

Project Design Phase-II
TechnologyStack(Architecture&Stack)

Date	16 May 2023
TeamID	NM2023TMID01183
ProjectName	Street quality identification

TechnicalArchitecture:

The Deliverables shall include the architectural diagrams below and the information as per the table 1 & table 2

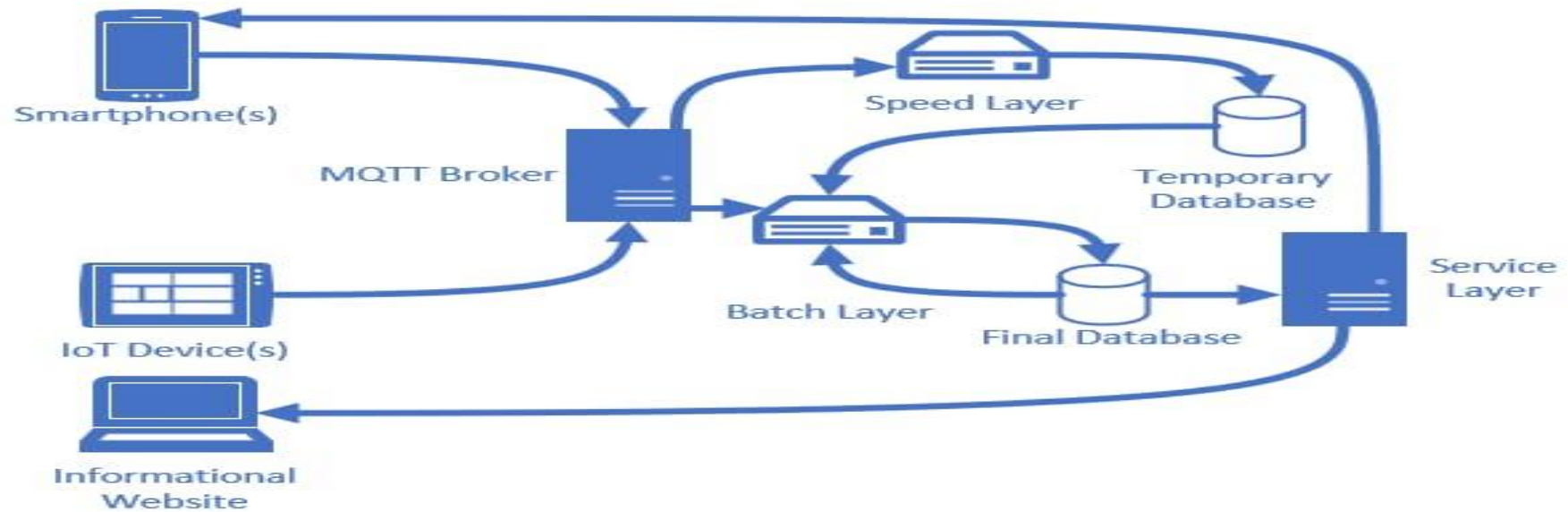


Table-1:Components&Technologies:

S.No	Component	Description	Technology
1.	User Interface	Once the address is entered, the user can click on the identify street quality button to initiate the process.	JavaScript,python

2.	Application Logic-1	User authentication : provide secure login mechanism for authorized users to access the system.	Java/Python
3.	Application Logic-2	These systems typically employ image processing algorithms to analyze street images captured by camers mounted on vechiles or other mobile platforms.	IBM Watson STTservice
4.	ApplicationLogic-3	Users can report street quality issues they encounter, including potholes, obstrutions, or any other road-related problems.	IBM Watson Assistant
5.	Database	We can utilize a relational database management system(RDBMS)	MySQL ,SQLite,python
6.	Cloud Database	We can use cloud database service that provide scalability, high availability, and easy data management.	Google cloud firestore
7.	FileStorage	Cloud store it as plain text, structured data or even consider using a binary format if performance or space efficiency is concern.	CRUD
8.	ExternalAPI-1	Geocoding API'S such as google maps geocoding API or open street map nominatim API ,allow you to convert street addresses into geographic coordinates.	Google location
9.	ExternalAPI-2	We can analyze street images or video to automatically detect and assess street quality indicators like potholes,cracks, or pavement condition.	Google location
10.	MachineLearningModel	Collect a dataset of street quality samples .the dataset should included labeled examples of streets with different quality levels.	Python ,R, Java.
11.	Infrastructure(Server/Cloud)	You may need to integrate this data collection process with your programming language infrastructure.	MySQL,postgreSQL,

Table-2:ApplicationCharacteristics:

S.No	Characteristics	Description	Technology
1.	Open-SourceFrameworks	The open source frameworks used are tensor flow ,open cv.	Open cv

