Project Design Phase-I
Solution Architecture

Date	08 October 2022
Team ID	PNT2022TMID32983
Project Name	Project – Smart solutions for railways
Maximum Marks	4 Marks

Solution Architecture:

Transportation systems are complex with respect to technology and operations due to the involvement of a wide range of human actors, organisations and technical solutions. There is a need to apply intelligent computerised systems for the operation and control of such complex environments, such as computerised traffic control systems for coordinating advanced transportation.

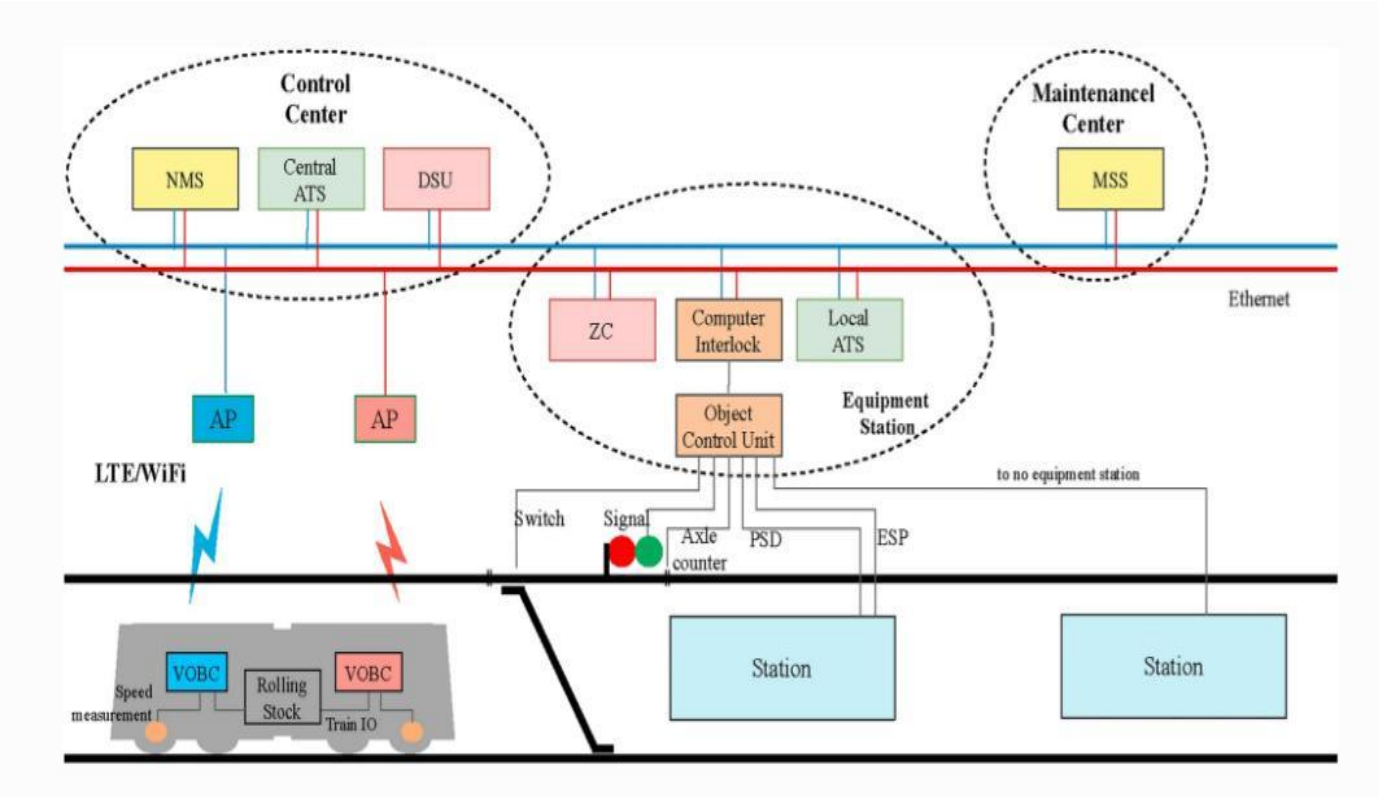
Digitisation of Railways Includes:

- **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.**

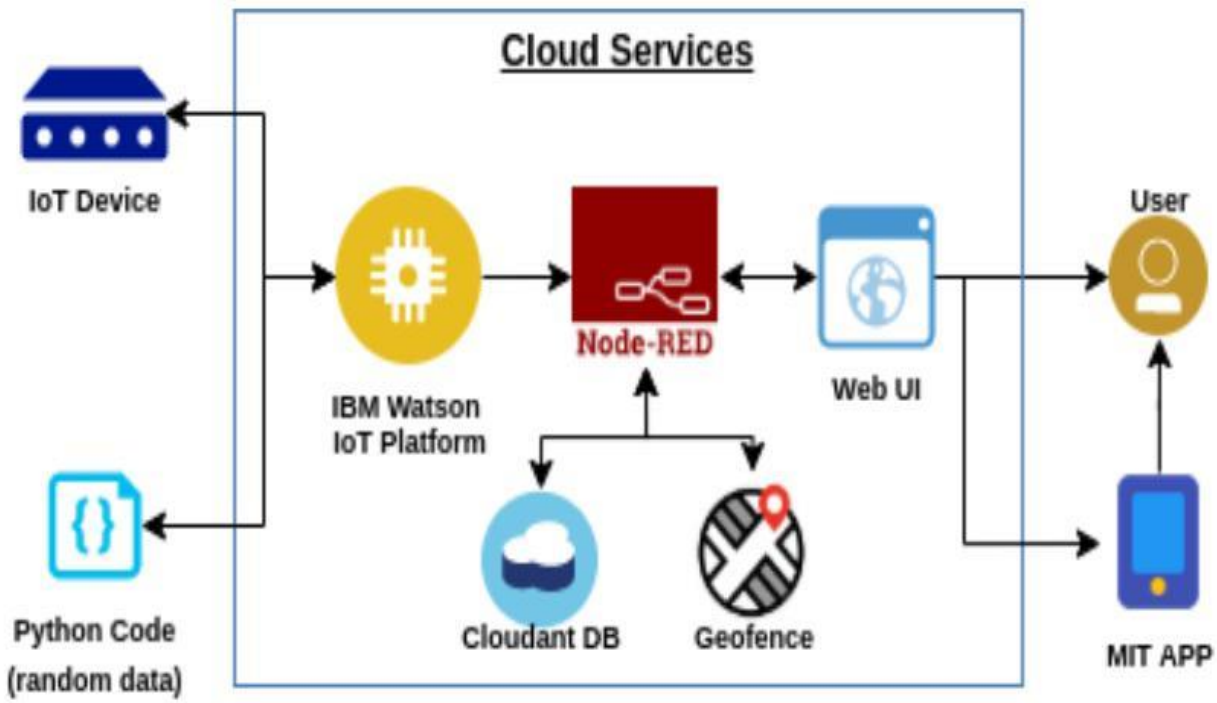
Solution architecture is a complex process – with many sub-processes – that bridges the gap between business problems and technology solutions. Its goals are to:

- **Find the best tech solution to solve existing business problems.**

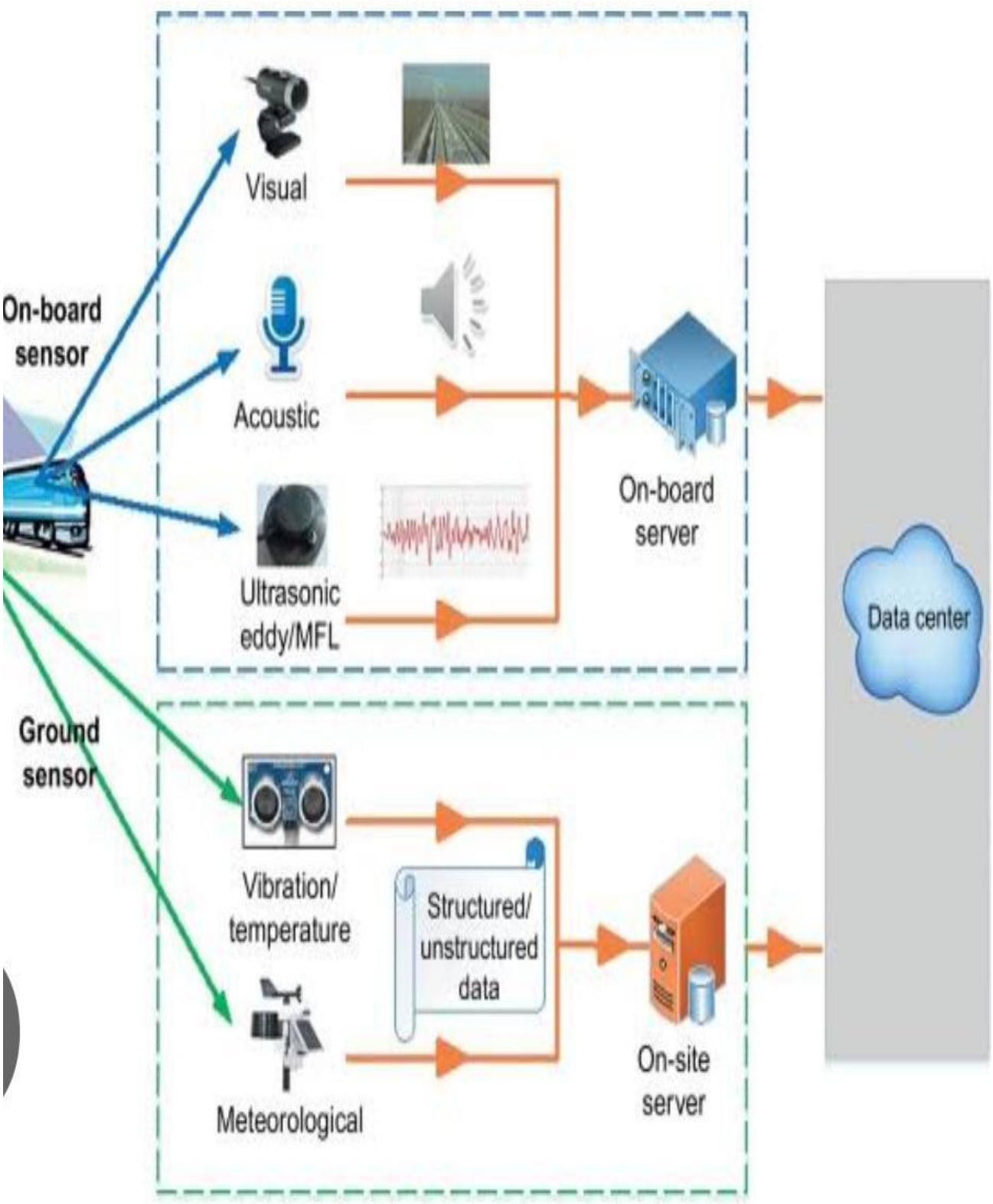
- **Describe the structure, characteristics, behavior etc…**

