AVEVA PI WORLD

From data to action

Leveraging data to support the nickel value chain

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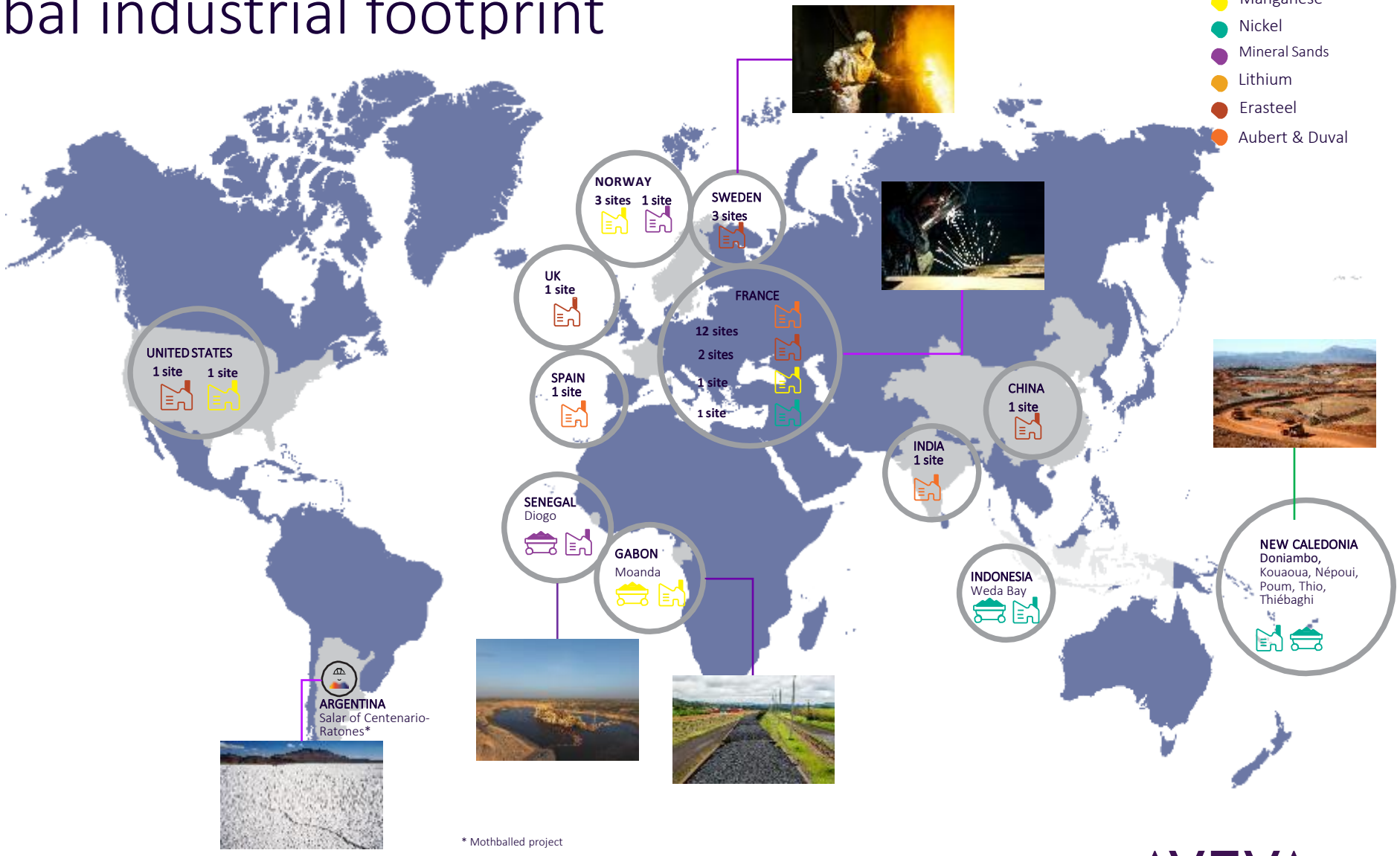
eramet, a global industrial footprint

