Project Design Phase-I
Solution Architecture

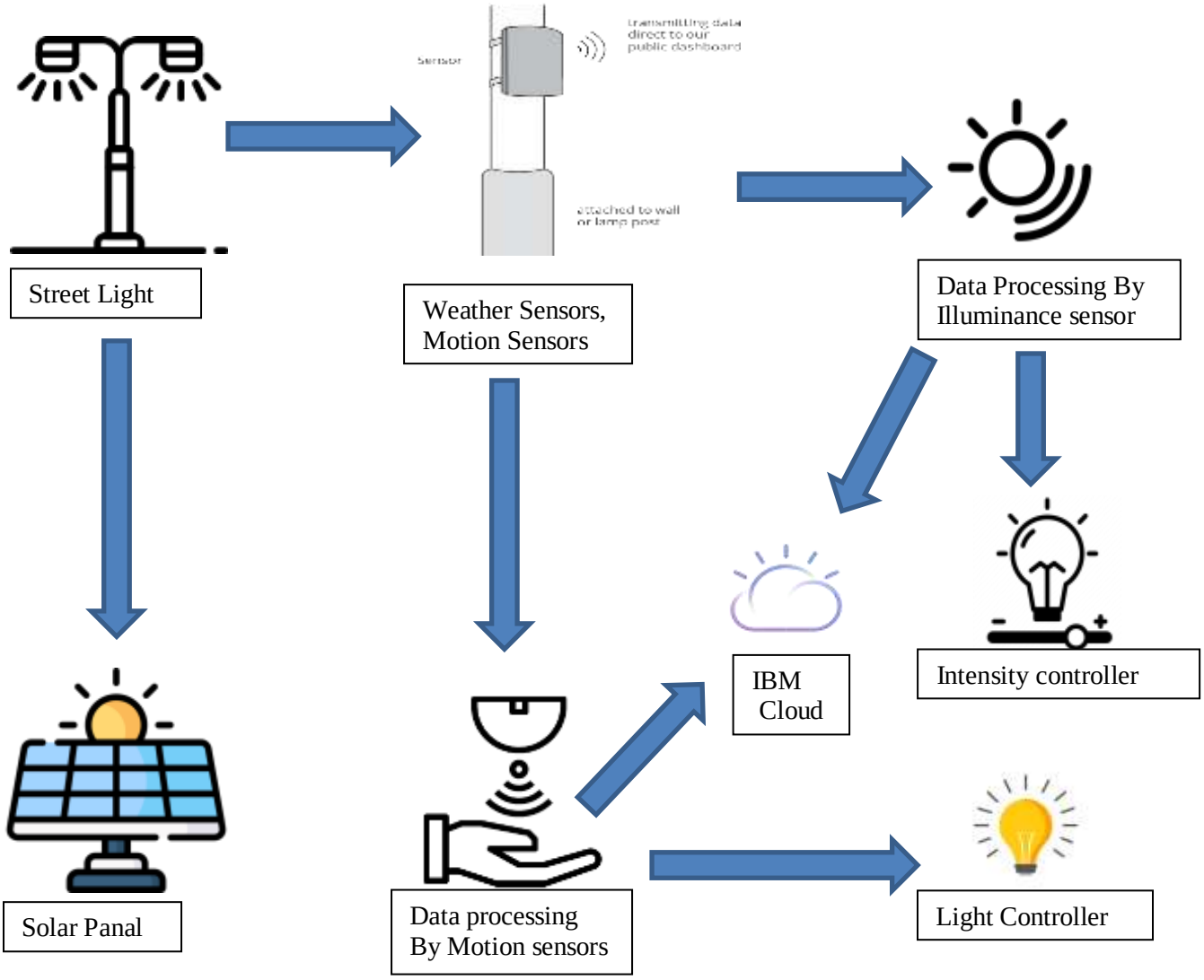
Date	07 May 2023
Team ID	NM2023TMID04258
Project Name	IOT based Weather Adaptive Street lighting system

Solution Architecture:

Solution architecture is a complex process – with many sub-processes – that bridges the gap between business problems and technology solutions. Its goals are to:

- Find the best tech solution to solve existing business problems.
- Describe the structure, characteristics, behaviour, and other aspects of the software to project stakeholders.
- Define features, development phases, and solution requirements.
- Provide specifications according to which the solution is defined, managed, and delivered.

Solution Architecture Diagram:



1. **Weather Sensors**: Detecting Current Weather Conditions

Weather sensors play a critical role in a weather adaptive street light system by collecting data on current weather conditions such as temperature, humidity, precipitation, and wind speed. These sensors can detect various types of weather conditions such as rainfall, snow, fog, or haze and send the data to a cloud-based platform for analysis. Based on this data, the system can adjust the light output of the LED street lights to provide optimal lighting for the current weather conditions.

2. **Motion Sensors**: Detecting Presence of People or Vehicles

Motion sensors are another key component of the solution architecture for a weather adaptive street light system. These sensors detect the presence of people or vehicles in the area and send this data to the cloud-based platform for analysis. Based on this data, the system can adjust the light output of the LED street lights to provide optimal lighting for the current traffic conditions.

3. **LED Street Lights**: Energy-Efficient Lighting

LED street lights are energy-efficient and can be dimmed or brightened based on the data received from the weather and motion sensors. They are powered by renewable energy sources such as solar or wind power, which are stored in batteries for use during periods of low energy production. The use of LED street lights results in significant energy savings compared to traditional street lights, reducing costs and environmental impact.

4. **Cloud-Based Platform**: Data Processing and Analysis

A cloud-based platform is used to collect and analyze data from the weather and motion sensors. The platform uses machine learning algorithms to process this data and predict future lighting needs based on historical patterns and trends. The platform also includes a dashboard that enables remote monitoring and control of the system's performance. This allows system administrators to adjust the light output of the LED street lights, monitor the system's energy consumption, and receive alerts for faults or issues with the system.

5**. Mobile App**: Reporting and Updates

A mobile app is provided for end-users, allowing them to report faults or issues with the system and receive updates on the system's performance. This provides a way for the system administrators to quickly respond to any issues or concerns raised by users, improving the overall user experience.