

Smart Solution for Railways

Literature Survey

The authors of [1] have worked to create Android Suburban Railway (ASR) ticketing, mainly to buy suburban tickets which is the most challenging when compared to booking the long journey tickets through 'M-ticket', since 'M-tickets' often fail with suburban (local travel) tickets. ASR tickets can be bought with just a smartphone application, where you can carry your suburban railway tickets on your smartphone as a QR (Quick Response) code. It uses the smartphone's "GPS" facility to validate your ticket. The user's ticket information is stored in a CLOUD database for security purposes which is missing in the present suburban system. Also, the ticket checker is provided with a checker application to search for the user's ticket with the ticket number in the cloud database for checking purposes.

In [2], the issues surrounding data capture and transmission to a storage system, powering of onboard systems, and the analysis of data and the distribution of information derived from the data are discussed. The advancements made in communication tools help in providing the actual condition and tracking of the rail vehicles in real-time to customers and entities in charge of maintenance by transmitting all the captured data to effective web-based applications and monitoring platforms that can be accessed through PC, tablets, or even smartphones.

[3] focuses on different communication technologies under the paradigm of IoT. The broadband communication technologies like Global System Mobile Communications- Railway (GSM-R), Long Term Evaluation (LTE), fifth generation (5G), IEEE 802.11 and Wireless Sensor Networks (WSN). In India, UIDAI Aadhar is used in this system in the process of booking tickets. The smart railway reservation database is maintained by two databases; one is the railway database and another one is maintained by UIDAI. It is efficient to use these two databases and perform a query service between two databases. Tickets are stored with the help of an Aadhar number and are verified utilizing the databases available.

The system proposed by [4] reforms the current ticket booking process for Suburban Railway. With the help of this application, travellers will be able to book their tickets through their mobile using Wi-Fi connectivity. It can also keep the track of most recent ticket purchases. This is an effort towards a queue-less ticket booking system and helps passengers utilize their time efficiently, which is wasted waiting in these queues. This system provides the facility and flexibility to book tickets using restricted Wi-Fi zones available on platforms. The provided Android application can be only accessed within the Wi-Fi zones only. After ticket booking, tickets will be downloaded directly on smartphones.

In the Indian Railways transport system and most other public transport systems, a passenger cannot book a ticket after the charting of the train is done. A seat remains unused if a passenger does not board a train or cancels his ticket after the charting of the train is done. The approach taken by [5] to overcome this issue is by using a dynamic seat allocation system that employs a QR Code containing the URL to an online website for railway reservations. In the QR code, a passenger-specific URL is stored. When a hand-held terminal device running on android OS reads this URL during the check-in of a passenger, the status of the seat is updated in the central database. Any passenger who doesn't

board the train would imply that their QR code check-in procedure was not completed, and after a specified time interval the ticket for that seat is automatically made available in the system for booking to other passengers.

To track the real-time positions of trains, the authors of [6] propose a system that enables the communication of real-time information about a train's position. By reading the data provided by all running trains, a complete network of each active train and its real-time position is obtained. The system uses an Arduino to provide the required computational power. The GPS module connected to the Arduino reads satellite data in accurately identify its current position. Using this data, the Arduino can compute the train's current latitude, longitude and speed of motion. An Ethernet Shield is used to provide each train with a static IP address. The remote user who wishes to track a train's position types in the IP address of the train in their web browser, which opens up the control panel for the train's Arduino and allows the user to view information regarding the train's position and speed.