SMART SOLUTION FOR RAILWAYS

DOMAINNAME:INTERNETOFTHINGS

TEAM ID : PNT2022TMID28342

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SMART SOLUTION FOR RAILWAYS

1. INTRODUCTION

The smart solution for railway isanew stage of the development ofintelligent transportation informationization, and it is the total integration and comprehensive embodiment of the railway informationization public service system .In 2010, the leadership of theMinistry ofRailways, in conjunction with the need to change the way of railway development, proposed the development direction for the smart solution railway. It is expected toimprovetheoverall capacityofthe railway throughthe intelligent development of the railway, accelerated the transformation ofthe railwaydevelopment mode, and realized the sustainable development ofthe railway.In recentyears,Chinahasbeenworking hard in the direction of railway informationization. However, as of now, there is still no standardizednorminthefieldofsmartrailways. People'sunderstandingofsmart railways is rather vague. In the research of top-level design of smart railways, itis necessary to establish a conceptual model of smart railways, clearly define the connotation and characteristicsofsmartrailways, and build a modelof a smart railway architecture system, whichwillnotonlyhelpdeepentheunderstandingofthesmartrailway,butalso playa guiding role in the development planning and construction of the smart solution for railway.

1.1. PROJECT OVERVIEW:

Transportationsystemsarecomplexwithrespecttotechnologyandoperationsdueto the involvement of a wide range of human actors, organisations and technical solutions.

There is a need to applyintelligent computerised systems for the operationand controlof suchcomplexenvironments,suchascomputerisedtrafficcontrolsystemsforcoordinating advanced transportation.

Industry4.0isenabled bysmart systemsandInternet-basedsolutions.Maintenance is oneoftheapplicationareasofself-learning, andsmart systemscanpredict failureandtrigger maintenance by making use of the Internet of things(IoT).

1.2 PURPOSE:

Toenablerailtransportationcompaniestooptimisetheirrailnetworks,IBMrecently unveiled the IBM Travel and Transportation (T&T) Framework.

It combines software products to make more intelligent use of all rail assets, from tracks to trains, so companies can meet the increasing consumer demand for more efficient and safer services.

The system is made up of elements such as IBM's new customer-centric reservation system, more efficient operations control and smart vision, and parts of it are already operational within some rail networks.

Raul Arce,vicepresident, Travel & Transportation at IBM, gives his view on smartersystems and how he believes the company will transform rail networks all over the world.

2. LITERATURE SURVEY:

BarryJesiaGandHarrisonJamesE(2008),

He entitled "Series of Injury because of Transport Accidents Involving Railway Train",he analyzed and compared the train accidents, hospitalization keep, etc. It gets in toadditional description of statistics. The danger of significant injury, based on distance cosmopolitan, is ten times bigger for passengers travel by automotive compared with passengers travelling by rail. The mean length of keep in hospital for a transport accident involving a railway train was four days that were longer than the mean length of keep for all External causes of injury.

ZuhairiMahdiAl-AhmedSalih(2013),

The research paper is about "Automatic Railway Gate and crossing control based sensors and microcontroller", he provides some solutions to minimize rail traffic accidents and discusses that this is dangerous than other transportation accidents in terms of severity anddeathrateetc.Therefore moreeffortsarenecessaryfor improving safety. Thereare many Railways crossing which are unmanned due to lack of manpower needed to fulfill the demand. Hence manyaccidentsoccurat suchcrossingsincethereisno onetotakecareofthe functioning of the railway gate when a train approaches the crossing .The main objectives of this Paper is to manage the control system of railway gate using microcontroller.

AnilM.D.etal(2014),

he discussed about "Advanced Railway accident prevention System Using Sensor Network"in that he talk about increased rail traffic density across the world

and in such circumstances how to control. This system makes uses of IR sensors, fire sensor, Zigbee and embeddedsystemswhichpreventaccident.Whenthetrainarrivalatadistinctivesidethen

transmitterIRsensorscreatetheirsuitablehintandthenattheequaltimethereceiverIR sensor receives their indication and makes railway into stopping position.

2.1 EXISTING PROBLEM:

In therecentyears, cities are digitally developing to enhance the all aspects of the urban life including economic, social and environmental aspects. These three aspects are considered to be the main pillars of sustainable development of a smart city. A core element in the smart city development is the mobility. This might include the physical mobility of people or the economic mobility. Introducing the smartness concept in the transportation infrastructure will influence the population growth and business needs.

2.2 REFERENCES:

[1] Automatic Railway Gate Control System Using 8051 microController; International Journal of ChemTech Research; Vol.11 No.04, pp 63-70, 2018.

[2] Yaping LEI Hongxiang XIAO Department of Asset Managemente, College of Information Science and Engineering Guilin University of Technology, Guilin UniversityofTechnology,Guilin541004China[14]H.Rowshandel*,G.L.Nicholson, C.L.

[3] POOVIZHIS*Assistant ProfessorDepartment ofElectronicsandCommunication EngineeringR.M.K.CollegeofEngineeringandTechnologyPuduvuyal,Tamilnadu, Indiapoovizhiece@rmkcet.ac.in

[4] Karthik Krishnamurthy , Monica Bobby Vidya V, Edwin Baby (2015).sensor based automatic railway gate ,international journal of advanced research in computer engineering and technology (IJARCET) volume-4, Issue-2, Feb. 20015.

[5] UjjwalKohli , Anmol Agarwal (2016),smart unmanned level crossing system in Indian railways research in international journal of recent trends in engineering and research (IJRTER) volume-04, Issue -10, OCT 2016

[6] VishwanathaCR,vidyashree PV, Sujit Kumar (2018), Smart railway gate system using internet of things (IOT) research in international journal of advance research in computer. Engineering and technology (IJARCET) volume -4, Issue-3, March 2018.

2.3 PROBLEM STATEMENT DEFINITION

A problem statement is a concise description of the problem or issues a project seeks to address. The problemstatement identifiesthe current state,the desired future state and any gaps betweenthetwo.Aproblemstatementisanimportantcommunicationtoolthatcanhelp

ensure everyone working on a projectknows what the problem they need to address is and why the project is important.

1. Undesirabledowntimeduetosuddenrepairscansoonbeathingofthe pastfor therailways.Predictiveandpreventivemaintenanceis feasibleand more effectiveintheIoTera.Smartsensorsandanalyticsacrossthetrainengine,coaches, andtracksallowrailsystemstoberemotelycheckedandrepairedbeforeasmallissu emagnifiesintohugetrouble.AssethealthmonitoringthroughIoTinsightsimpliesl essofmaintenancedelaysandhelpsinextending thelife of railinfrastructure.

2. The operatorscan controltheirtrainsmoreefficientlyby trackingthem acrossnetworksand processingthedatausinganalytics.Somecompaniesalso employIoTtochecktheflowofpassengers—thosewaitingatthestations,travelingi neachtraincoach,andthetimeswhenthepassengerflowisthe highest.Analyticson suchdatacanguideoperatorson optimizationoftravel schedules aspercommuters'needs anddemands.

Weatheralsoaffectsrailsysteminaregion.Itcanimpactthecondition of rollingstockand its regularoperations.TheIoTsavvyoperatorshave startedto incorporatepredictiveweathermodelingintheiroperationstobereadyforand avoidserviceinterruptions causedbyadverse weatherconditions.

3. IDEATION & PROPOSEDSOLUTION

Ideation is the process where you generate ideas and solutions through sessions such asSketching,Prototyping,Brainstorming,Brainwriting, WorstPossibleIdea,andawealthof other ideation techniques. Ideation is also the third stage in the Design Thinking process.