13 097

3 671 M€

20



* Mothballed project

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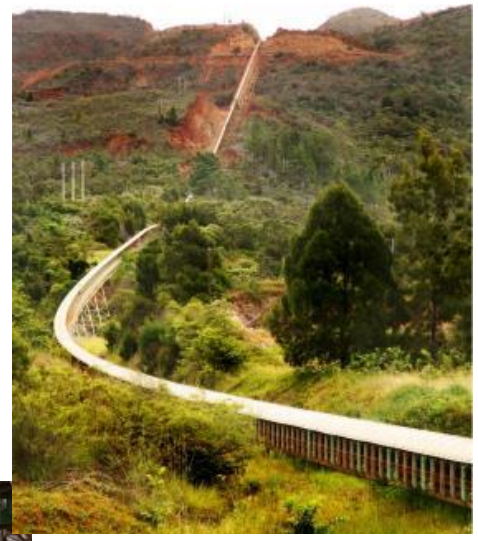
eramet LE NICKEL-SLN , from ore to metal



- 140 years old
- First ferro-nickel producer
- First private employer in New Caledonia
- 10+ sites on the island

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World class upstream operations

Challenge

- SLN is struggling to achieve the mining production increase (x3)
- An IROC (Integrated Remote Operation Centre) initiative aims to improve decision making
- The IROC overlooks the mining value chain to ensure compliance

Solution

- Deploy the latest PI System technology including PI AF and PI Vision as an advanced foundation for aggregating the multiple data available over its operations and leverage this information into the IROC
- Rely on a trusted partner with mining experience to speed up industrialization and coach SLN's team

Benefits

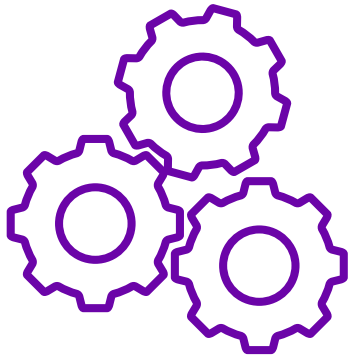
- Accelerated intervention in case of performance deviation
- Holistic and structured view of the operations
- Common basis for communication
- Better understanding of performance for improvement initiatives

Before looking deeper at the technology aspect of the project

Addressing 3 key pillars of digital transformation…

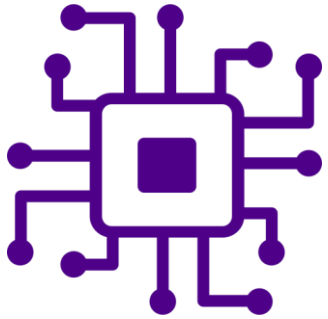
People

- New role definition with different skillset requirements
- Change management process to integrate the IROC to the existing operations
- Development of PI System competencies in SLN's team



Process

- Real time alerting process integrated into the performance management rituals
- All improvement loops - Assessment / Bottleneck analysis / Action prioritization – Benefit from the performance information
- Operational excellence culture prior to moving forward with the technological transformation



Technology

- Many existing systems—FMS, SCADA, GPS trackers, etc.—and new ones—IoT, API
- PI System technology including PI AF and PI Vision as the cornerstone from a technology standpoint. Fully integrated with the Business Intelligence process
- Single source of true for operational data; looking forward to data science initiatives

…in an agile approach around the clock !

Inputs From SLN
CUPIDOM Team

CUPIDOM Manager

BBA As coach for internalization

Team

1
2
3
4
5
6
7
8
9

WIP Backlog

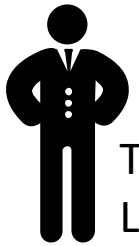
Team selects starting at top as much as it can commit to deliver by end of the sprint

2 Weeks Planning

NEXT

Ready to Work NEXT

Ready



Team Leader

Impediments (red flags)

WIP Backlog

Daily Mgmt Stand-up

2-Week-long "sprint"

Ready

End of sprint demo (validate)

End of sprint retrospective (Adjust)

