

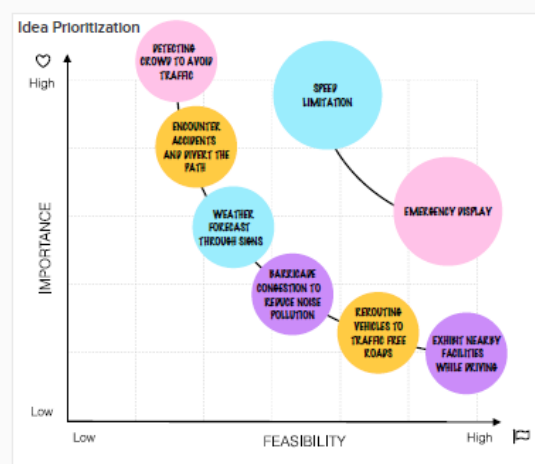
Signs with Smart Connectivity for Better Road Safety

Team ID	PNT2022TMID11060
Team Leader	P.Ramkumar
Team Member	N.Mugilan karthik
Team Member	N.Kaushik
Team Member	S.Nishanth

PROJECT OBJECTIVES:

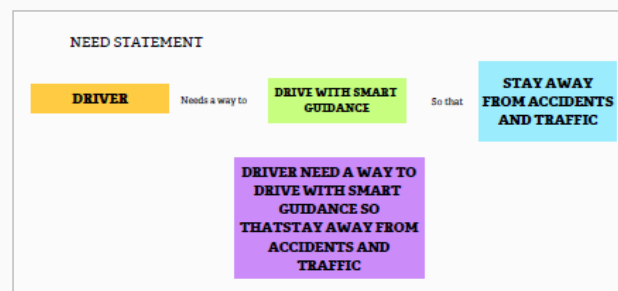
Smart connected sign boards are used to replace static signboards. These intelligent connected sign boards receive automatic weather updates from a web app utilising weather API. The posted speed limit could go up or down depending on the conditions. The display of the diversion signs depends on the flow of traffic and potential fatalities. In line with this, warning signs are also posted in schools, hospitals, etc. Since there is no real hardware involved, we utilise random values in Python to process sensor data

IDEATION:



EMPATHY MAP:

S.NO.	NAME/ REG NO.	DESIGNATION	COLLEGE NAME
1	RAMKUMAR P 011519106112	TEAM LEADER	K.RAMKRISHNAN COLLEGE OF ENGINEERING
2	MUGLAN KARTIK N 811519106096	MEMBER 1	K.RAMKRISHNAN COLLEGE OF ENGINEERING
3	KAUSHIK N 811519106068	MEMBER 2	K.RAMKRISHNAN COLLEGE OF ENGINEERING
4	NISHANTH S 811519106095	MEMBER 3	K.RAMKRISHNAN COLLEGE OF ENGINEERING



LITERATURE SURVEY:

- Muhammed O Sayin published on "IEEE 2019". We suggest a game theoretical and ad hoc intervention detection mechanism for trustworthy smart road signs in this research. Smart road signs, which contain smart codes (such as those visible at infrared) on their surface to give smart vehicles more precise information, are a potential trend in intelligent transportation systems. Road sign classification issues are now more in line with communication settings than they were previously. This makes it possible for us to incorporate proven communication theory results—like error-correction techniques—into the problem of classifying road signs. Recent research has demonstrated that algorithms for classifying traffic signs based on vision are susceptible to adversarial interference, even on a tiny scale that is undetectable to humans. On the other hand, smart codes created using error-correction techniques may become robust against random or small-scale intelligent disturbances. However, as people are unable to see or understand smart road signs, they are not involved in their recognition. Since humans function differently than machines, there is no equivalent concept of undetectable perturbations. Since the attacker can strike more forcefully without such a limitation, robustness against small scale perturbations would not be sufficient.
- Usha Devi Gandhi published on "International Conference on Reliability ,Optimization and Information technology 2014". The major problems in transportation, including those related to safety, mobility, and the environment, are being addressed through connected car technology. One of the key goals of this project is the safety application of