3.1 EMPATHY MAP CANVAS:

An empathy map is*a* collaborative tool teams can use to gain a deeper insight into their customers. Much like a user persona, anempathymap canrepresent a groupofusers, suchas a customer segment. The empathy map was originally created by Dave Gray and has gained much popularity within the agile community.

The empathy map represents a principal user and helps teams better understand their motivations, concerns, and user experience. Empathy mapping is a simple yet effective workshop that can be conducted with a variety of different users in mind, anywhere from stakeholders, individual use cases, or entire teams of people.

Anempathymap canvashelps brands provide a betterexperience for users byhelping teams understand the perspectives and mindset oftheir customers. Using a template to create an empathy map canvas reduces the preparation time and standardizes the process so you create empathy map canvases of similar quality.Empathy is important because it helps us understand how others are feeling so we can respond appropriately to the situation. It is typically associated with social behaviour and there is lots of research showing that greater empathy leads to more helping behaviour.

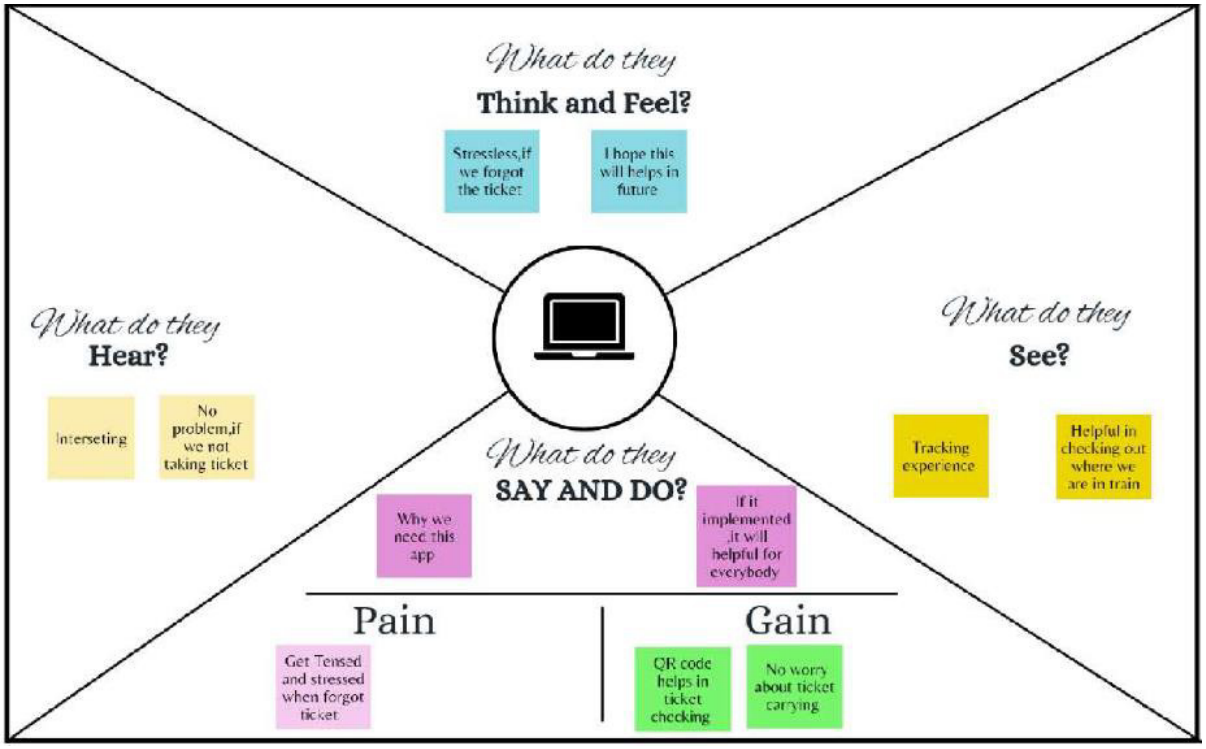
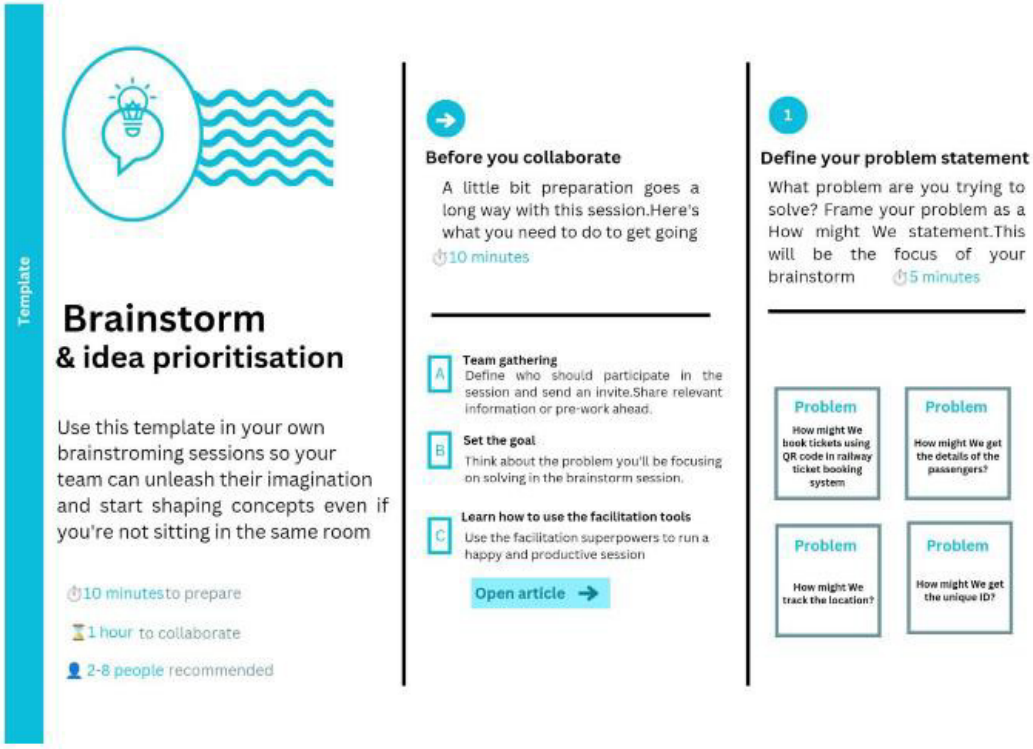


Fig:Empathymap

3.2 IDEATION & BRAINSTORMING:

Brainstorming is usually conducted by getting a group of people together to come up with either general new ideas or ideas for solving a specific problem or dealing with aspecific situation. For example, a major corporation that recently learned it is the object of a major lawsuit maywant to gathertogether topexecutives

for a brainstorming sessiononhow to publicly respond to the lawsuit being filed.



