



Talgo

GESTIÓN DINÁMICA DEL MANTENIMIENTO BASADO EN INTELIGENCIA ARTIFICIAL Y GEMELOS DIGITALES

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TALGO

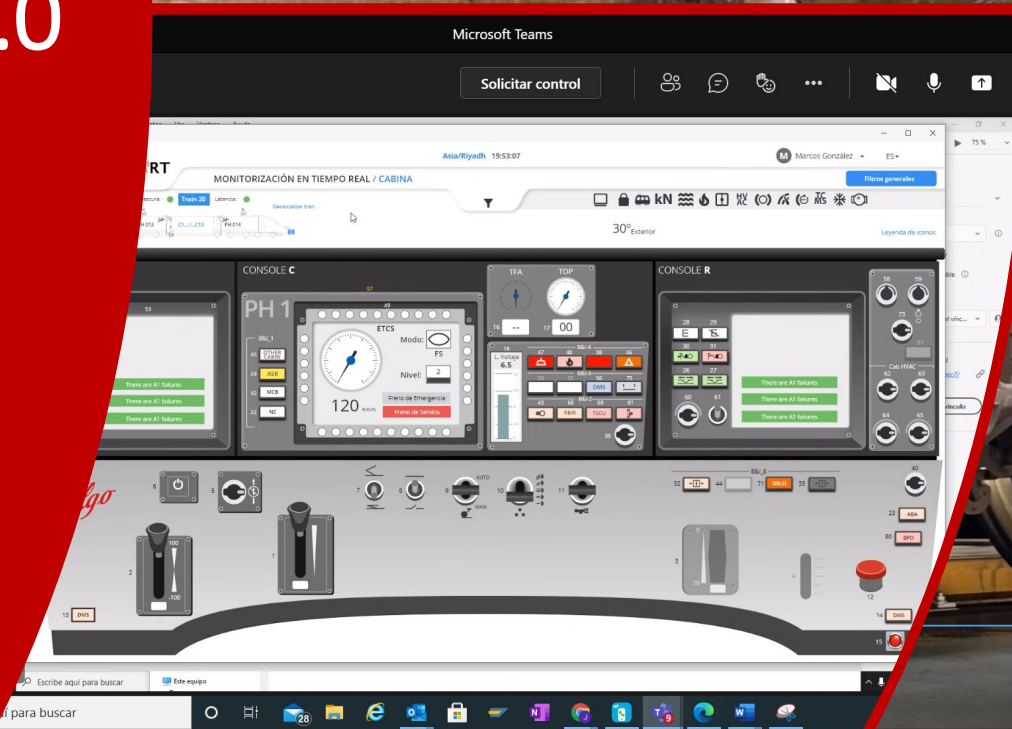
Jornadas técnicas ICAI. Aplicación de las tecnologías de IA al Ferrocarril