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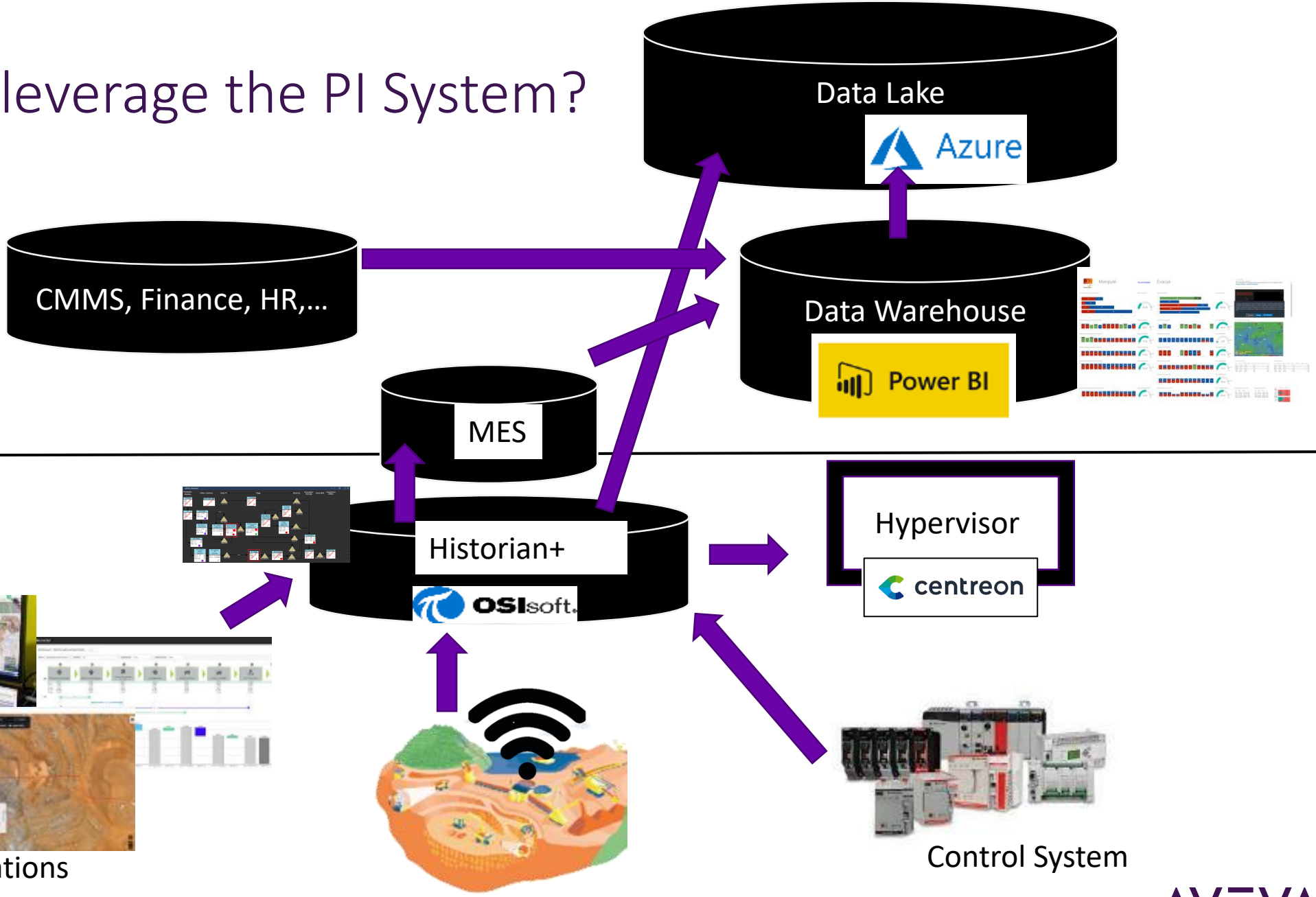
Development approach

How did we leverage the PI System?

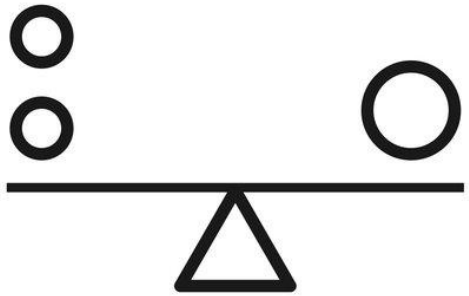
- Performance trends, multisite comparison
- Real-time monitoring & operation



