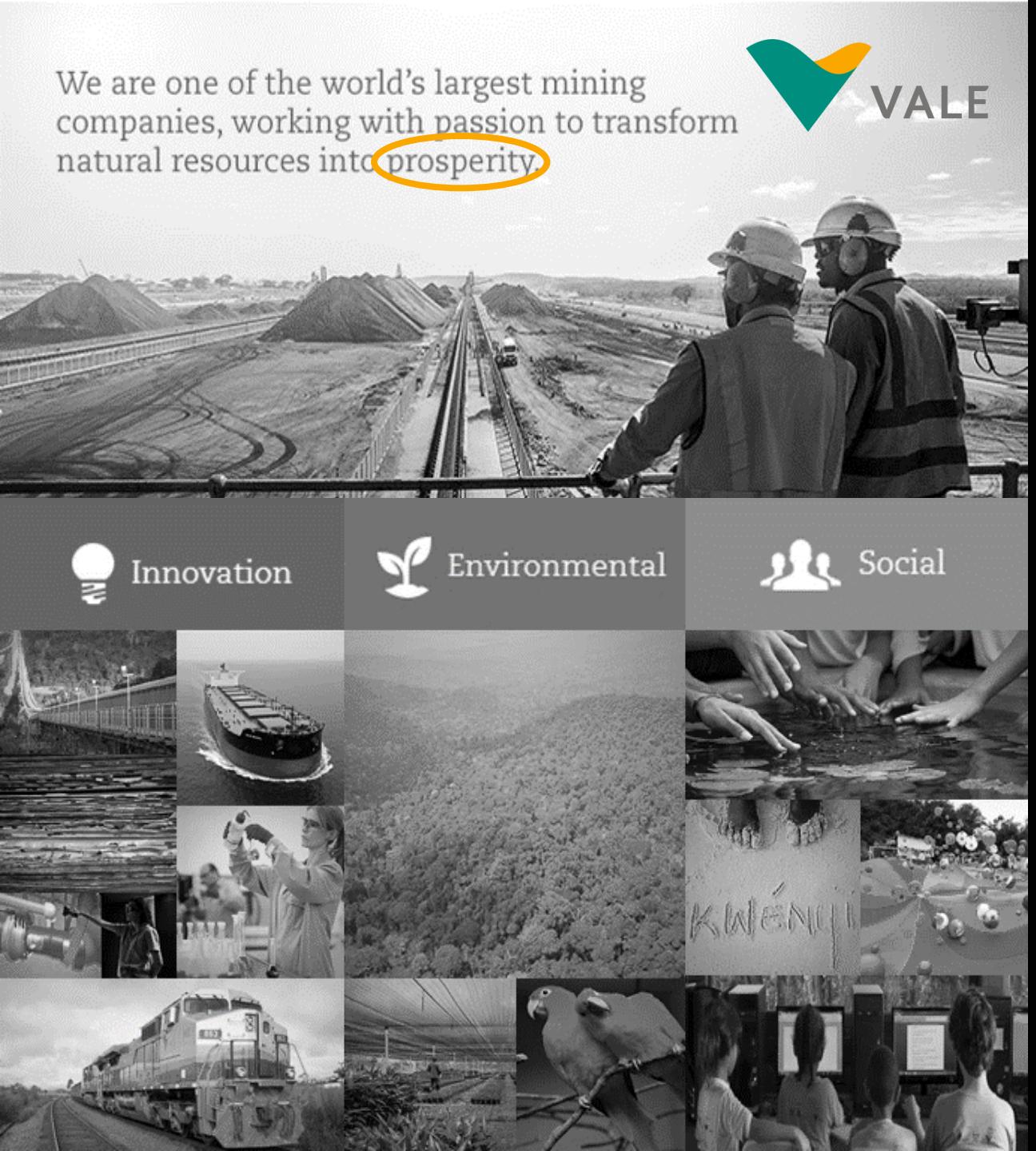
helio.mosquim@vale.com | 3rd International SAP Metals & Mining Summit | Moscow, Sept 2017

VALE


We are one of the world's largest mining companies, working with passion to transform natural resources into prosperity.
VALE
Innovation
Environmental
Social

PURPOSE

TEAM

VALE

DIVERSITY

Mining: Iron, Nickle, Copper, Coal, Manganese
+ **Energy, Logistics, Steel**

VALE

+US$ 124 bi

Investments over the last 10 years

FUNDING

2Q17 US$ 2.1 bi

Free Cash Flow

VALE

90 Million Tpy

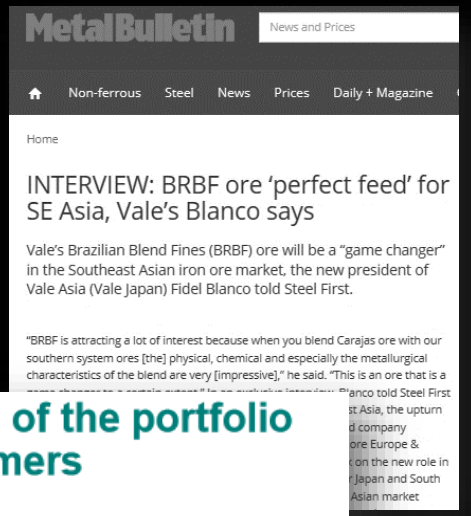
DISRUPT

Radical Efficiency and Sustainability

-41% C1 Cost @ US$ 7.7/t , -70% Fuel, -93% Water Consumption, -50% CO^2 Emission

VALE

Customer Centric


MetalBulletin

News and Prices

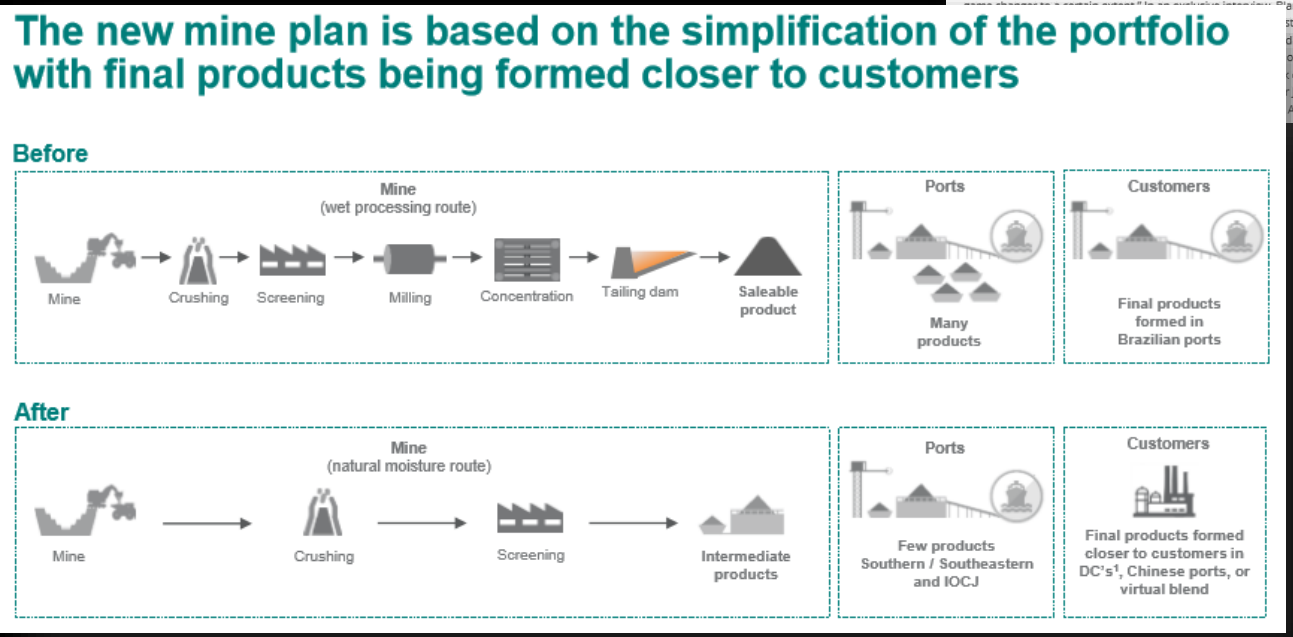
Non-ferrous Steel News Prices Daily + Magazine

Home

INTERVIEW: BRBF ore 'perfect feed' for SE Asia, Vale's Blanco says

Vale's Brazilian Blend Fines (BRBF) ore will be a "game changer" in the Southeast Asian iron ore market, the new president of Vale Asia (Vale Japan) Fidel Blanco told Steel First.

