

Control
Room

Infrastructure
Maintenance

Rolling
& Vehicle
Maintenance

Predictive
& Optimized
Maintenance



Predictive & Optimized Maintenance

Dynamic Maintenance Management System (DMMS) project originates aiming to overcome the current maintenance paradigm (planned maintenance/corrective maintenance) based upon fixed parameters, such as time/km, and to optimise and increase effectiveness in failures management and materials usage. In order to achieve those goals, the following actions are essential:

- On-board remote access diagnostics: Diagnostic, status and process data generated by on-board systems; recorded, processed and transmitted to ground.
- On ground diagnostic point: Fixed stations gathering data about inbound/outbound rolling stock status, measuring wear levels of those parts which can't be detected by on-board systems (wheels, brakes, pantograph, etc.)

- Dynamic Maintenance Management System: On ground system concentrating all the informations generated by pre-existing systems and integrated also with other Trenitalia's systems, in order to:
 - Help corrective maintenance;
 - Develop predictive maintenance: (specify blocks of rules applicable on rolling stock, execute diagnostic and predictive algorithms, supply a proper analysis environment);
 - Measure and manage trains' parts wear (identification and handling of the life-wealth markers of different components);
 - Dynamically plan maintenance operations.

Once put into operation, exploiting the in-memory abilities

of SAP HANA technology, the derived signals (remote access diagnostics rules output, predictive models or life-health's markers calculations output) are being processed from on-board sensors. They are integrated, if necessary, with identification or transactional data coming from RSMS or other systems.

Finally, the architecture includes a Business intelligence component exploiting Qlik Sense technology, which processes stored data (arranged through associative logic that allows development of applications with huge amounts of data, typical for signals/events coming from on board trains) and supplies the reporting and analysis tools required for Business in order to understand informations coming from diagnostics and evaluate predictive processing for the purpose of maintenance.