



How to integrate the PI system in in an overall architectural approach - The Metallo HMI CASE

Presented by Luc Verhelst, CIO, Metallo Group



Agenda

- Metallo introduction
- The new Zinc Fumer as next step in recycling & metal valorisation
- The Metallo industry 4.0 vision towards the future
- The HMI project as a new interface for our operators
- The use of the PI System in trending analysis
- IT's all about the data at Metallo: Architecture and Applications
- Lessons learned & best practices when implementing the OSIsoft PI System
- Wrap-up / Q&A

BIO: Luc Verhelst



Luc Verhelst is an experienced CIO, digital consultant and IT Risk adviser.

Luc is currently holding the position as CIO for Metallo group.

Before that he was CIO of the EMA, the European Medicines Agency, based in London, responsible for the supervision of medicines inside Europe.

Previously Luc held different leading CIO roles in leading companies in finance, media, healthcare and logistics.

Luc is also the honorary chairman of MIT-Club, leading Belgian CIO community exchanging valuable CIO knowledge and experiences.

Luc is ISACA certified (CGEIT) and specialised in digital strategies with focus on IT governance, architecture and specifically the IT Risk domain.

Metallo: Strategic Vision – The global recycler of choice

- Be the global recycler of choice ...
 - Preferred partner to process **complex materials** (complex = complex composition and impurities)
 - Caring for the **environment** and minimizing waste
 - No raw material mines – “urban mining” recycler of waste metals
- Maximising the value of a variety of metals, this as an answer to increasing metal scarcity
 - We valorize non-ferrous metals and bring them back in the value chain
 - Our refining processes are unique, **innovative** and sustainable
 - We actively contribute to preserve natural resources



Metallo: Key Statistics & Features



- Private company, founded in 1919
 - Still privately owned (Private equity partner)
- 100% secondary feed (recycled materials) since 1975
- “Metallo: The Furnace of Innovation”
- 2 sites, acting as 1 company:
 - Metallo Belgium in Beerse near Antwerp
 - Metallo Spain in Berango near Bilbao
- 500 employees
- Treatment capacity of 400 000 tpa of Cu, Sn, Pb, Ni and Zn scrap
- World’s largest producer of secondary tin

Catalyst for Digital Change: New FUMER installation (2015)

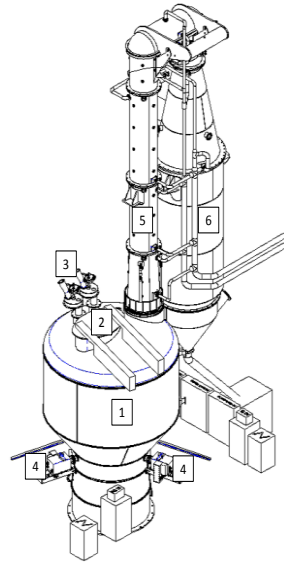


Business Case: Further treatment of fayalitic slag

Further treatment
of fayalitic slag



Metamix[®]
5% Zn
95% minerals



**Slag Treatment Unit
(STU)**



**Zinc concentrate
> 65% Zn**



**Clean Slag
Koranel[®]
< 1.5% Zn**



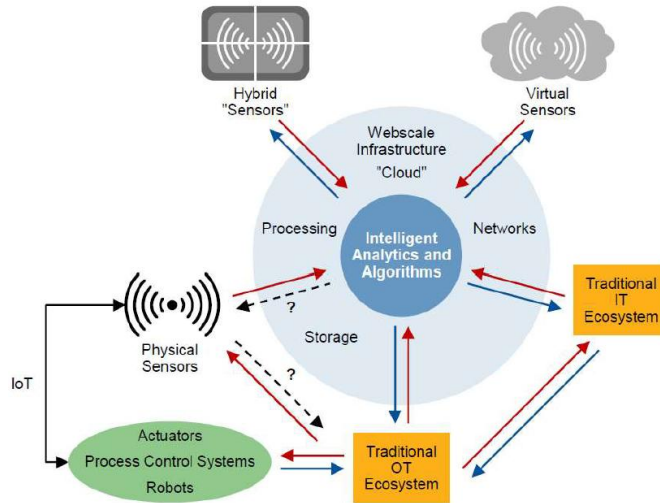
Metallo zero-waste flow sheet



The Metallo interpretation of Industry 4.0.

