IoTBasedSafetyGadgetforChildSafetyMonitoringAndNotiﬁcation:

**Batch:**B9-3A5E

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1. **INTRODUCTION:-**
   1. **PROJECTOVERVIEW:-**

# Child tracker helps the parents in continuously monitoring thechild'slocation.Theycansimplyleavetheirchildreninschoolorparksandcreateageofencearoundtheparticularlocation.Bycontinuouslycheckingthe child's location notiﬁcations will be generated if the child crosses thegeofence.Notiﬁcationswillbesentaccordingtothechild'slocationtotheirparents or caretakers. The entire location data will be stored in thedatabase.

**1.2.PURPOSE:**

# The novelty of the work is that the system automatically alerts theparents/caretakerbysendingSMS,whenimmediateattentionisrequired

forthechildduringemergency

## LITERATURESURVEY:-

* 1. **EXISTINGPROBLEM:**

# Nowadays, there are many projects for child safety Monitoringonly .But we exploit the IoT device for monitoring the location and alsoparentscancreatethegeofencetheywish,theSMSissenttotheparentsifthechildcrossesthegeofence.

## REFERENCES

* + 1. N.Senthamilarasi,N.Dhivyabharathi,D.EzhilarasiandR.B.Sangavi:-ChildSafetyMonitoringSystemBasedonIOT-NOV2019[2]MNandiniPriyanka,SMurugan,KNHSrinivas,TDSSarveswaraRao,EKusumaKumari:-SmartIOTDeviceforChildSafetyandTracking[3]P.

Poonkuzhali1,R.Aarthi2,Yazhini.V.M3,Yuvashree.S4,Vidhyalakshmi.G:-ChildMonitoringand

SafetySystemUsingWSNandIOTTechnology

## PROBLEMSTATEMENTANDDEFINITION:-

The overall percentage of child abuse cases ﬁled recently in the world is about 80%, out ofwhich 74 percent are girl children and the rest are boys. For every 40 seconds, a child goesmissing in this world. Children are the backbone of one’s nation, if the future of children wasaffected, it would impact the entire growth of that nation. Due to the abuse, the emotional andmental stability of the children gets affected which in turn ruins their career and future. Theseinnocentchildrenarenotresponsibleforwhathappenstothem.So,parentsareresponsiblefortakingcareoftheirownchildren.But,duetoeconomicconditionsandtheaimtofocusontheirchild’s future and career, parents are forced to crave for money. Hence, it becomes diﬃcult tocling on to their children all the time. In our system, we provide an environment where thisproblemcanberesolvedinaneﬃcientmanner.Itallowsparentstoeasilymonitortheirchildrenin real time just like staying beside them as well as focusing on their own career without anymanualintervention.

DEFINITION:-

Childtrackerhelpstheparentsincontinuouslymonitoringthechild'slocation.

They can simply leave their children in school or parks and create a geofence around theparticularlocation.Bycontinuouslycheckingthechild’slocationnotiﬁcationswillbegenerated

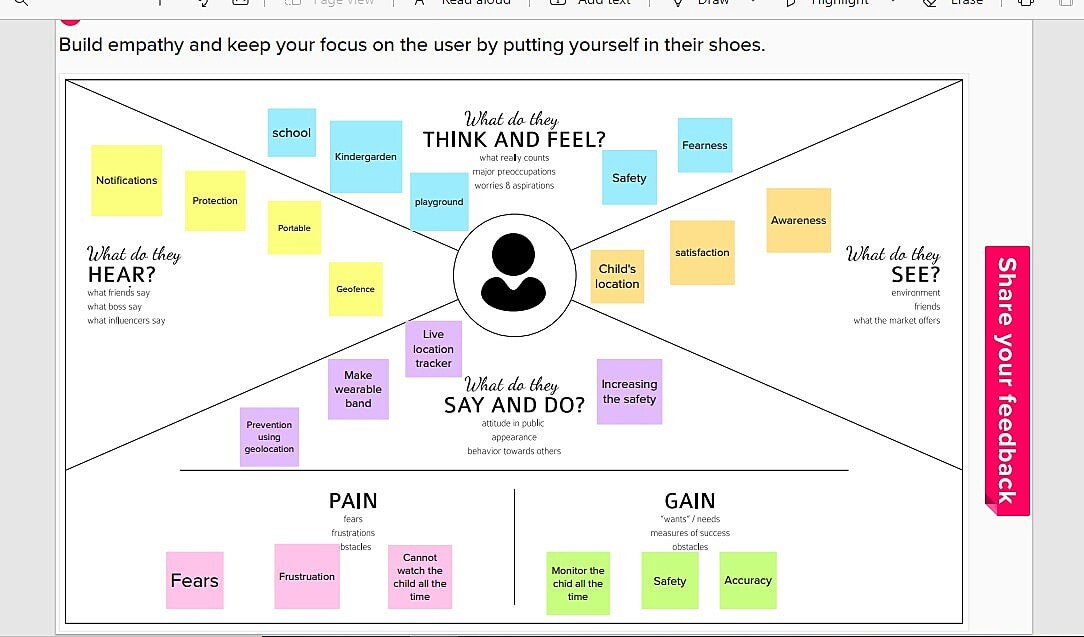
ifthechildcrossesthegeofence.

