**PROJECT TITLE: SMART CITY**

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**Introduction**

Major cities around the world are facing significant challenges with their transportation system, including heavy traffic congestion, long commute times, and limited public transportation options. In Ghana, President Atta Mills surprised a mass crowd when he appeared late after trekking on foot through a jammed traffic, abandoning the presidential fleet of four BMWs and one four-wheel drive on the street during Eidul-Fitr celebration at El-Wak Sport Stadium in Accra. (Mahama, 2009).

Street lighting accounts for 15 - 40% of the overall energy consumed in standard cities worldwide. Energy efficiency determinations and design can reduce streetlighting cost by 35 - 70%. (Subramani, C., Surya, S., Gowtham, J., et al, 2019). The ability to implement such energy saving technologies will help to reduce the cost and the need for new generation plants.

Another major problem faced globally is air pollution. It has been tagged the most-pressing environmental health problem of our time, accounting for an estimated 7 million premature deaths every year. Approximately, nine out of ten people from around the world breathe unclean air, which heightens the risk of asthma, heart diseases and lung cancer. (UN Environment Programme, 2022).

The effect of bad weather conditions on agriculture can lead to food insecurity in the future. Climate change contributes substantially to food insecurity. Bad weather conditions lead to poor performance of crops and livestock, reducing food production and leading to increase in food and energy prices.

This proposal outlines a plan to implement smart city system that will address these issues and improve the quality of life for people.

**Problem statement**

Traffic congestion in major cities in the world affect the daily lives of citizens. Commute times are long and unpredictable, and public transportation options are limited. This leads to increased air pollution, reduced productivity and decrease in the overall quality of life for the citizens. Unforeseen bad weather conditions of important areas globally affect agriculture, which eventually lead to food scarcity and increased prices of goods and services, leading to economic hardship.

**Significance of the work**

The implementation of the smart city system will greatly improve the quality of life for people, businesses and corporations. It aims to monitor and address environmental concerns and air pollution. The system will provide traffic data that will be used to optimize traffic flow and reduce congestions, thereby leading to increased productivity. Also, it will provide information on air polluted areas and this will help people to avoid theses areas, which will eventually help to reduce the risk of diseases like asthma, heart diseases and lung cancer. It will enable management agencies to spot theses areas and put corrective measures in place.

The system will monitor and provide information on weather conditions like temperature, humidity and pressure. This data will help in the agricultural sector, where farmers will get real-time weather updates of location. This will enable farmers and other individuals to put measures in place and plan their daily activities. In so doing, it will increase agricultural productivity.

**Research and information gathering**

**Proposed solution**

A smart city system will be implemented to address these challenges in cities. The system will include the following components.

Advanced traffic monitoring systems. This will include traffic monitoring cameras and real-time traffic data that will be used to optimize traffic flow and reduce congestion.

Public transportation optimization. This will include real-time tracking of public transportation vehicles and the integration of this data with the traffic management systems, allowing for more efficient routing of buses and trains.

Smart energy conservation and efficiency system: This will include smart sensors that will be used to implement smart streetlights dim when there are no cars or pedestrians on the on the roadways. There will be smart system that will automate the operation of streetlight during day and night.

Air quality monitoring system: This will include sensors that will constantly monitor the air and transmit collected data to cloud servers. These data will be analysed to generate warning on poor air quality at public areas.

Weather monitoring system: This will include devices and sensors that monitors temperature, humidity and pressure and transmit collected data to webservers, which will be analysed to generate awareness of weather conditions at areas of interest.

**Evaluation and monitoring**

The smart city system will be evaluated and monitored using the following metrics:

Average travel time: The average travel time for citizens will be measured before and after the implementation of the its to determine if there has been an improvement.

Air quality: Air quality will be measured before and after the system implementation to determine if there has been an improvement.

Energy conservation and efficiency: Energy efficiency and cost will be measured before and after the implementation of the system.

**Conclusion**

The smart city system will address the significant challenges facing the city’s transportation system and will improve the quality of life for the citizens. The system will reduce traffic congestion, increase the efficiency of public transportation, improve energy conservation and efficiency, provide real-time update on temperature, humidity and pressure of various locations and improve air quality.

**References**

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