How this is reflected in our HMI project

In the Industry 4.0 era the world of OT and IT are coming together



Traditional IT

ERP, supply chain, business processes, databases, customer, end users, etc.

Traditional OT

Technologies that manage industrial plant, processes, buildings, etc.

Physical Sensors

Pressure, temperature, flow, etc.

Hybrid Sensors

Mobile phones, tablets, laptops, etc.

Virtual Sensors

External data, social networks, search engines, e-commerce sites, etc.

3 Inputs influencing the Metallo Digital Strategy

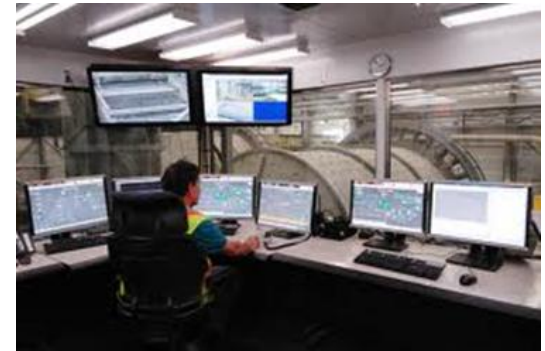
IN THE INDUSTRY 4.0 ERA THE WORLD OF OT AND IT ARE COMING TOGETHER



MATERIAL FLOW AUTOMATION VISION



NEW HMI INTERFACE INSIDE PRODUCTION



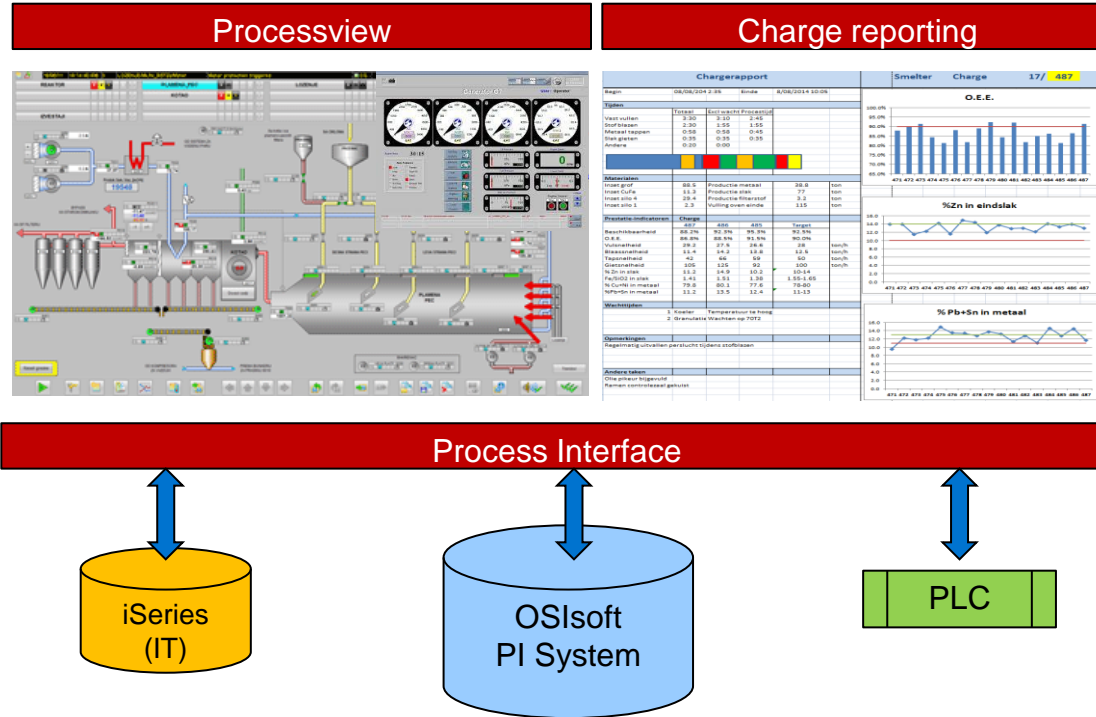
METALLO 4.0 INTERPRETATION AIMS IMPLEMENTING SOME OF THESE IDEAS IN A **PRAGMATIC WAY**

