A Novel Approach For Smart Fan & Light Control System For Industrial Applications

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ABSTRACT:

When it's hot outside, utilising a fan is a more cost-effective option than turning on the air conditioner, especially in places where heat is unavoidable. However, certain issues have occurred, such as users forgetting to show off while gone, and some individuals experiencing discomfort and perhaps frustration while getting up from their seat to alter the speed. These result in a rise in power bills as a result of keeping the fan on while it's not in use, and they can also result in tragedies, such as fires, when the motor heats up.The ESP8266 microcontroller was used to build a prototype of a smart fan, while the LM35 and HC-SR04 were used to measure temperature for speed control and identify the user for automated on/off, respectively. After utilising the prototype, a set of participants were interviewed to provide feedback, comments, and ideas based on their experiences. The results reveal that they were pleased with the automation, which gave them the impression of being in a modern home with an automated wind blower.

Keywords: Smart fan, Relay driver,

INTRODUCTION

In locations where the temperature is consistently high, fans are often used. Also, despite the fact that the concept of a smart home has been around for decades, it is gaining popularity throughout the world [1,2,3]. When all of the fan speeds are changeable, issues occur; however, this may be done manually. It implies that if the user wishes to change the speed, they must go to the fan and push the button on their own. Another disadvantage is that many individuals forget to display the fan after they have done using it [4,5]. They simply exit the room, oblivious to the fact that the fan is still open. As a result, the power cost has increased, and 5-10% of the electricity utilised is wasted.

Because the fan is powered by the spinning of a motor, it may sometimes create a fire. If the motor runs for a lengthy period of time, it produces heat, and the fan body is made of plastic, which can easily catch fire.

Because of the ease of not having to touch the system directly, a system operated by a remote device such as a remote may be a preferable option [6,7]. The mechanism that will be created throughout this study will be known as "Smart Fan." The smart fan can alter its speed according to the temperature in the room.It also starts operating when the user sits down, such as on a

sofa or in a chair [8,9]. When the user exits the seat, the fan should be turned off. This was said to provide consumer comfort while also lowering energy usage.
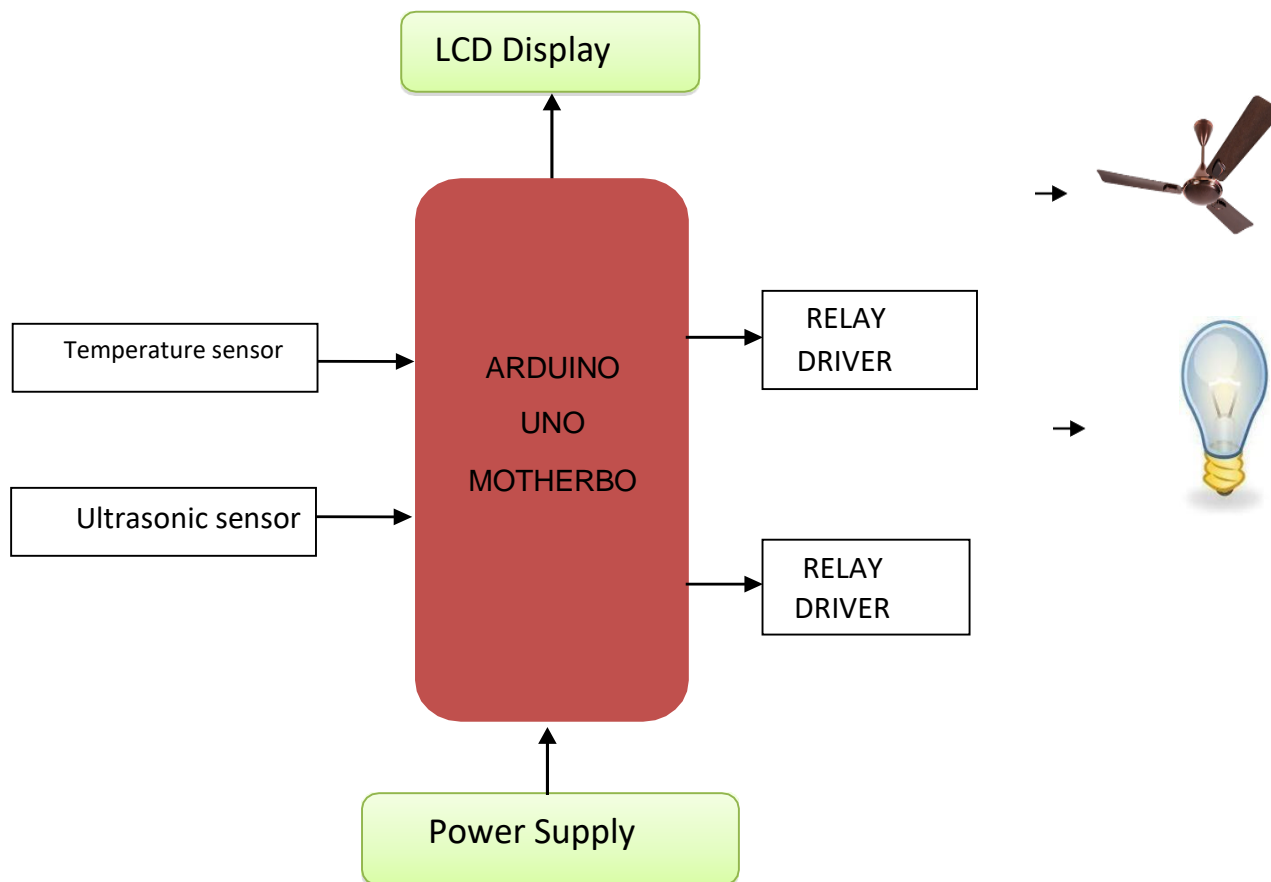
BLOCK DIAGRAM