"BRBF is attracting a lot of interest because when you blend Carajas ore with our southern system ores [the] physical, chemical and especially the metallurgical characteristics of the blend are very [impressive]," he said. "This is an ore that is a



DESIGN

Brazilian Blend Fines

Sources: http://www.vale.com/brasil/EN/investors
https://www.metalbulletin.com/Article/3546684/INTERVIEW-BRBF-ore-perfect-feed-for-SE-Asia-Vales-Blanco-says.html

VALE

Business Imperatives

Integration + Simplification + Productivity

- Integrated Process Management
- Operational Excellence (Ports, Railroad, Mining)
- Capital Projects Framework
- Environment and H&S
- Collaboration & Connectivity

Digital Transformation

- *Industrial IT Systems*
- *Advanced Analytics & Machine Learning*
- *Data Capture and IoT*

Business Outcomes

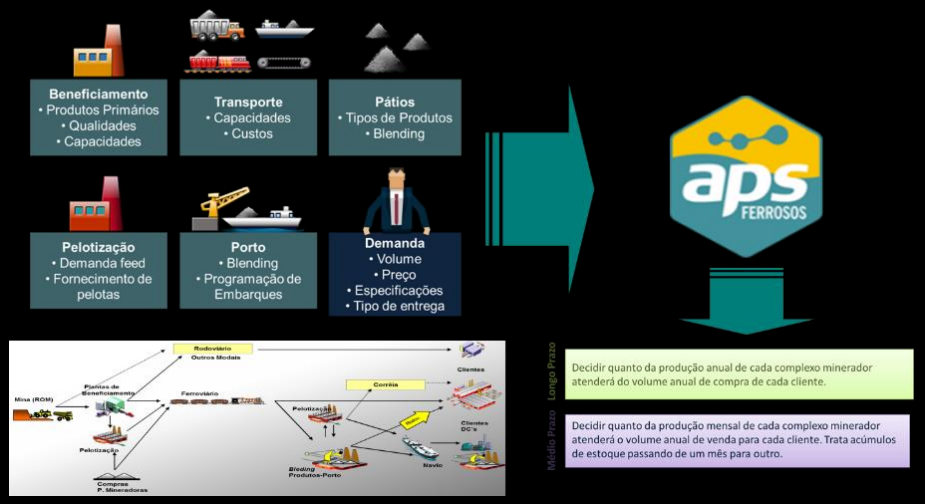
- **Optimization of Value Chain**
- **Improve Maintenance Effectiveness** (Trucks, Conveyors, Rolling stock)
- **Improve Critical Asset Efficiency** (Plants, Trucks, Rolling stock)
- **Improve Workforce Effectiveness**

~US$ ↑2bi EBITDA*

VALE

Estimated benefits up to 2020. Details @: http://www.vale.com/brasil/EN/investors

Digital Supply Chain



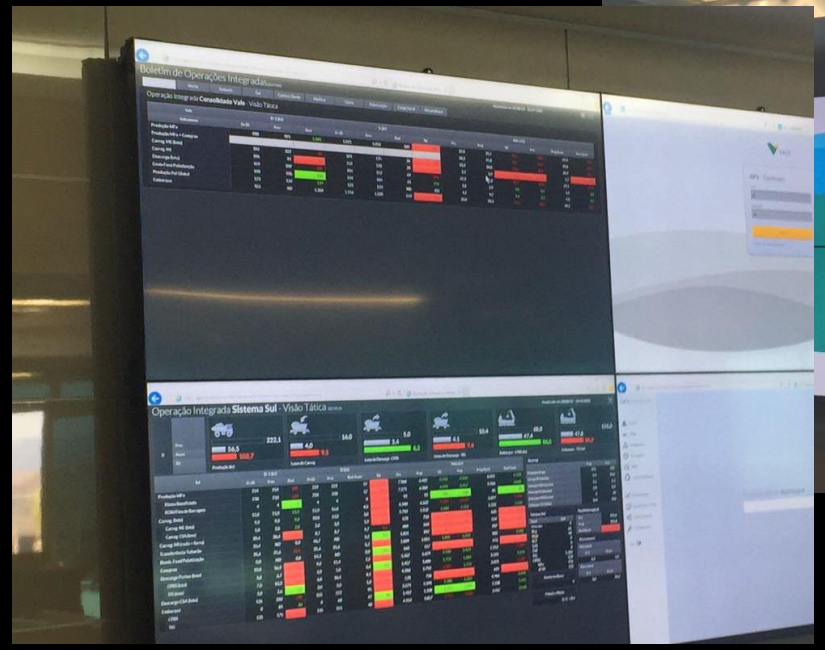
Optimization Models: Volume x Costs x Prices

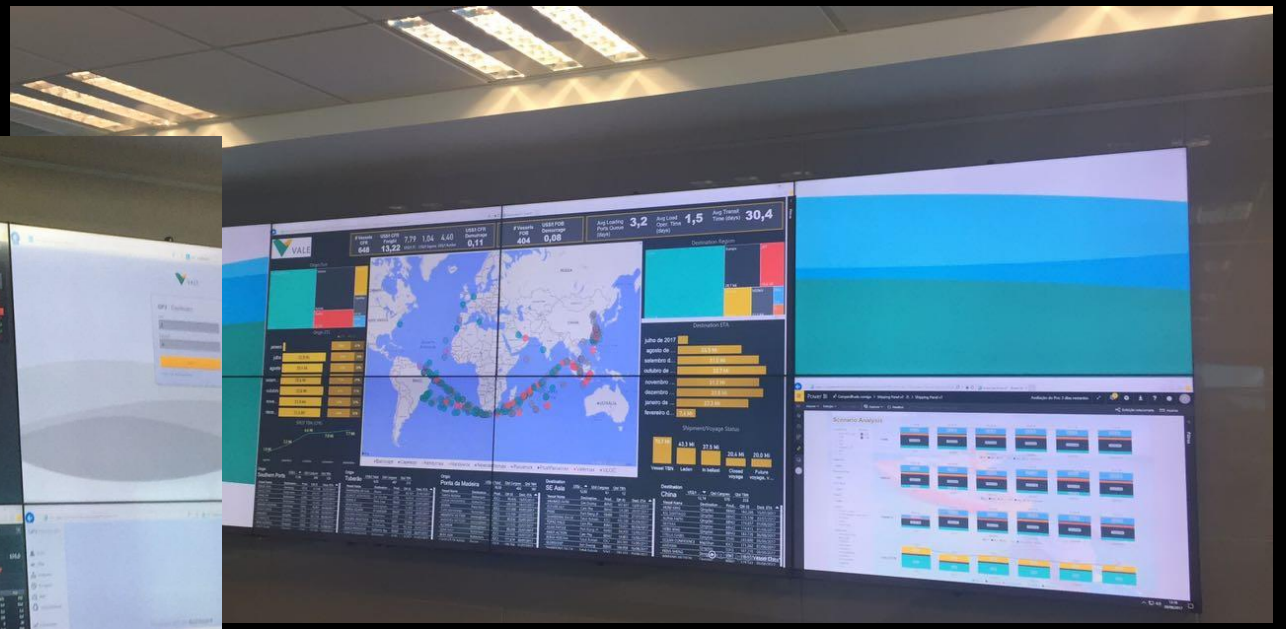
Shipping Fleet Optimization System

⬆ MARGIN

VALE

Digital Operation





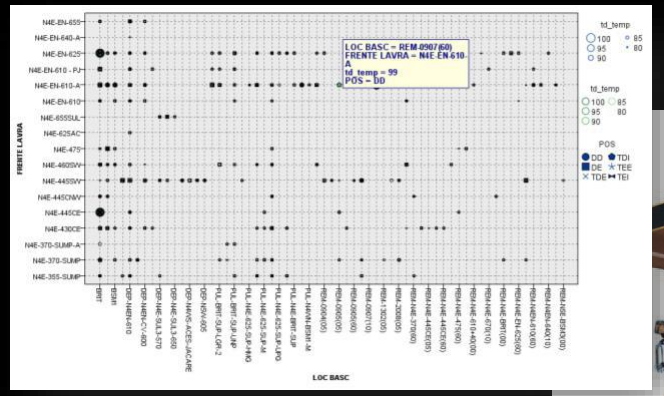
Integrated Operations: Planning, Scheduling, Execution and Analysis