Deployed use cases

A balanced approach to ensure constant value delivery

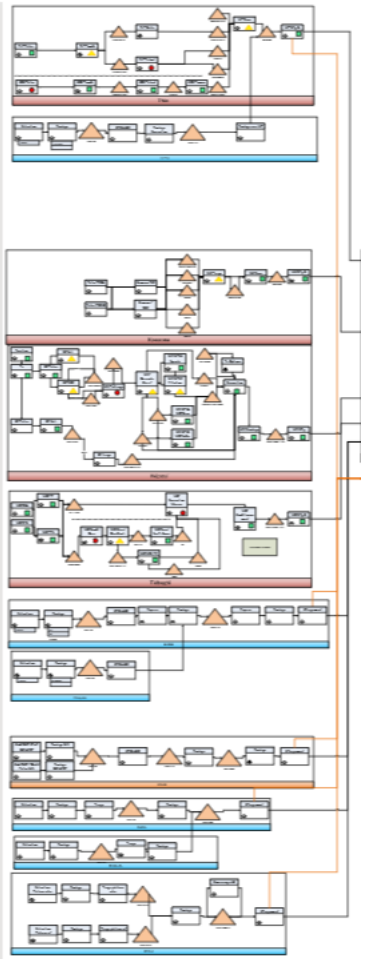
Complexity
- Data collection
- Data processing
- Visualization

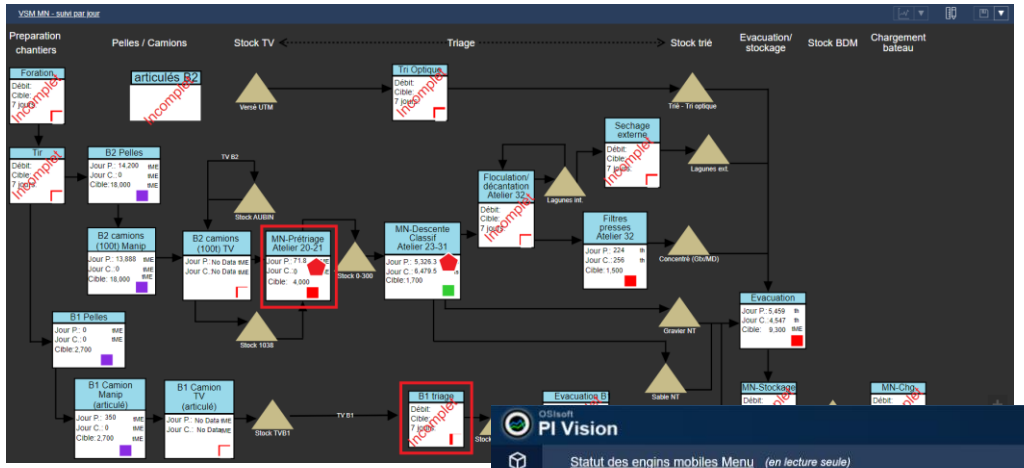


Value delivery
- Alert
- Pain point to be addressed

Value chain digitalization → Mining fleet → Fixed assets → Logistic assets → Geology

A process based approach





Components used

- PI-RDBMS
- AF/EF
- PI-Vision

It all starts with a better process understanding

- Common and easy way to understand the process of each site
- Comparison with target and previous periods
- Standardization of source data

Challenge(s)