"THE METALLO WAY"

Old situation: Many Screens, OT & IT separate



The HMI concept: A new interface for the operators



The New Situation

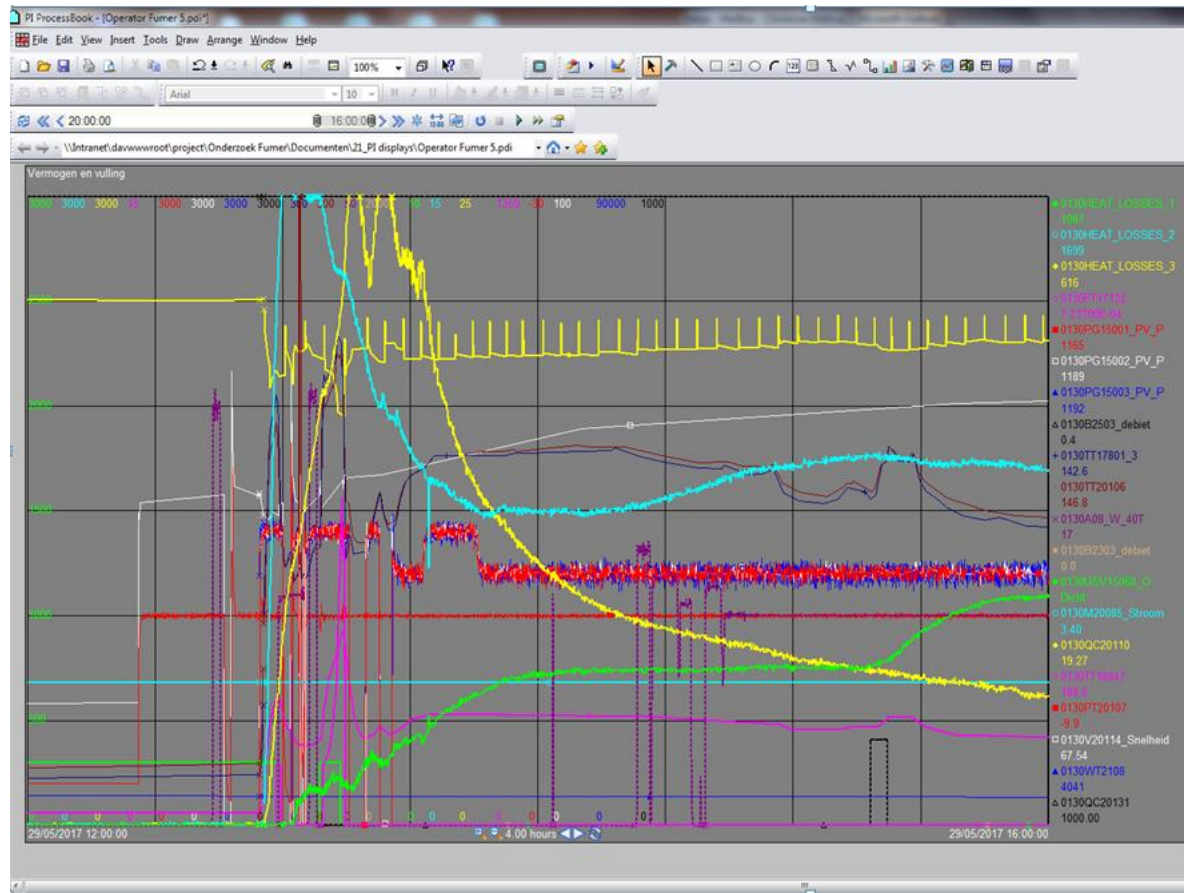




Metallo usage of trending analysis

PI System for trend analysis

- PI is very user friendly and very intuitive, showing trends over time
- *PI Gives us the opportunity to visualize many different observations: heat losses, plasma power, electricity usage, oxygen in process gasses, CO, weight...*
- *Valuable info for (re) training the operators*

