ABSTRACT

People use Indian Railways to travel even on daily basis and if the railways are not secure and prone to accident then life of many A lot of people in India travel to other places using railways and some people are at risk. A lot of railway accidents occur at level crossing that is the point of intersection of road and railway track and the reason in most of the cases in human error. So, to avoid the accidents caused due to human failure this model is to make level crossing unmanned and smart than can reduce the chances of accidents manifold. In this proposed paper we have implemented ideas such as pre-crashing using RFID senser. This model automatically closes the gates of railway crossing when the train is arriving near the crossing before a safe interval of time so that there is no chance of human error. Also, our model keeps a track of the train passed from the particular crossing along with exact time of passing so that the data is maintained that too without human effort.

INTRODUCTION

Railways have to continually ensure that the rolling stock and infrastructure are in good condition, with high resilience against failures. There are number of challenges in planning of high-quality maintenance that has to be organized on efficient and cost effective manner. We wanted to be apart of our surrounding with some change and advancement so that it can bring the better life of the middle class and lower class people to travel in high secutity and advanced locomotions .the train is one and only most widely used transportion and not only for this they are used for goods transportion also .Indian railways are not able to facilate the customer properly due to crowded amount of people. Statistics show that the leading cause of

death by injury in railways traffic accidents(two train collision each other). There are number of causes for which an accident can occur, some of them are; lack of training for driving or less experinessed, use of mobile phone while driving, unskilled drivers, driving while intoxicated, bad railway tack condition, overloading in tain and negligence traffic management. In this survey paper, we briefly review selected railway accidents detection techniques and propose a solution. Rear end crashes occur mainly due to obstracle and crack in tracks. According to recent statistics, a major percentage of train accident happen due to not proper survillance of railway track The existing system in semi automated railway accidents are occuring at frequently, consideration this in mind we want to bring some change and make it effective so that it becomes a complsory and law for pratice.

OBJECTIVE

1. 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.
2. IoT technologies help railways successfully manage passenger safety, operational efficiency, and the passenger experience
3. Smart sensors can be used to track important assets, manage passenger flow, and enable predictive maintenance
4. Connect people, sensors, trains and automated train systems with the highest security. Transform your communications and operations from departure to destination and beyond. Secure communications. Enhancing

overall service. Lower operational cost IoT applications.

The Corporate aim of the Indian Railways is to commit itself to ensuring that all its activities are managed to the highest level of safety which is pragmatic and reasonably practicable to achieve

EXISTING METHOD

Most of the public transportation infrastructure in European cities is easily accessible. The majority of the tram/train stations are located in an open and "gate-free" environment, easy available to everyone and hence introduces potential malfunctions in the system. This is why fare dodging (hopping on the tram/train without paying for a ticket) is simple. This paper suggests a conceptual framework and architecture to capture free riders (fare dodgers) in an early stage by using a RFID distance scan combined with people counting techniques as a tool to locate and monitor passengers. As a case study this paper uses the ticketing system in The Netherlands. It is a RFID-based ticketing system which uses a smartcard called OV-Chip card. It explains the current setup in The Netherlands, systems and architectures used and shows where possible problems and improvements could be achieved. An experiment is done to measure certain basic distance read ranges in different situations and locations. The results show that by making use of a different system architecture (RFID technology and People Counting Techniques) an improvement in catching free rides (faredodgers) in a much earlier stage is inspectors.

LITERATURE SURVEY 1

SUMMARY OF LITERATURE SURVEY

A review has been made on Internet is basically system of interconnected computers through network. But now its use is changing with changing world and it is not just confined to emails or web browsing. Today’s internet also deals with embedded sensors and has led to development of smart homes, smart rural area, e-health care’s etc. and this introduced the concept of IoT made based on the survey.

1.2 A CAREER PATH RECOMMENDATION FRAMEWORK

In today's world, recommendation systems are used to solve the problem of information overload in many areas allowing users to focus on important information based on their interests. One of the areas where such systems can play a major role is in helping students achieve their career goals by generating personalized job and skill recommendations. At present, there are any job posting websites providing a huge amount of information and students need to spend hours to find jobs that match their interests. At the same time, existing job recommendation systems only consider the user's field of interest, but do not take into consideration the user's profile and skills, which can generate more relevant career recommendations for users.

