



IOT in Indian Railways

Category: Transportation

Indian Railways (IR) is India's national railway and the fourth-largest railway network in the world by size. It runs close to 20000 passenger trains per day commuting millions of passengers everyday. Eventhough Indian railways does great service, there were several operational inefficiencies such as frequent train delays, accidents due to large number of unmanned junctions, accidents due to Trespassing and large number of avoidable collision causing several injuries and deaths. From 2004 to 2015, deaths due to raiways accidents are 290,000 of which 170,000 are due to trespassing and unmanned junctions.

How SAP Leonardo IOT can help?

While Indian railways is doing several initiatives to avoid train accidents, we can make use of SAP Leonardo IOT framework.

- **Install Sensors** on the train track at regular intervals (*say one in 200m*). These sensors can sense for trains movements and transmits info when train crosses the location. Using Edge services, data can be securely transmitted to SAP Cloud platform. Data can be processed using Smart applications built on the SAP Leonardo to process the location info and trigger alert to nearby gates.
- **Build smart gates:** Gates equipped to receive alerts from SAP Cloud platform and raise alarms or signal red when train is within 5-10 kilometers. When train crosses the junction, the application resets the status and opens the gates.

Other Benefits due to the sensors:

- **Tresspassing:** Smart Alarms can be placed in places where people trespass a lot. These alarms receive info from the sensors installed in the tracks and raise alarms when it senses any human movement while train is nearing the circle (*around 200 meters*).
- **Increase Passenger experience:** Delays in trains are quite frequent in Indian Railways. Trains get delayed for several reasons like fault in track, flood, accidents etc., When trains are delayed, passengers who were waiting in the stations gets frustrated. Also, waiting in the platform causes crowd plus garbaging the platforms etc.,. With IOT in the tracks, Railways can send location of trains to passengers through smartAPP, so that passengers can arrive station at exact time rather than waiting for several hours.
- **Optimize the tracks:** In India, most of the routes are single-track. Trains travelling both directions share same track using track junctions. The issue is, when one train is delayed, the other train has to wait until the train is crossed. By having sensors in the track, we can smartly measure and analyze the train positions so that these track-junctions can be optimized. We can assess where the bottle neck happens, so that we can extend the single track to double tracks in those regions.
- **New trains:** By analyzing the train patterns in particular track, we can also plan for new trains whenever a track is idle for several hours.

References:

https://en.wikipedia.org/wiki/Indian_Railways

<https://edition.cnn.com/2016/11/22/asia/india-railway-system/index.html>