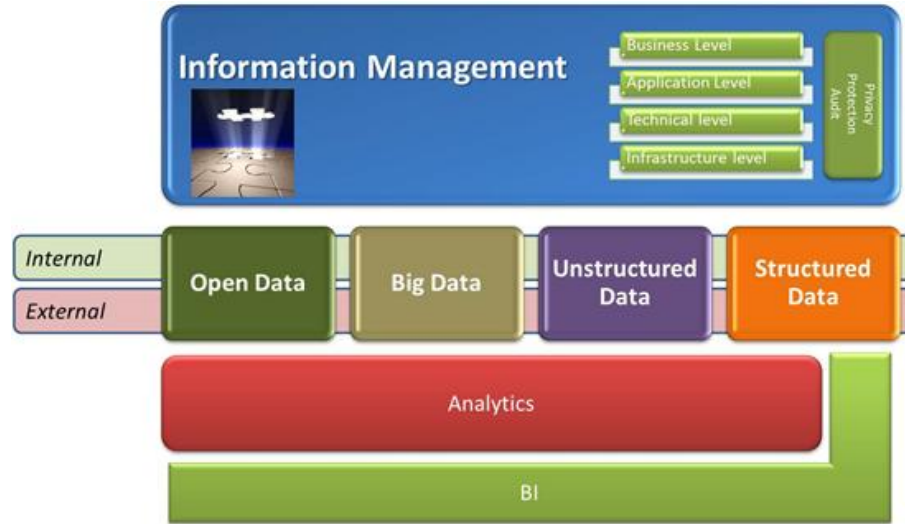




IT's all about data and architecture

A global vision on Information Management

- The global vision drives our enterprise architecture, which processes touch which data?
- In our vision OT data (eg PLC) and IT data (MES, ERP) are both to be considered as information, preferably combined