* Notiﬁcationswillbesentaccordingtothechild'slocationtotheirparentsorcaretakers.
* Theentirelocationdatawillbestoredinthedatabase.
* Ifthechildisindangerthenitwillsendthealertornotiﬁcationtotheirparentsorcaretakers.
* Thealertcanbesenttoallthepeoplewhoareupdatedintheprocess.
* Ifthedeviceismissedsomewherethenwecantracethelocationandrescuethedevice.

## IDEATIONANDPROPOSEDSOLUTION:-

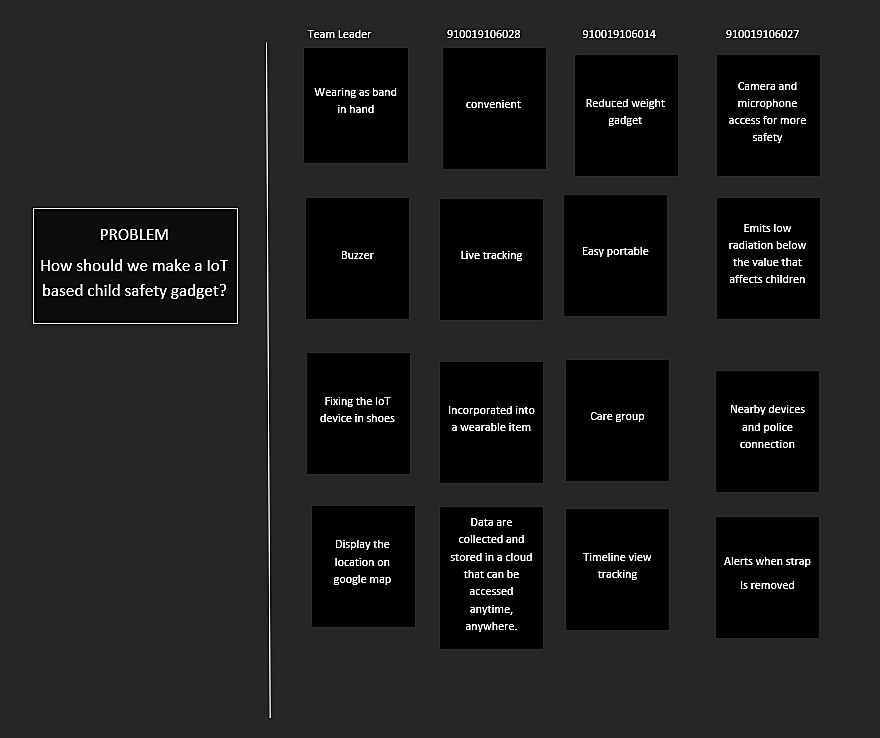
* 1. **EMPATHYMAPCANVAS:-**

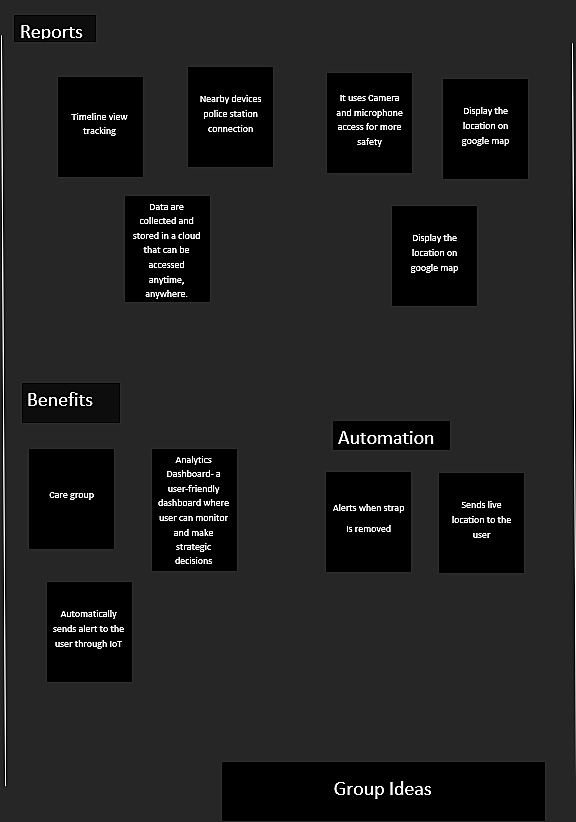
Empathymapistobridgetheunderstandingofenduser



## IDEATION&BRAINSTORMING:-

Ideationisaspeciﬁctechniquethatisutilizedtogeneratenewideas.Ideationismostcommonlymorethoughtofasbeinganindividualpursuit,whilebrainstormingisalmostalwaysagroupactivity.