29 de octubre 2024

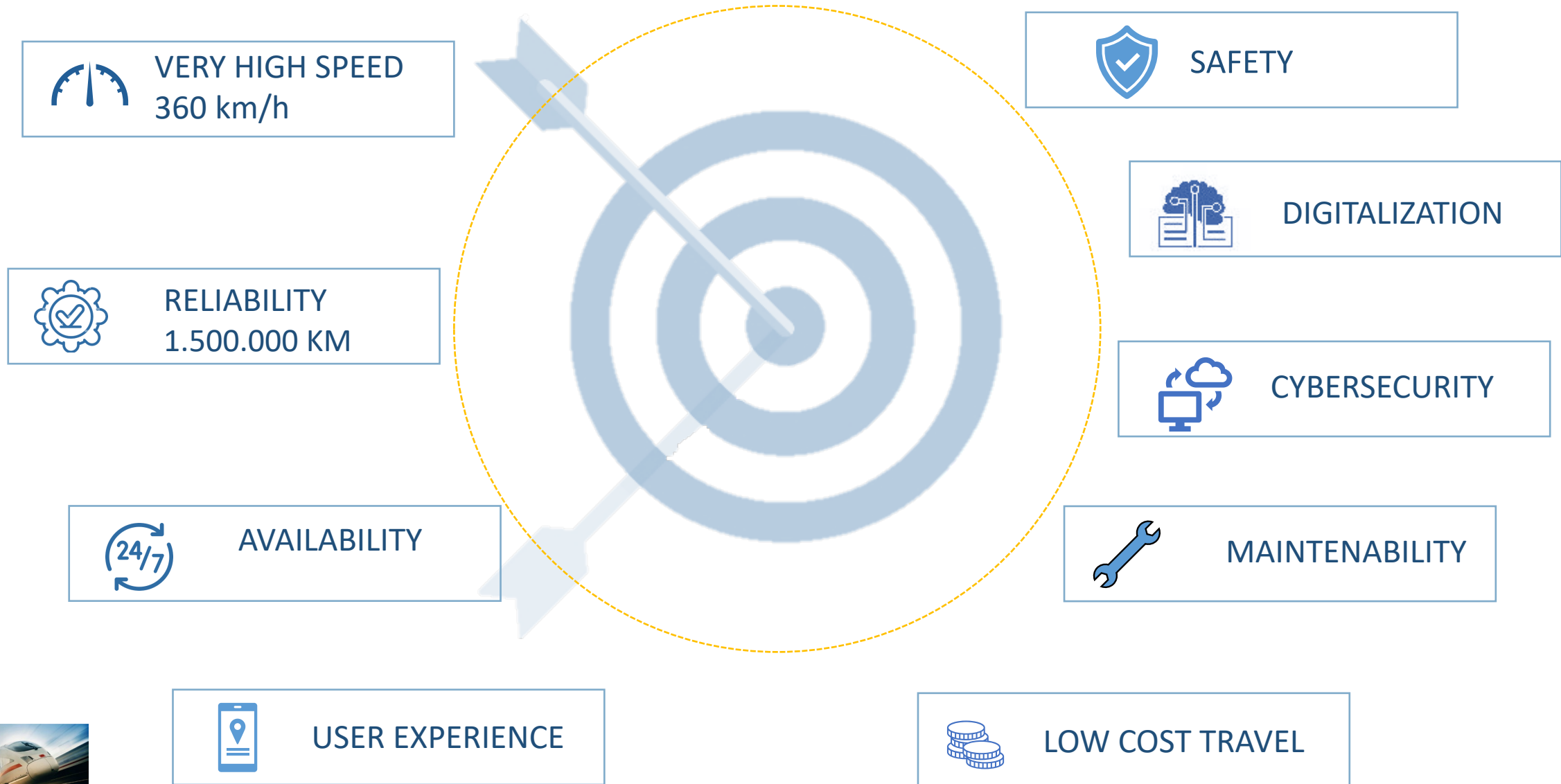


ASOCIACIÓN NACIONAL
DE INGENIEROS DEL ICAI

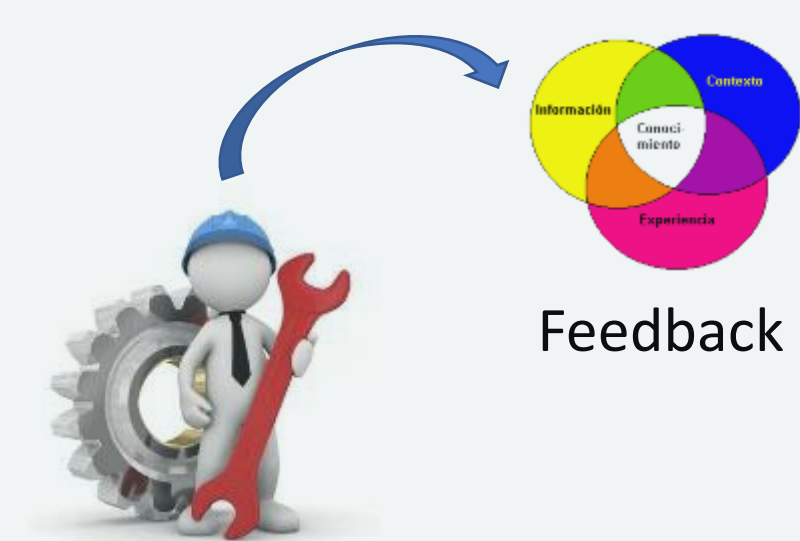
TALGO SMART MAINTENANCE 4.0



CHALLENGES AND MARKET REQUIREMENTS



Return of experience in upcoming projects



Maintenance

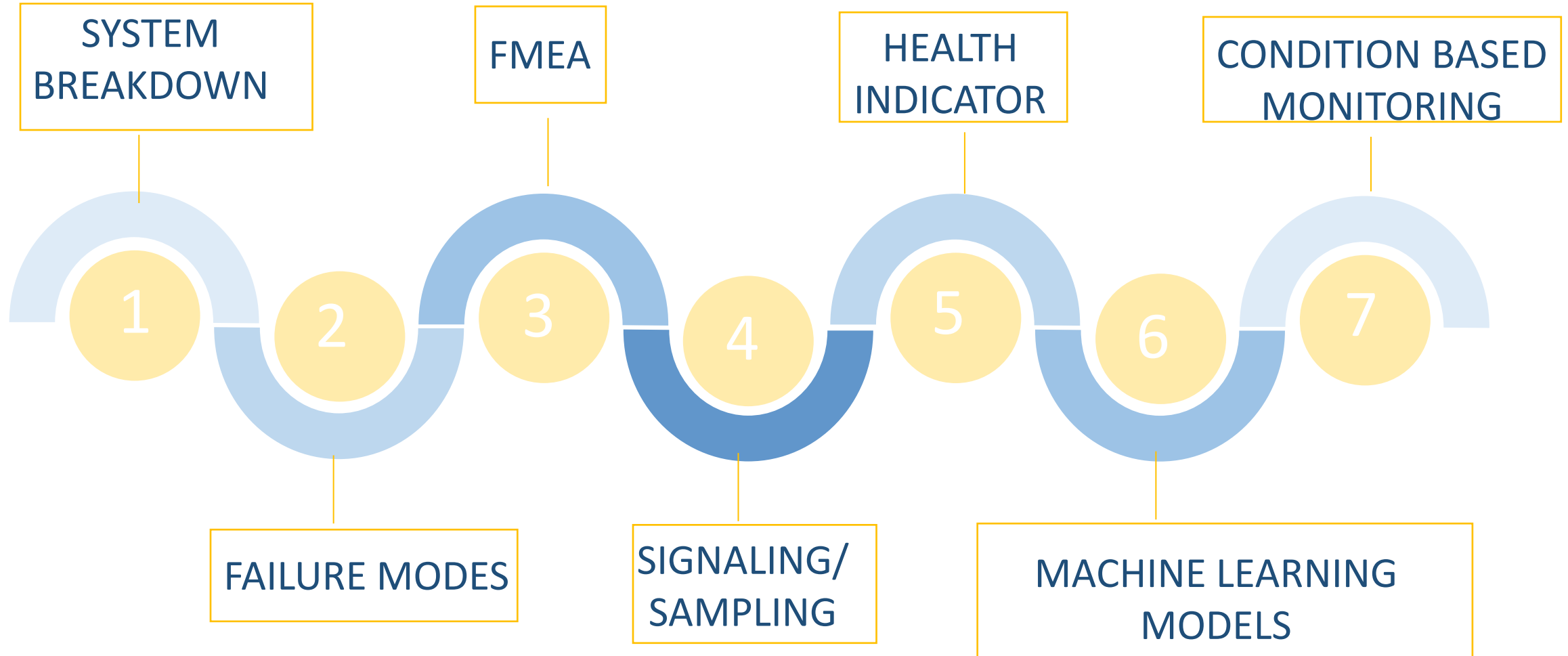


Project



LCC
CAPEX 25%
OPEX 75%





1



Real Time Condition