the Intelligent Transport System (ITS). The goal of safety application is to develop the vehicle industry globally through research and commercial endeavours. In this project, our main focus is on vehicle-to-vehicle (V2V) communication, which, once automobiles are connected, allows them to exchange data with other vehicles on the road and helps to decrease highway accidents. In the end, connectivity between vehicles is achieved by a variety of complimentary technologies based on Wi-Fi, GPS, and Dedicated Short Range Communication (V2V) and V2I (vehicle-to-infrastructure) (DSRC). VANETS are also viewed as one of the most crucial safety simulations. Vehicle-to-vehicle (V2V) communication with minimal latency is supported by the usage of DSRC technologies.

- Kuppusamy Pothanaicker published on “Research Gate 2018”. The Internet of Things revolution opens up countless dimensionalities for commercial, residential, and industrial usage. The process is efficient and takes less time to process the workforce thanks to the integration of sensors and manhandling devices with the current infrastructure. In order to speed up signal processing at road intersection traffic signal posts and decrease waiting times, jamming, and contamination, a unique smart traffic signal system is developed. It makes use of smart servers and cloud-oriented infrastructure. This suggested method also tracks moving vehicles by observing their motion and changing the signal used to guide them. This tracking system would be used to identify automobiles engaged in accidents and unlawful movement. The use of vehicles parked at a four-way intersection at a signalised intersection allows for the observation of multi-location data and the analysis of a single point well-designed decision using a genetic algorithm. The trials were carried out using an Arduino Uno kit, and the smart traffic light system was assessed by contrasting it with the conventional traffic system. The findings demonstrate that the suggested strategy makes travel hassle-free by reducing accidents and green signal wait times.
- Sharmin Akter Rima published on “Smart Security Surveillance Using IOT 2018”. Life is changing drastically as a result of the development of technology and ICT. Internet of Things (IoT) has become an essential component of daily life in the twenty-first century thanks to the gift of the internet. IoT today imparts new types of breakthroughs in addition to enabling everyday living experiences. It has been discovered that IoT is crucial for ensuring security. The goal of this study proposal is to use an IoT-enabled smart security surveillance system to increase home security. The goal of the research is to create the smartest doorbell possible with increased security, adaptability, and connectivity. In this work, the system uses a sensor and a camera to detect motion in front of the door and take a picture, which is then delivered to the user's mobile phone along with the email containing the picture and a note about the detection. A push button is also taken into consideration for visitor engagement. While seated online, the user may view what is happening immediately in front of the door. On the basis of a passive infrared (PIR) sensor and a button, a camera module is set up to take a photo of the visitor and broadcast a video. The system for recognising and classifying the visitor's gesture using CV will eventually get more AI applied to it.

- Rishit Dagli published on “International Research Journal of Engineering and Technology”. This essay offers a methodical method for implementing the smart city concept while keeping costs down. By using cameras (to monitor the situation), LEDs with varying intensities (to reduce power loss), an emergency call system (to prevent crimes), cost-effective and low-power beacons (to push notifications), and control devices in buildings, homes, offices, and hotels to save power through an app or website (which can also be done by voice).
- Abhinav Krishna Baroorkar published on “International Research Journal of Engineering and Technology”. This essay seeks to offer remedies that will enhance riding comfort and safety. The bike won't start unless the user is wearing a helmet in order to enforce helmet use. The report also suggests a method for obtaining the rider's real-time location and for utilising it to turn off the horn in no-honking zones. The suggested system can identify an accident and provide emergency contact information with the aid of several sensors put on the helmet and bike. Solar power can be employed to boost the system's overall efficiency even more.
- Umesh Kumar Lilhore published on “Design and Implementation of an ML and IoT Based Adaptive Traffic-Management System for Smart Cities 2022”. Traffic congestion, pollution, and delays in logistical transit have all been brought on by the rapid expansion in the number of automobiles in urban areas. IoT is a new breakthrough that is advancing the world toward intelligent management systems and automated procedures. This makes a significant contribution to automation and intelligent societies. Traffic regulation and effective congestion management assist conserve many priceless resources. In order to recognise, gather, and send data, autonomous cars and intelligent gadgets are equipped with an IoT-based ITM system set of sensors. Another method to enhance the transportation system is machine learning (ML). Numerous issues with the current transport management solutions lead to traffic jams, delays, and a high death rate. The design and implementation of an adaptive traffic management system are presented in this research paper. The suggested system's design is built on three key components: vehicles, infrastructure, and events. The design makes use of a number of scenarios to address every potential problem with the transportation system. The DBSCAN clustering algorithm, which is based on machine learning, is also used by the proposed ATM system to find any unintentional anomalies. The suggested ATM model continuously modifies the timing of traffic signals based on the volume of traffic and anticipated movements from neighbouring crossings. By progressively allowing cars to cross green lights, it considerably reduces travel time. It also eases traffic congestion by creating a smoother transition.
- Sunghee Lee published on “International Conference on Information and Communication technology convergence”. Smart signage, which offers individualised service by adapting content to the user situation, is the next evolution of digital signage. However, because it is difficult to connect more sensing devices, prior smart signage

