UNIVERSITI TEKNOLOGI MARA

ADVANCE INDOOR MOBILE AIR QUALITY MONITORING SYSTEM

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ABSTRACT

Due to an enormous rise in the amount of time spent inside as a result of industrial growth, indoor air quality has emerged as a major issue in the preservation of human life. Public health experts, environmental regulators, and business experts are working to enhance the overall health, comfort, and well-being of building occupants. Even though ventilation and air purification systems are placed in several interior areas, the purity of the air cannot be guaranteed without effective monitoring systems. In the rapidly advancing world of technology, the integration of Internet of Things (IoT) devices has become increasingly common to enhance the capabilities of various systems. One such application involves the incorporation of an air quality monitoring system into a line-following robot. This system utilizes the DHT11 sensor for temperature and humidity measurements, the MQ-135 sensor for detecting air quality, an LCD display for local information, and the ESP8266 module for online connectivity through Blynk. In this study, we developed a smart indoor air quality monitoring device, measuring components of temperature, humidity, NH3, NOx, CO2, benzene, smoke, and other dangerous gases in the atmosphere. Using short and long-distance communication modules, the smart air quality monitoring system is connected to a built smartphone application to oversee the air quality in the area. As a result, the smart air quality monitoring system may be used to predict future air quality, which would help to enhance indoor air quality in real time.

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TABLE OF CONTENT

Page

1. CHAPTER 1: INTRODUCTION

1.1.   Research Background

In response to the quickening pace of industrialization and the expansion of traffic, both the public and the government are paying more attention to air pollution in emerging nations. The global average temperature gradually increases, and the atmospheric CO2 concentration has exceeded 400 ppm due to the intensification of greenhouse effect. Hence it must be prevented at all cause but that is not the only thing that has been affected by those harmful gases. It has been shown that these gases are the main causes of respiratory problems.[6] The growing number of serious respiratory ailments is one of the most well-known consequences of prolonged exposure to air pollution.

In some studies, it shown that proper time for ventilation can help with the indoor air quality as in study [7] two-week homes had lower formaldehyde, radon and CO2 when operated with whole-house mechanical ventilation and had faster PM2.5 decays following indoor emission events. Overall indoor air quality satisfaction was similar in Oregon and Colorado, but more Colorado participants (19 vs. 3%) felt their indoor air quality could be improved and more reported dryness as a problem (58 vs. 14%). Besides, [9] these findings may provide initial evidence for an upper bound of the range of ventilation rates within which increased ventilation rates provide benefits in reducing illness absence. Research [8], states that Mechanical ventilation carries an energy penalty but introduces outside air into a home and is a core element of standards designed to mitigate indoor air quality hazards.

1.2.   Motivation

The inspiration behind undertaking this extension stems from a deep-seated commitment for tending to the basic challenges posed by discussing contamination in our quickly advancing urban and mechanical scenes. With the surge in respiratory illnesses connected to delayed introduction to destitute discussion quality, there's a critical requirement for imaginative and versatile arrangements. The integration of an IoT-based Discuss Quality