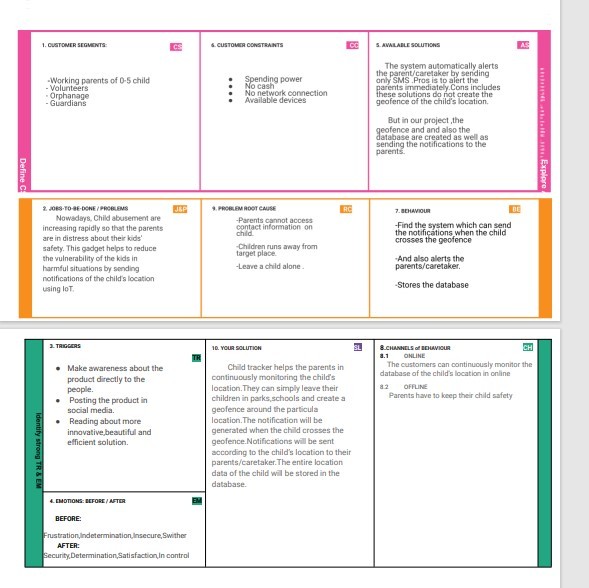




## PROPOSEDSOLUTION:

|  |  |  |
| --- | --- | --- |
| **1** | ProblemStatement(Problemtobesolved) | Nowadays,parentsconcernmoreaboutseriouscasessuch as missing children,abduction and abuse. Theycannotsitwiththeirchildrenor24\*7hourstosecure  theirchildrenandmonitorthechildren’sactivities |
| **2** | Idea/Solutiondescription | CreateaChildtrackerwhichhelpstheparentsincontinuouslymonitoringthechild'slocation.Thenotiﬁcation will be sent according to the child'slocationtotheirparentsorcaretakers.Theentire  locationdatawillbestoredinthedatabase. |
| **3** | Novelty/Uniqueness | The novelty of the work is that the systemautomaticallyalertstheparent/caretakerbysendingnotiﬁcation,whenimmediateattentionisrequiredfor  thechildduringemergency |
| **4** | SocialImpact/CustomerSatisfaction | Theparentsmaygetthenotiﬁcationaboutwhetherthechildreachedtheschoolornot |
| **5** | BusinessModel(RevenueModel) | * Easytouse * Lowcost * Weightless * Compatible |
| **6** | ScalabilityoftheSolution | * Gadgetensuresthesafetyandtrackingofthechildren * Parentsneednotworryabouttheirchildren |

* 1. **PROPOSEDSOLUTIONFIT:-**



## FUNCTIONALREQUIREMENTS:-

Followingarethefunctionalrequirementsoftheproposedsolution.

|  |  |  |
| --- | --- | --- |
| **FRNo.** | **FunctionalRequirement(Epic)** | **SubRequirement(Story/Sub-Task)** |
| FR1 | Uservisibility | EmergencyalertsviaFastSMSandthroughinternet |
| FR2 | Userreception | Notiﬁcationswillbesenttotheirparentsiftheir child crosses the geofence and alsothelocationofachildisstoredinthe  database |
| FR3 | UserUnderstanding | Based on the values collected by thedevice, The user will understand that iftheyreceiveanySMS,thentheirchildisin  danger. |
| FR4 | Useraction | If anything happens to the child, parentneeds to take appropriate measures tohelpandmaketheirfeelchildrensafeassoonasthealertreceived |

## NONFUNCTIONALREQUIREMENTS:-

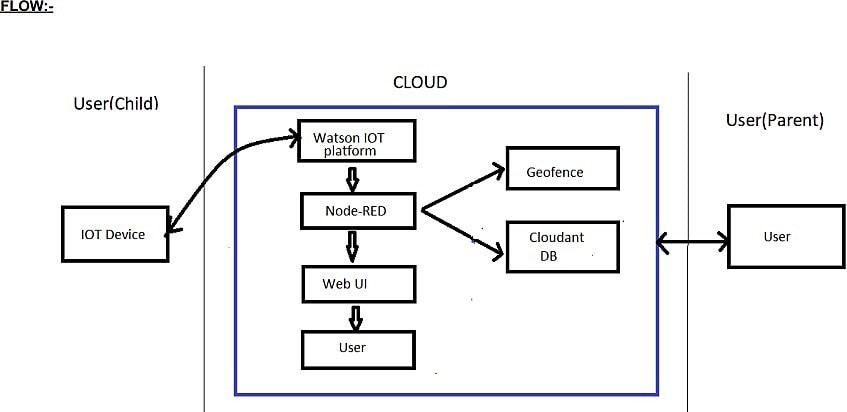
|  |  |  |
| --- | --- | --- |
| FRNo. | Non-FunctionalRequirement | Description |
| NFR-1 | Usability | It be required to preclude children beforebeing harmed, an autonomous real-timemonitoringsystemisnecessaryforevery  childawayfromtheirparents. |
| NFR-2 | Security | It be supposed to be designed to wearablewithoutanyproblems.Itwouldbewearedbythechildrenallthetimeanditshouldgive  assurancethatitworksallthetime |

|  |  |  |
| --- | --- | --- |
| NFR-3 | Reliability | It should be actively being monitor the childandshouldsendinformationtotheparentsallthetime.Itmustrecognizethedangercaused  tothechildimmediately. |
| NFR-4 | Performance | Notiﬁcationwillbesenttotheparentsifthechildcrossesthegeofence. |
| NFR-5 | Availability | Itmustbeactiveforalldayandremainactiveat least a week for a single charge. So, itwould be useful for the parents NFR6Scalability This device ought to have theoption to effortlessly change overhaulconcurringtochangeandneedin  requirements |
| NFR-6 | Scalability | This device ought to have the option toeffortlesslychangeoverhaulconcurringto  changeandneedinrequirements |

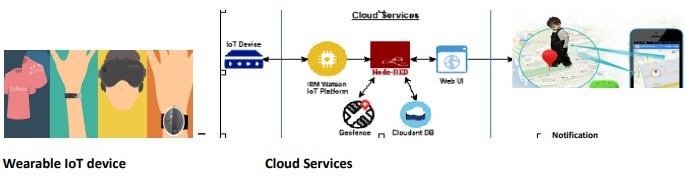
1. **PROJECTDESIGN:-**

## DataFlowDiagrams

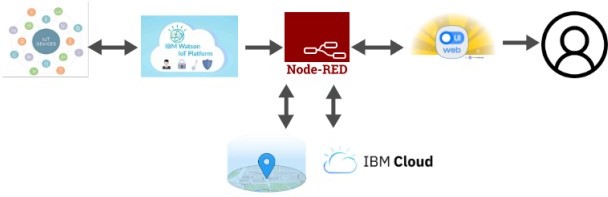
ADataFlowDiagram(DFD)isatraditionalvisualrepresentationoftheinformationﬂows within a system. A neat and clear DFD can depict the right amount of the systemrequirementgraphically.Itshowshowdataentersandleavesthesystem,whatchangestheinformation,andwheredataisstored