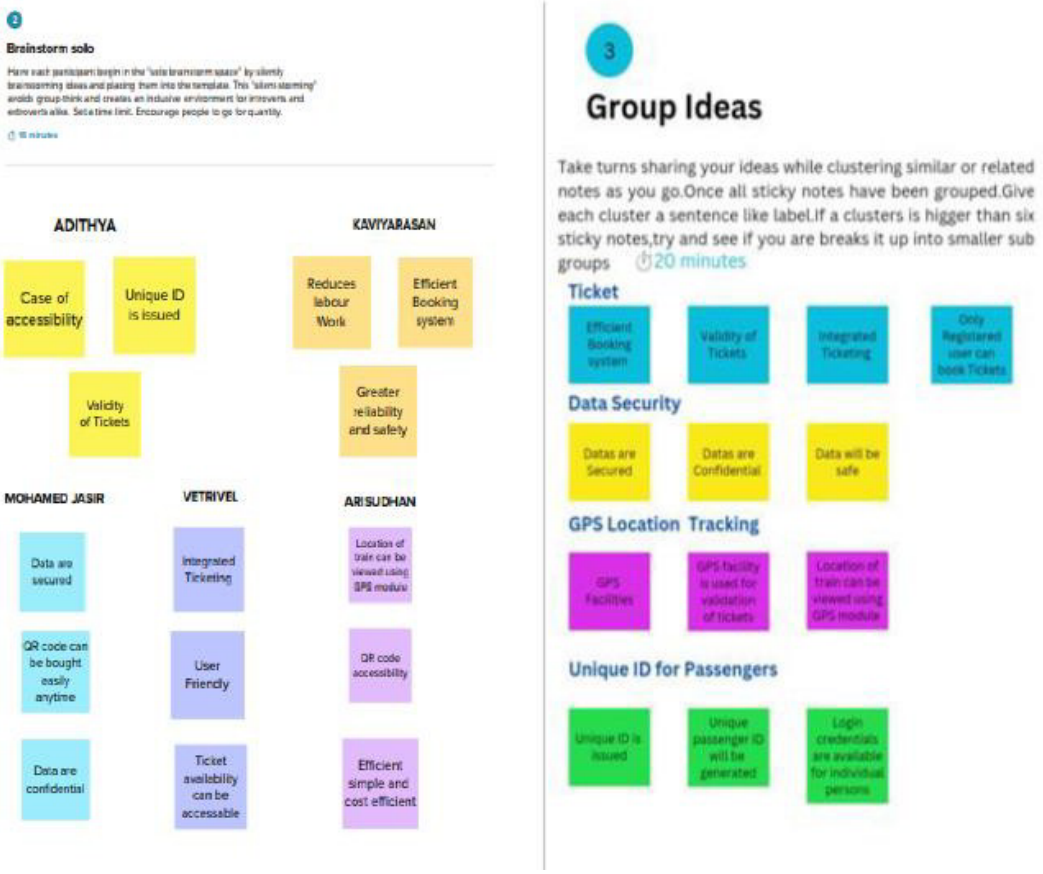


Fig:BrainStorm

3.3 PROPOSED SOLUTION

Develop an ML model for prediction of power output from meteorological variables using historical weather data and actual power output results. So the prediction will be more genuine and trustworthy.

We used Boosted Tree Regression model which is one of the types of “Decision Trees” which are very credible for accurate predictions. Develop an web page which only takes location geo-coordinates as input and in backend will get weather forecast details and the predictions of power output from forecasted details.

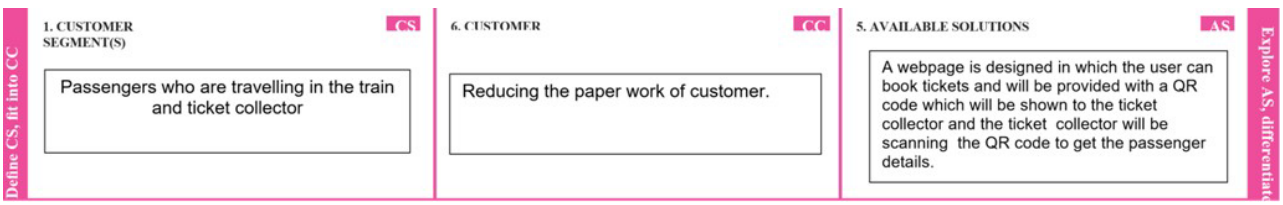
S.No.	Parameter	Description
1.	Problem Statement (Problem to besolved)	SmartSolutionsforrailwaysisdesignedtoreducedthe workloadoftheuserandalsothe useofpaperandalso providesthe live location of the train. Intheirbusyscheduleasfast roamingworldpublicinneed ofonlinebookingprocess.Thequeuesinfront oftheticket countersinrailwaystations havebeendrasticallyincreased over the period of time. Ticket reservation through counter is not sufficient and convenient for the passengers.The passengers are strugglingto getticketsinthetimefromticket counters. Sotheyliketoswitchoveronlineticket booking.
2	Idea / Solution description	A webpage isdesigned inwhichtheusercanbooktickets and willbe provided witha QRcode whichwill be shown to the ticket collector and the ticket collector will be scanning the QR code to getthe passenger details. Thewebpagealsoshowsthelivelocationsofthetrainby placing a GPS module in thetrain. The location of the journey will be updated continuously in the webpage. Thebookingdetailsoftheuserwill bestored inthedatabase whichcanberetrievedanytime.

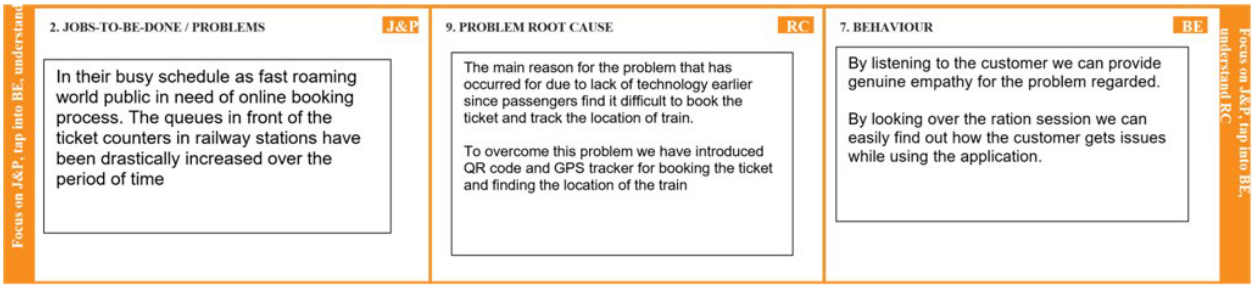
3	Novelty/Uniquenes s	AQRcodewillbeprovided bythewebpagetotheuser whichwill reduce the paper work. Allthe bookingdetailsofthecustomerswillbestoredin thedatabase with a unique ID andthey can be retrieved backwhentheTicket CollectorscanstheQRCode.You can also view interactive seat map

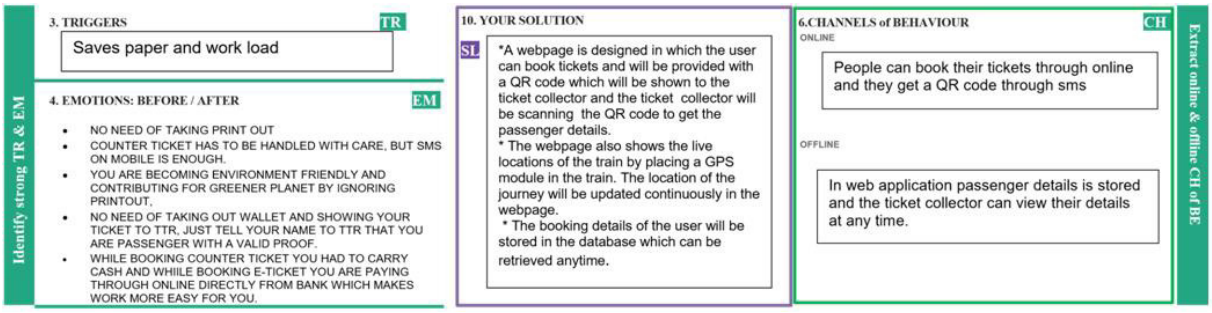
4	Business Model (Revenue Model)	Withthissolution- Byusingthisapplications,thecustomer canschedule their destination, view interactive seat map and select their seat for their convenience. Moreever, it enables your customersorganize trips and dailyshuttleseffortlesslyanditalso reducesthecarryingof tickets. The customer can also watch the current location of the train. Withoutthissolution- theyhavetotraveltothestationto book tickets and also have to carrytheir tickets to show ticketcollector
5	Scalability of the Solution	Noneedoftakingprint out. Counter ticket has to be handled with care, but SMS on mobile is more than enough. Youarebecomingenvironment friendlyand contributing for greener plantby ignoring printout. No need of taking out wallet and showing your ticket to TTR, just tell your name to TTRthat you are passenger with a valid proof. While booking counter ticket you had to carry cash and whilebookingE-ticketyouarepayingthroughonline directlyfrombankwhichmakesworkmoreeasyforyou.