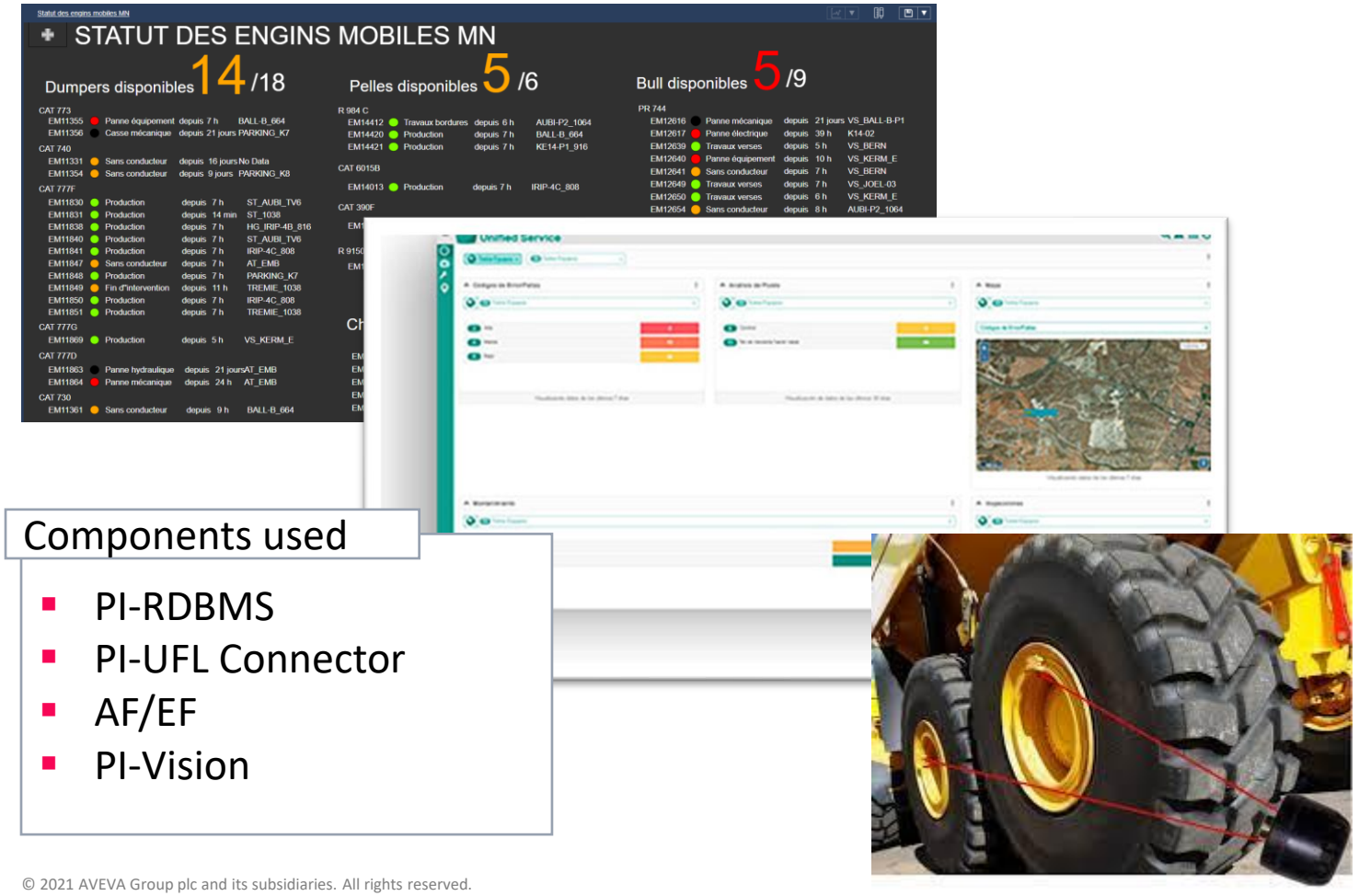
- Different from one site to the other
- Lots of information to ramp up the development team

Lessons learned and/or benefits

- Faster onboarding of new resources

Close-up on mining fleet

Aggregate different sources



Components used

- PI-RDBMS
- PI-UFL Connector
- AF/EF
- PI-Vision

Challenges

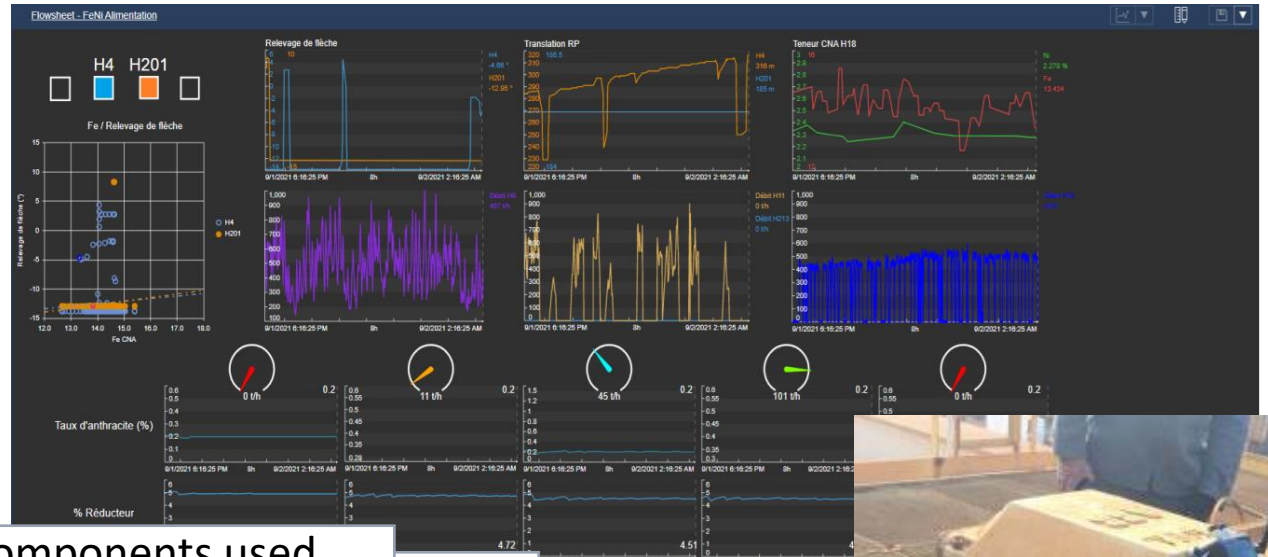
- 3 types of FMS (Fleet Management System);
  the objective is not to rewrite a legacy FMS, but to build on top of the existing ones
- Integration of new systems
  - API from OEM
  - IoT (WebAPI) from tire sensors