## Solution&TechnicalArchitecture:-



TechnicalArchitecture:-



## UserStories:

Usethebelowtemplatetolistalltheuserstoriesfortheproduct.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **User** | **Function** | **User** | **UserStory/Task** | **Acceptance** | **Priori** | **Relea** |
| **Type** | **al** | **Story** |  | **criteria** | **ty** | **se** |
|  | **Requirem** | **Numb** |  |  |  |  |
|  | **ent** | **er** |  |  |  |  |
|  | **(Epic)** |  |  |  |  |  |
| Custom | Registrati | USN-1 | Asauser,Ican | Icanaccess | High | Sprint- |
| er(Web | on |  | registerforthe | myaccount/ |  | 1 |
| user) |  |  | applicationbyentering | dashboard |  |  |
|  |  |  | myemail,password, |  |  |  |
|  |  |  | andconfirmingmy |  |  |  |
|  |  |  | password. |  |  |  |
|  |  | USN-2 | Asauser,Iwill | Icanreceive | High | Sprint- |
|  | receiveconfirmation | confirmation |  | 1 |
|  | emailonceIhave | emailandclick |  |  |
|  | registeredforthe | confirm |  |  |
|  | application |  |  |  |
|  |  | USN-3 | Asauser,Ican | Icanregister | Low | Sprint- |
|  | registerforthe | andaccessthe |  | 2 |
|  | applicationthrough | dashboardwith |  |  |
|  | Facebook | FacebookLogin |  |  |
|  |  | USN-4 | Asauser,Ican |  | Medi | Sprint- |
|  | registerforthe | um | 1 |
|  | applicationthrough |  |  |
|  | Gmail |  |  |
|  | Login | USN-5 | Asauser,Icanlog |  | High | Sprint- |
|  |  | intotheapplicationby |  | 1 |
|  |  | enteringemailand |  |  |
|  |  | password |  |  |
|  | Dashboa | USN-6 | AsaUser,Icanview | Icanview | High | Sprint- |
| rd |  | theDashboard | the |  | 2 |
|  |  |  | locations |  |  |
|  |  |  | which is |  |  |
|  |  |  | stored in |  |  |
|  |  |  | the |  |  |
|  |  |  | database |  |  |
|  |  |  | ofthechild |  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | viadashboard |  |  |
| CustomerCareExecutive |  | USN-7 | As a customer careexecutive,I will detecttheproblems | I will detect theproblems andcorrect them ifthedeviceface  any | Medium | Sprint-3 |
| Administrator |  | USN-8 | Asanadministrator,Iensuretheefficiency  ofthedevice | I will ensureefficiency,cost,e  tc | High | Sprint-4 |

## PROJECTPLANNINGANDSCHEDULING:-

* 1. SprintPlanningandEstimation:

## Productbacklogandsprintschedule:-

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Sprint** | **FunctionalRequirement(Epic)** | **UserStoryNumb**  **er** | **UserStory/Task** | **StoryPoints** | **Priority** | **TeamMembers** |
| Sprint-1 |  | US-1 | Create the IBM Cloudservices which are beingusedinthisproject. | 6 | High | NishanthiG,pugazhmathiR,MuthuamyA,Harisurajkum  arD |
| Sprint-1 |  | US-2 | Configure the IBM Cloudservices which are beingused in completing thisproject. | 4 | Medium | NishanthiG,pugazhmathiR,MuthuamyA,Harisurajkum  arD |
| Sprint-1 |  | US-3 | IBMWatsonIoTplatformacts as the mediator toconnect the webapplicationtoIoT  devices,socreatethe | 5 | Medium | NishanthiG,pugazhmathiR,MuthuamyA,Harisurajkum  arD |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | IBMWatsonIoTplatform. |  |  |  |
| Sprint-1 |  | US-4 | In order to connect theIoT device to the IBMcloud, create a device inthe IBM Watson IoTplatformandgetthe  devicecredentials. | 5 | High | NishanthiG,pugazhmathiR,MuthuamyA,HarisurajkumarD |
| Sprint-2 |  | US-1 | Configure the connectionsecurity and create APIkeys that are used in theNode-RED service foraccessingtheIBMIoT  Platform. | 10 | High | NishanthiG,pugazhmathiR,MuthuamyA,HarisurajkumarD |
| Sprint-2 |  | US-2 | Create a Node-REDservice. | 10 | High | NishanthiG,pugazhmathiR,MuthuamyA,Harisurajkum  arD |
| Sprint-3 |  | US-1 | Develop a python scripttocreatethe geofenceand publish the locationofthechildtotheIBM  IoTplatform | 7 | High | NishanthiG,pugazhmathiR,MuthuamyA,Harisurajkum  arD |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Sprint** | **FunctionalRequirement(Epic)** | **UserStoryNumb**  **er** | **UserStory/Task** | **StoryPoints** | **Priority** | **TeamMembers** |
| Sprint-3 |  | US-2 | After developing pythoncode, commands arereceived just print thestatements whichrepresentsthelocationof  thechild | 5 | Medium | NishanthiG,pugazhmathiR,MuthuamyA,HarisurajkumarD |