Fig. 1.BLOCK DIAGRAM

ARDUINO UNO

One of the open source electronics platform is Arduino.It comprises of both hardware and software. It is utilized to configuration, create and test complex hardware models and items. Arduino board equipment contains microcontroller with electronic parts. Any errandshould be possible by programming the Arduino by utilizing programming. Though the programming language of the Arduino is very simple everyone can write the program without knowing the algorithms and codes.
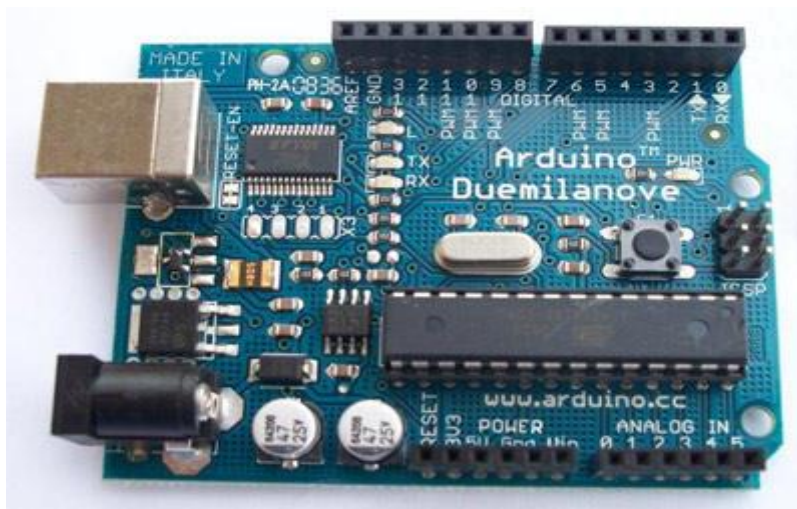
Fig.2. Arduino UNO board

Open source platform which is excellently designed is Arduino. The specially designed boards in Arduino is programmed by utilizing the Arduino Programming Language(APL).

In Industries, the presence of Arduino has been expanded rapidly and for making commercial products also it can be widely used by experts. The presence of Arduino reduces the efforts for making complex coding and designing the hardware.