3.4.PROBLEM SOLUTION FIT:

Problem-Solution canvas is a tool for entrepreneurs, marketers and corporate innovators, which helps them identify solutions with higher chances for solution adoption, reduce time spent on solution testing and get a better overview of current situation.




Focus on J&P, tap into BE, understand
2. JOBS-TO-BE-DONE / PROBLEMS
J&P
In their busy schedule as fast roaming world public in need of online booking process. The queues in front of the ticket counters in railway stations have been drastically increased over the period of time
9. PROBLEM ROOT CAUSE
RC
The main reason for the problem that has occurred for due to lack of technology earlier since passengers find it difficult to book the ticket and track the location of train.
To overcome this problem we have introduced QR code and GPS tracker for booking the ticket and finding the location of the train
7. BEHAVIOUR
BE
By listening to the customer we can provide genuine empathy for the problem regarded.
By looking over the ration session we can easily find out how the customer gets issues while using the application.
Focus on J&P, tap into BE, understand RC



4. REQUIREMENTANALYSIS

Functionalrequirements are the desired operations ofa program, or systemas defined in software development and systems engineering.

1.Functionalrequirement.

2.Non-functionalrequirements.

Functional requirements:

Followingarethefunctionalrequirementsoftheproposedsolution.

FRNo.	FunctionalRequirement(Epic)	SubRequirement(Story/Sub-Task)
FR-1	UserRegistration	RegistrationthroughForm
FR-2	UserConfirmation	ConfirmationviaEmailConfirmationviaOTP
FR-3	UserQRcodegeneration	QRcodeisgenerated
FR-4	GPStracker	Locationistracked

Non-functional requirements:

Followingarethenon-functionalrequirementsoftheproposedsolution.

FRNo.	Non-FunctionalRequirement	Description
NFR-1	Usability	Userscannavigateeasily
NFR-2	Security	Thedetailsaresecuredinthedatabase
NFR-3	Reliability	Reliabletotheuserswithoutanyfailureasitisnot fixed to limited number of users

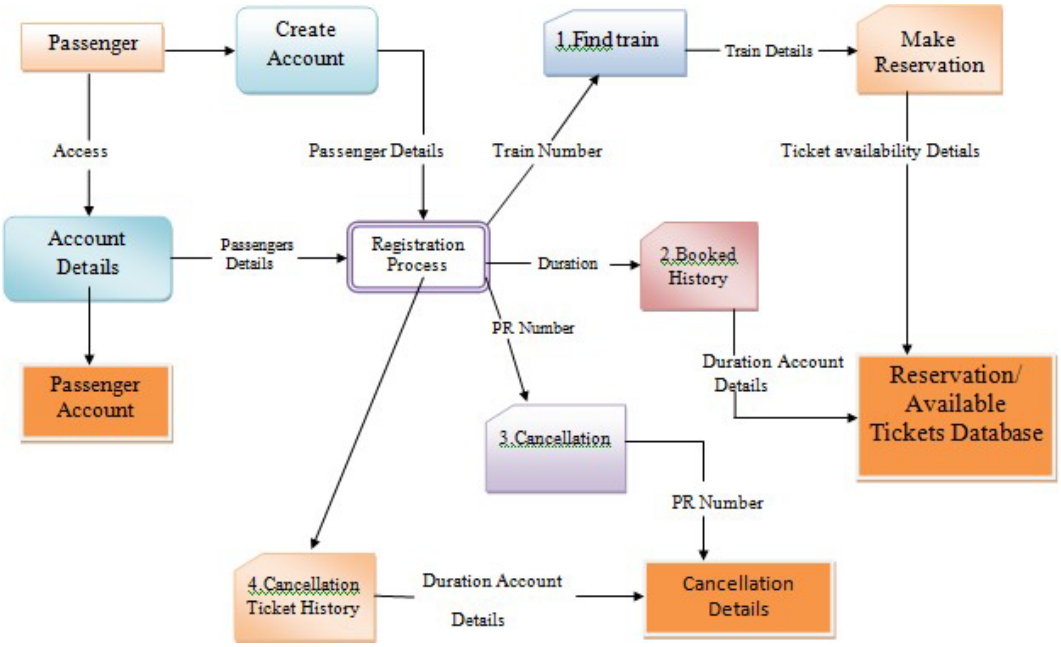
NFR-4	Performance	User-friendly
NFR-5	Availability	Availableanytimeatthetimeofease
NFR-6	Scalability	Supporttheuserswiththeirneedsinreserving ticketand tracking the location.

5. PROJECT DESIGN

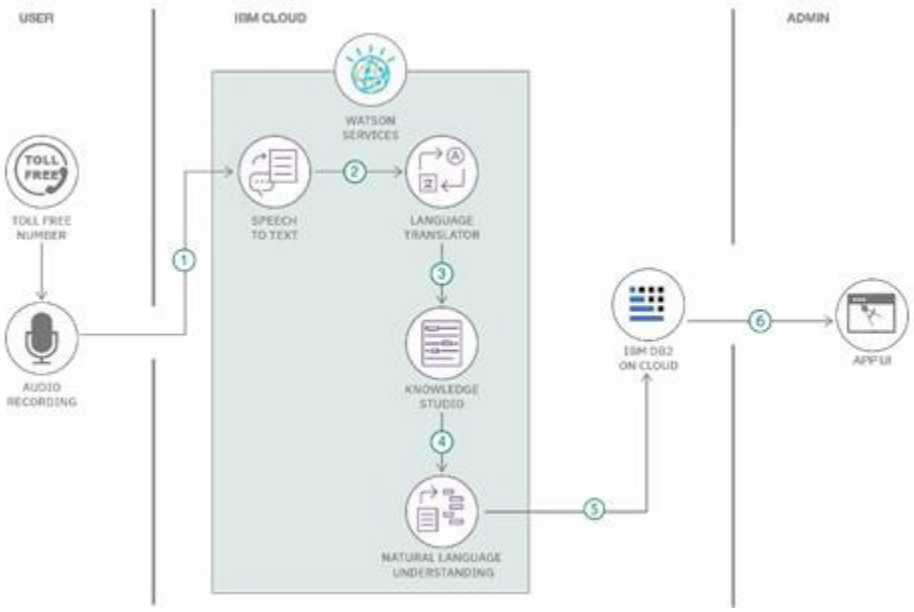
Projectdesign is an early phase of a project where the project's key features, structure, criteria for success, and major deliverables are planned out. The aim is to develop one or more designs that can be used to achieve the desired project goals. importance of project designs are They help your team understand how to move through a project in the correctway.Theyhelp youavoidomitting important stepsoritems.Theyhelp you lookmore professional. They put the 'know how' in the business, instead of in employees.

5.1 DATA FLOW DIAGRAMS

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored.



5.2 SOLUTION & TECHNICAL ARCHITECTURE:



6. PROJECT PLANNING & SCHEDULING

Projectplanningisa discipline addressing how to complete a project in a certain timeframe, usually with defined stages and designated resources. One view of project planning divides the activity into these steps: setting measurableobjectives. identifying deliverables.