Monitoring

2



Annomaly detection
models based on AI

3



Predictive
Condition based
Maintenance



Avril



EG-F074



DB-F073



AV-102



AV-130



S6 RUSIA



AV-112



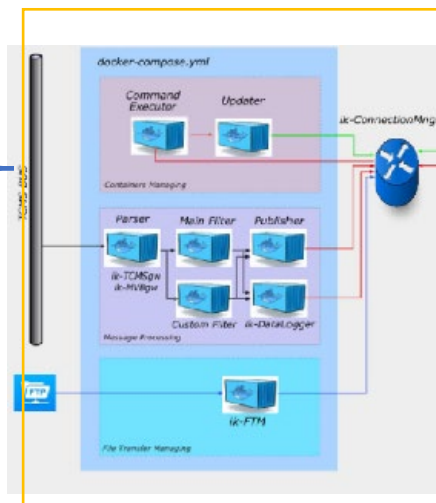
UY-250



S8 USA

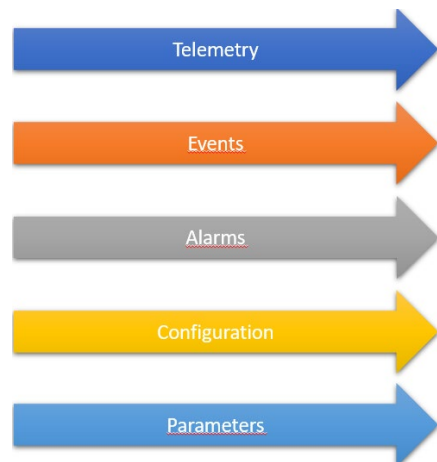
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COMUNICATION ARCHITECTURE OF THE DIGITAL PLATFORM