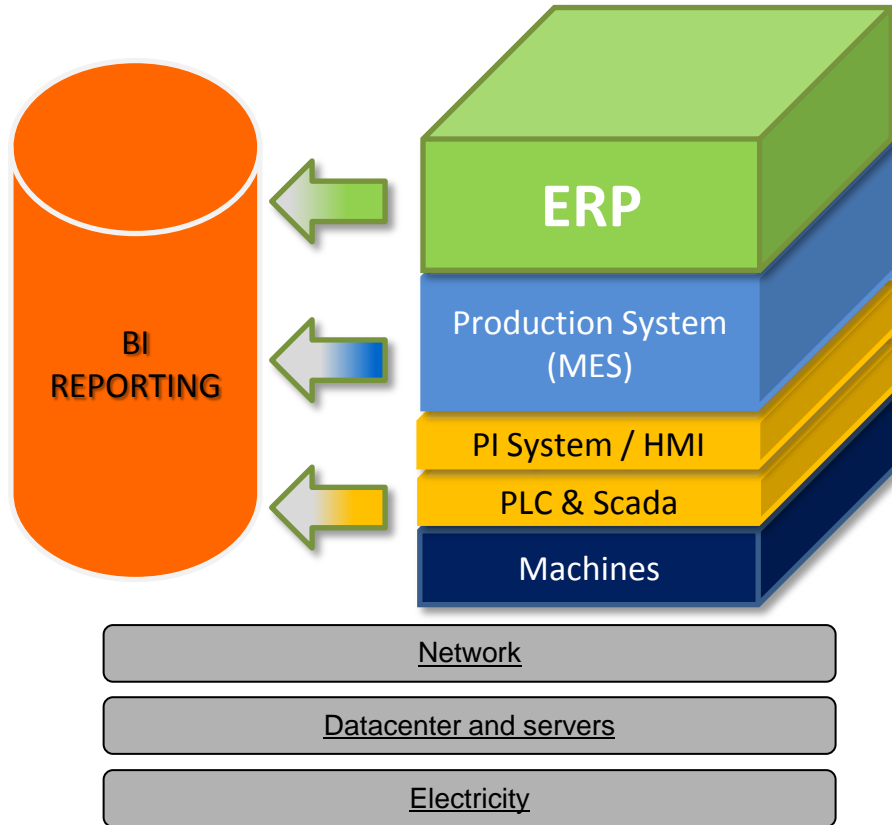


How do we manage, manipulate & secure the data in our applications and on our servers?

What type of data can/should we have or provide/publish?

How can we get maximal value out of this data?

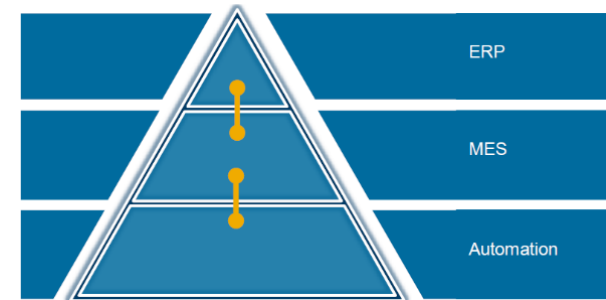
Metallo Digital Architecture based on ISA95



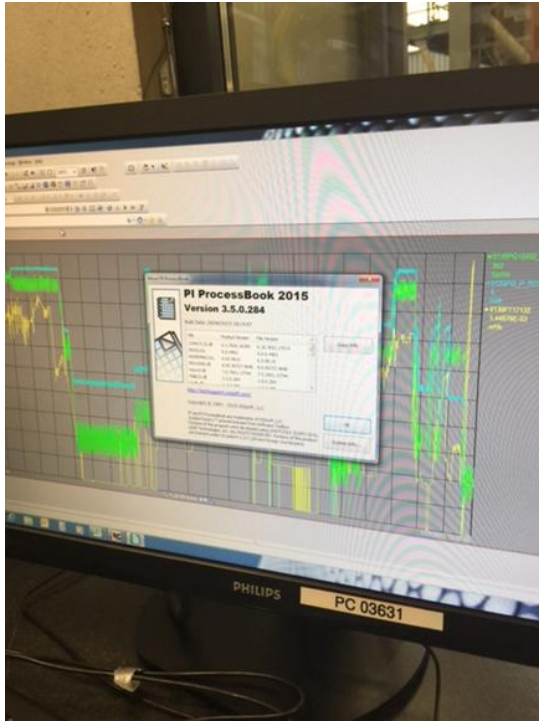
One Enterprise Architecture:

- Application architecture
- Data architecture (common definitions, all aligned)
- Security architecture
- Infrastructure architecture (common network, datacenter, servers)

Application architecture based on ISA95

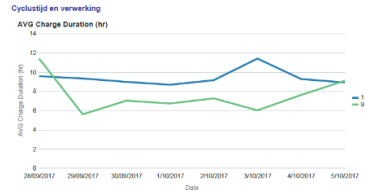
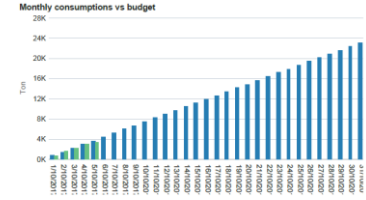