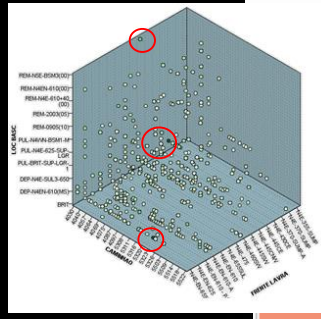
VALE

“Don’t tell it, show it.”

Health & Safety Prediction Model

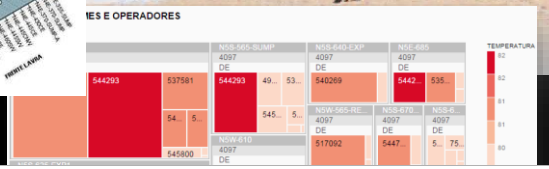
Early warning signals



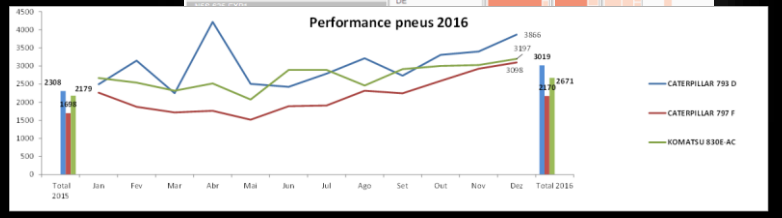


Predictive Maintenance

Predict imminent failures



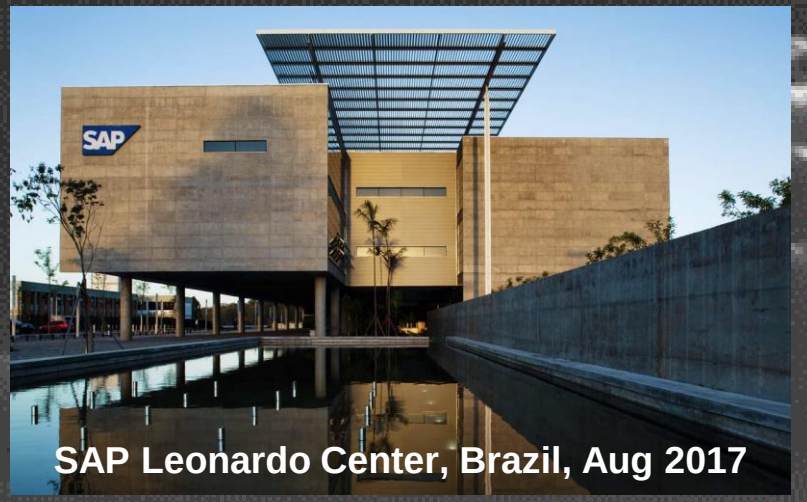
Predict tire life cycle



Rapid low cost prototype

for showing impressive results

VALE



SAP Leonardo Center, Brazil, Aug 2017

A STARTUP CHALLENGE

VALE

Aug 2nd
Wed

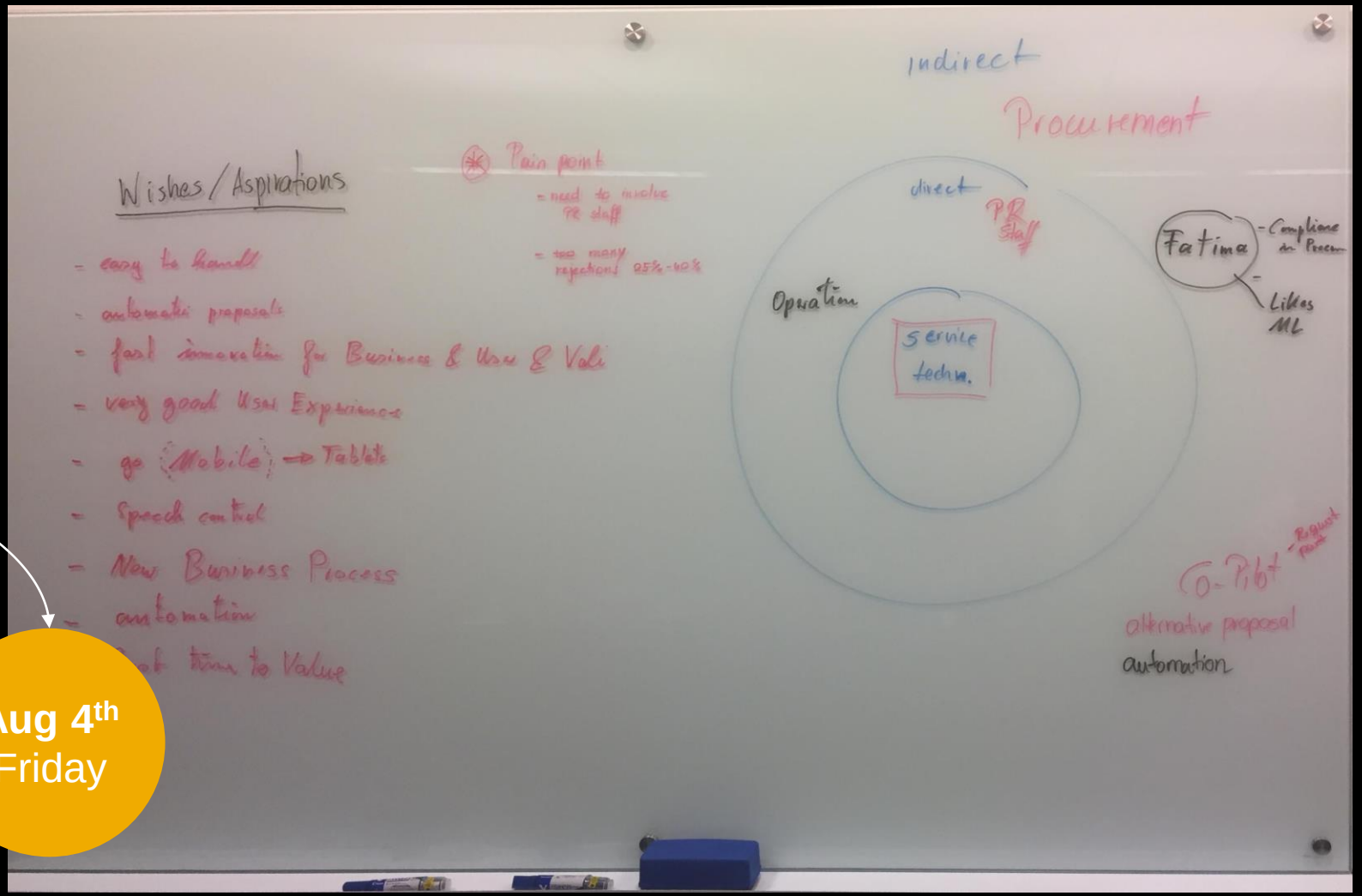
1st touch point with sharing the challenges and the vision