firms have had trouble expanding their service. Additionally, earlier smart signage systems simply took into account a single sign for a service. In this study, we provide an IoT-based framework for smart signage. The suggested platform offers customizable service expansion through IoT-based communication between sensors and the signage platform. We also recommend connecting, monitoring, and controlling signage using IoT. As a result, our platform can dynamically create a service group of signages and allow them to work together to provide a service across a large region. We put the smart nursing home service into place to demonstrate the performance of the suggested platform. The service demonstrates how IoT gadgets and billboards may connect to the platform dynamically and work together to provide a service across a large region.

PROJECT DESIGN PHASE 1 :

PROBLEM SOLUTION FIT:



PROPOSED SOLUTION:

Project Design Phase-I
Proposed Solution Template

Date	30 September 2022
Team ID	PNT2022TMID11060
Project Name	Signs with smart connectivity for better road safety
Maximum Marks	Marks

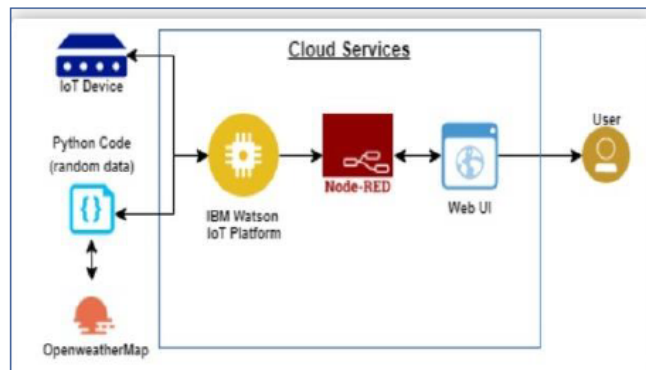
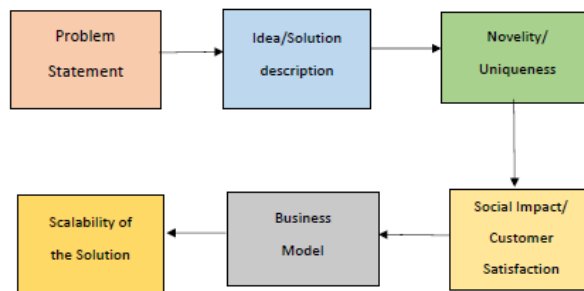
Proposed Solution Template:

Project team shall fill the following information in proposed solution template.

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Avoid traffic, overspeed and accidents in roads by using IOT
2.	Idea / Solution description	Guiding the drivers by making smart displays on the road while, smart signs are constructed with IOT and LED.
3.	Novelty / Uniqueness	Collision of vehicles should be avoided by diverting the vehicles to traffic free roads. Also, Weather can be identified before entering the road by IOT apps. Speed limitation can be adjusted via the application or displaying about the information about the routes such as display of school, college hospital area etc.
4.	Social Impact / Customer Satisfaction	By Displaying the ambulance emergency on the roads should clear the route for the ambulance that makes the patient to reach the hospital on time.
5.	Business Model (Revenue Model)	The model will be the speakable application in future which overcomes many road issues happening at present. since the government can set aside a distinct budget for it.