1.3 JOB RECOMMENDATION BASED ON JOB SEEKER SKILLS:

AN EMPIRICAL STUDY

In the last years, job recommender systems have become popular since they successfully reduce information overload by generating personalized job suggestions. The contributions of this work are twofold, we: Smart Rail Infrastructure Professional Interview ... Use your curiosity as a weapon to acquire knowledge through work experience. It forwards the proposal of a framework for job recommendation based on professional skills of job seekers.

1.4 RECOMMENDER SYSTEMS:

A SURVEY

From the last two decades internet-based recruiting platforms have become a primary channel in most companies for recruiting talents. Such portals decrease the advertisement cost, but they suffer from information overload problem. Job portals using traditional information retrieval techniques such as Boolean search methods are typically using simple word matching algorithms. The main issue of these portals is their inability to understand the complexity of matching between candidates' desires and organizations' requirements. Hence, a vast number of deserving candidates misses the opportunity to get an appropriate job. The recent recommender systems have achieved success in e commerce applications. In order to improve the functionality of e-recruitment process, many recommendation systems approaches have been proposed.

1.5 JOB RECOMMENDATION SYSTEM USING SMART SOLUTION FOR RAILWAY PROCESSING

Almost all the countries across the globe strive to meet the demand for safe, fast, and reliable rail services. Lack of operational efficiency and reliability, safety and security issues, besides aging railway systems and practices are haunting various countries to bring about a change in their existing rail infrastructure. The global rail industry struggles to meet the increasing demand for freight and passenger transportation due to lack of optimized use of rail network and inefficient use of rail assets. Often they suffer from the lack in smart technologies and latest technological updates to provide the most efficient passenger services. This is expected to induce rail executives to build rail systems that are smarter and more efficient.

1.6 JOB RECOMMENDATION SYSTEM IN PHP

This is also a Major Railway Ticket Reservation system Project, which you can submit in final year. But if you need Mini Project on Railway Ticket Reservation system then we can develop it also. Also if you are looking for DBMS Project on Railway Ticket. Reservation system then you can develop it in MySQL and PHP. You can run this project in XAMP, WAMP, MAMP or LAMP server. We have implemented advance search feature for searching records on various criteria for Booking, Timetable, Fare also admin can perform Create, read, update and delete(CRUD) operations on Stations, Customers, Trains. In this project all the

modules like Timetable, Customers, Booking are tightly coupled and we can track the in formations easily. If you are looking for Free Railway.

PROPOSED METHOD

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.

Industry 4.0 is enabled by smart systems and Internet-based solutions. Maintenance is one of the application areas of self-learning, and smart systems can predict failure and trigger maintenance by making use of the Internet of things (IoT).

There is no established path for success of any emerging technology, but creating a roadmap can help the rail and aviation industries to bring a more digital and connected future. The need for these industries to be smart is there because Industry 4.0, or the fourth generation of industrial activity, ensures reliability and safety to these sectors.

With automation of the manufacturing industry, these sectors will realise efficiency, capacity and cost benefits of Industry 4.0. Enhanced industry-wide condition monitoring will also help reduce unplanned maintenance. Both sectors are in constant search for improvements to deliver better and secure customer experience.

Digital Railway Solution

The digital railway programme is focussed mainly on digital signaling technology, which aims to enhance safety and speed up 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 communicate seamlessly and instantaneously. The key to digitisation is the interoperability of systems while retaining a critical approach to data security. Rail service information could even be integrated with other transport modes, such as bus and taxi services, to guide passengers through smooth door-to-door journeys. Holistic data management could lead to the transformational change in real-time intelligent traffic management and in-cab signalling. This could improve customer satisfaction, with station information systems and personalised messaging providing passengers with all the relevant information they need.

The IoT-connected trains

He IoT can interconnect all objects and devices that were previously not part of a network for predictive analytics. 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 maximiseconnectivity and allowpassgerse to continue their activities on smart deviceswhile travelling. Train-to-train communication through the cloud enables operators to transmit data about equipment, tracks and stations among themselves.

Big Data analytics for smart railways

The complete Big Data architecture includes the IoT and cloud computing devices. These work together to create smart railways that have selflearning capabilities to predict failure, make diagnoses and trigger maintenance actions. The architecture utilises multiple data sources to extract relevant information. It helps users to know what happened when, so they can go back and do the root cause analysis from the data, and take appropriate corrective action.