Aug 3rd
Thursday

Draft 4 week work plan for a fast jump start

Aug 4th
Friday

Vale ready to go for Exploration workshop



SAP Run Simple

VALE

Aug 5th
Saturday

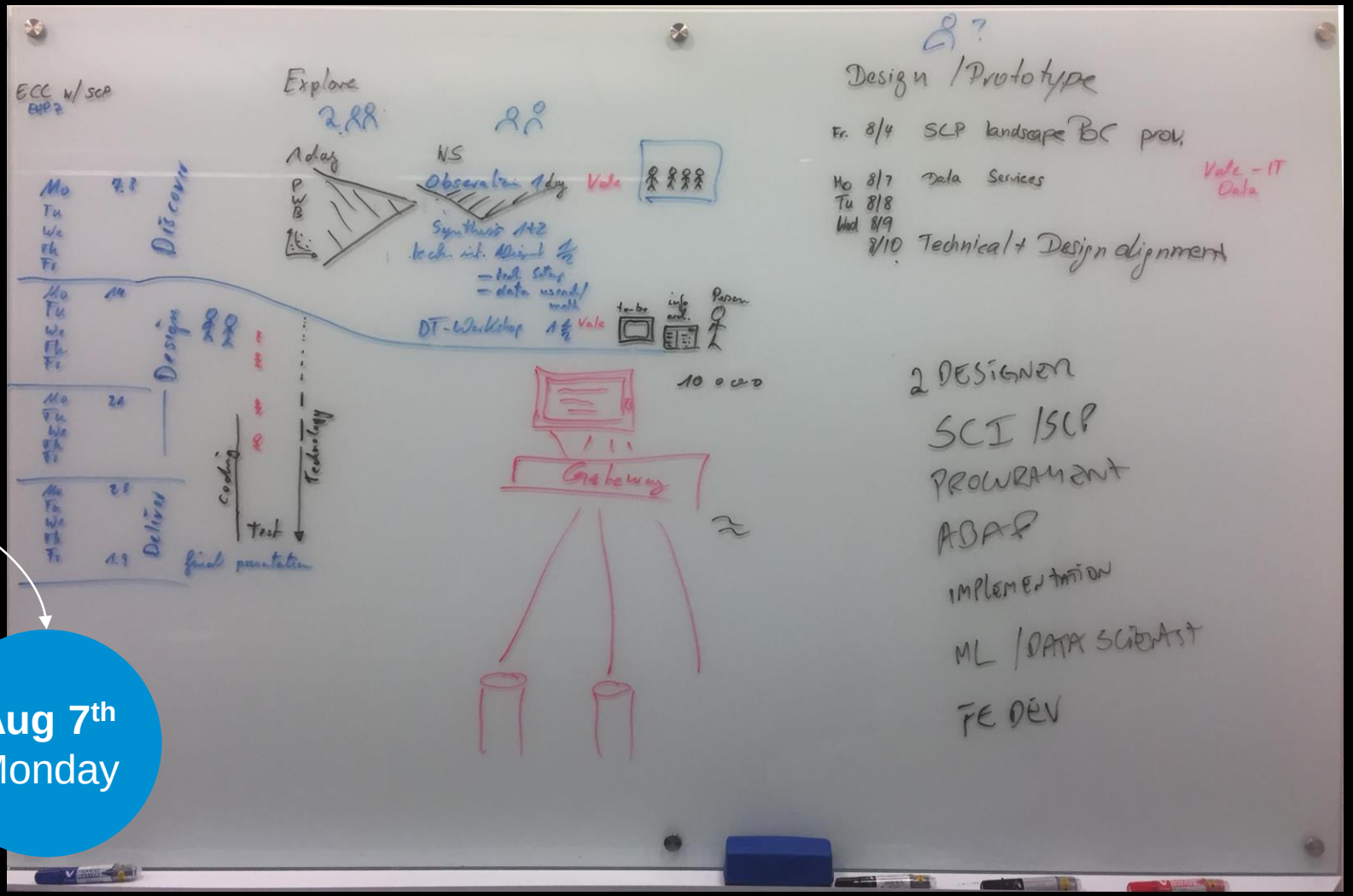
Onboarding of SAP team members and flight / hotel bookings

Aug 6th
Sunday

Briefing in Belo Horizonte for 3 day engagement

Aug 7th
Monday

Exploration Workshop



SAP Run Simple

VALE

User Pain Points

- Manual Process
- A lot of screens
- Decentralized information
- A lot of shared files
- Unknown information
- High number of rejections

CASE STUDY: VALE S.A.

Summary

As part of a larger digital transformation, VALE is innovating their processes to be more efficient and effective. The goal was to operate and innovate user centric and design driven to have the most improvements including the people participating in the process. The challenge was to reduce the number of purchase requisitions that are being rejected causing a lot of delays in the maintenance and operations of the mines. Thus, VALE engaged with SAP to build an integrated prototype in 4 weeks using Design Thinking methodology and Leonardo cloud service platform.

User research: key figures

5 End-users Interviewed

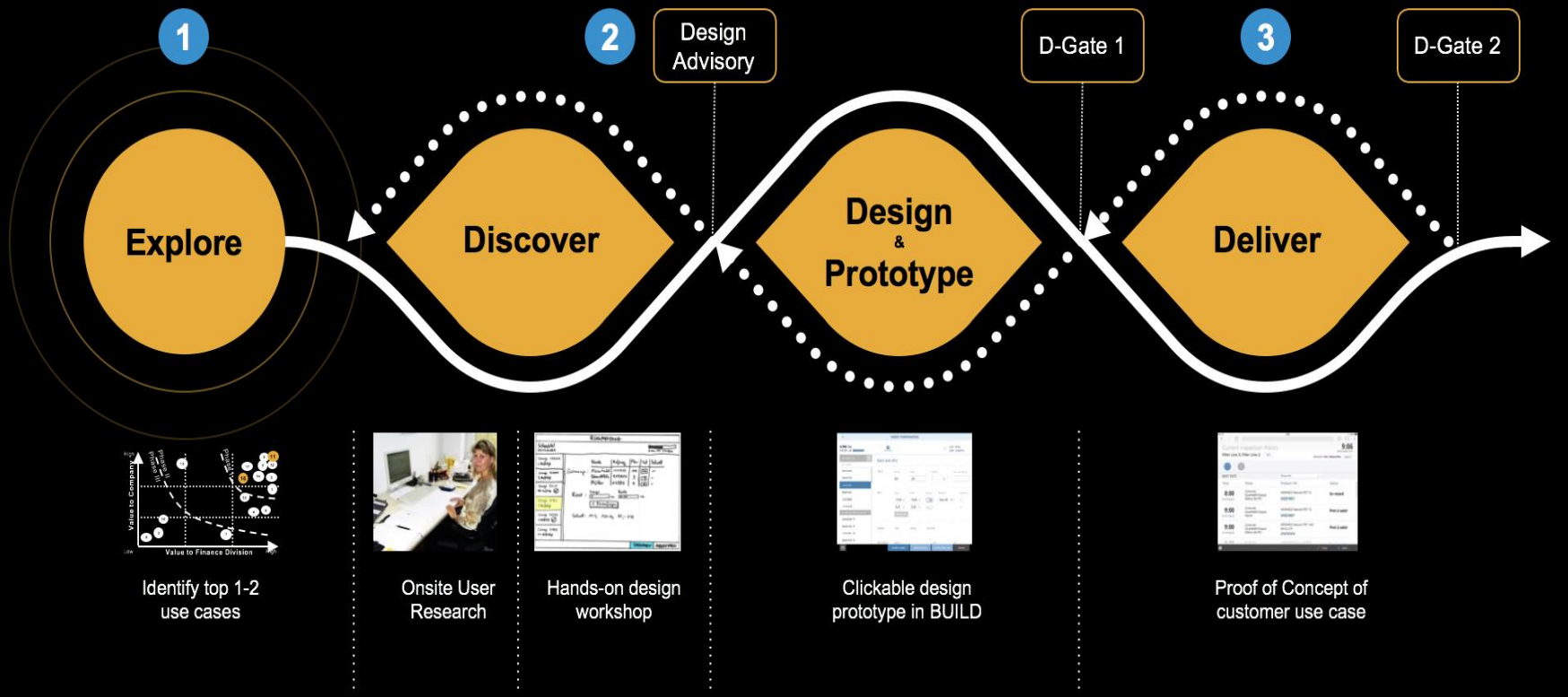
3 Roles involved

2 DT Workshops

26 participants

SAP Leonardo Open Innovation

Deliver SAP Leonardo Innovation Use Cases by involving Real End Users



Objective:

Reduce the high number rejections for spot purchase requisitions in VALE

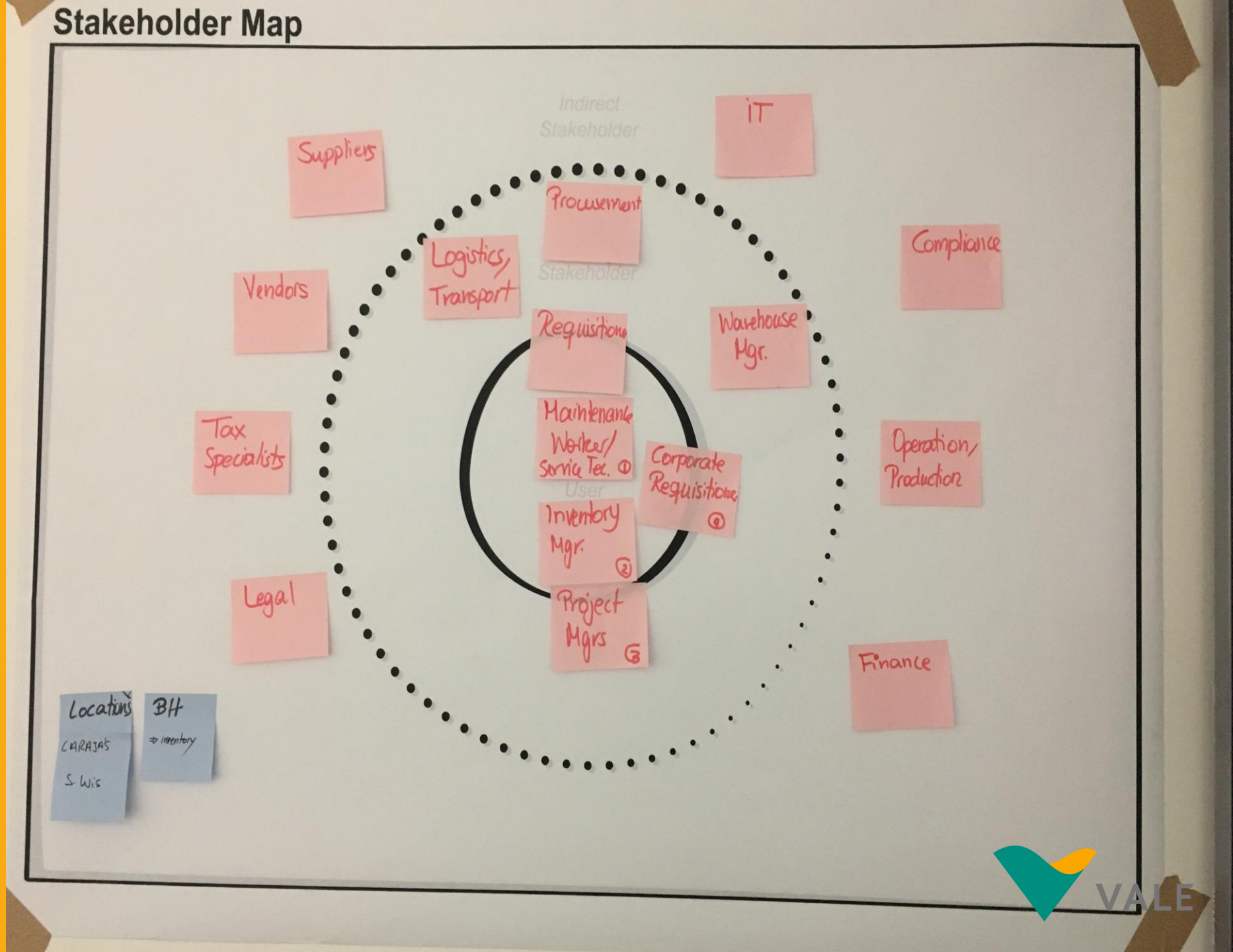
From Exploration workshop to live Prototype on SAP Leonardo in

4 weeks

Challenges

- Several unnecessary fields in the purchase requisition confusing the user;
- Different source to find the proper item (associated to a contract);
- Complex Integration landscape to support the process;
- 25-40% of the Purchase Requisition rejected by procurement;
- ~50% of Rejection are related to the items with Contracts already in place;
- Huge volume of RFQs lines with different vendor lists;
- Generic Service Master – Lack of description for the service required;

Stakeholder Map from Exploration workshop

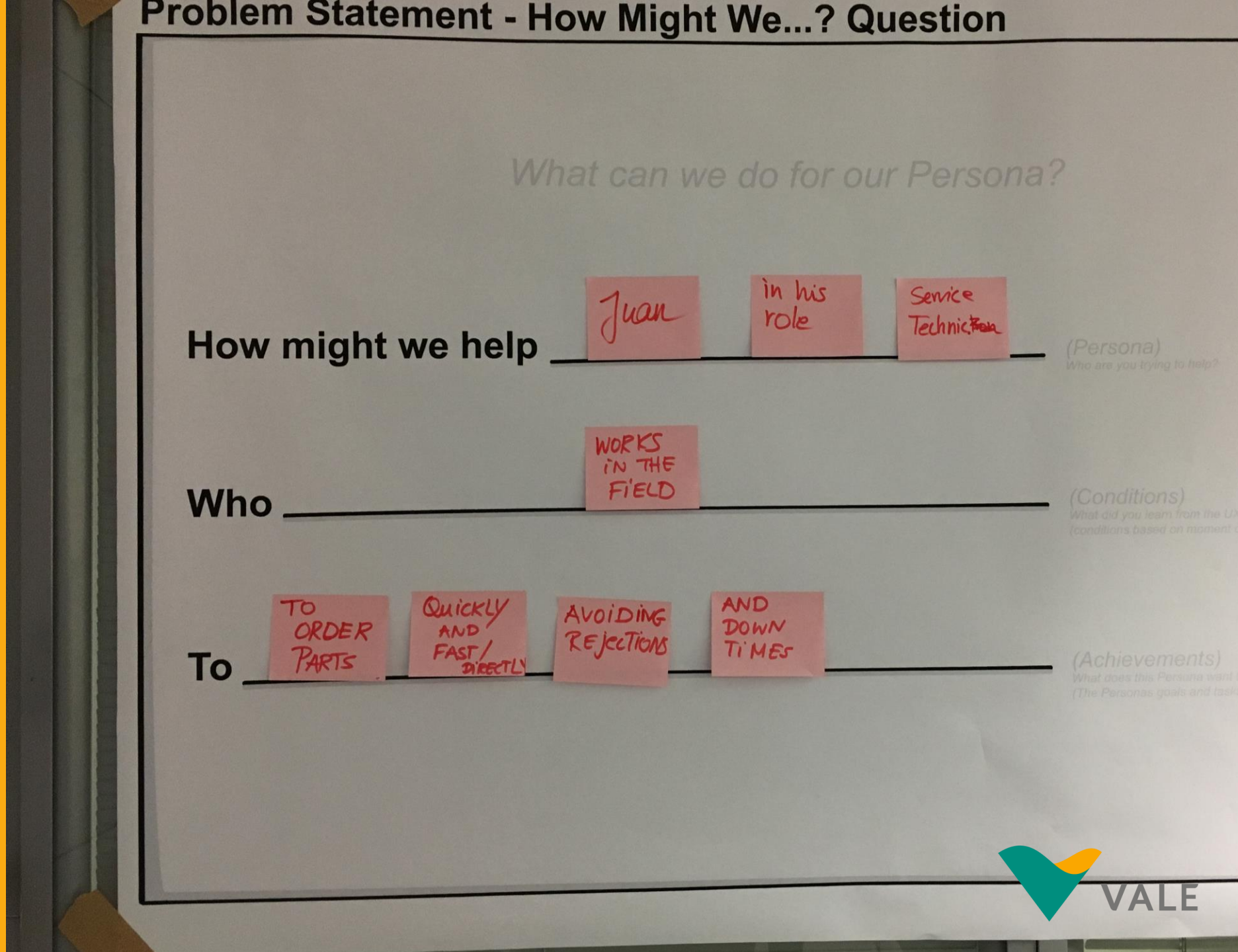


INTERNAL

How Might We

from Exploration workshop

August 7th



CASE STUDY: VALE S.A.