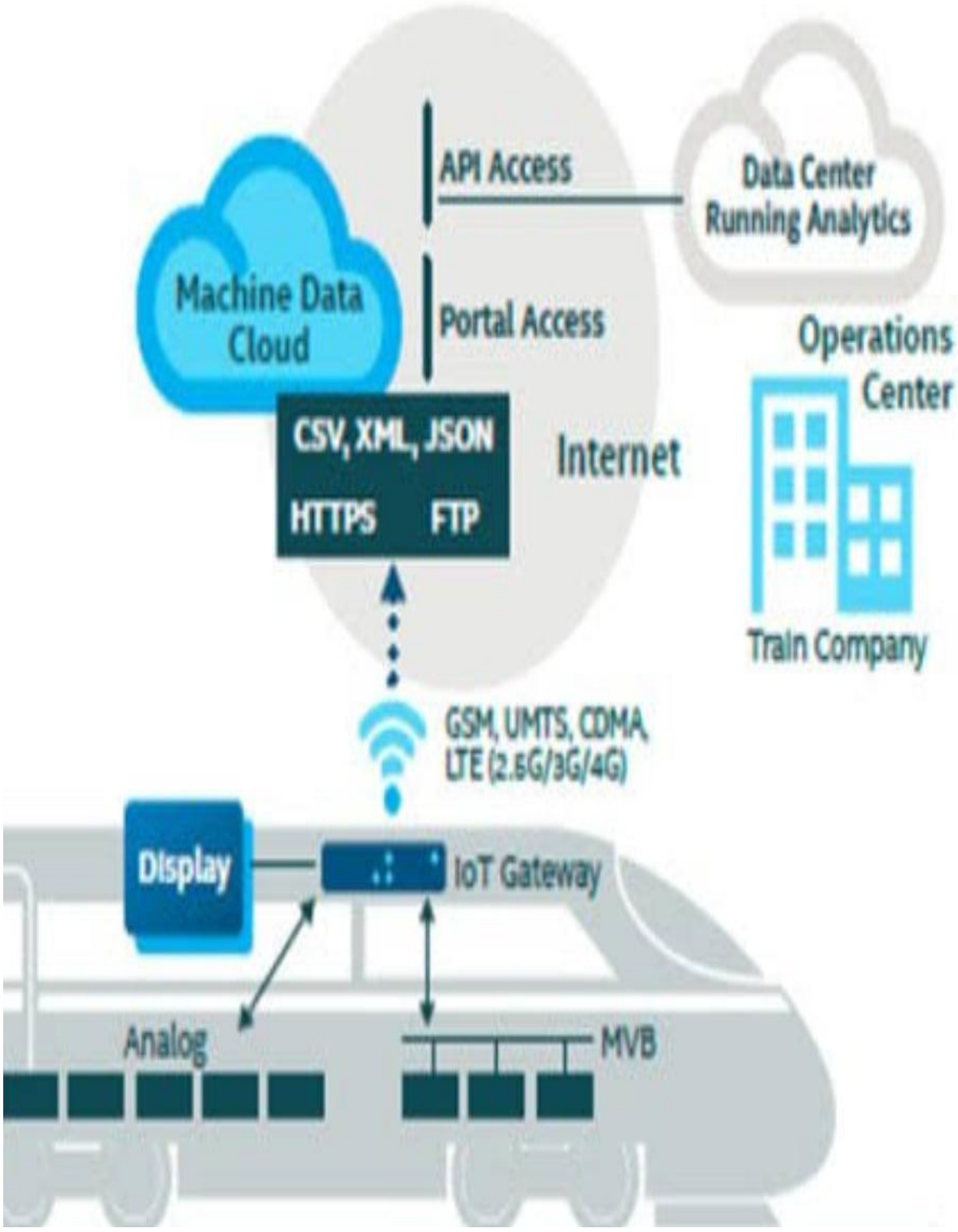


Smart solution of railways based on IOT



Solution Architecture Diagram




API Access
Data Center
Running Analytics
Machine Data
Cloud
Portal Access
Operations
Center
CSV, XML, JSON
HTTPS FTP
Internet
Train Company
GSM, UMTS, CDMA,
LTE (2.5G/3G/4G)
Display
IoT Gateway
Analog
MVB