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Smart Cooler

Shaikh Irfan Abrar[1], Sheikh Ashar Sheikh Afsar[2], Dhananjay Yedlabadkar[3], Krishna Pande[4], Abdul Razzaque[5]

Student, Computer Science and Engineering, Anjuman College of Engineering and Technology, Nagpur, India[1-4]

Assistant Professor, Computer Science and Engineering, Anjuman College of Engineering and Technology, Nagpur, India[5]

Abstract: The **"Smart Cooler"** aims to create a device that can detect the temperature and water level of a water cooler automatically. The project is based on Internet of Things (IoT) technology, which enables remote monitoring and control of the water cooler.The device consists of a microcontroller, temperature sensor, water sensor, water pump, and relay module, all connected together with jumper wires and a breadboard. The microcontroller reads the temperature and water level data from the sensors and sends it to a cloud platform through a Wi-Fi module. The cloud platform stores the data in a database and makes it accessible through a web application or mobile app.

The Smart Cooler project has several benefits. Firstly, it eliminates the need for manual monitoring of the water cooler, which can be time-consuming and prone to errors. Secondly, it enables real-time monitoring and control of the water cooler, which can help prevent any potential issues before they become serious. Finally, it provides a user-friendly interface for accessing the data, which can help users make informed decisions about the water cooler.In conclusion, the Smart Cooler project is an innovative and practical application of IoT technology, which can improve the functionality and efficiency of water coolers.

Keywords: IoT, Smart connectivity, Energy efficiency, Evaporative cooling technology, Remote control, Humidity control, Smart sensors.

I. INTRODUCTION

A smart desert cooler is a technological innovation designed to provide efficient and eco-friendly cooling in hot and dry regions. Unlike traditional air conditioners, which use refrigerants and consume a lot of electricity, smart desert coolers use a combination of evaporative cooling and fan technology to cool the air, making them more energy-efficient and cost-effective.

These coolers come equipped with smart features such as Wi-Fi connectivity, mobile app control, voice control, and scheduling capabilities, making them convenient to use and customize according to individual preferences. Some models also have air purification filters that remove pollutants and allergens, providing clean and fresh air to breathe.

Smart desert coolers are an ideal cooling solution for areas with low humidity levels, such as deserts, as they work by adding moisture to the air, making it cooler and more comfortable. They are also environmentally friendly, as they do not use harmful refrigerants or chemicals and operate on a fraction of the energy consumption of traditional air conditioning units.

II. RELATED WORK

"Smart Cooler: An IoT-Based System for Monitoring and Controlling the Temperature of Beverages" by M. A. Rashid et al. This paper presents a smart cooler system that uses IoT sensors to monitor the temperature of beverages and control the cooler's cooling system. The system also includes a mobile app for remote monitoring and control.

"Intelligent Cooling System for Efficient Energy Management in Smart Buildings" by S. K. Das et al. This paper proposes an intelligent cooling system for smart buildings that uses AI algorithms to optimize energy consumption and maintain a comfortable indoor environment. The system uses data from IoT sensors to adjust the cooling system according to the occupancy and temperature of different rooms.

"Smart Refrigerator: A Comprehensive Review" by M. N. Islam et al. This paper provides a comprehensive review of smart refrigerators, which are a type of smart cooler that integrates various features such as temperature monitoring, food inventory management, and recipe suggestions. The paper discusses the various technologies used in smart refrigerators, including IoT sensors, AI algorithms, and natural language processing.

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"Smart Air Conditioner: A Review" by S. K. Nandy et al. This paper provides a review of smart air conditioners, which are a type of smart cooler that uses IoT sensors and AI algorithms to optimize energy consumption and provide enhanced comfort. The paper discusses various technologies used in smart air conditioners, including machine learning algorithms, fuzzy logic, and neural networks.

"Smart Energy Management System for Refrigeration" by S. S. Kaur et al. This paper presents a smart energy management system for refrigeration, which uses IoT sensors to monitor temperature and energy consumption and uses AI algorithms to optimize the cooling system's performance. The system also includes a user-friendly
Interface interface for remote monitoring and control.

III. PROPOSED METHODOLOGY

The proposed system, Smart Cooler, is an IoT-based solution designed to monitor and control water coolers automatically. The system consists of several modules, including temperature and water level sensors, a micro controller. The temperature and water level sensors measure the temperature and water level inside the water cooler and transmit the data to the micro-controller. The micro-controller processes the data and controls the cooler's functionality, including turning the motor or compressor on or off based on the data.

Modules

Module 1 :

In this module working with different water level sensors for the accurate measuring of the water level in the water tank and designing the proper mechanism, circuits and conditional codes that push into the NodeMCU micro-controller to run system .

Module 2 :

In this module working with different Temperature sensors for the accurate measuring of the temperature readings and designing circuits and conditional codes for this system.

Module 3 :

Combining both the Water level detection system and Temperature detection system and integrated this systems in the NodeMCU micro-controller ,and testing it for proper working.