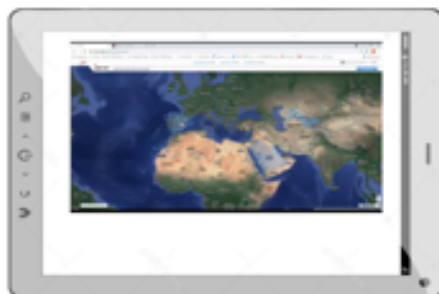
Gateway

30.000 sig/sec MQTT
5 GB /train/day



Google Cloud





FLEET GEOLOCATION



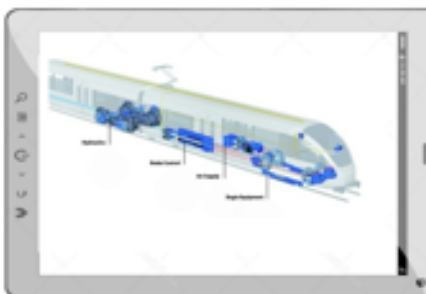
REMOTE HMI



REAL TIME MONITORING



PREDICTIVE MAINTENANCE



DIGITAL TWINS



TALVI. AUTOMATIC VEHICLE INSPECTION



SAFETY



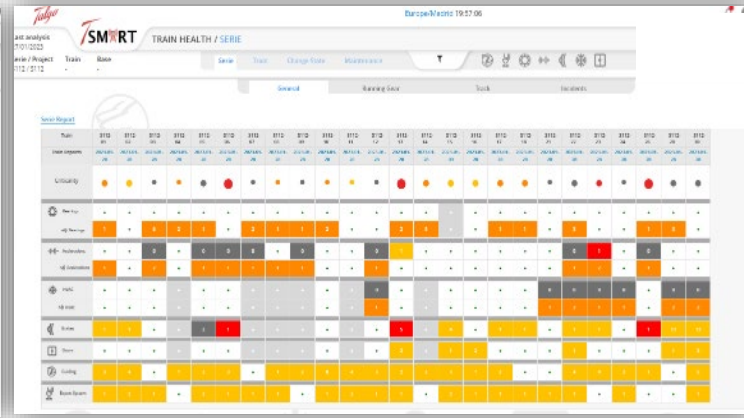
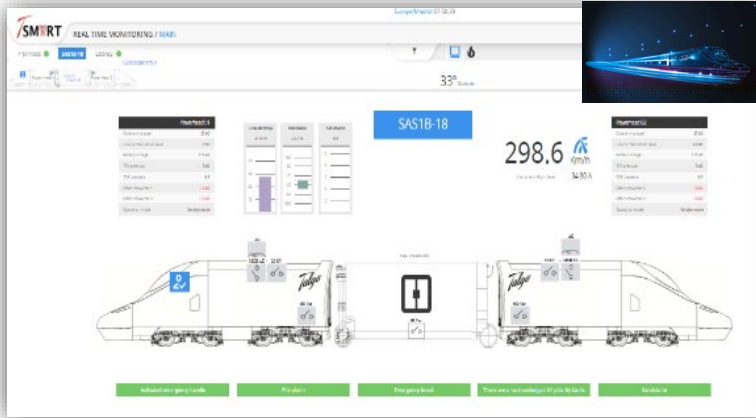
AVAILABILITY