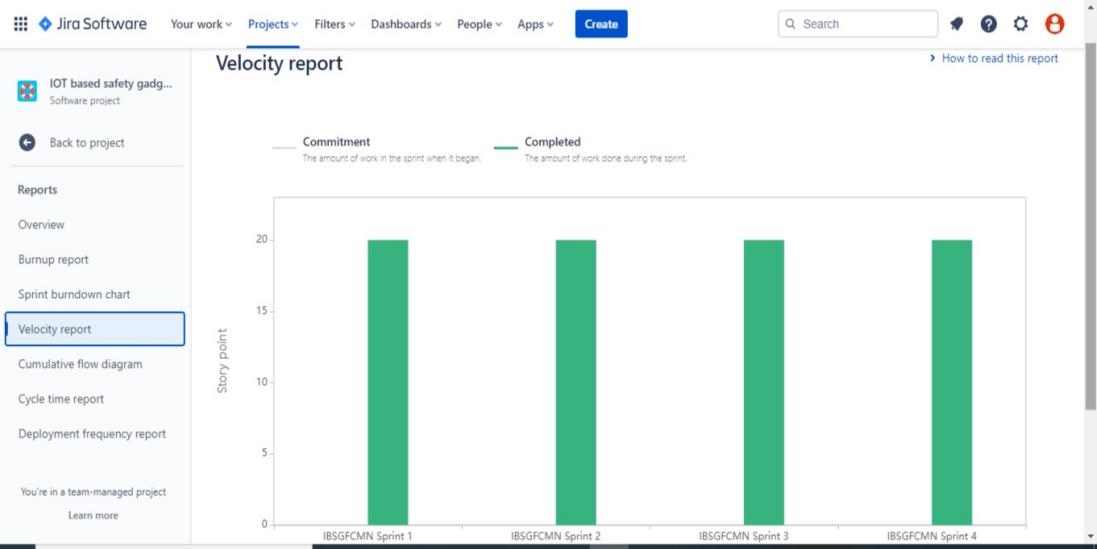
|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Sprint-3 |  | US-3 | PublishDataToTheIBMCloud | 8 | High | NishanthiG,pugazhmathiR,MuthuamyA,Harisurajkum  arD |
| Sprint-4 |  | US-1 | CreateWebUIinNode-Red | 10 | High | NishanthiG,pugazhmathiR,MuthuamyA,Harisurajkum  arD |
| Sprint-4 |  | US-2 | Configure the Node-REDflow to receive data fromthe IBM IoT platform andalso use Cloudant DBnodes to store thereceivedlocationdatain  thecloudantDB | 10 | High | NishanthiG,pugazhmathiR,MuthuamyA,HarisurajkumarD |

**ProjectTracker,Velocity&BurndownChart:(4Marks)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Sprint** | **TotalStoryPoints** | **Duration** | **Sprint StartDate** | **Sprint EndDate(Planned)** | **StoryPointsCompleted(as onPlanned**  **EndDate)** | **Sprint ReleaseDate(Actual)** |
| Sprint-1 | 20 | 6Days | 24Oct2022 | 29Oct2022 | 20 | 29Oct2022 |
| Sprint-2 | 20 | 6Days | 31Oct2022 | 05Nov2022 | 20 | 05Nov2022 |
| Sprint-3 | 20 | 6Days | 07Nov  2022 | 12Nov2022 | 20 | 12Nov2022 |
| Sprint-4 | 20 | 6Days | 14Nov  2022 | 19Nov2022 | 20 | 19Nov2022 |