The product records which contains all the source code library are likewise publicly released. It is very well may be changed by a client to make the undertaking more adaptable and improve its capacities. A solid online local area support is given by Arduino

ULTRASONIC SENSOR

Ultrasonic sensors are contraptions that usage electrical-mechanical energy change. In order to quantify the distance from the sensor to the objective item, the mechanical energy is in the form of ultrasonic waves. Ultrasonic waves are longitudinal mechanical waves. These waves travel along the course of wave spread through the medium.Based on the type, the frequency ranges of sound is widely classified as below:
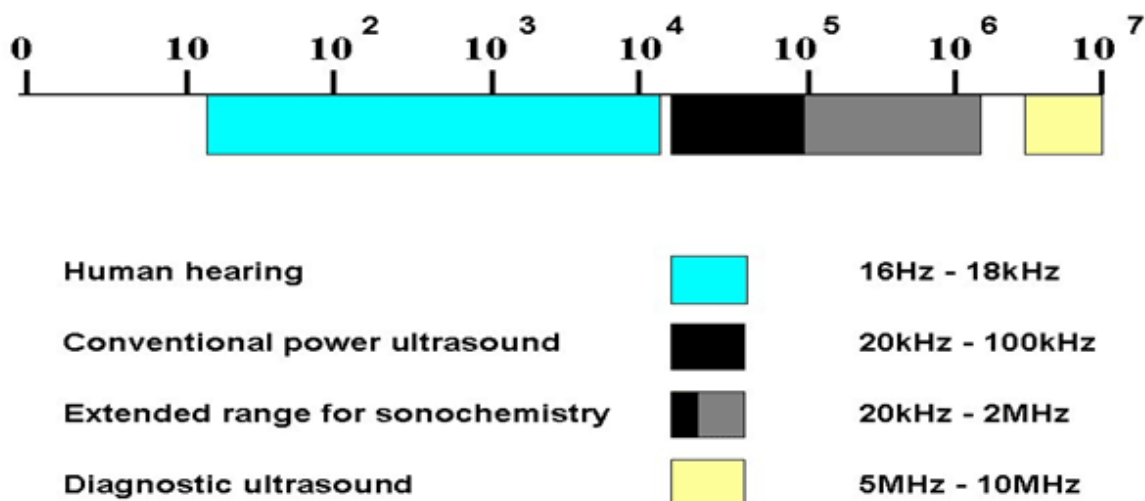
The Frequency Ranges of the Sound

0	10	10^2	10^3	10^4	10^5	10^6	10^7

Human hearing — 16Hz - 18kHz

Conventional power ultrasound — 20kHz - 100kHz

Extended range for sonochemistry — 20kHz - 2MHz

Diagnostic ultrasound — 5MHz - 10MHz

Fig.3. Frequency Ranges of Sound

RELAY DRIVER

Relay is perhaps the main electromechanical gadgets exceptionally utilized in mechanical applications explicitly in computerization. A hand-off is utilized for electronic to electrical interfacing for example it is utilized to turn on or off electrical circuits working at high AC voltage utilizing a low DC control voltage. A transfer by and large has two sections, a loop which works at the appraised DC voltage and a precisely portable switch. These circuits are electrically secluded yet attractively associated with one another, thus any flaw on either side doesn't influences the opposite side.

Fig.4. Relay Driver

There are five terminals in the relay switch. In which two terminals are utilized to give the information DC voltage otherwise called the working voltage of the transfer. Transfers are accessible in various working voltages like 6V, 12V, 24V and so forth. The remainder of the three terminals are utilized to interface the high voltage AC circuit.

There are different kinds of transfers are accessible dependent on types and classifications and to track down the right yield terminal design, you need to see information sheet or manual. The terminals of the hand-off can be distinguished by utilizing a multimeter and in some cases in the hand-off itself it is printed.

LCD DISPLAY

A Liquid precise stone showcase is a level board show or other electronically controlledoptical gadget that utilizes fluid gems with polarizers to adjust light. To produce colour or monochrome images, liquid crystals use a backlight or reflector rather than emitting light directly.
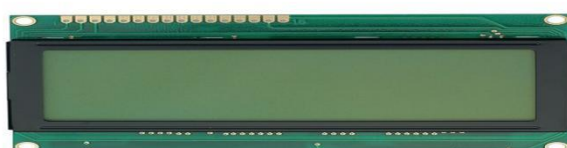