Discover

Scope

Mobile App that supports an intelligent purchase requisition process

360° Research

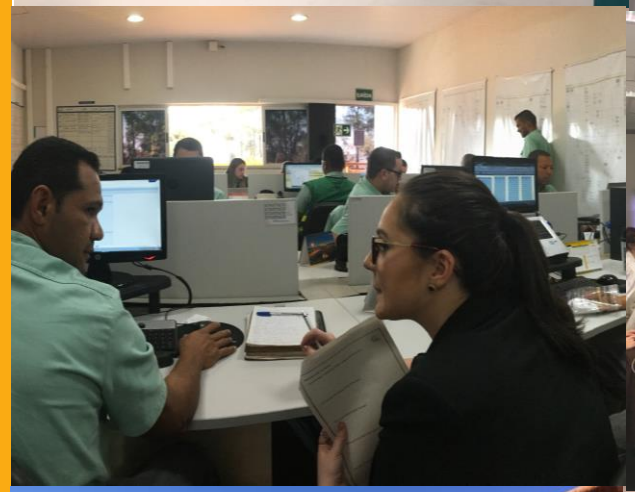
On-site visit to the mine for observation and interviews with 3 related roles.

Synthesize

Workshop with end users to present the synthesis results and design solution together

Outcome

Low-fidelity prototype of smart purchase requisition process to reduce rejections



On-site observations

Synthesis presentation

Design workshop

CASE STUDY: VALE S.A.

Design

Prototype

Mobile App that supports an intelligent purchase requisition process

Validate

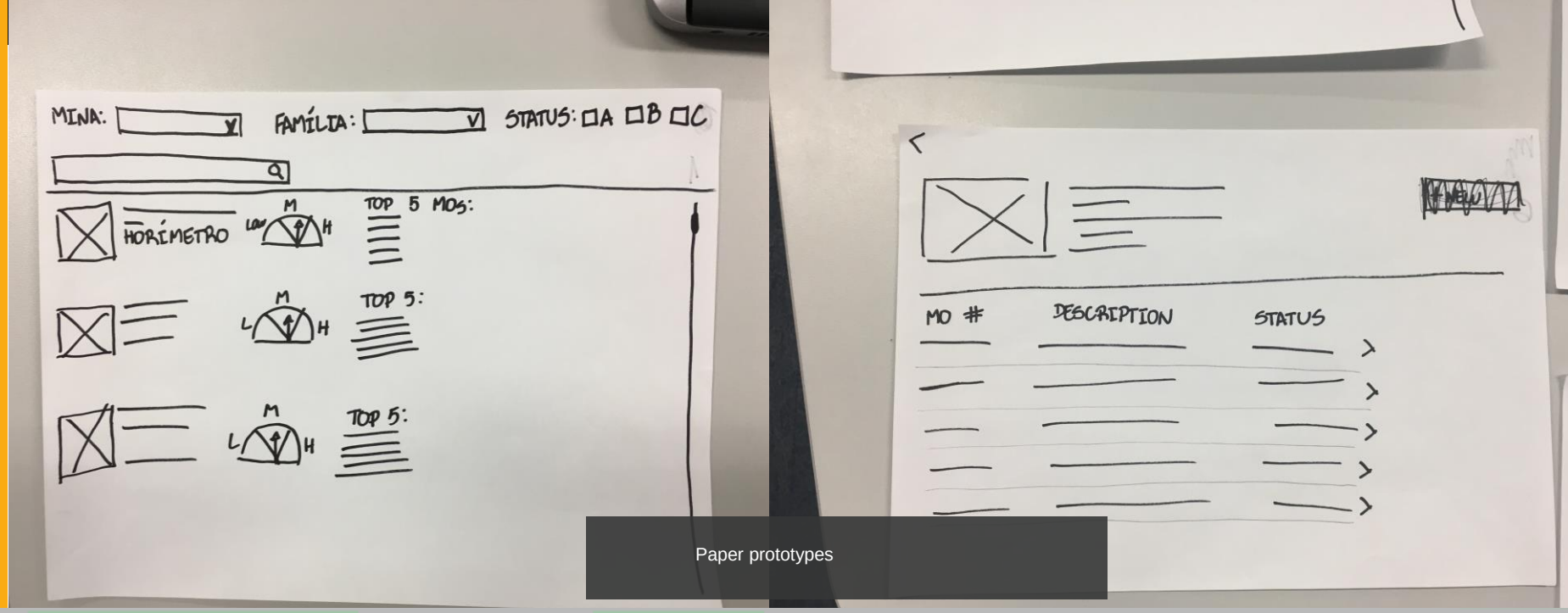
Validation with end-users and business

Iterate

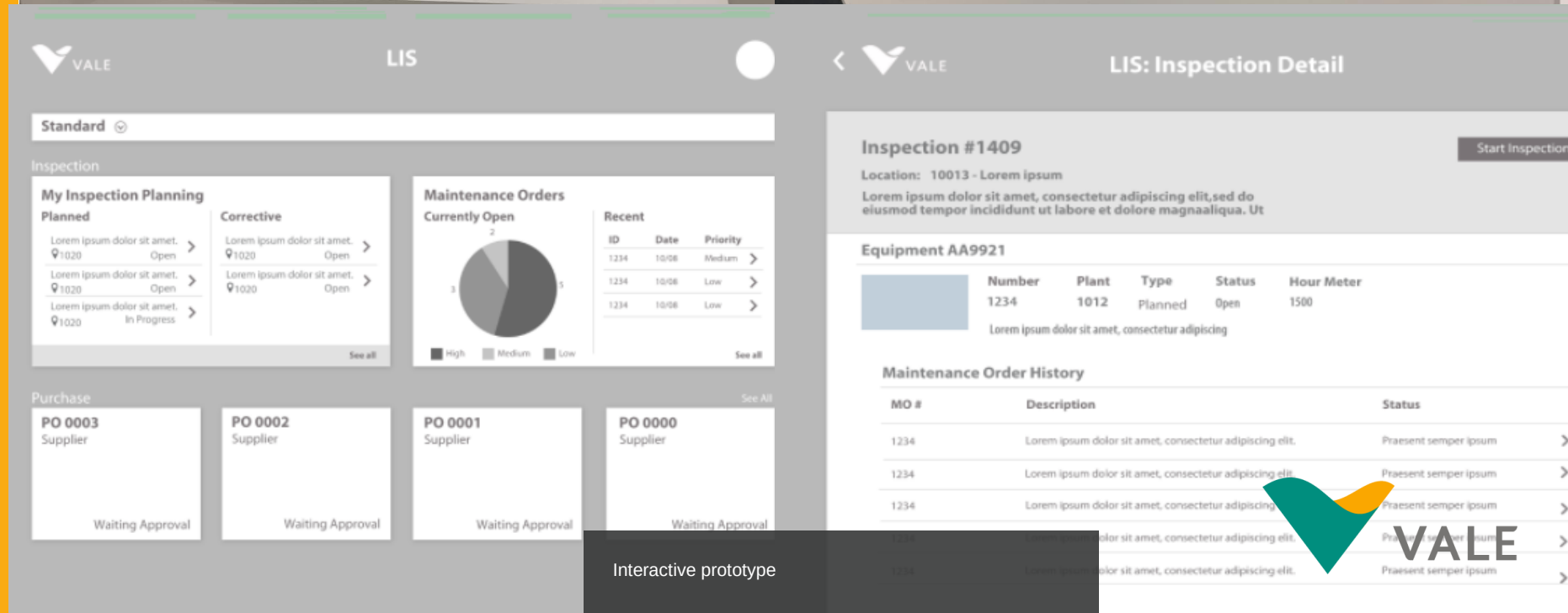
Integration of the end-user feedback in the clickable prototypes and visual design.