2.	Security Implementations	Use appropriate input validation techniques like parameterized queries or prepared statements to avoid direct user input in queries or commands.	XSS,HTTPS
3.	Scalable Architecture	Capable of efficiently accommodating growing user demand and increasing data vloumes while maintaining high performance and accuracy	Technology used
4.	Availability	Widely accessible and readily available for users,providing real-time street quality data and analysis through user-friendly platform and applicaions.	Technology used

S.No	Characteristics	Description	Technology
5.	Performance	The systems typically employ image processing algorithms to analyze street images captured by cameras mounted on vehicles or other mobile platforms.	Technology used

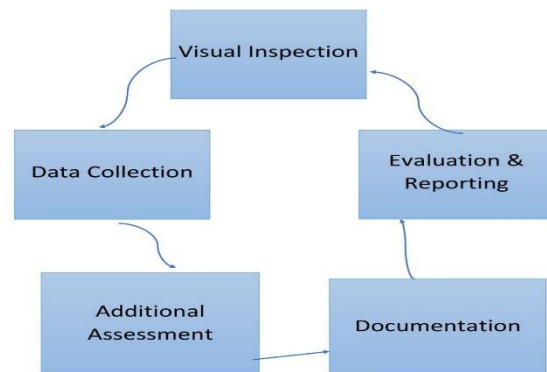
Project Design Phase-II Data Flow Diagram & User Stories

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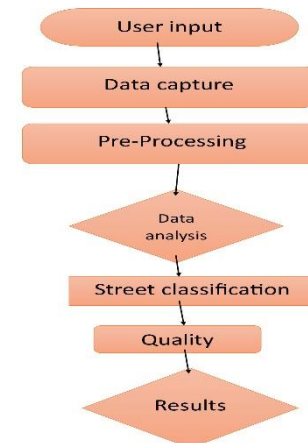
Data Flow Diagrams:

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.

Example: [Simplified](#)



Example: Data Flow Diagram



User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Team Member
Customer(Urban planner)	Registration	USN-1	As a user once I visited the website for sign up I will enter the credentials like name, email id, password etc....	I can access my account in Google	High	Musica
		USN-2	As a user I can also signup with my Google account.	I can receive confirmation email & click confirm	High	Nithyasri
		USN-3	As a user, I can register for the application through social medias.	I can register & access the dashboard with Facebook Login	Medium	Narmatha
		USN-4	As a city resident,I want to report street quality issues so that they can be addressed by the local authorities.		Medium	Priyadharshini
	Login	USN-5	Once I get registered, I will receive a confirmation mail.	I can register & access the dashboard with Facebook Login	High	Musica
	Dashboard	USN-6	By login I will get into the website dashboard.	All the information about the website are given in the dashboard.	High	Nithyasri
Performance	Registration	USN-7	As a user, I will receive confirmation email once I have registered for the application	By giving this credential details I can access my account or Dashboard.	Low	Narmatha
		USN-8	As a user once I visited the website for signup I will enter the credentials like name, email	Through confirmation mail I have get into the website	Medium	Priyadharshini
Analysis	Registration	USN-9	As a user I can also signup with my Google account.	By entering my Facebook details I can get sign in with the website.	Low	Musica
	Login	USN-10	After getting signup, I can login into the website by entering the email and password.	Once I get the login I can enter the dashboard of the website.	High	Nithyasri
Administrator	Maintenance	USN-11	As a administrator I can maintain all the activities of the website.	Administrator must maintain all activities of both the all performance.	Medium	Narmatha

Project Design Phase-II

Solution Requirements (Functional & Non-functional)

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Functional Requirements:

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User authentication requirement	Provide secure login mechanism for authorized users to access the system.
FR-2	Mobile accessibility requirement	Ensure the system is responsive and accessible on mobile device, allowing user to access the street quality information.
FR-3	Notification requirement	Sent timely notifications or alerts to user regarding significance changes in street quality, road closures, or safety concerns.
FR-4	Reporting requirements	Allow the users to generate reports, summarizing street quality assessments.
FR-5	Data export requirement	Provide a options to export data in a various formats, such as CSV or PDF for the further analysis or sharing.
FR-6	Feedback requirements	Enable users to provide feedback on street quality or report specific issues the encounter.

Non-functional Requirements:

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

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	Efficient, user-friendly interface with real-time data visualization , intuitive mapping functionality , and clear indicators for smoothness, potholes ,cracks, and overall road condition.
NFR-2	Security	Implementing security measure to ensure accurate street quality identification through continuous monitoring, data encryption, and strict access controls.
NFR-3	Reliability	Ensuring reliable street quality identification through robust data collection, advanced analytics, and quality assurance protocols.