RELIABILITY



MONITORIZACIÓN ESTADO DE SALUD DE TRENES EN TIEMPO REAL



REAL TIME MONITORING

PREDICTIVE MAINTENANCE. CBM

EXPERT SYSTEM



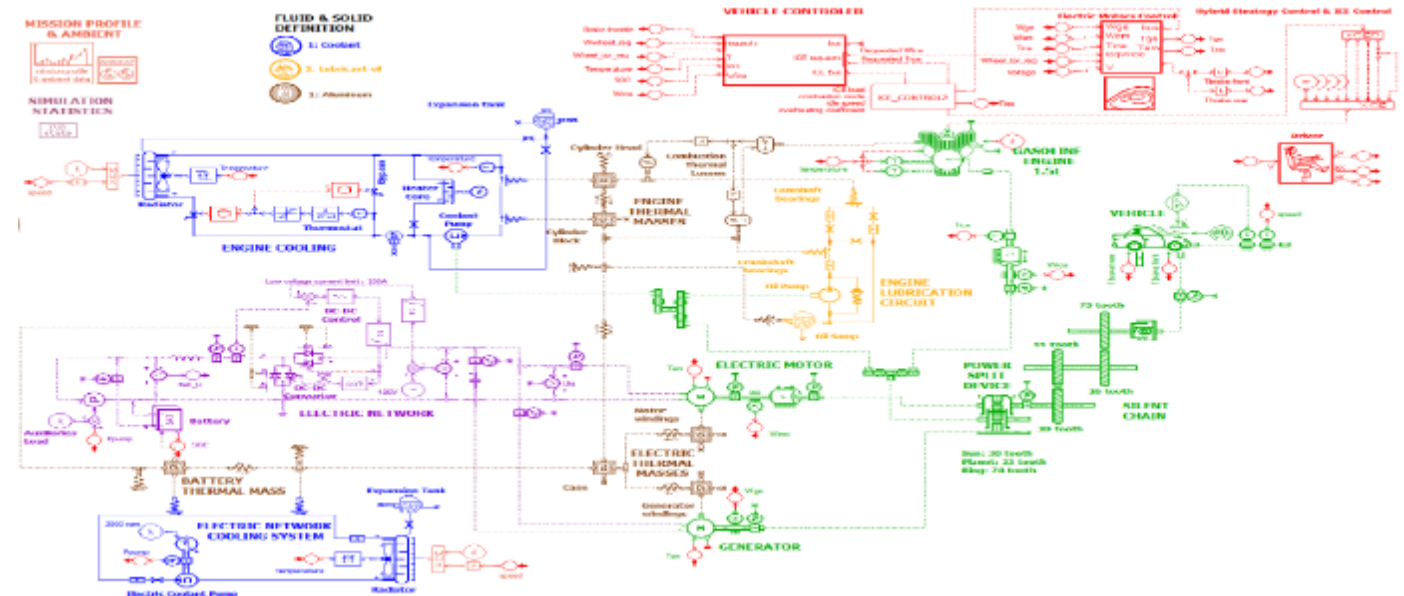
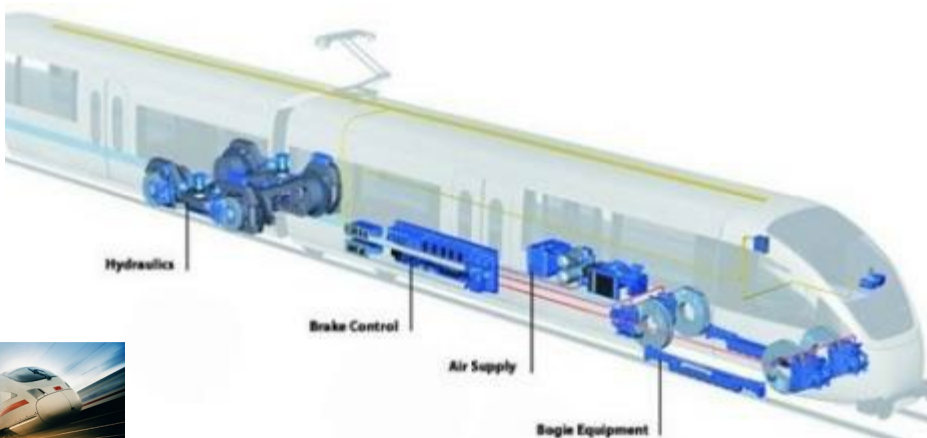


USE CASE: HVAC , Doors, batteries, motors..

Virtual replicas to simulate physical systems.

Advantages:

- Simulation learning to improve the prognostics.
- Synthetic data generation to improve machine learning models