Benefits

- Ability to compare similar assets
- Single location with all machine data

Close-up on fixed assets

Blend real time and IoT information



Components used

- PI-OPC Interface
- PI-UFL Connector
- AF/EF
- PI-Vision

Challenges

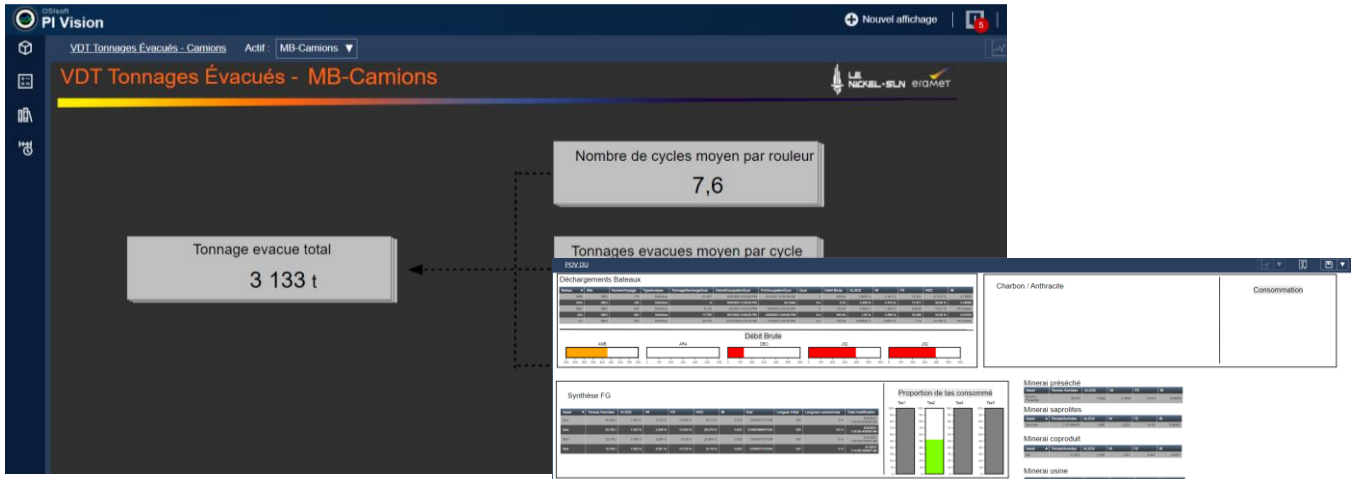
- Data quality
- Operational mode automatic categorization
- IoT integration versus OPC e.g. vibration sensors

Benefits

- Bring context to time series data with Event Frame
- Monitor performance for specific operational mode