Fig. 5. LCD Display

POWER SUPPLY

Power supply is a reference to a wellspring of electrical force. A contraption or structure that arrangements electrical or various kinds of energy to a yield weight or assembling of weights is known as force supply unit or PSU. The term is most generally applied to electrical energy supplies, less frequency to mechanical ones, and now and again to others.
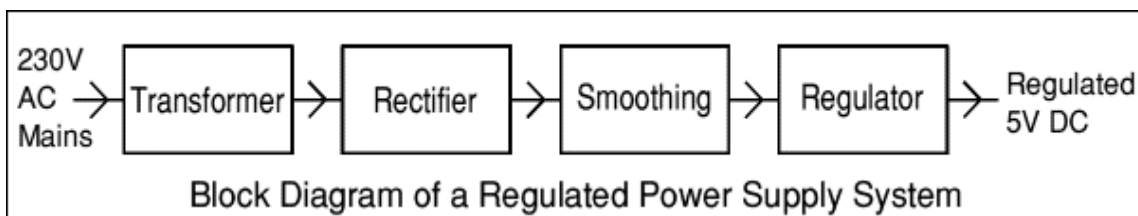

Fig. 6. Power Supply

The power supply for electronic gadgets can beseparated into two sections. One is linear power supply and the other is switching power supply. The plan of the linear power supply is straightforward yet it turns out to be progressively cumbersome and weighty for high current gadgets; voltage guideline in a straight stockpile can bring about low effectiveness. An exchanged mode supply of a similar rating as a direct inventory will be more modest, is typically more proficient, however will be more unpredictable.

RESULT AND DISCUSSION

This research's prototype system is a great fan for a group of individuals. They may not desire one since they live in a society where such a system does not exist; nevertheless, once they have tried one, they are content and appreciative of its benefits and comfortability. Even if the hardware utilised in this study isn't suitable for business use and isn't good enough for the market, there are better options, and the fan's features enticed people to keep using it. Because it's merely a home item, this approach doesn't have a database.
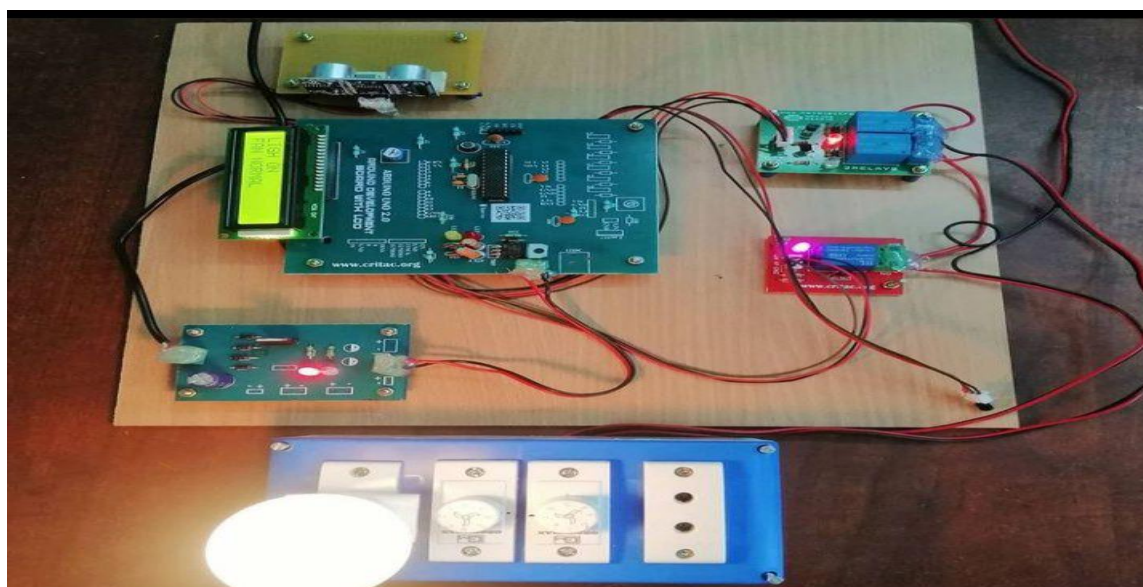

Fig. 7. Hardware Result

CONCLUSION

It may, however, be put together for future work to gather and analyse data for a variety of reasons, including user behaviour, energy consumption forecast, and historical data usage over specified time periods for energy consumption reduction. Finally, what was gained from all of the feedbacks was that any systems should be developed based on the customers' wants, preferences, and likes in order to make the simplest out of it.

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