Sprint	Functional requirements(epic)		Userstory /task	Story points	Priority	Team Members
Sprint-1	Registration	USN-1	Auser can register throughthe website	2	High	
Sprint-1	Confirmation	USN-2	Confirmation messageis received throughemail orotpthrough phone	1	High	Adithya

Sprint-2	booking	USN-3	Auser can booktheirseat throughthe web	2	Low	Kaviyarasan
Sprint-2	Confirmation	USN-4	AQRcode is generated and sendthrough theuser	2	Medium	
Sprint-3	verification	USN-5	Aticket collector is verified Throughthe QRcode	1	High	Vetrivel
Sprint-4	Locationtracking	USN-6	AGpslocation ofthetrainis showinthe web	2	high	Mohamed Jasir

6.2 SPRINT DELIVERY SCHEDULE:

Sprintparticipantshaveproducedsketchesanddrawings,writing,photographs,comic strips, videos and fully coded working prototypes. The answer is whatever's right to answer the problem.

Sprint	Total Story points	Duration	Sprint Start Date	Sprint End Date(planned)	Story Points completed (as on planned Enddate)	Sprint Release Data(Actual)
Sprint-1	20	6Days	24oct 2022	29oct2022	20	29Oct 2022
Sprint-2	20	6Days	31oct 2022	05Nov2022	20	05NOV2022
Sprint-3	20	6Days	07Nov 2022	12Nov2022	20	12 Nov2022
Sprint-4	20	6Days	14Nov 2022	14Nov2022	20	19 Nov2022

7. CODING&SOLUTIONING

7.1 FEATURE:

QR CODE SCANNER:

```
import cv2 as cv
importnumpyasnp
import time
importpyzbar.pyzbaraspyzbar
fromibmcloudant.cloudant_v1importCloudantV1
fromibmcloudantimportCouchDbSessionAuthenticator
fromibm_cloud_sdk_core.authenticatorsimportBasicAuthenticator import
wiotp.sdk.device

authenticator=BasicAuthenticator('apikey-v2- 2ji0x00sov1b6clf61hctelp07os2c41mauy6mk7a3ot',
'6866a033c311b4968d996ca9fa217206')
service=CloudantV1(authenticator=authenticator) service.set_service_url('https://apikey-v2-
2ji0x00sov1b6clf61hctelp07os2c41mauy6mk7a3ot:6866a033c311b4968d996ca9fa
217206@53e4077b-d008-4545-8ea1-1d70926b1b71-
bluemix.cloudantnosqldb.appdomain.cloud')

cap = cv.VideoCapture(0)
font=cv.FONT_HERSHEY_PLAIN if not
cap.isOpened():
        print("Cannotopencamera") exit()


myConfig={
        "identity":{
                "orgId":"u3neop",
                "typeId":"qrcode",
                "deviceId":"1234567"
                },
        "auth":{
                "token":"1234567890"
                }
        }
defmyCommandCallback(cmd):
        print("MessagereceivedfromIBMIoTPlatform:%s"% cmd.data['command'])
        m=cmd.data['command']

client=wiotp.sdk.device.DeviceClient(config=myConfig, logHandlers=None)
client.connect()

defpub(data):
        client.publishEvent(eventId="status",msgFormat="json", data=response, qos=0,
onPublish=None)
        print("PublisheddataSuccessfully:%s",response) print("\n")

whileTrue:
```

```
    ret,frame=cap.read()
    decodedObjects=pyzbar.decode(frame) if not ret:
        print("Can'treceiveframe(streamend?).Exiting...") break
    for obj in decodedObjects: a=obj.data.decode('UTF-8')
        cv.putText(frame,"Ticket",(50,50),font,2,
                        (255,0,0),3)

        try:
            response=service.get_document( db='bo
                okingdetails', doc_id = a
                ).get_result()
            print(response) print("\n\n")
            pub(response) time.sleep(5)
        except Exception as e: response={'Error':'NotaValidTicket'}
            pub(response)
            print("NotaValidTicket") print("\n\n")
            time.sleep(5)

    cv.imshow("Frame",frame)
    ifcv.waitKey(1)&0xFF==ord('q'): break
    client.commandCallback=myCommandCallback cap.release()
cv.destroyAllWindows() client.disconnect()
```

8. TESTING

The purpose oftesting is to discover errors. Testing is the process oftrying to discover every conceivable fault or weakness in a work product. It provides a wayto check the functionality of components, sub-assemblies, assemblies and/or a finished product. It is the process of exercising softwarewith the intent of ensuringthattheSoftwaresystem meets its requirements and user expectations and does not fail in an unacceptable manner. There are various types of test. Each test type addresses a specific testing requirement.

8.1 TEST CASES:

A testcase has components thatdescribeinput, actionandan expectedresponse, in ordertodetermineifafeatureofanapplicationisworkingcorrectly.Atestcaseisaset

ofinstructions on “HOW” to validate a particular test objective/target, which when followed will tell us if the expected behavior of the system is satisfied or not.

Characteristics of a goodtestcase:

- Accurate:Exactsthepurpose.
- Economical:Nounnecessarystepsorwords.
- Traceable:Capableofbeing tracedto requirements.
- Repeatable:Canbeusedtoperformthetestover andover.
- Reusable:Canbereused ifnecessary.

TYPES OF TESTS

1. Unit testing

Unit testing involves the design of test cases that validate that the internal program logic is functioning properly, and that program inputs produce valid outputs. All decision branches and internal code flow should be validated. It is the testing of individual software units of the application .it is done after the completion of an individual unit beforeintegration. This is a structural testing, that relies on knowledge of its construction and is invasive. Unit tests perform basic tests at component level and test a specific businessprocess, application, and/or systemconfiguration. Unit tests ensurethat eachunique pathofa business process performs accurately to the documented specifications and contains clearly defined inputs and expected results.

2. Integration testing

Integration tests are designed to test integrated software components to determine if they actually run as one program.Testing is event driven and is more concerned with the basic outcome of screens or fields. Integration tests demonstrate that although thecomponents wereindividuallysatisfaction,as shown by successfullyunittesting, the combinationofcomponents is correct and consistent. Integrationtesting is specificallyaimed atexposing the problems that arise from the combination of components.

3. Functional test

Functional tests provide systematic demonstrations that functions tested are available as specified by the business and technical requirements, system documentation, and user manuals.

Functionaltestingiscenteredonthefollowingitems:

Valid Input :identified classes of valid input must be

accepted. Invalid Input

:identifiedclassesofinvalidinputmustberejected.

Functions : identified functions must be exercised.

Output

:identifiedclassesofapplicationoutputsmustbeexercis

ed. Systems/Procedures: interfacing systems or procedures must be

invoked.

Organizationandpreparationoffunctionaltestsis focusedonrequirements, keyfunctions, or special test cases. In addition, systematic coverage pertaining to identify Business process flows; data fields, predefined processes, and successive processes must be considered for testing. Before functional testing is complete, additional tests are identified and the effective value of current tests is determined.

4. System Test

System testing ensures that the entire integrated software system meets requirements. It testsa configuration to ensure known and predictable results. An example of system testing is the configuration-oriented system integration test. System testing is based on processdescriptions and flows, emphasizing pre-driven process links and integration points.

5. White BoxTesting

White Box Testing is a testing in which in which the software tester has knowledge of the inner workings, structure and language ofthe software,or at least itspurpose.It ispurpose.It is used to test areas that cannot be reached from a black box level.

6. Black BoxTesting

Black Box Testing is testing the softwarewithout any knowledge of the inner workings, structureor languageofthe modulebeing tested.Black boxtests, as most other kindsoftests, must be written from a definitive source document, such as specification or requirements document, such as specification or requirements document. It is a testing in which the software under test is treated, as a black box

.you cannot “see” into it. The test providesinputs and responds to outputs without considering how the software works.