Outcome

Implemented prototypes with integration to ERP using machine learning on SAP Cloud Platform



Paper prototypes

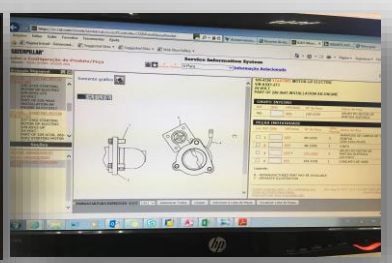


Interactive prototype

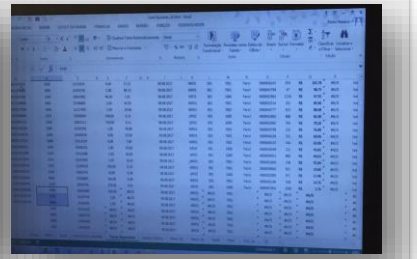
BEFORE

Manual updated wall with information on inspections

SAP ERP



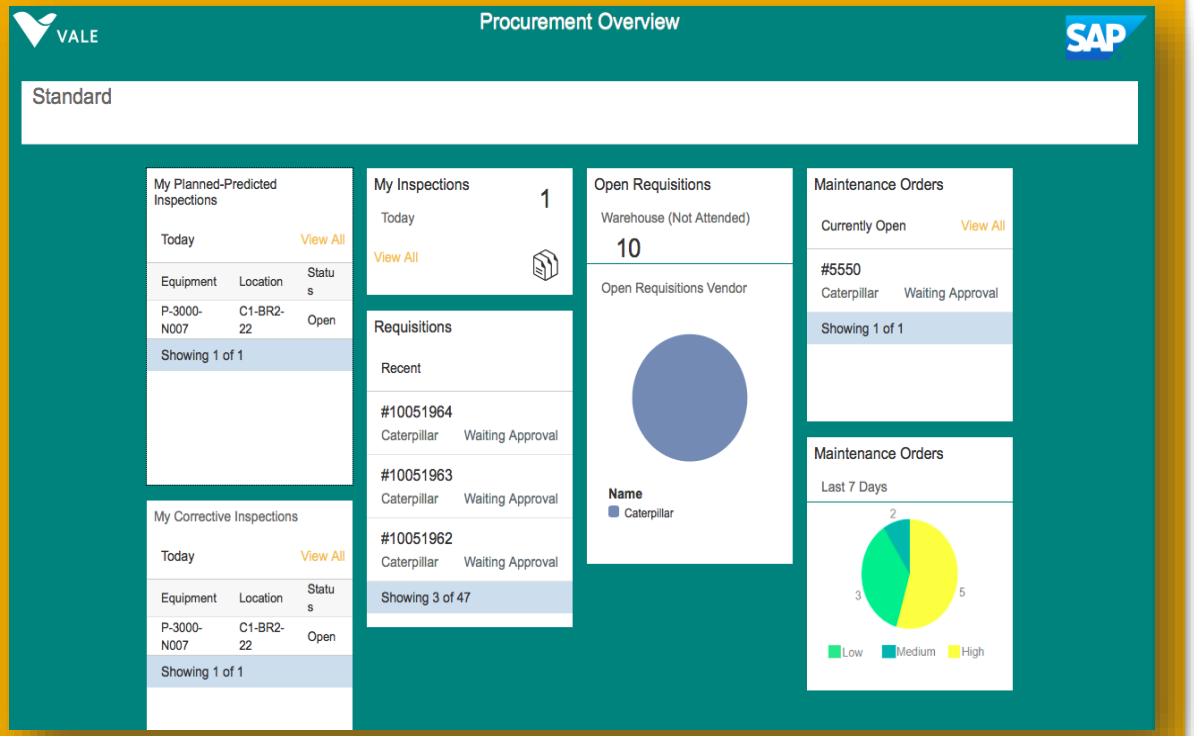
Vendor Catalogue



Personal Excel File

AFTER

Increased asset, maintenance and people effectiveness



Single access point, simplified process, intelligent check for contract with intelligence for easy update of ERP through SAP Cloud Platform

86% reduction of purchase requisition rejections

VALE

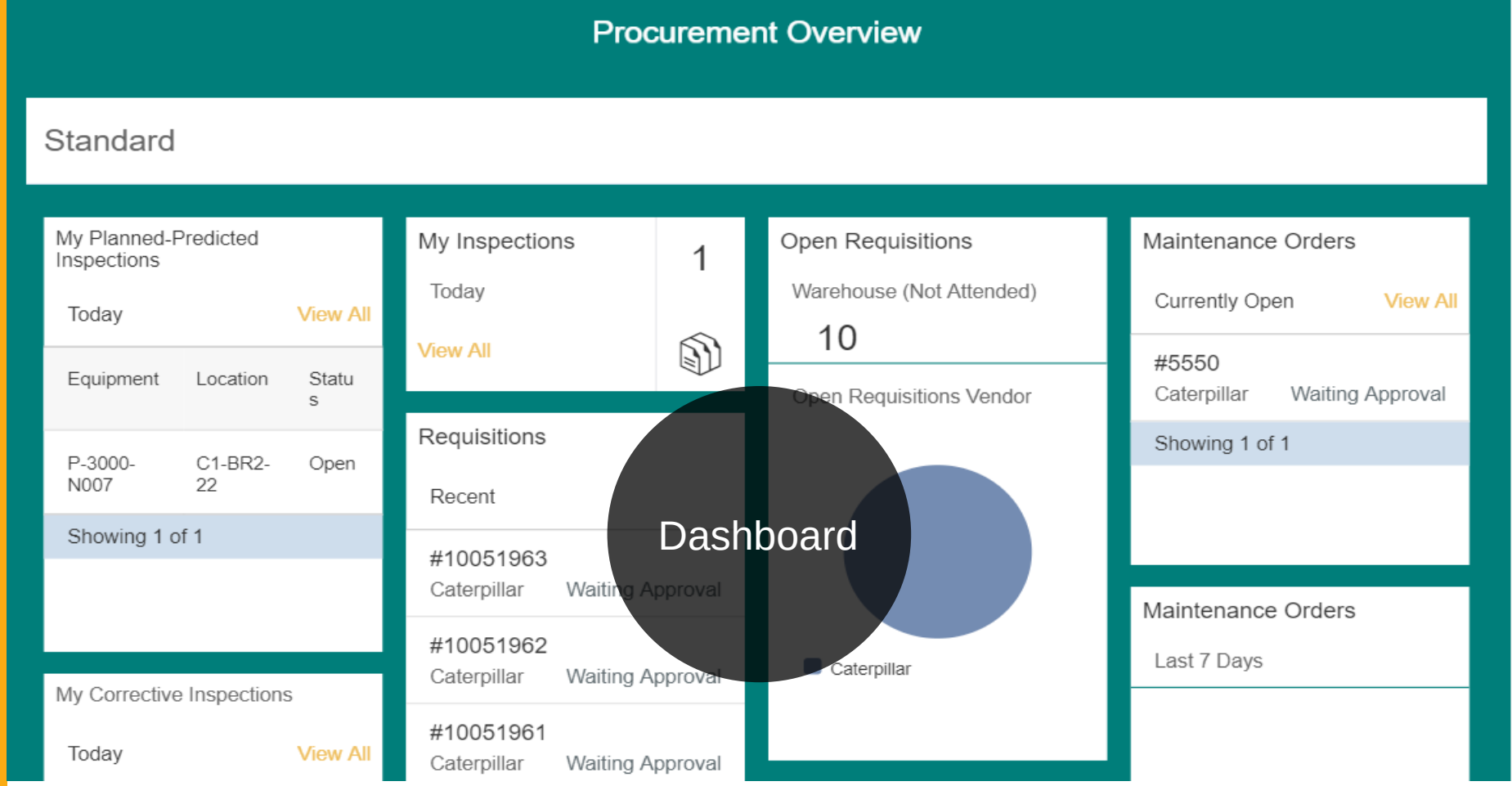
CASE STUDY: VALE S.A.