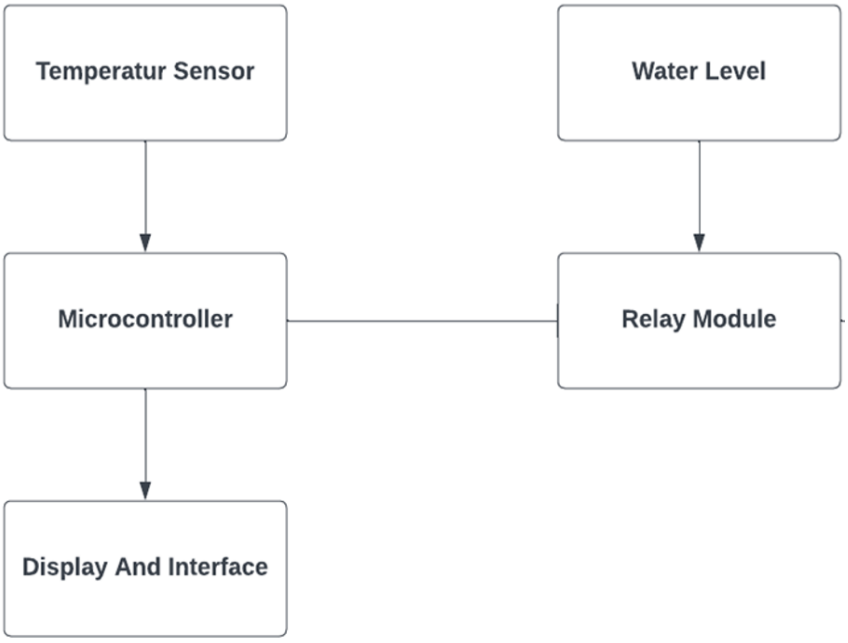

Figure 1: - Block Diagram

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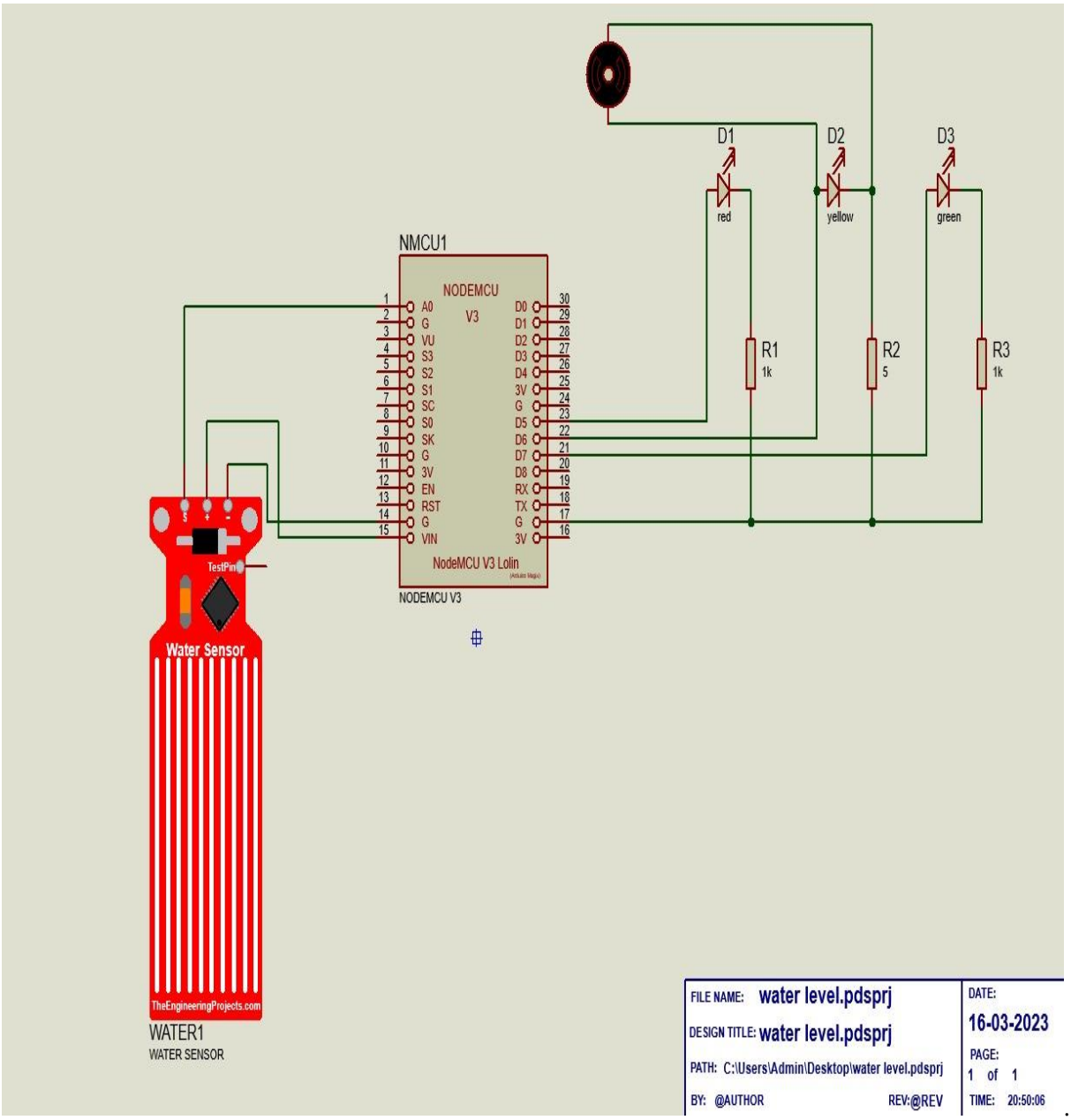