7. Unit Testing:

Unit testing is usuallyconducted as partofa combined code and unit test phase ofthe softwarelifecycle,althoughit isnot uncommonforcodingandunit testingto beconductedas two distinct phases.

7.1 Test strategy and approach

Fieldtestingwillbeperformedmanuallyandfunctionaltestswillbewrittenindetail.

7.2 Test objectives

- Allfieldentriesmustworkproperly.
- Pagesmust beactivatedfromthe identified link.
- Theentryscreen,messagesandresponsesmustnotbedelayed.

7.3 Features to betested

- Verifythattheentriesareofthecorrectformat
- Noduplicateentriesshouldbeallowed
- Alllinksshould taketheusertothecorrectpage.

8. IntegrationTesting

Softwareintegrationtesting is the incremental integration testing of two or more integrated software components on a single platform to produce failures caused by interface defects. The task of the integration test is to check that components or software applications,

e.g. components ina softwaresystemor –onestep up – softwareapplicationsat thecompany level – interact without error.

TestResults: All the test cases mentioned above passed successfully.No defectsencountered.

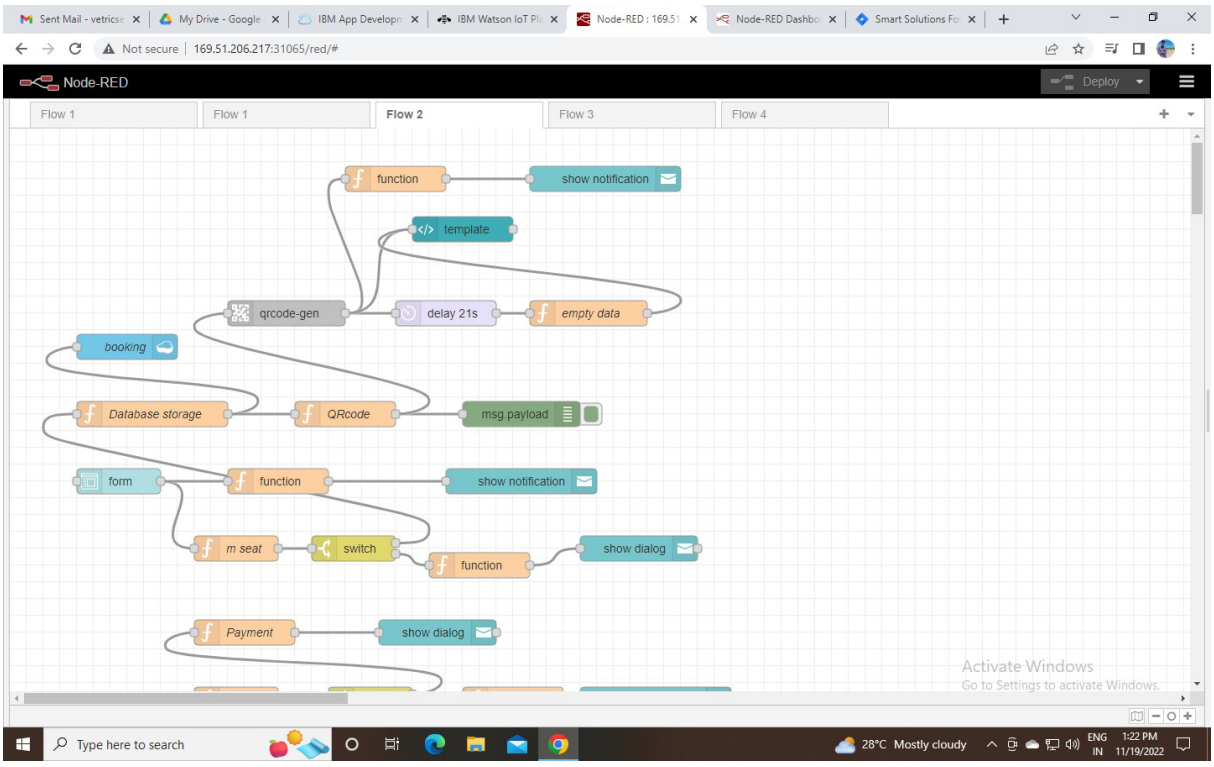
8.2 User Acceptance Testing

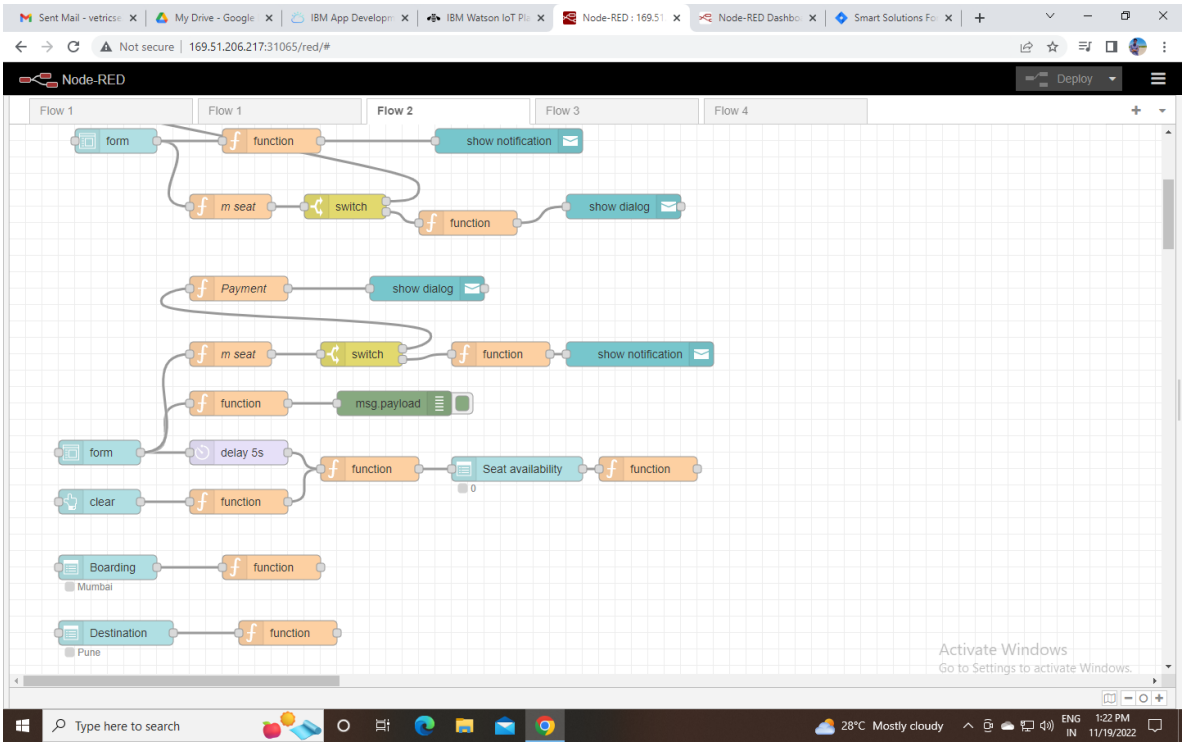
User Acceptance Testing is a critical phase of any project and requires significant participation by the end user. It also ensures that the system meets the functional requirements.