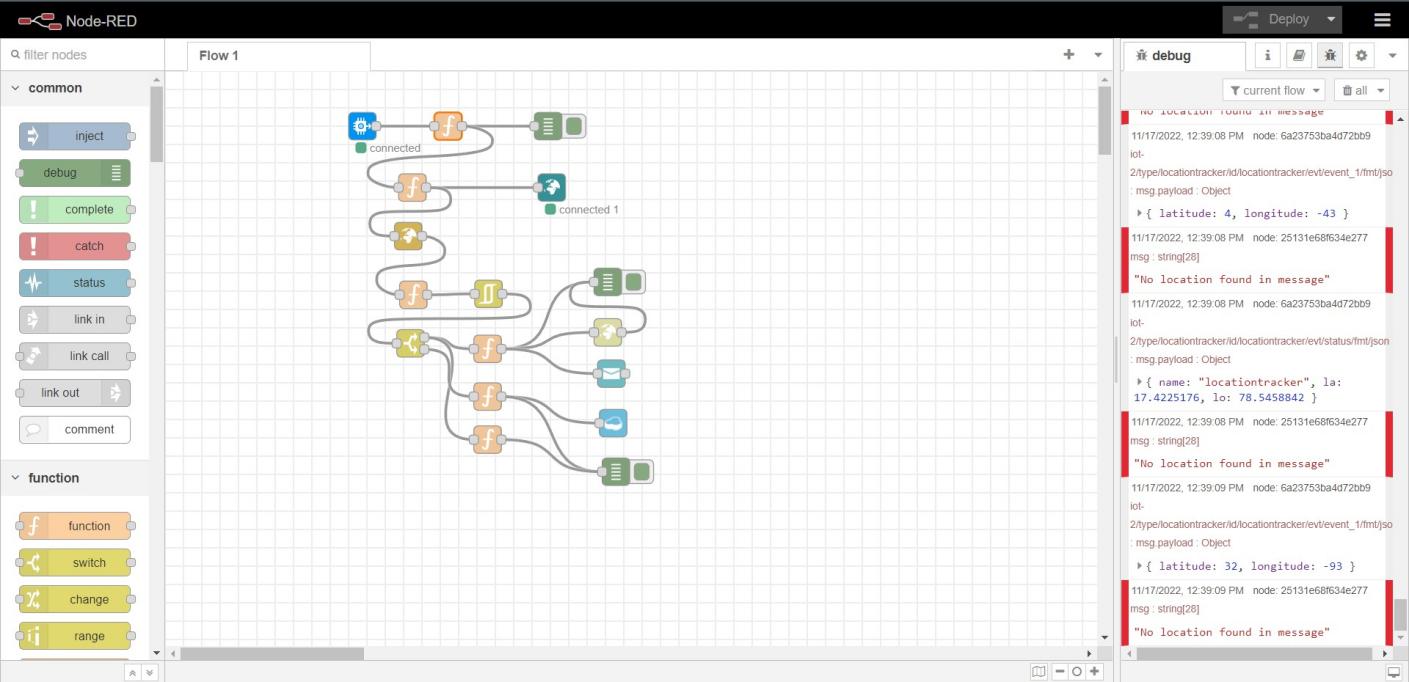
## 6.3.REPORTSFROMJIRA:-

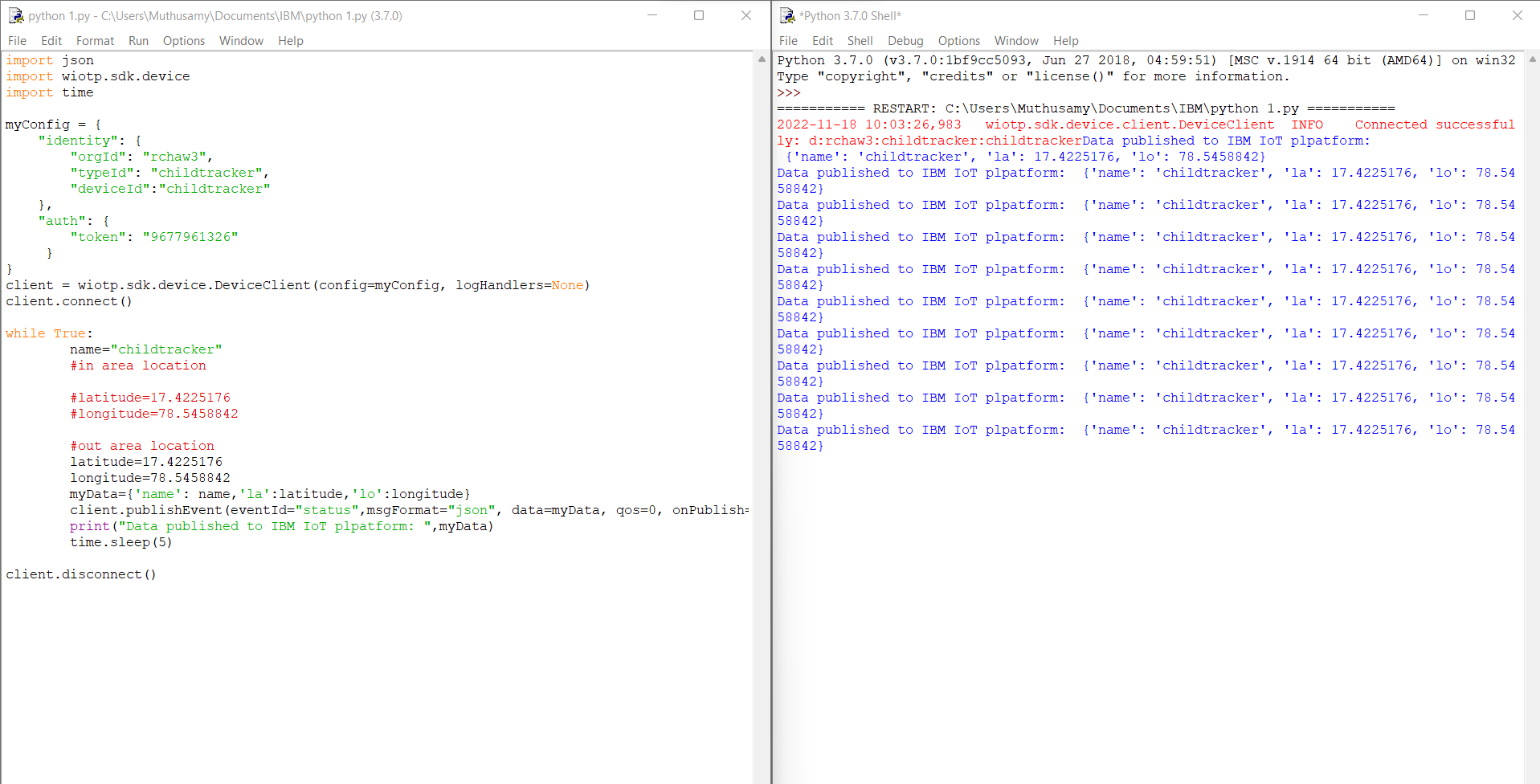
[**Jira report**](https://pnt2022tmid47484.atlassian.net/jira/software/projects/IBSGFCMN/boards/1/backlog)





