INFSOFT
smart connected locations

Measuring Train Wagon Utilization in Rail Traffic

AT A GLANCE

- anonymized analysis of movement profiles
- capacity utilization forecasts
- real-time information about train capacity utilization
- routing to wagon with sufficient seat capacity

PROBLEM DEFINITION

A railway company runs several hundred passenger trains. The operator uses expensive and inaccurate systems in order to forecast the utilization and make the correct number of trains and staff available.

Travelers are often faced with the problem of getting into a crowded wagon and not knowing in which direction they may still be able to find free seats.

SOLUTION

The movement profiles of all passengers who carry a smartphone are collected and evaluated anonymously. As soon as enough data has been collected, forecasts can be made. Many passengers, for example commuters, most of the time take the same route. Thus, very precise prognoses can be made. Through reference measurements, inaccuracies can be erased.
Passengers can also benefit from the implementation of a tracking system. In an app, they can see in real time which wagons of the train have a low level of utilization and can head for a wagon with free seats.

TECHNICAL IMPLEMENTATION

Each wagon is equipped with one infsoft Locator Node. The small hardware components are connected to the electrical grid and detect all devices which send out Wi-Fi signals (passengers' smartphones). The anonymous data is stored in a database and then can be interpreted and combined. Following infsoft's "Smart Connected Locations" approach and using the possibilities of Big Data, as many data as possible is being enriched and combined. Thus, intelligent forecasts can be made. Attention should be paid to the restrictions regarding Wi-Fi tracking, which means that it is not always possible to clearly determine the number of devices in an area.
The employees can access the data in a clear web interface and optimize the number of trains. People who are near the train but not inside, can be filtered out applying certain logics. Taking the GPS signal into account, it is also possible to determine how many people got on and off the train at certain train stations.

The collected utilization data can also be processed in an app for passengers. The position of the user can be determined via Bluetooth Low Energy (BLE) beacons installed at the station or the BLE sensors of the infsoft Locator Nodes. The passenger receives real-time information on the utilization of the incoming train, indicating which wagons are the least frequented and on which track section he has to board the train in order to find a free seat.

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