

PROJECT **OBJECTIVE**

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TEAM ID	PNT2022TMID38287
PROJECT NAME	SMART SOLUTION FOR RAILWAYS-IOT
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MAXIMUM MARKS	4

OBJECTIVE:

Its application increases safety, efficiency and ease of use with train management systems. Control and surveillance systems reduce the risk of collisions and regulate speed. Advanced consumer technologies help maximise connectivity and allow passengers to continue their activities on smart devices while travelling.

Digital Railway Solution

train movement in a congested network. If all data from signalling, rolling stock and passenger traffic control systems is brought together on a common platform, the entire network will be able to The digital railway programme is focussed mainly on digital signalling technology, which aims to enhance safety and speed up communicate seamlessly and instantaneously. The key to digitisation is the interoperability of systems while retaining a critical approach to data security.

Predictive maintenance and CMMS

Modern, next-generation asset and maintenance management starts with the adoption of a smart computerised maintenance management system

(CMMS). Reliable railway maintenance is required to improve critical issues like safety, delays and overall system capacity. It is expected to rely on smart transportation systems and interconnected solutions such as predictive maintenance. An interconnected CMMS can help maintain, manage and connect tracks, terminals, rolling stocks and communications infrastructure. It can identify maintenance issues before these impact safety, operations or revenue. It collects, stores and analyses data to prevent breakdowns and issue predictive maintenance algorithms to extend equipment life.

Digital Twin— Digital platform for railways and airways

A digital twin refers to a virtual replica of a physical asset, like an aircraft engine or a rail engine. It is a vital element of the digital rail solution that is continually updated as per the rail network. It enables engineers to test detailed what-if scenarios that could help in decision-making around the planning of enhancement and maintenance programmes. It could identify the most-valued solution that would have the greatest efficiencies and minimise disruptions.

Digitisation of Railways Includes:

- B-scan ultrasonic rail flaw detection (both non-stop and stop-and-verify systems) and track inspection with automated high-speed test trains.
- Train control system levels 2 and 3 for high-density routes to increase network capacity and maintain the required safety standards.
- Increased surveillance of personnel with both interior and exterior locomotive-mounted video surveillance to improve monitoring.
- Track-laying machines for mechanisation of construction.
- Electrification through machines such as self-propelled overhead electrification laying trains.

- Complete train scanners for improved diagnostics and maintenance.
- Use of distributed power to improve the efficiency of train operations with coordinated acceleration and deceleration.
- Establishment of smart railway stations by implementing access control at entry points.
- e-ticketing with services such as infotainment and app-based systems.
- Use of training simulators and virtual reality (VR) training systems to improve personnel capabilities.