TALVI– Automatic Maintenance vehicle inspection

In seconds, on track, in real time

ADVANTAGES

Daily remote control inspection →
Increase of the maintenance intervals



Higher control of wear elements



Increase of the availability of the depots



Increase of the operational availability of the fleet





TALVI– PoC. Automatic Maintenance vehicle inspection

In seconds, on track, in real time





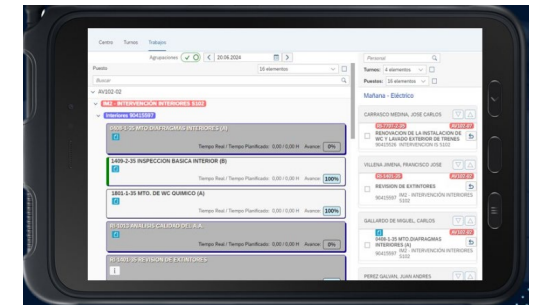
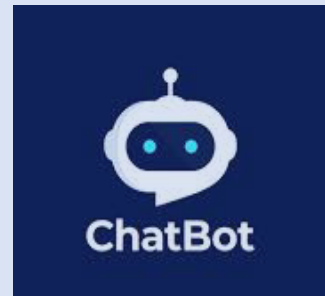
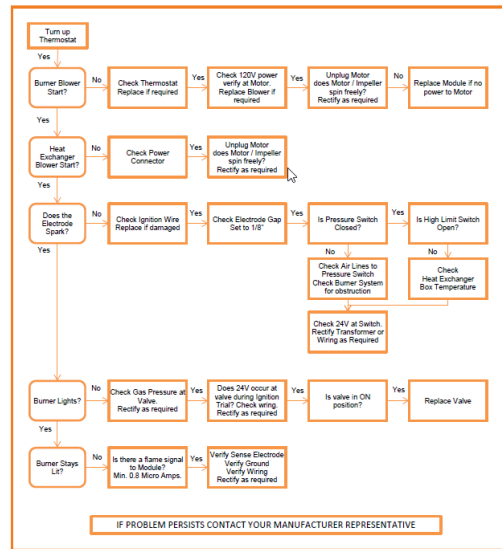


GENERATIVE AI CHATBOT SMART MAINTENANCE ASSISTANCE

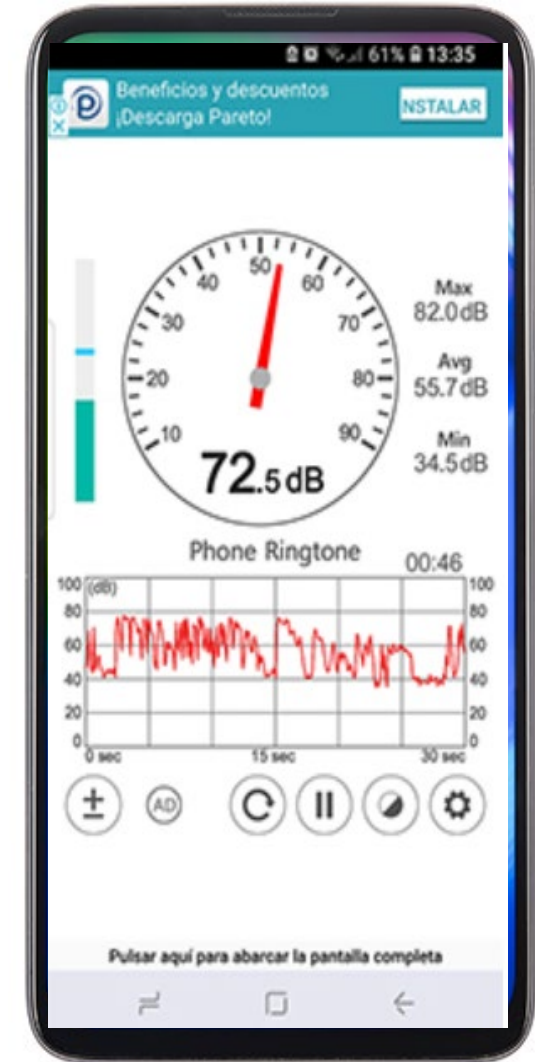
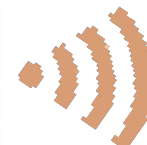
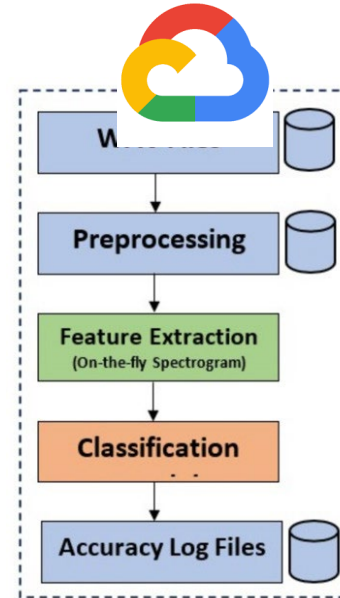
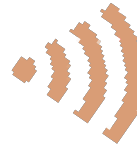
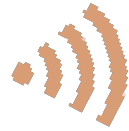
HISTORICAL REPAIR DATA



TROUBLESHOOTING MANUALS



Analizador de anomalías rodamientos por sonido basado en ML





Talgo

Gracias!

