**Project Design Phase-II**

**Solution Requirements (Functional & Non-functional)**

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| Date | 12 May 2023 |
| Team ID | NM2023TMID22230 |
| Project Name | Project - SQUID: Street Quality Identification |

**Functional Requirements:**

Following are the functional requirements of the proposed solution.

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| **FR No.** | **Functional Requirement (Epic)** | **Sub Requirement (Story / Sub-Task)** |
| FR-1 | Sensor Deployment and Data Collection | 1. Identify the appropriate type and number of sensors needed to capture data related to street quality  2. Develop a deployment plan for installing sensors in the targeted area  3. Ensure sensors are properly calibrated and functioning correctly to capture accurate data  4. Establish a method for transmitting sensor data to a central server for processing |
| FR-2 | Data Processing and Analysis | 1. Develop algorithms to process and analyze sensor data, such as identifying potholes, cracks, and bumps  2. Identify thresholds or criteria for defining street quality, such as the number or severity of potholes  3. Develop models to predict how street quality may change over time based on the collected data  4. Analyze trends and patterns in the data to identify areas or factors that may contribute to poor street quality |
| FR-3 | Data Visualization and Reporting | 1. Develop dashboards or other visualizations that provide real-time updates on street quality to stakeholders  2. Develop reports that summarize trends and patterns in the data over time  3. Allow stakeholders to customize visualizations or reports to meet their specific needs |
| FR-4 | Maintenance and Repair Management | 1. Develop a method for prioritizing maintenance and repair tasks based on the severity and location of street quality issues  2. Establish communication channels with maintenance and repair teams to ensure timely and accurate repairs  3. Monitor and track maintenance and repair activities to ensure they are completed as expected |
| FR-5 | Data Security and Privacy | 1. Establish appropriate access controls to ensure only authorized users can access and modify data  2. Implement measures to protect data privacy, such as anonymizing or aggregating data to prevent identification of individual vehicles or drivers  3. Develop a disaster recovery plan to ensure data can be recovered in the event of a system failure or other disaster. |

**Non-functional Requirements:**

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

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| **FR No.** | **Non-Functional Requirement** | **Description** |
| NFR-1 | **Usability** | The solution should be easy to use and accessible to different types of users, such as maintenance personnel, decision-makers, and the general public. |
| NFR-2 | **Security** | The solution should ensure data privacy and confidentiality by implementing secure communication protocols, access control, and data encryption. |
| NFR-3 | **Reliability** | The solution should be reliable and able to consistently collect, process, and analyze data from IoT sensors to identify street quality parameters. |
| NFR-4 | **Performance** | The solution should have optimal performance to ensure timely data processing and analysis. It should also be able to handle peak loads during high traffic periods. |
| NFR-5 | **Availability** | The solution should have high availability to ensure that it is accessible to users and stakeholders at all times. This requires robust infrastructure and redundancy measures to avoid downtime. |
| NFR-6 | **Scalability** | The solution should be scalable to accommodate additional IoT sensors as needed without compromising the system's availability. |