6.	Scalability of the Solution	It is a terrific initiative to raise awareness among the populace for the government to carry out things for commoners. This opens the door for a safer environment since the government can set aside a distinct budget for it.
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SOLUTION ARCHITECTURE:



PROJECT DESIGN PHASE 2 :

COUSTOMER JOURNEY MAP :

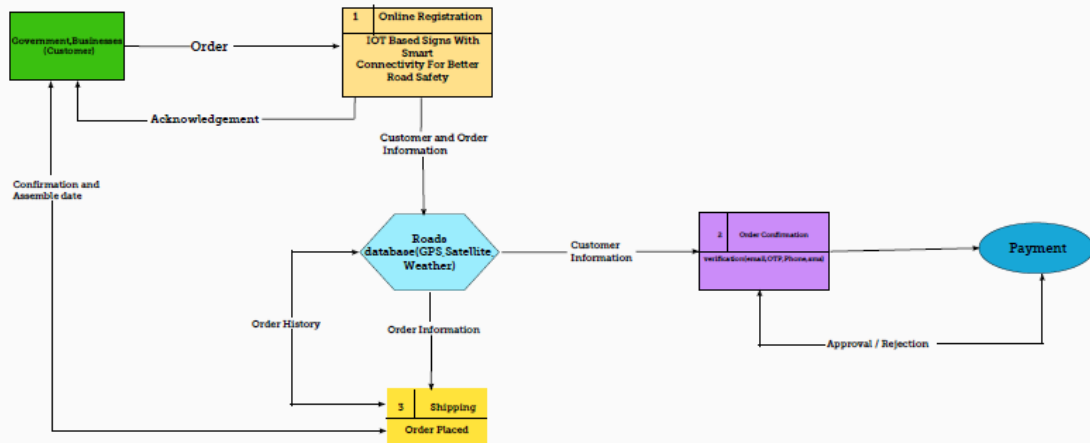
Customer Journey Map					
PHASES	Motivation	Information gathering	Analyzes various products	chooses the most efficient product	Payment
Actions	wishes to allay fears regarding road safety	wishes to choose an effective product to boost road safety	Static boards are another product accessible.	Smart boards outperform static boards in terms of efficiency.	Following product fulfilment
Touchpoints	Buyers are overjoyed	Following the installation, the government will no longer have to be concerned about traffic safety.	The different product options available delight the user.	After receiving this, the government will be unconcerned about safety.	The product is acquired by the government when its value has been determined.
Customer Feeling	😊	☹️	😊	😊	😊
Customer Thoughts	The consumer believes it will help to enhance the road's condition.	The consumer expects it to last for a long time.	The customer anticipates that a different alternative will be presented.	They will find it simple and straightforward to choose a product.	They anticipate that the product will be simple to use.
Opportunities	Increased road safety helps the customer.	The customer is informed of the manufacturing process for the goods.	The customer will be made aware of other products.	The purchaser discovers which product is the best.	The customer will have a pleasant journey.

DATA FLOW DIAGRAM :

Project Design Phase-II Data Flow Diagrams

Date	13 oct 2022
Team Id	PNT2022TMID11060
Project Name	Project - IOT based Signs With Smart Connectivity For Better Road Safety
Maximum Marks	4 Marks

Data Flow Diagrams



FUNCTIONAL REQUIRMENTS :

Project Design Phase-II
Solution Requirements (Functional & Non-functional)

Date	11 October 2022
Team ID	PNT2022TMID11060
Project Name	Signs With Smart Connectivity for Better Road Safety
Maximum Marks	4 Marks

Functional Requirements:

Following are the functional requirements of the proposed solution.