Safety is a key area of concentration

Safety is, of course, a primary element of IoT applications and solutions when it comes to train management. One safety use case is on-board train location and detection systems that enable trains to be aware of the positions of other trains. This reduces the risk of collisions while allowing trains to operate safely in close proximity to one another. Speed monitoring and control is

another important safety application. Systems have been developed that can display train velocity for drivers and report speeds back to central control systems. On-board monitoring systems are interconnected with outdoor signalling systems that can regulate train speeds or even remotely command trains to stop based on track conditions, the positions of switches, the presence of other trains on the track and other factors.

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Status of implementation of Smart Yard

1. Initially in 1st phase, 40 identified yards will be converted into Smart Yards.

2. COFMOW (a unit of Indian Railways) has been nominated for carrying out the overall work of Smart Yards.

The implementation of aforementioned technology driven automatic predictive maintenance practices for up-keep of Rolling Stock not only will benefit Indian Railways on account of efficient/safe operation of trains but will also benefit on economic ground.

Features Work

1. IoT technologies help railways successfully manage passenger safety, operational efficiency, and the passenger experience. Smart sensors can be used to track important assets, manage passenger flow, and enable predictive maintenance.

2. IoT technologies help railways successfully manage passenger safety, operational efficiency, and the passenger experience.

3. Smart sensors can be used to track important assets, manage passenger flow, and enable predictive maintenance.

4. Operators that modernize their core technology and transportation infrastructure and integrate Internet of Things (IoT) technology, artificial intelligence (AI), and deep learning capabilities will benefit from rich data and insights that can help tackle the challenges of today—increasing demand, legacy infrastructure capacity limitations, and growing passenger experience expectations.

5. Today, railways are more important than ever as country and city governments are being asked to find innovative ways to safely get back to business post-COVID, meet the changing needs of their citizens, address urban population increases, and reduce their environmental impact.

CODE

GRP-LOCATION.PY

```
import time import sys

Import ibmiotf.application  Import ibmiotf.device Import
random import requests import json


        #Provide your IBM Watson Device

        Credentials organization = "0z828r"

        deviceType = "iotdevice"        #Credentials of

        Watson IoT sensor simulator deviceId = "1001"

        authMethod = "token" authToken = "prathyusha"
```

```
        # Initialize the device client.
        L=0

        try:
                deviceOptions = {"org": organization, "type": deviceType, "id":
        deviceId, "auth-method": authMethod, "auth-token": authToken}
        deviceCli = ibmiotf.device.Client(deviceOptions)
                        #.....

        except Exception as e:
                         print("Caught exception connecting device: %s" % str(e))
                        sys.exit()

        # Connect and send a datapoint "hello" with value "world" into the cloud as an event of type
        "greeting"
        10
        times
        devic
        eCli
connect()

while True:
overpass_url = "http://overpass-api.de/api/interpreter"
overpass_query = """
[out:json];area[name="India"];(node[place="village"](area););
```

```
out;
 """

 response =
requests.get(
overpass_url,
params={'data':
overpass_query}
                    )

coords = []     if
response.status_co
de == 200: data =
response.json()
 Places =
data.get('elements', [])
for place in places:
 coords.append((place['lat'], place['lon']))
                        print ("Got %s village
                coordinates!" % len(coords))
                print (coords[0])     else:
                        print("Error")

                   i = random.randint(1,100)
                   L = coords[i]
                   #Send random gprs data to node-red to IBM
```

Watson

data = {"d":{ 'Latitude' : L[0], 'Longitude' : L[1]}}

#print data def

myOnPublishCall

back():

print("Published gprs location = ", L, "to IBM Watson")

success = deviceCli.publishEvent("Data", "json", data, qos=0,

on_publish=myOnPublishCallback) time.sleep(12) if not success:

print("Not connected to IoTF") time.sleep(1)

deviceCli.disconnect()