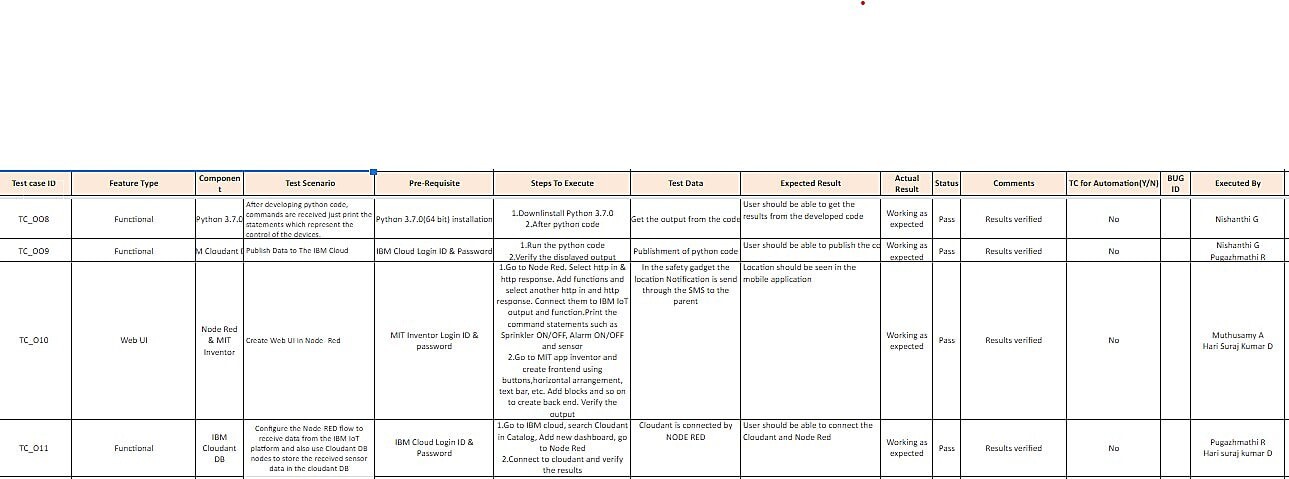
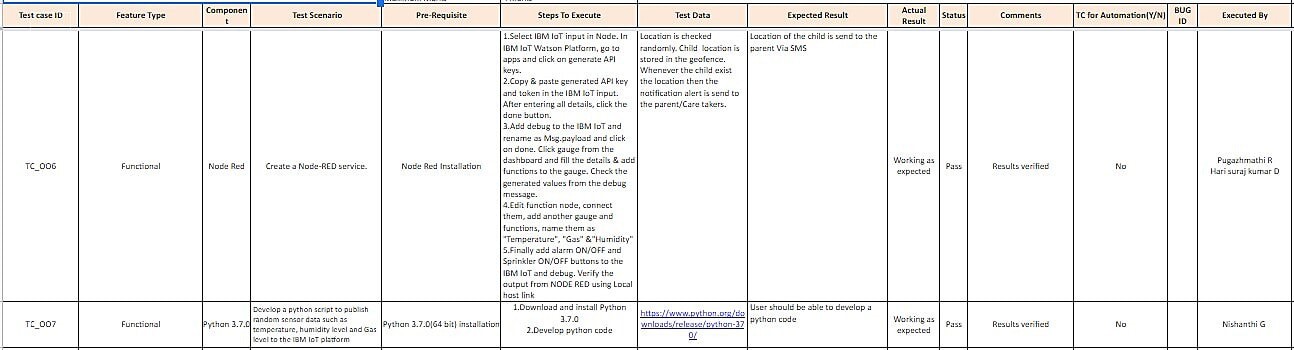
## CODING&SOLUTIONING:-