Close-up on logistics assets

Structure Pit-to-Port information data



Components used

- PI-UFL Connector
- AF/EF
- PI-Vision

Challenges

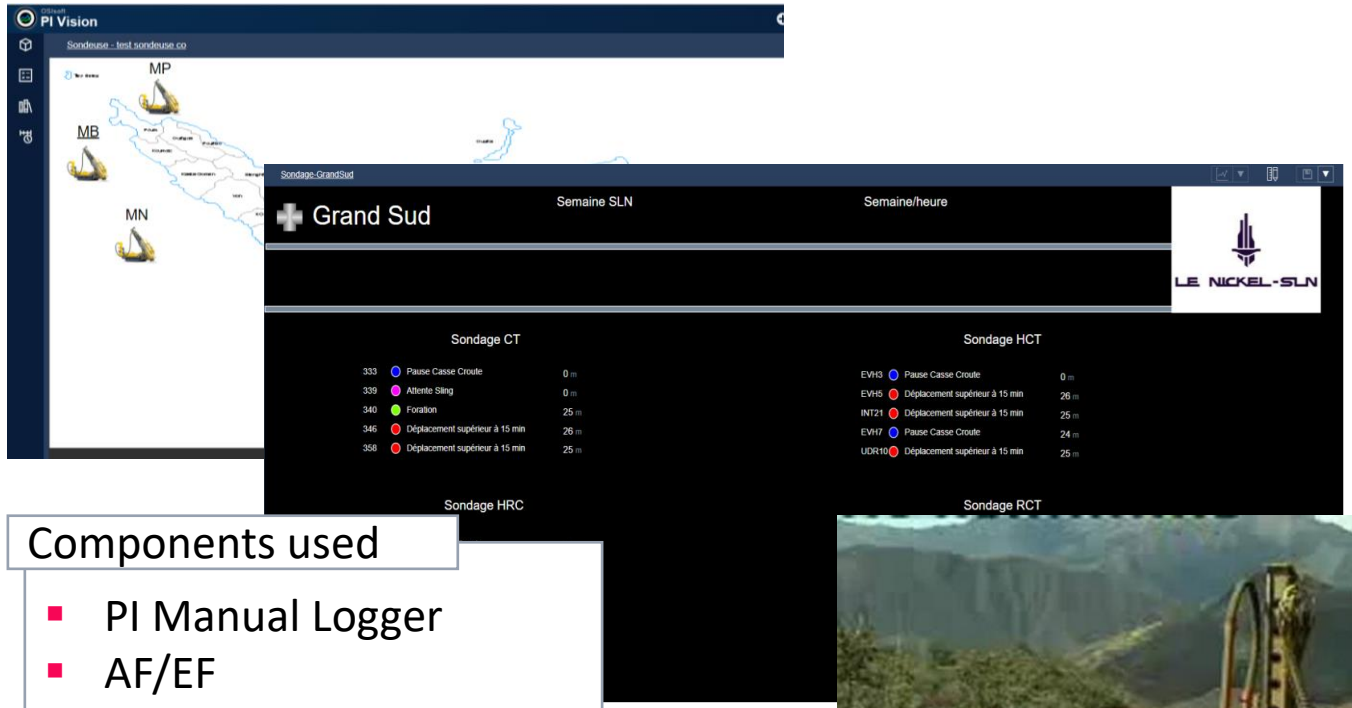
- Integration of third-party operator data
- Access to external data sources (external Web service)
- Data transformation to feed the AF Model

Benefits

- Real-time monitoring of operator’s performance
- Value driver tree

Close-up on exploration geology

Monitoring assets with low connectivity



Components used

- PI Manual Logger
- AF/EF
- PI-Vision

Challenges

- Manual entries
- Low connectivity

Benefits

- Bring visibility to the exploration process
- Reduce response time to deviation

Lessons learned / First results

People - Process - Technology

- Integration capacity leverage with the right asset modelling
  - Standard model, standard KPI

- Have a deep understanding of your data type (time series vs relational)
  - Leverage event frame to aggregate time series data

- Industrial IT vs Business Intelligence
  - PI is not a Business Intelligence platform but is a cornerstone in preparing the data for such platforms.

➔in less than 1 year, monthly rate of 2000 alerts/month over the whole value chain ➔ 1 operational improvement /site / day
➔OEE improvement on bottlenecks

1st year implementation

- 25 K PI points
- 60 interfaces running
- > 350 assets
- 45 K attributes
- 12 K analyses

Delivering incremental value

Going further

- Continue to consolidate all performance data, structure them and provide easy access (PI Vision vs Datalink)
- Hypervisor integration with AF Notifications capability
- Connection to Data Warehouse and Data Lake with PI Integrator…

  … to leverage Data Science capabilities (e.g. Machine Learning)

“Faster, Higher, Stronger – Together.”

Pierre De Coubertin

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