PI System & IT BI reports



Copy of Chargeblad sep 2017 vblum - Microsoft Excel

Chargeblad Fumer												Charge nr 232		METALLO THE FINANCE OF INNOVATION											
Proces opmerking												Wachttijd		Deel №2n = 3											
Procesopvolging												Stalnames													
Step	Tijd			Tijdstop			Percele gewicht	Vaste stak gewicht	Productie Efficiënt	Ton stak in oven	Staal nr	Tijd	N2n	N2n	Percele gewicht	Vaste stak gewicht	Gewicht stu./Stk	Percele vast deel	Ton stak in oven						
Begin Charge	30 aug 13:46	Vullings-over			Leeg tot bodem-reactor		0	0	0	0	1	30 aug 12:53	14,676	0,363	0	0	0	0	0						
Nulken Vast	30 aug 08:31				Netto gewicht		0	0	0	0	2	30 aug 19:59			5382	27	9125	0	0						
Nulken Vt. Proc.1	30 aug 11:14	Vol Gewichts	34700	kg	Leeg Gewichts	18980	kg	Netto Gewichts	15720	kg	0	0	0	0	601	0	3	30 aug 19:59	5382	27	9125	0			
Nulken Vt. Proc.2	30 aug 11:33	Vol Gewichts	32000	kg	Leeg Gewichts	18000	kg	Netto Gewichts	14000	kg	0	0	0	0	595	0	4	30 aug 14:08	14 621	0,36	100	0	895	0	
Nulken Vt. Proc.3	30 aug 12:03	Vol Gewichts	36200	kg	Leeg Gewichts	20400	kg	Netto Gewichts	15800	kg	0	0	0	0	609	0	5	30 aug 18:10	13 718	0,248	369	0	720	0	
Nulken Vt. Proc.4	30 aug 12:16	Vol Gewichts	36900	kg	Leeg Gewichts	20700	kg	Netto Gewichts	16200	kg	0	0	0	0	632	0	6	30 aug 16:18	11 469	0,113	1059	0	1059	0	
Fumen	30 aug 12:46	Vol Gewichts					0	0	0	0	7	30 aug 17:09	9,2	0,61	1952	0	0	0	0	4891	0				
Nabehouden	30 aug 20:41						5435	0	9839	0	8	30 aug 18:24	6,066	0,61	3962	-1	7127	0							
Stak Slepen	30 aug 20:41	Temperatuur	2160	°C	Exaltherm Stak		normaal				9	30 aug 19:41	3,492	0,272	4847	4	8796								
							5435	0	9841	0	10	30 aug 20:41	3,777	0,064	5435	0	9822								
Brake Charge	30 aug 21:18	Vullings-over			Gewichts stu./Stk		10600	kg	5435	368	10600	#VALUE													
Step	Over	Doel	%	Step	Over	Doel	%	Materialen																	
Opmatten charge	18:45	0:15	7952%	Stak Slepen	0:17	0:30		Percele gewicht				5435	kg												
Nulken Vt	1:31	0:45	104%	Meskel Teppen	0:00	0:30		Vaste stak gewicht				358	kg												
Nulken Vast	2:43	0:30	543%					Overbaar gewicht				61800	kg												
Fumen-nabehouden	7:55	2:30	917%					Filterstof/produccer				10600	kg												



PI Datalink *add-in* for excel (for analysis and reporting)

IT BI reports

PI ProcessBook

Lessons learned

- Before starting you need a well thought through architecture:
 - Decide what goes on layer 4, layer 3, layer 2 & layer 1
 - Determine responsibilities and teams
 - Scoping of products: MES, PI System, SCADA, PLC
- Ensure yourself in regards to internal commitment and technical support
- The PI System is not a MES replacement
- Neither a SCADA replacement

- The PI System compliments and supports other systems

Questions

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

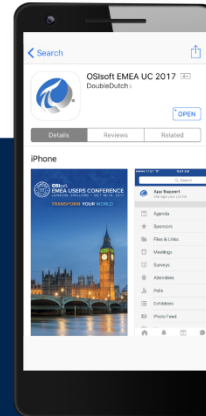


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Danke

谢谢

Merci

Gracias

Thank You

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Спасибо

Obrigado