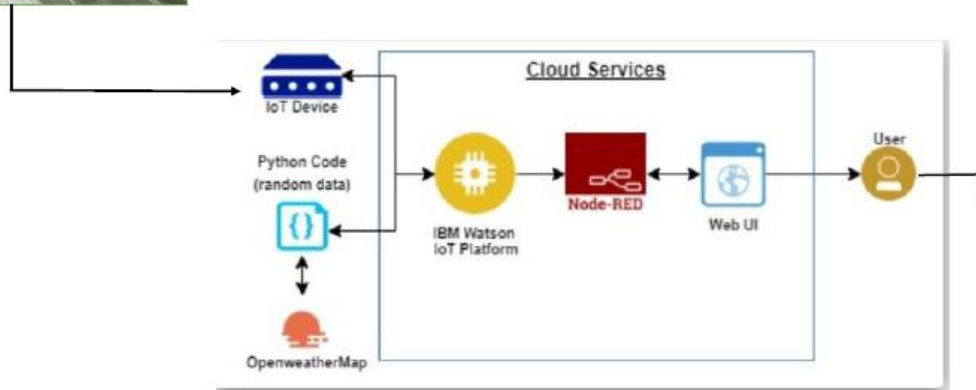
FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Requirements	Smart linked sign boards that meet all requirements will replace static signboards.
FR-2	User Registration	Manual Sign-Up using a Website or Gmail
FR-3	User Confirmation	Confirmation through phone Confirmation Through email And OTP authentication
FR-4	Payments options	Bank Transfer
FR-5	Product Delivery and installation	The length of the road will affect the installation cost.
FR-6	Product Feedback	Through a website via Gmail

Non-functional Requirements:

Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	Have easy-to-follow product instructions and a self-explanatory product..
NFR-2	Security	The network must contain cloud data, condensing it to be Avoid real-time avoidance, and keep an eye on the board at all times.
NFR-3	Reliability	Testing of hardware components is done on regular frequency
NFR-4	Performance	The user experience on the smart board needs to be improved, and output needs to be accurate.
NFR-5	Availability	Depending on the requirements of the user, all required functions will be offered.
NFR-6	Scalability	The product should cover the full highway system and is based on road safety.

TECHNOLOGY ARCHITECTURE:



MILESTONE AND ACTIVITY LIST :

Project Planning Phase

Milestone and Activity List

Date	10 November 2022
Team ID	PNT2022TMD11060
Project Name	Signs with smart connectivity for better road safety

TITLE	DESCRIPTION	DATE
Literature Survey& Information Gathering	A literature review is a thorough summary of earlier studies on the subject. The literature review examines scholarly books, journals, and other sources that are pertinent to a particular field of study.	3 September 2022
Prepare Empathy Map	Teams can utilise an empathy map as a collaborative tool to learn more about their clients. It aids in our comprehension of the customer's suffering, benefits, and challenges from their perspective.	10 September 2022
Ideation- Brainstorming	Brainstorming is a group problem-solving method that helped us to gather and organize various ideas and thoughts from teammembers.	17 September 2022
Define Problem statement	<p>We can concentrate on what matters to create experiences that people will love by using the customer problem statement.</p> <p>We were able to identify the right solution for the problems consumers were facing thanks to a clearly stated customer problem statement.</p>	19 September 2022