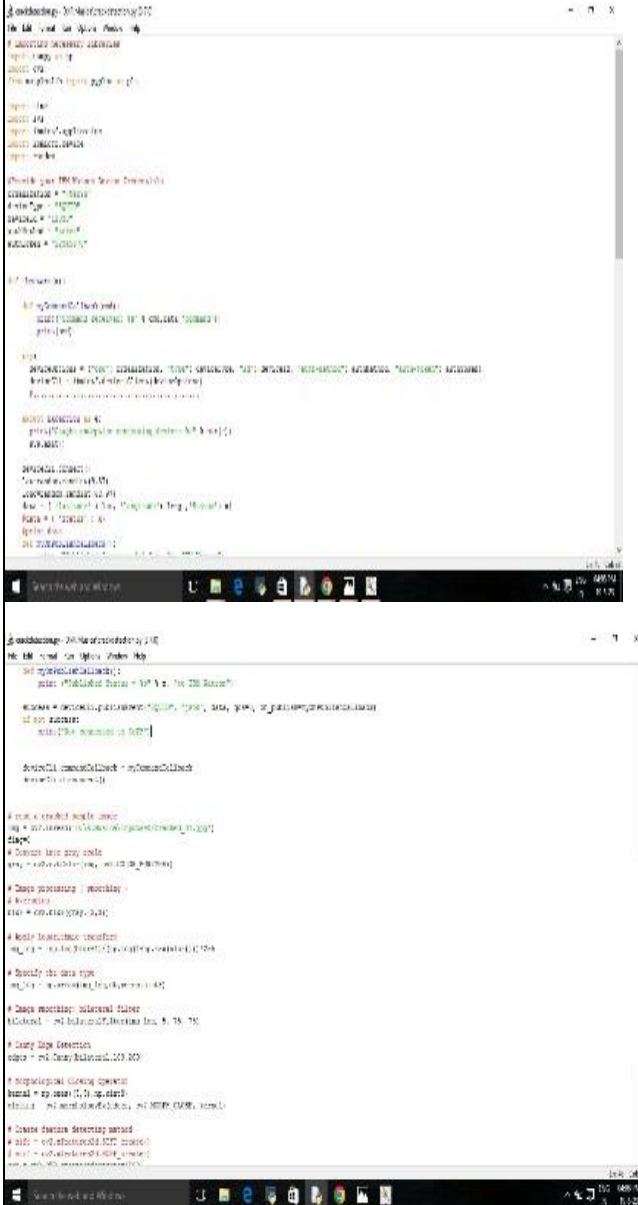
NFR-4	Performance	The performance of street quality identification can vary depending on the specific method and technologies used. However, recent advancements in computer vision and machine learning techniques have significantly improved the accuracy and efficiency of street quality identification systems.
NFR-5	Availability	Widely accessible and readily available for users, providing real-time street quality data and analysis through user-friendly platforms and applications.
NFR-6	Scalability	Designed to handle large –scale data processing and analysis, allowing seamless expansion and integration with diverse urban environments. Capable of efficiently accommodating growing user demand and increasing data volumes while maintaining high performance and accuracy.

Project Development Phase Performance Test

Date	13 May 2023
Team ID	NM2023TMID01183
Project Name	Street Quality Identification

Model Performance Testing:

Project team shall fill the following information in the performance testing template.

Parameter	Values	Screenshot
		 <p>The top screenshot shows the MATLAB code for loading data from a CSV file and saving the results. The code includes comments in Chinese and English, and the results are displayed in the command window.</p> <pre> load('data.csv'); save('data.mat'); </pre> <p>The bottom screenshot shows the MATLAB code for loading data from a CSV file and saving the results. The code includes comments in Chinese and English, and the results are displayed in the command window.</p> <pre> load('data.csv'); save('data.mat'); </pre>

Metrics

Wowki Execution time and
Output screenshot
Or
Python accuracy of
prediction and output
screenshot

[illegible]

The image shows a MATLAB script editor window with the following code:

```

function mySimulink
% mySimulink: Simulate a Simulink model and plot the output.
% Usage: mySimulink('model_name')
% Example: mySimulink('mySimulink')

% Define the Simulink model name
modelName = 'mySimulink';

% Connect to the Simulink model
simulinkModel = simset('ModelName', modelName);

% Run the simulation
[~, ~] = sim(simulinkModel, 10);

% Plot the output
plot(0:10, ~, 'b');
xlabel('Time');
ylabel('Output');

```

The command window shows the execution of the script, displaying the path to the Simulink model and the resulting plot of 'Output' versus 'Time'.

```

>> mySimulink
mySimulink: Simulate a Simulink model and plot the output.
Usage: mySimulink('model_name')
Example: mySimulink('mySimulink')

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```

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