QR Scanner

importcv2 importnumpyasnp importtime

importpyzbar.pyzbaraspuzbar

fromibmcloudant.cloudant_v1importcloudant

v1

fromibmcloudantimportcouchDbsessionAuthe

nticator

fromibm_cloud_sdk_core.Authenticatorsimpo

rtBasicAuhtenticator

authenticator=BasicAuthenticator('apikey-v2-16u3crmdpkghhxefdikvpssoh5fwezrmuup5fv5g3ubz','b0ab119f45d3e6255eabb978)

```
service=cloudantv1(authenticator=authenticator)

service.set_service_url('https://apikey-v2-
16u3crmdpkghhxefdikvpssoh5fwezrmuup5fv5g3ubz:b0ab119f45d3e6255eabb978



cap=cv2.videoCap

ture(0)

font=cv2.FONT

HERSHEY_PLAIN



whileTrue:

_,frame=cap.read

(0)

decodeObjects=p

yzbar.decode(fra

me)

forobjindecodeO

bjects:

        #print("Data",obj.data)

a=obj.data.decode('UTF-8')

cv2.putText(frame,"Ticket",(50,50),font,

2,(255,0,0),3)          #print(a)          try:

            responce=service.get_document(db='booking',doc_id=a).get_result()



print(response)
```

```
time.sleep(5)


exceptExceptiona
se:
print("NotvalidT
icket")
time.sleep(5)
cap.imshow("Fra
me",frame)
ifcv2.waitKey{1}&
0XFF==ord('q'):
        break
cap.release()
cv2.destroyAllWi
ndows()
client.disconnect
()
```

RESULTS

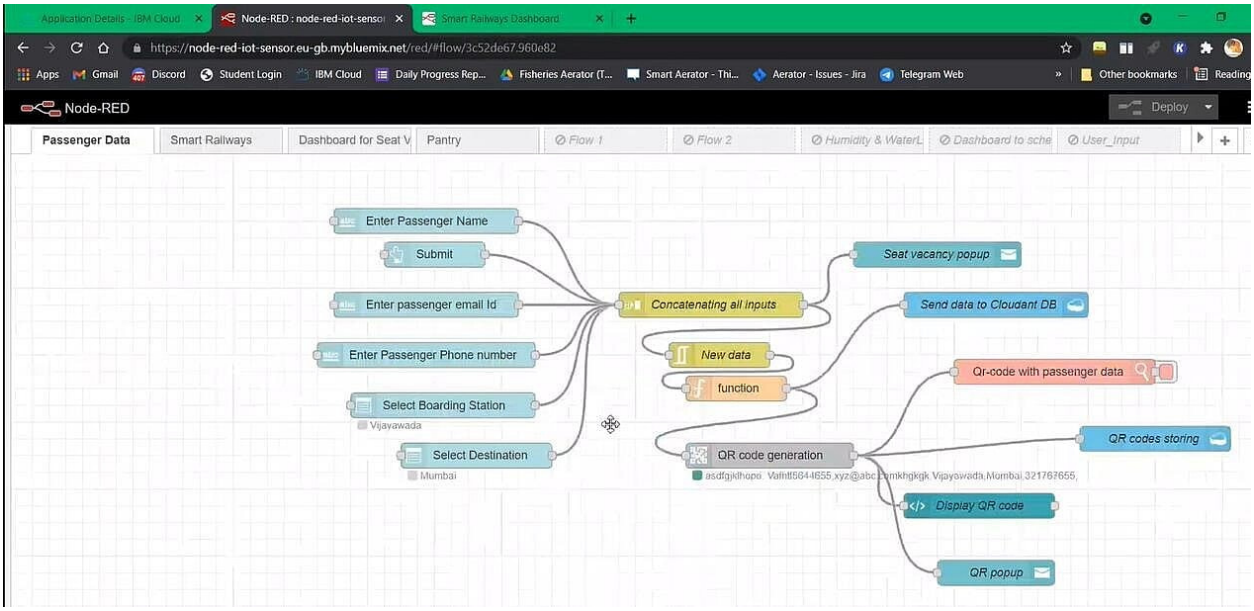
Encouraged by the results of deployment of OMRS, including some critical detection which could have potentially been cause of an accident, not otherwise detectable by normal maintenance procedure, Indian Railways is now going ahead with greater adoption of track side based maintenance systems with an aim towards predictive maintenance.