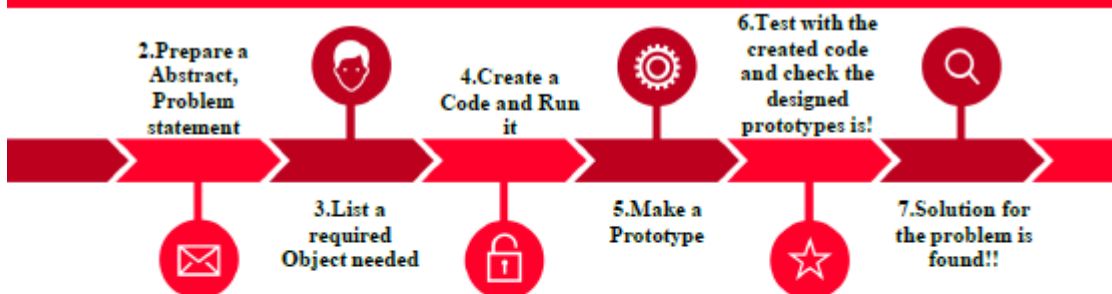
Problem Solution Fit	It aided in our comprehension and analysis of all of our customers' thoughts, choices of solutions, issues, underlying causes, actions, and emotions.	26 September 2022
Proposed solution	It aided in our analysis and examination of our solution's distinctiveness, social impact, business strategy, scalability, and other factors.	28 September 2022
Solution Architecture	A complicated process with numerous sub-processes, solution architecture connects business issues with technological solutions. It aided in our comprehension of the project's characteristics and elements.	1 October 2022
Customer journey map	Analyzing the many phases, interactions, motivations and goals, advantages and drawbacks, and chances was helpful.	7 October 2022
Solution requirements	Analyzing the many phases, interactions, motivations and goals, advantages and drawbacks, and chances was helpful.	12 October 2022
Technology stack	Analyzing the many steps, interactions, motivations, goals, and opportunities as well as their advantages and disadvantages was helpful.	15 October 2022

Data flow	The classic visual representation of how information moves through a system is a data flow diagram (DFD). A tidy and understandable DFD can graphically represent the appropriate quantity of the system demand. It demonstrates how information enters and exits the system, what modifies the data, and where information is kept.	11 October 2022
Sprint Delivery plan	In scrum, an activity called sprint planning establishes what can be completed in the following sprint and how it will be done. It facilitates task organisation and completion for us. efficiently and effectively.	22 October 2022
Prepare milestone and activity list	helps us comprehend and assess our current progress and accuracy.	23 October 2022
Project Development - Delivery of Sprint-1	Create and submit the code after testing it.	In progress

SPRINT DELIVERY PLAN :

TOPIC	SPRINT PLAN
TEAM ID	PNT2022TMID11060
PROJECT NAME	Signs with Smart Connectivity for Better Road Safety
DATE	29-OCT-2022

1. Identify the Problem



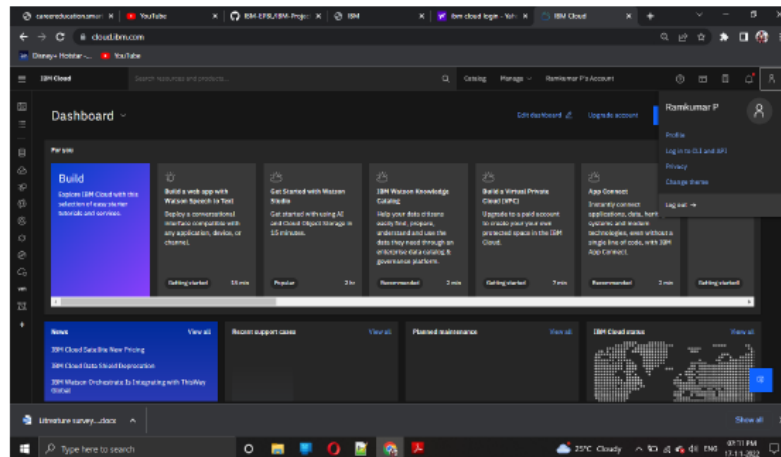
PREREQUISITES :

IBM CLOUD SERVICES :

Prerequisites IBM Cloud Services

Date	17 November 2022
Team ID	PNT2022TMID11060
Project Name	Project - Signs with smart connectivity for Better road safety
Maximum Marks	4 Marks

Signs with smart connectivity for Better road safety



OPENWEATHER APP :

Prerequisites

WEATHER SOFTWARE

Date	17 November 2022
Team ID	PNT2022TMID11060
Project Name	Project - Signs with smart connectivity for Better road safety
Maximum Marks	4 Marks

Signs with smart connectivity for Better road safety



IBM SOFTWARE:

Prerequisites PYTHON SOFTWARE

Date	17 November 2022
Team ID	PNT2022TMD11060
Project Name	Project - Signs with smart connectivity for Better road safety
Maximum Marks	4 Marks

Signs with smart connectivity for Better road safety