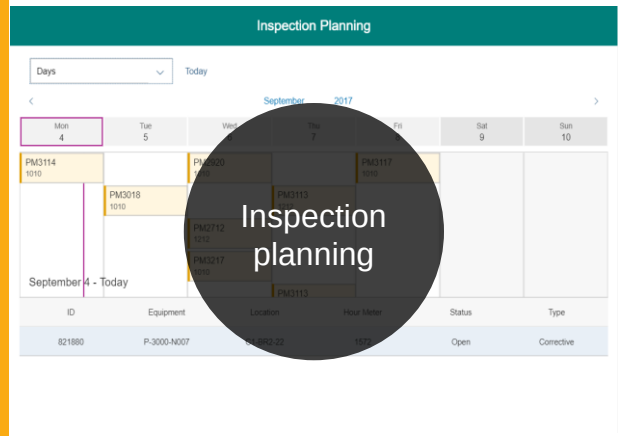
Deliver

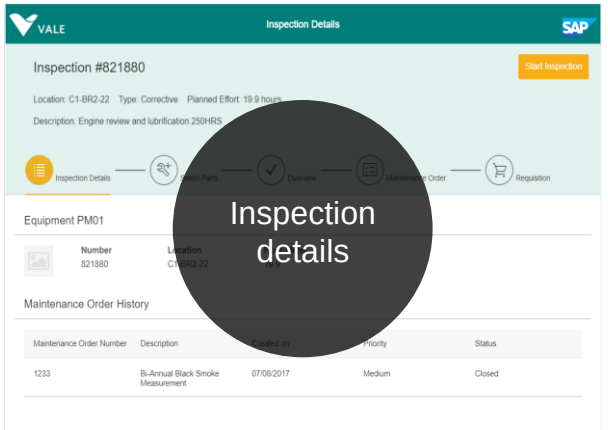
Leonardo Smart Purchase Requisitions

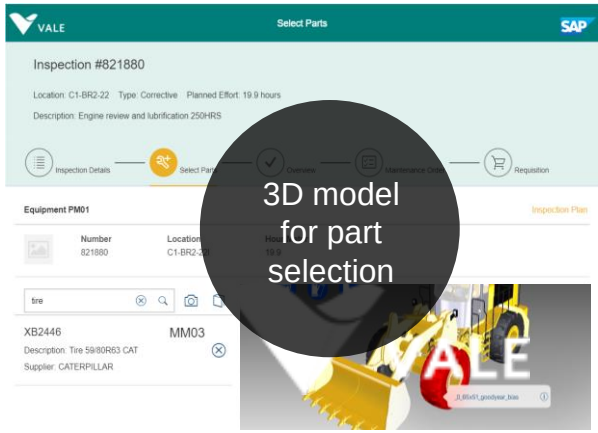
Outcome

Creation of a functional integrated, user validated PoC









Long term approa

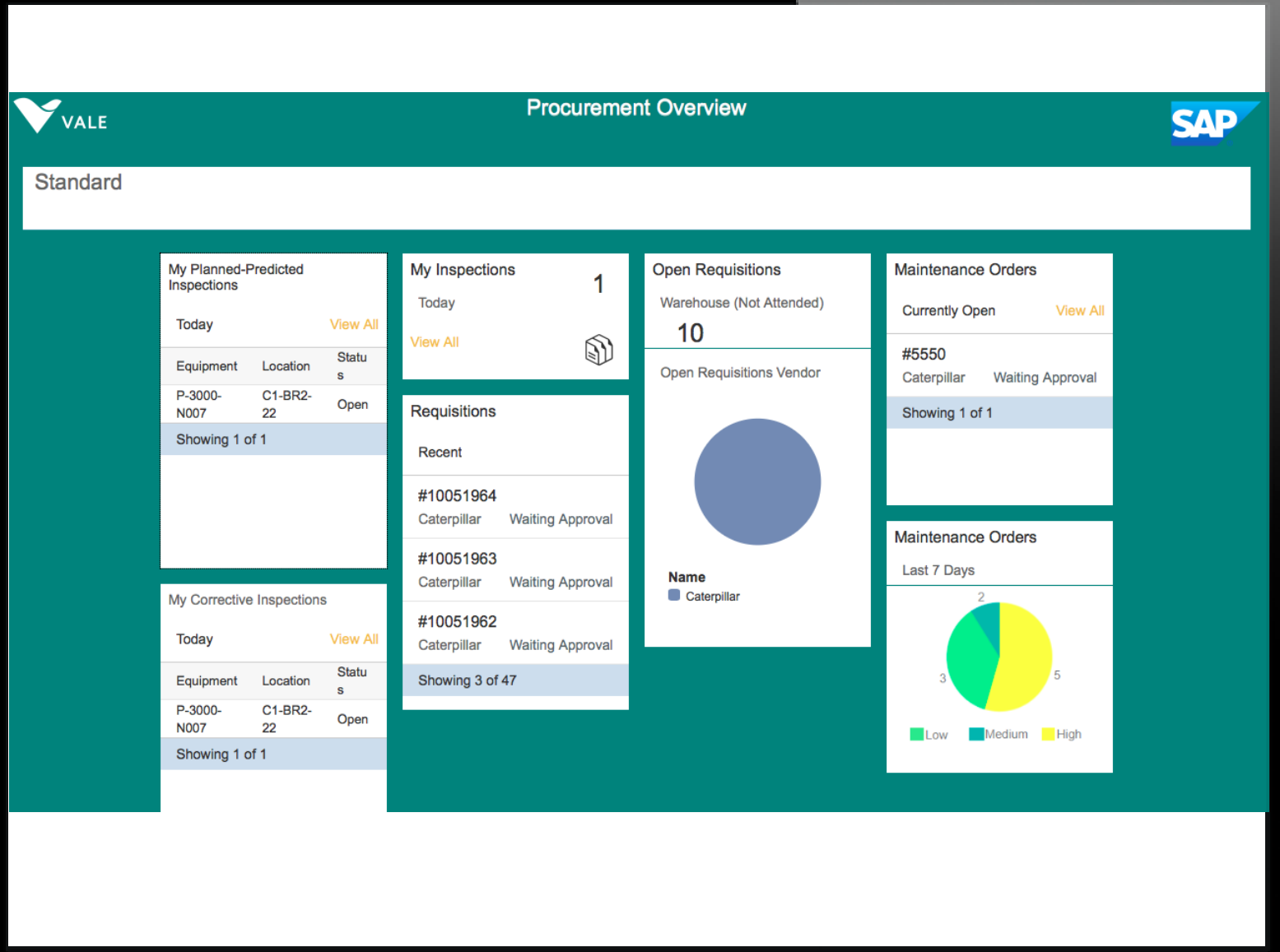
Design produces results!

Optimizing purchase requisition and maintenance process

Increased asset, maintenance and people effectiveness

86%

elimination of purchase requisition rejections



THANK YOU

VALE