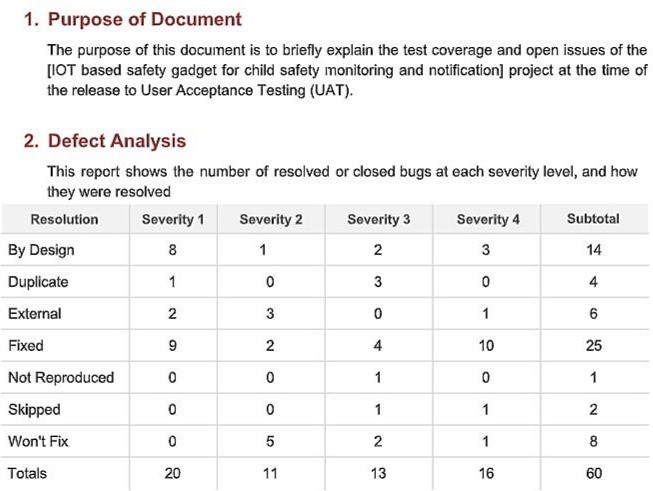


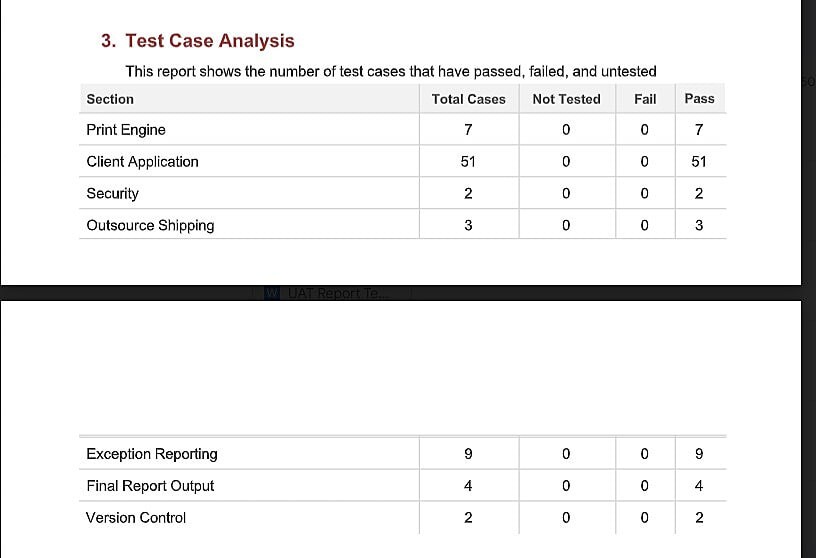
1. **TESTING:-**

## a.TestCases:

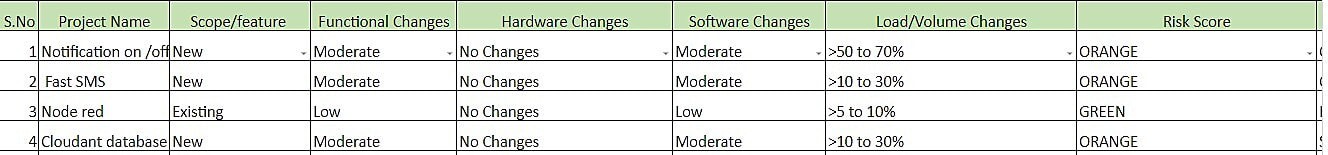


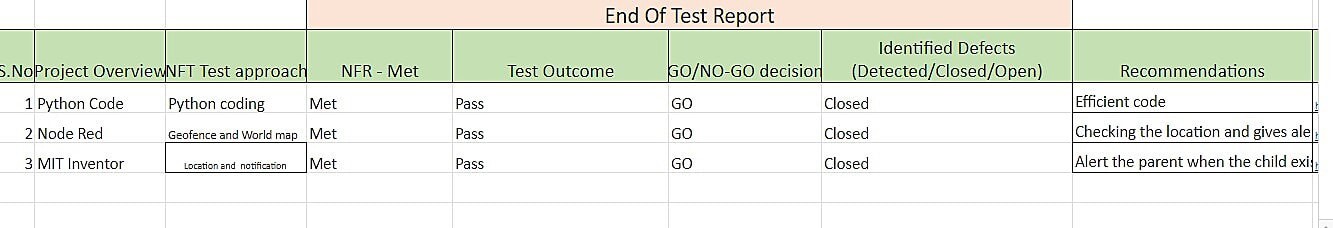
**b.AcceptanceTesting:-**





## RESULTS:-

**a.PerformanceMetrics:**



## ADVANTAGES:-

1. Itassistsparentstocontinuouslymonitoringtheirchildrenremotely.
2. Incasesituationshappen,notiﬁcationswillbesenttoparentssothatactionscanbetaken.3.Childsafetycanbeensured.

4.Crimeratewillbereduced.

## DISADVANTAGES:-

1. WearabledeviceswhichareusedtolocatethechildrenonlythroughWi-ﬁandBluetooth.
2. Itcauseshealthissues.

## CONCLUSION:-

Nowadays,thesecurityforthechildrenisverylow.Thereareasubstantialamountofcasesregistered regarding child safety. In recent times, the schools and the parents are very muchworried about their school children for school transport and other places. So, the Safety andmonitoring of school children is very much diﬃcult. In this project we are introducing the IOTbased embedded system used in this project. So we propose a system to monitor theparametersofthechildcontinuouslyandalsotheirlocationforsafetypurposes.So,thisdeviceusessmartchildtracking.

## FUTURESCOPE:-

The Smart IoT device for child safety and tracking helping the parents to locate and monitortheirchildren.Ifanyabnormalvaluesareread,thenanSMSissenttotheparentsmobileandanMMS indicating an image captured by the serial camera is also sent. The future scope of thework is to implement the IoT device which ensures the complete solution for child safetyproblems.

## APPENDIX:-

importjson

## SourceCode:-

importwiotp.sdk.deviceimporttime

myConfig = {"identity":{

"orgId": "rchaw3","typeId":"locationtracker",

"deviceId":"locationtracker"

},

"auth":{

"token":"rW@X48h+v(PA8XnMZM"

}

}

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

whileTrue:

name="locationtracker"#inarealocation

#latitude=17.4225176#longitude=78.5458842

#out area locationlatitude=17.4225176longitude=78.5458842

myData={'name': name,'la':latitude,'lo':longitude}client.publishEvent(eventId="status",msgFormat="json",data=myData,qos=0,onPublish=None)print("DatapublishedtoIBMIoTplatform:",myData)

time.sleep(5)

client.disconnect()

## GITHUBLINK:-

[Github](https://github.com/IBM-EPBL/IBM-Project-6061-1658822631)

## DEMOLINK:-

[**https://drive.google.com/file/d/10Hc-6qM0WEQXM1Mrh21vxWQXGl1zu1NP/view?usp=drivesdk**](https://drive.google.com/file/d/10Hc-6qM0WEQXM1Mrh21vxWQXGl1zu1NP/view?usp=drivesdk%20)