Further, moving towards predictive maintenance practices in yards, Indian Railways is envisaging to convert its ‘freight examination yards’ into technology driven ‘Smart Yards’ for

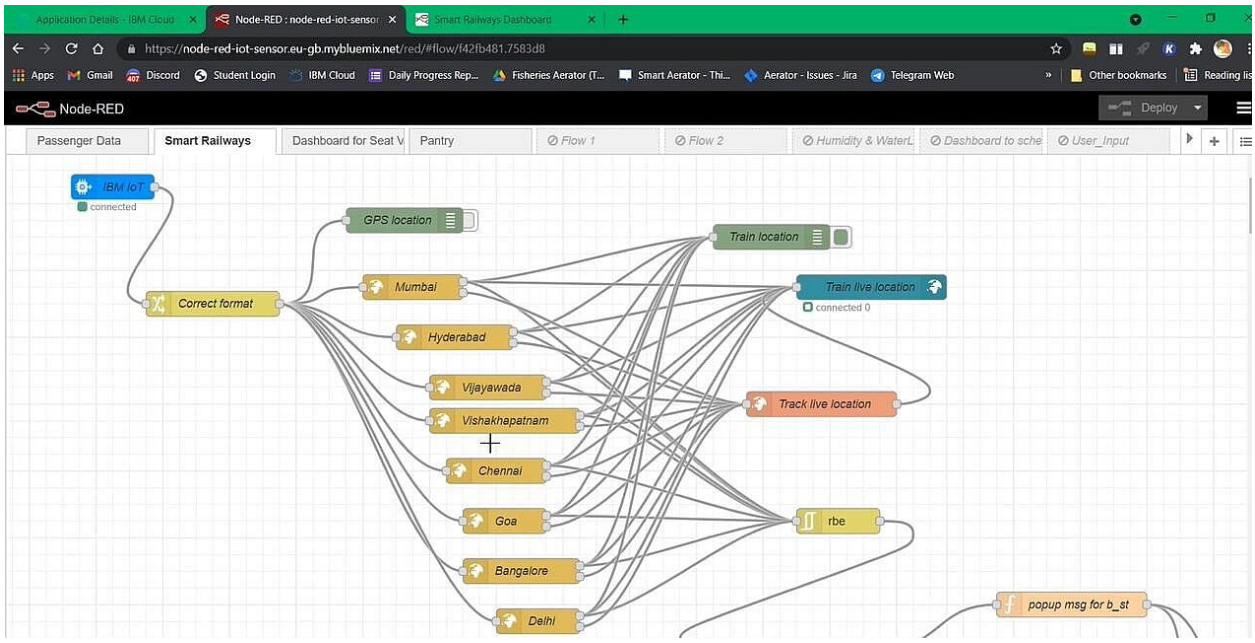
automatic detection of faults/defects/deficiencies in freight wagons.

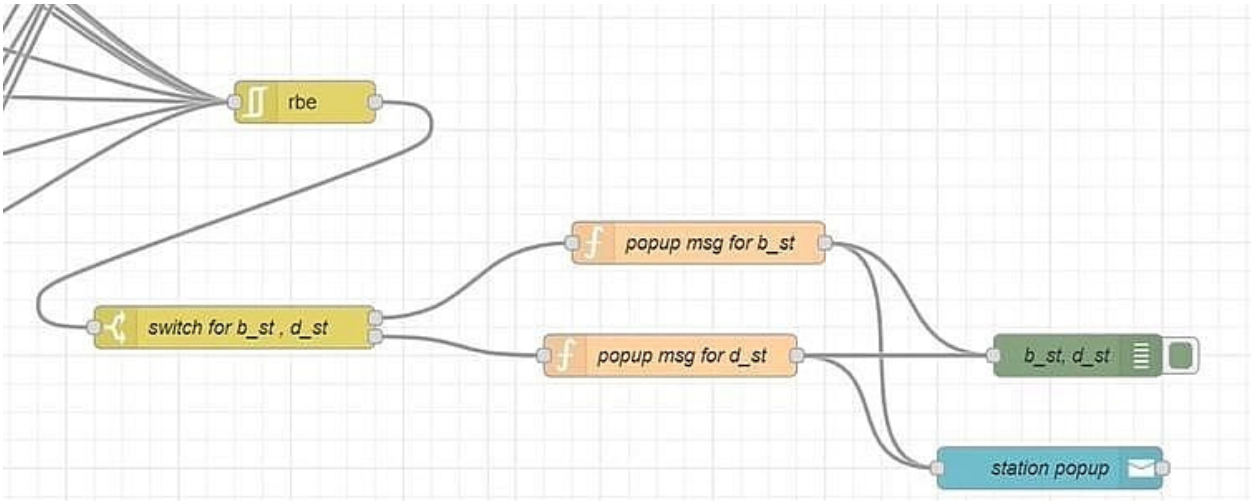
These Smart Yards will predict anomalies like Hot Wheel Hot Axle, defective bearings, defective wheels, hanging/loose/missing parts etc.long before any failure actually happens. Smart Yards will be equipped with various automated technology driven systems including OMRS, Hot Box Detector, Wheel Profile Recorder and Machine Vision Equipments etc.