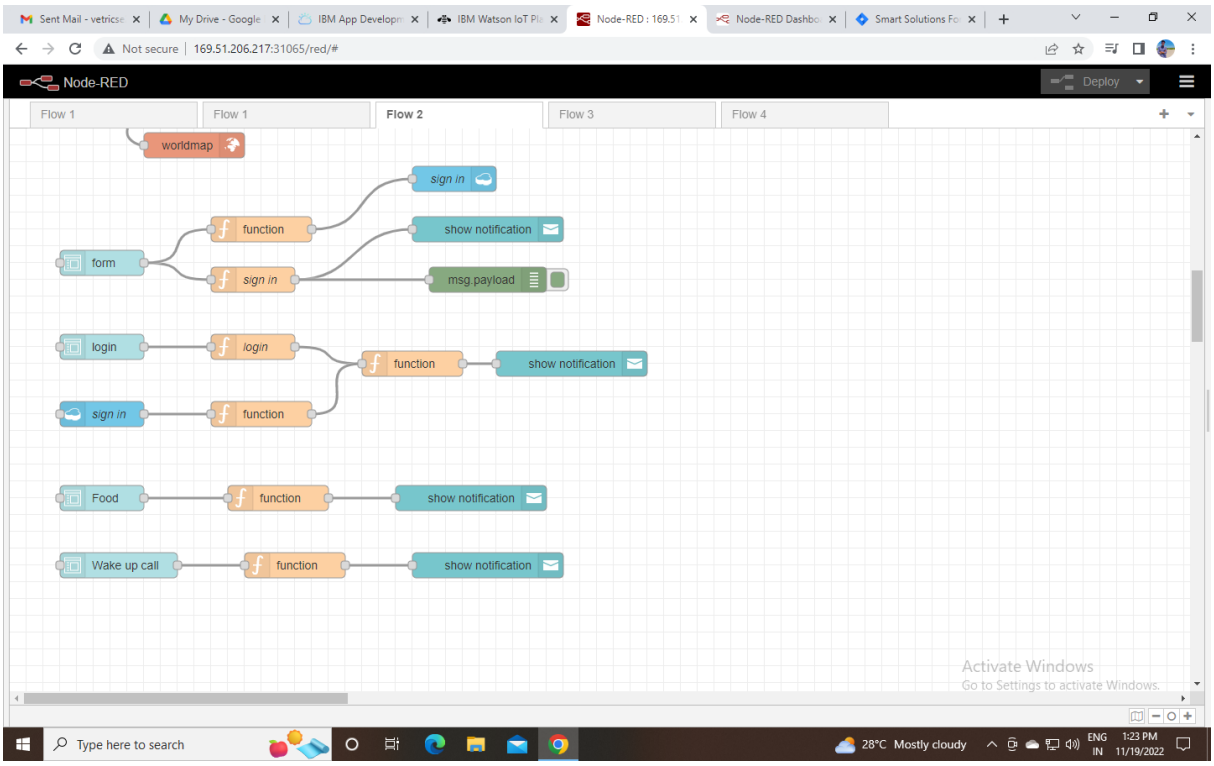
Testresults: All the test cases mentioned above passed successfully.No defectsencountered.

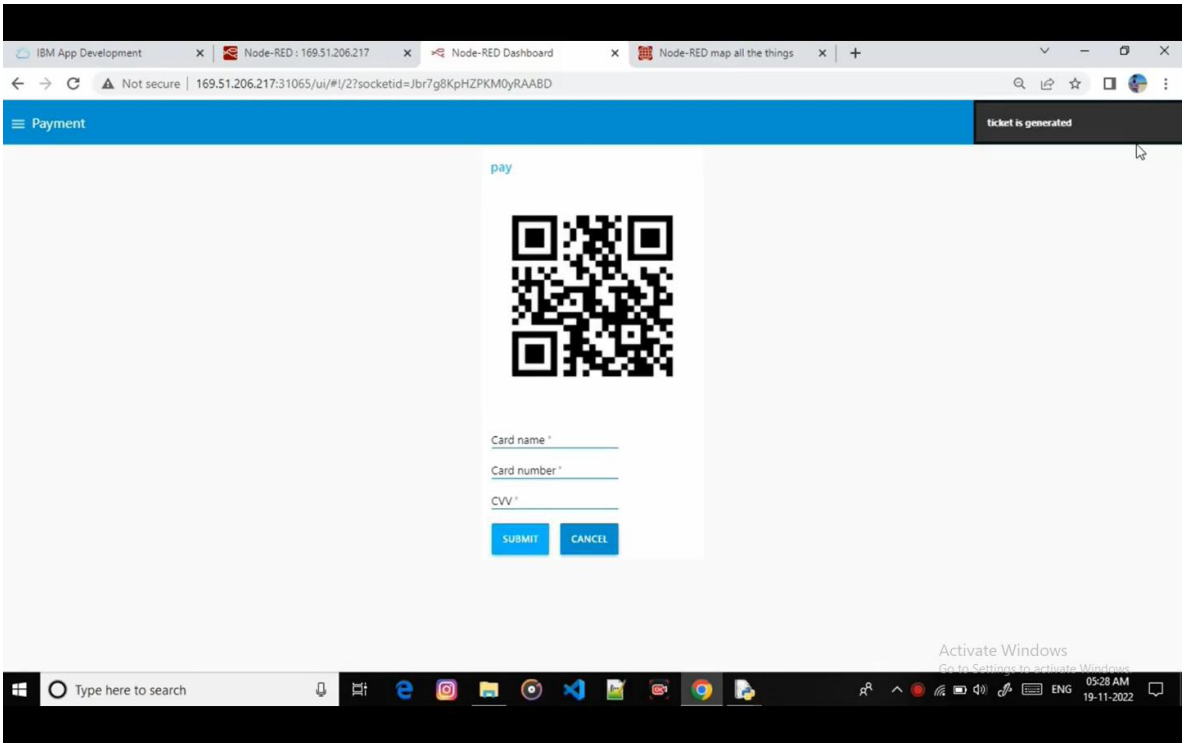
9. RESULTS

9.1 PERFORMANCE METRICS:






Node-RED
Deploy
Flow 1
Flow 1
Flow 2
Flow 3
Flow 4
worldmap
sign in
function
show notification
form
sign in
msg.payload
login
login
function
show notification
sign in
function
Food
function
show notification
Wake up call
function
show notification
Activate Windows
Go to Settings to activate Windows.
Type here to search
28°C Mostly cloudy
ENG
IN
1:23 PM
11/19/2022


IBM App Development
Node-RED : 169.51.206.217
Node-RED Dashboard
Node-RED map all the things
Not secure
169.51.206.217:31065/ui/#!/2?socketid=Jbr7g8KpHZPKM0yRAABD
Payment
ticket is generated
pay
Card name *
Card number *
CVV *
SUBMIT
CANCEL
Activate Windows
Type here to search
ENG
05:28 AM
19-11-2022

10. ADVANTAGES & DISADVANTAGES

ADVANTAGES:

In this work, a keen railroad crossing framework is proposed based Internet of Things. We built up a model for this and effectively checked the opening and shutting of the door during trainappearance. It is easyto understand, and has required alternatives, whichcanbe used by the client to playout the ideal tasks. The objectives that are accomplished are:

- Lesshumaninclusion
- Effectiveadministrationofrailroaddoors
- Simpledevelopmentofthesensorsonthetrack
- Decreasedblundersbecauseofhumanintercession
- Versatile and adaptable for additional upgrade. This workofferedaspeedy and upgraded working model of SMART SOLUTION FOR RAILWAY . This is usefulto the individuals living in the remote zones with unmanned railroad doors.