Figure 2: - Water level

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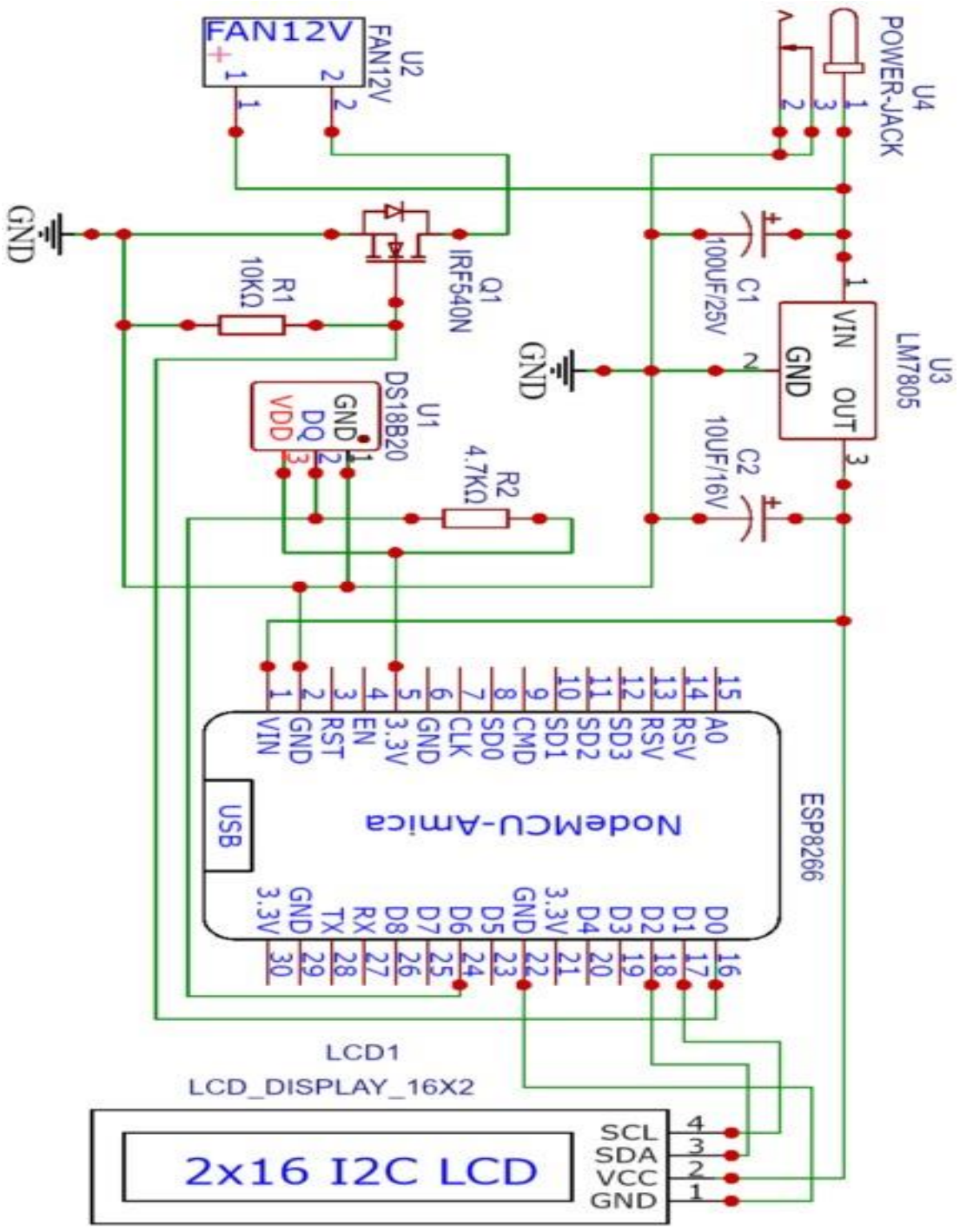

Figure 2: - Temperature detection

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IV. CONCLUSION

A smart desert cooler is a technologically advanced version of traditional evaporative air coolers. It offers several features like Wi-Fi connectivity, voice control, smart thermostat, and mobile app control, among others. In conclusion, a smart desert cooler is an excellent option for individuals living in dry and hot climates, as it can provide a more comfortable and healthier living environment. The smart features of the cooler allow users to adjust the temperature, fan speed, and mode from anywhere using their smartphones. Additionally, the ability to monitor and control the cooler remotely can help save energy and reduce electricity bills. However, it's important to note that smart desert coolers can be more expensive than traditional models, and the additional features may not be necessary for everyone. Ultimately, the decision to purchase a smart desert cooler will depend on individual needs, budget, and preferences.

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