PASSENGER DATA:

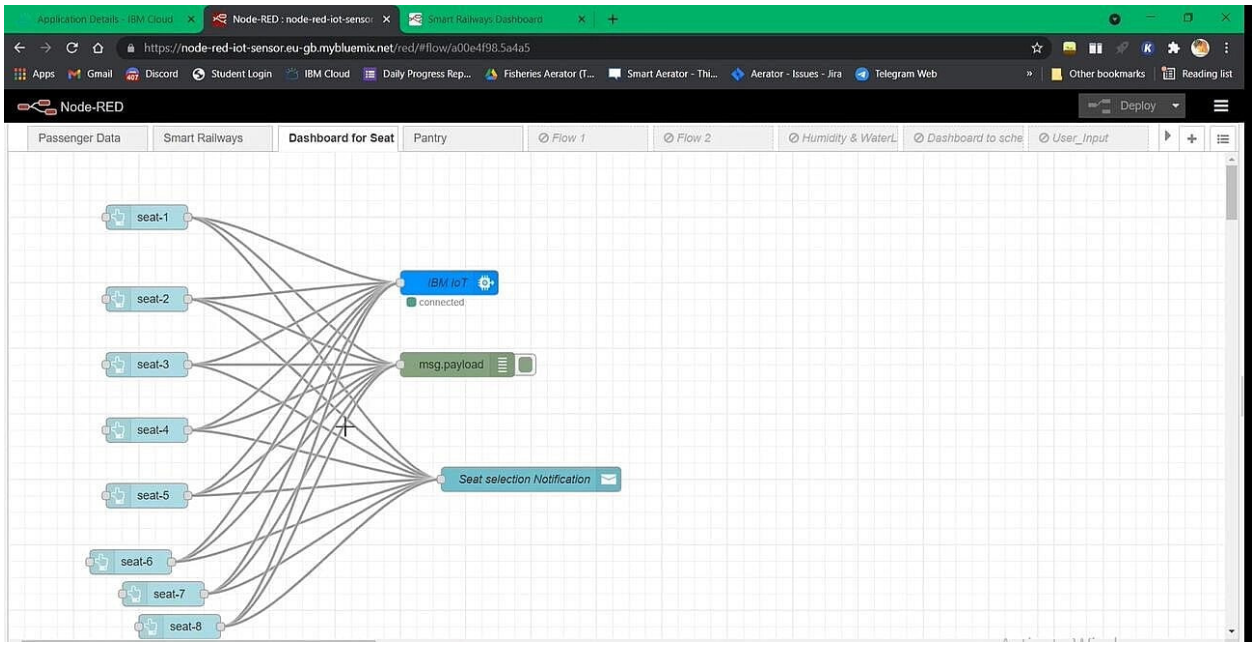


Smart railways:

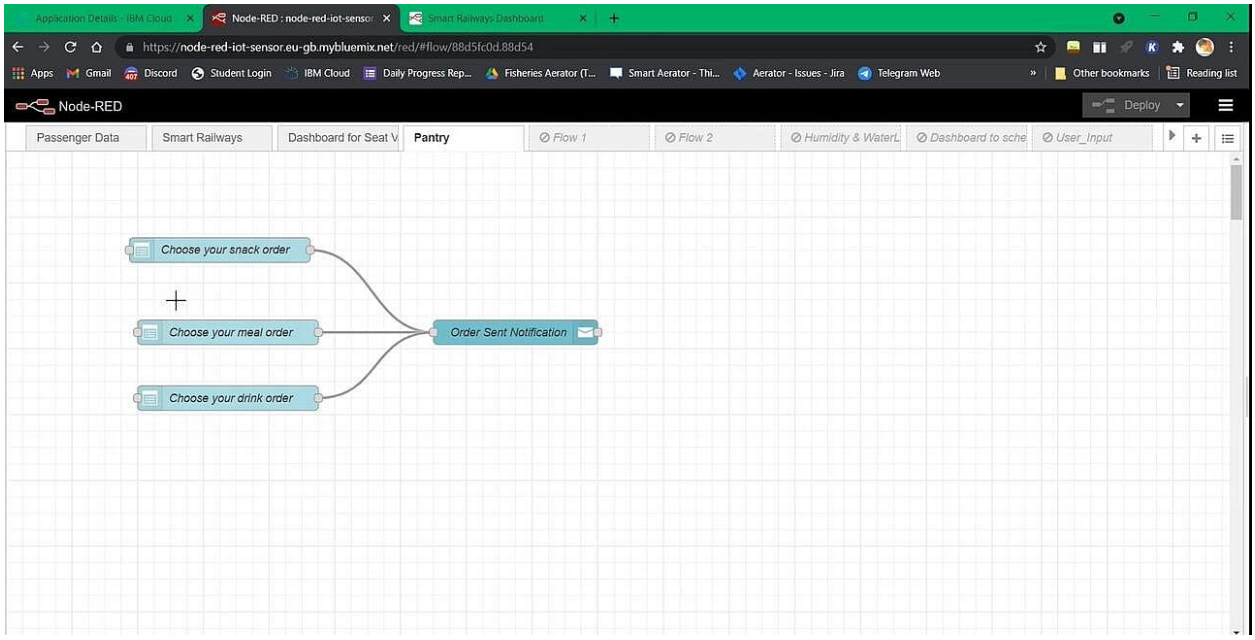




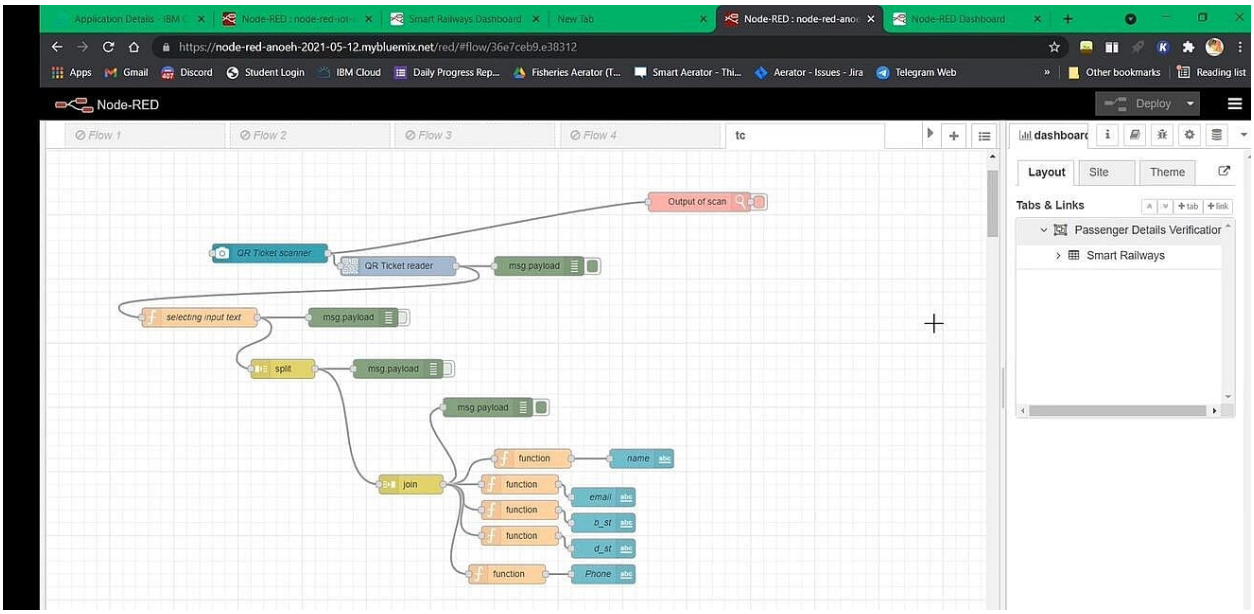
Dashboard for seat vacancy:


Node-RED : node-red-iot-sensor
https://node-red-iot-sensor.eu-gb.mybluemix.net/red/#flow/a00e4f98.5a4a5
Node-RED
Deploy
Passenger Data
Smart Railways
Dashboard for Seat
Pantry
seat-1
seat-2
seat-3
seat-4
seat-5
seat-6
seat-7
seat-8
IBM IoT
connected
msg.payload
Seat selection Notification

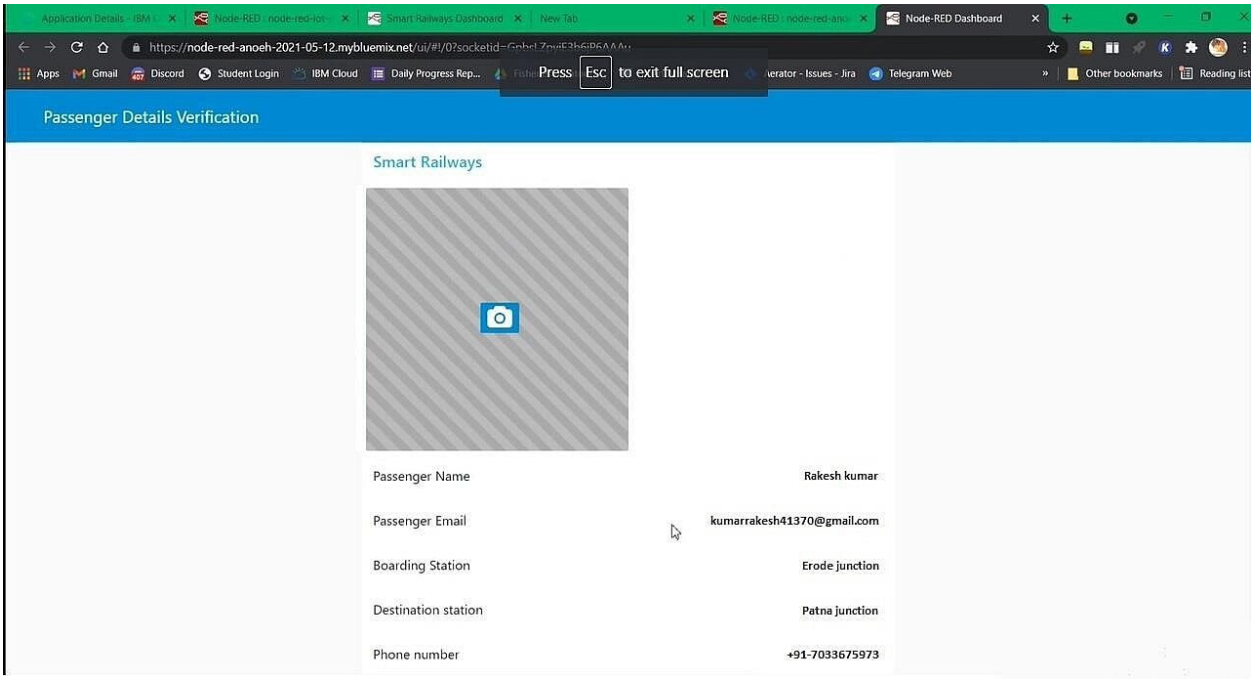
Pantry:


Node-RED : node-red-iot-sensor
https://node-red-iot-sensor.eu-gb.mybluemix.net/red/#flow/88d5fc0d.88d54
Node-RED
Deploy
Passenger Data
Smart Railways
Dashboard for Seat V
Pantry
Choose your snack order
Choose your meal order
Choose your drink order
Order Sent Notification

Tc:



Scanned output at tc:



CONCLUSION

The railway industry is on its way to integrate predictive maintenance and Big Data. Recent advancements in sensors and condition monitoring technologies have led to continuous data collection and evaluation, significantly minimising the number and cost of unscheduled maintenance.

Most significant improvements have been evidenced by more informative and user-friendly websites, mobile applications for real-time information about vehicles in motion, and e-ticket purchases and timetable information implemented at stations and stops. With the rise of Industry 4.0, railway companies can now ensure that they are prepared to avoid the surprise of equipment downtime.

APPENDIX

GitHub Link :

https://github.com/IBM-EPBL/IBM-Project-3141-1658503014

Project Demo Link :

https://drive.google.com/drive/folders/1CFZj3n3a07goCEmfcRUsWOuPTNFVMIWY?usp=sharing