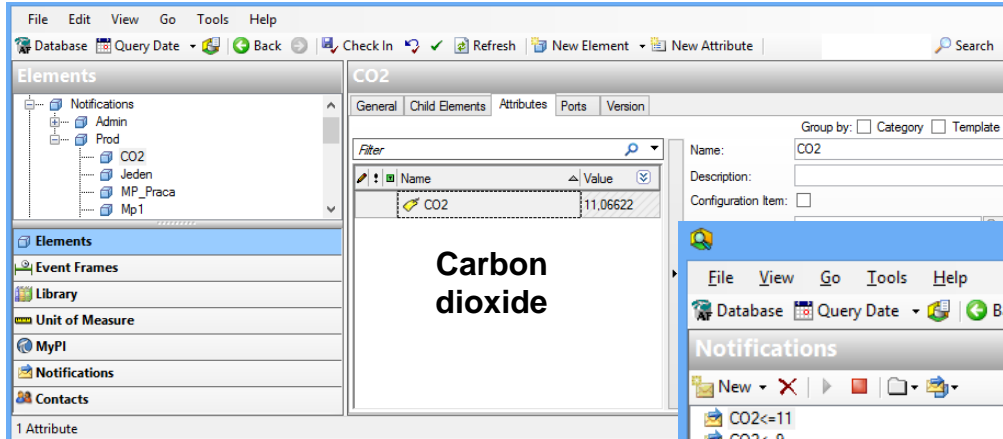
Paper Log Books Replaced by Spreadsheets Linked to the PI System

Shop Floor Operators Performance Available While on Job

View to the Future Allows to Prepare Power Plant Operations
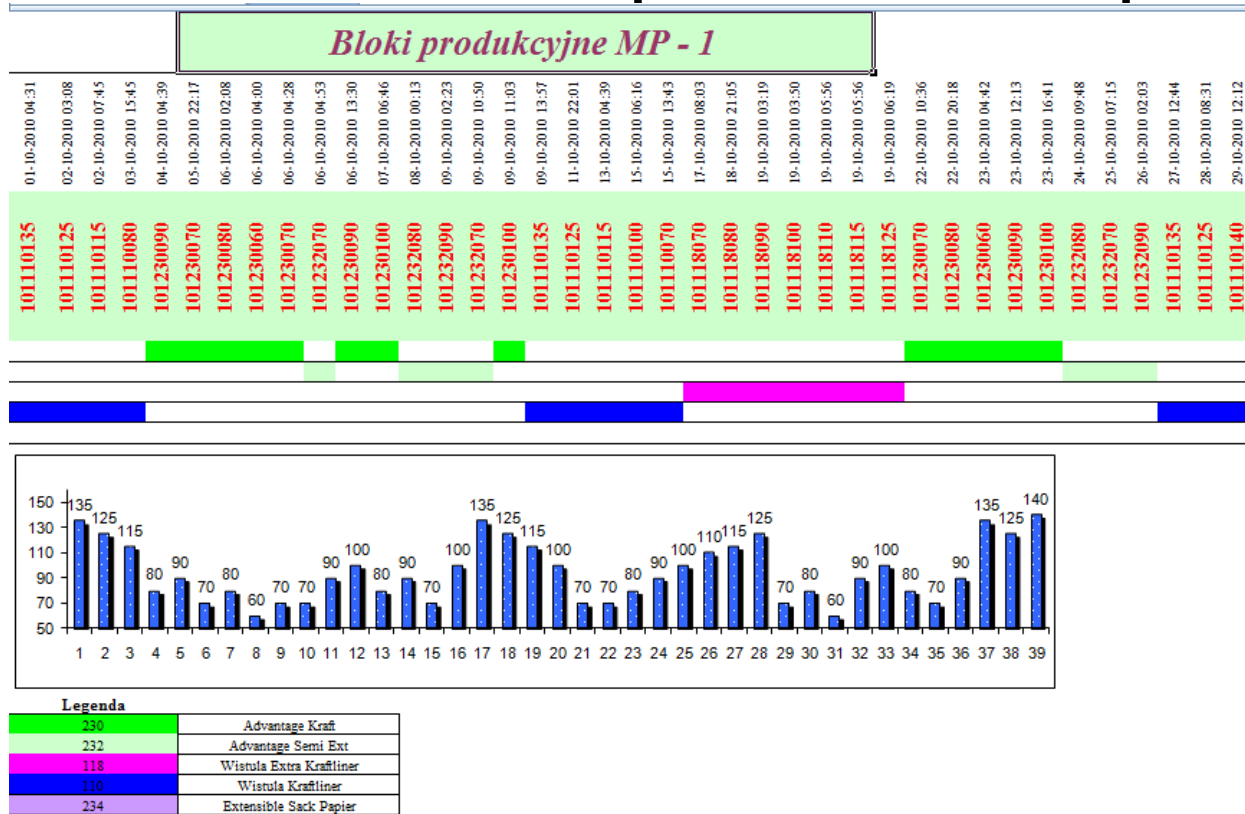
Maya people were right.

There was in fact an END in 2012...

…they just forget to tell us, that we will be able to use PI Server 2012 afterwards.

Maciej Koszur

maciej.koszur@mondigroup.com

Process-IT Manager

Mondi Świecie S.A.

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22

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