DISADVANTAGES

- Railwaytransportis**itsinflexibility**.
- Itroutesandtimingscannotbeadjustedtoindividualrequirements.
- Rail transport cannot provide door to door service as it is tied to a particular track. Intermediate loading or unloading involves greater cost, more wear and tear and wastage of time.
- Norailservice/limitedserviceinruralorhillyareas

11. CONCLUSION

At present the current framework isphysicallyand humancontrolled frameworkonce the train leaves the station. The station ace advises the guard about the appearance regarding the train through the phone. When the watchman gets the

data then he shuts the entryway relying upon the planning atwhich the train shows up. Thus in the eventthat the train is late

because of specific reasons, at that point entryway stay shut for quite a while causing traffic close to the doors. There is no unified framework is accessible by and by signals are control by mean of interlocking and wrong signals and sign gadget which is absolutely self-loader framework. The programmed railroad entrywaycontrolat the level intersection and hostile to crash gadget. The ideal opportunity for which it is shut is less contrasted with the physically worked entryways and furthermore lessens the human work. This kind of entryways can be utilized in an unmanned level intersection where the odds of mishaps are higher and solid activity is required. Since the activity is programmed mistake because of manual activity is forestalled. Also, executing the work railroad framework can be brought together which can control the train crash mishaps. Another methodology for improving wellbeing at LCs and train crash on IR has been proposed. Organizations have been given to keep up recordsofLC inventories mishap/episode reports. A normal appraisal of wellbeing execution ought to be finished. This methodologyought to havetheoptionto cut downtherising pattern in mishaps at LCs and train impact mishap. This undertaking utilizes the current framework of railroads forexamplepresent flagging strategy and meets all the necessities to have a programmed controlling of the railroad traffic. It gives the management and control frameworkgivethe intend to constant investigation survey and information assortment for the reason for upkeep on the versatile and fixed offices for the assuranceofactivitywellbeing and support 60 effectiveness just as the security examination dynamic framework dependent on the portionofwellbeing information. The extraordinaryaccomplishment ofpresent dayadvancements in each important field and the mechanical improvement of the railroad business itself have furnished rail route with practicality to win higher help quality and quicker speed.

12. FUTURE SCOPE

Automation of the railway gate control system is implemented in order to reduce interaction of lifting andshutting the intersection entryway which permits and maintains a strategic distance from vehicles and individuals from passing the intersection. Rail crossing has been the underlying driver for of accident and numerous deadly issues. Computerization ofthe intersectionentryways makes simple and secureto controlthe doors. People maymake off base or accidents 57 which might be extremely risky, mechanization of entire thing will abbreviate

potentialoutcomes ofthe disasters and mistake. Computerizationofthe lifting and closing of the railroad crossing door with the utilization of Arduinoutilizingsensor and utilizingengineswillhelpincontrollingtheentryways.Thiscanbeexecutedintheremote

region where it is hard for people to work in likein the spots of extraordinary climate. As everything in this worldhas a constraint our set forth frameworkrepresents a few impediments which utilization of Infra-Red sensors are. Regardless of train or some other article in its inclusion territory it will distinguish as an item is identified which is incorrect. Second restriction happens to be while lifting and closing of intersection entryway however this flops in staying away from the developments of the vehicles intruding. We just control crossingdoor here. Soasto determinethis issue, wetakehelpofweight that goesabout asan extra to the set forth work. Alongside Infra-Red sensors it is acceptable to utilize loadsensors. Herethe heap sensor utilization isconstrained as it isn't financiallypracticalfor little territory however when actualized in a bigger degree this will give a tremendous effect. Future usage can be made by settling the present issues utilizing the above said recommendations and joining them in the framework.

13. APPENDIX

SOURCE CODE

DEVELOP A PYTHON CODE FOR PUBLISHING THE LOCATION:

```
importwiotp.sdk.devi
ce import time
importrandom
myConfig = {
        "identity":{
                "orgId":"u3neop",
                "typeId": "GPS",
                "deviceId":"12345"
        },
        "auth":{
                "token":"1234567890"
        }
}


defmyCommandCallback(cmd):
        print("MessagereceivedfromIBMIoTPlatform: %s"%cmd.data['command'])
        m=cmd.data['command']

client=wiotp.sdk.device.DeviceClient(config=myConfig,logHandlers=None)
client.connect()

defpub(data):
        client.publishEvent(eventId="status",msgFormat="json",data=myData,qos=0,
onPublish=None)
        print("PublisheddataSuccessfully:%s",myData)

whileTrue:
        myData={'name':'Train1','lat':17.6387448,'lon':78.4754336}
        pub (myData)
        time.sleep(3)
        #myData={'name':'Train2','lat':17.6387448,'lon':78.4754336)
        #pub (myData)
        #time.sleep(3)
        myData={'name':'Train1','lat':17.6341908,'lon':78.4744722}
        pub(myData)
        time.sleep(3)
        myData={'name':'Train1','lat':17.6340889,'lon':78.4745052}
        pub (myData)
        time.sleep(3)
        myData={'name':'Train1','lat':17.6248626,'lon':78.4720259}
        pub (myData)
        time.sleep(3)
        myData={'name':'Train1','lat':17.6188577,'lon':78.4698726}
```

```
            pub(myData)
            time.sleep(3)
            myData={'name':'Train1','lat':17.6132382,'lon':78.4707318}
            pub (myData)
            time.sleep(3)
            client.commandCallback=myCommandCallback
client.disconnect ()
```

QR CODE SCANNER:

```
import cv2 as cv
importnumpyasnp
import time
importpyzbar.pyzbaraspyzbar
fromibmcloudant.cloudant_v1importCloudantV1
fromibmcloudantimportCouchDbSessionAuthenticator
fromibm_cloud_sdk_core.authenticatorsimportBasicAuthenticator
import wiotp.sdk.device
authenticator=BasicAuthenticator('apikey-v2-
2ji0x00sov1b6clf61hctelp07os2c41mauy6mk7a3ot','6866a033c311b4968d996ca9f
a217206') service=CloudantV1(authenticator=authenticator)
service.set_service_url('https://apikey-v2-
2ji0x00sov1b6clf61hctelp07os2c41mauy6mk7a3ot:6866a033c311b4968d996ca9fa2
17206@ 53e4077b-d008-4545-8ea1-1d70926b1b71-
bluemix.cloudantnosqldb.appdomain.cloud')

cap= cv.VideoCapture(0)
font=cv.FONT_HERSHEY_PLAIN if
not cap.isOpened():
   print("Cannotopencamera")
   exit()


myConfig =
   { "identity":{
      "orgId":"u3neop",
      "typeId":"qrcode",
      "deviceId":"1234567"
      },
   "auth":{
      "token":"1234567890"
      }
   }
def myCommandCallback(cmd):
   print("MessagereceivedfromIBMIoTPlatform:%s"%cmd.data['command'])
   m=cmd.data['command']

client=wiotp.sdk.device.DeviceClient(config=myConfig,logHandlers=None)
client.connect()
```

```
defpub(data):
   client.publishEvent(eventId="status",msgFormat="json",data=response,qos=0,
onPublish=None)
   print("PublisheddataSuccessfully:%s",response)
   print("\n")

whileTrue:
   ret,frame=cap.read()
   decodedObjects=pyzbar.decode(fra
   me) if not ret:
      print("Can'treceiveframe(streamend?).Exiting...")
      break
   for obj in decodedObjects:
      a=obj.data.decode('UTF-8')
      cv.putText(frame,"Ticket",(50,50),font,
      2,
               (255,0,0),3)

      try:
         response=service.get_document(
             db='bookingdetails',
            doc_id=a
            ).get_result()
         print(response)
         print("\n\n")
         pub(response)
         time.sleep(5)
      except Exception as e:
         response={'Error':'NotaValidTicket'}
         pub(response)
         print("NotaValidTicket")
         print("\n\n")
         time.sleep(5)

   cv.imshow("Frame",frame)
   ifcv.waitKey(1)&0xFF==ord('q'): break
   client.commandCallback=myCommandCallback
cap.release()
cv.destroyAllWindows()
client.disconnect()
```

GITHUB LINK:

https://github.com/IBM-EPBL/IBM-Project-27934-1660101572