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ARDUINO BASED AUTOMATIC WATER PUMP LEVEL ADJUSTMENT & MONITORING SYSTEM

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Abstract: Water is the most significant thing for humans. Wells, tanks, canals are the most supply for the provision of water within the farmland. within the ancient manner of rise down the we tend toll and shifting the pump, it's a really tedious and long job. With the assistance of hardware and code components, we are planning a tool that may help the farmers to change this regular work by adjusting the pump in line with water level. This is the most motivation for this study to deploy computing techniques in creating a security mechanism that may mechanically shift the pump in line with the amount of water within the well and conjointly will flip on/off the pump because the use of water for watering the crops and filling the cistern is done. Thus, the automated shifting of the pump, automatic turn on/off of the pump, and observation of the installation will facilitate save the lifetime of the farmer by electrical shock, also help save water because it is extremely restricted somewhere and also save electricity. Arduino may be an American Standard Code for Information Interchange text file programmable circuit board that may be programmed to sense and manage objects among the physical world. A pump is a tool that moves fluids (liquids or gases) by mechanical action. AN integrated development setting (IDE) is additionally a writing application that gives comprehensive facilities to computer programmers for code package development.

INTRODUCTION

Water is a universal solvent that plays an important role in our everyday life. It is used in everyday activities. In farms, we will find out that the boreholes and wells have tanks for water storage before pumping it into the field. People often turn on their water pump when they wish to water their crops and when the water level in the tank is low, then turn it off when the tanks begin to overflow and the crop irrigation is over. At the Farms, farmers switch on the water pumps and sometimes set off to do certain work or even fall asleep, forgetting to switch off the main switch when the tank is full and watering is done. In this project, we are using an ultrasonic sensor to sense the water level along with software in a windows-based PC. Some physical elements must be managed in everyday life for them to fulfill their expected behaviors. A control system, therefore, is a device, or a group of devices, that controls, directs, or regulates the actions of some other device and system. As a result, automated control entails creating a control system that operates with little or no human intervention. Several of these are included in the design of everyday gadgets. The purpose of this paper was to demonstrate our work on integrating a control system into an autonomous water pump level adjustment and monitoring system. Eliminating the main culprits of water waste and human suffering in various locations during pumping and dispensing into overhead tanks. The creation of the many devices corresponding to mobile phones and computers has caused many individuals to place confidence in technology to speak with their friends, store data such as pictures, movies, documents, and music. individuals with the assistance of smartphones will currently connect with the web while not needing a computer, whereas still giving equivalent practicality however through totally different means. With the introduction of advanced software packages and hardware devices, smartphones are now powerful devices and became a very important part of people's daily lives. One of the most important features is the Smartphone's ability to connect and communicate with other devices. A field that is recently gaining popularity is Water pump Level adjustment and Smartphones can potentially be used as information or functionality hubs in monitoring systems.

PROPOSED METHODOLOGY

The created wireless automated water level controller is based on a mobile application in which an Arduino Uno microcontroller is programmed to carry out all the control functions and to provide appropriate digital outputs that turn the water pump on and off at the lowest and maximum values defined, HC-SR04 ultrasonic sensors installed at the top of the machine to monitor by transmitting and receiving sound waves to determine the water level, an android mobile application named Water HMI that makes it possible to have a picture of what is happening in the well or the storage tank in real-time and also increases the flexibility of controlling the water pump, The ESP8266 Wi-Fi module is the component that allows the mobile app to interface with a DC-to-DC converter, which converts 12V DC to 3.3V DC. which is needed by the Wi-Fi module in the system, a 5V DC Relay (SRD-05VDC-SL-C) that switches the water pump ON or OFF, and the DC water pumping machine. The above figure depicts the block diagram of the mobile application-based wireless automated water level controller. The block diagram is depicted in the diagram above. The proposed concept of the water pump level monitoring and controlling system. When the module is turned on, the ultrasonic sensor sends out

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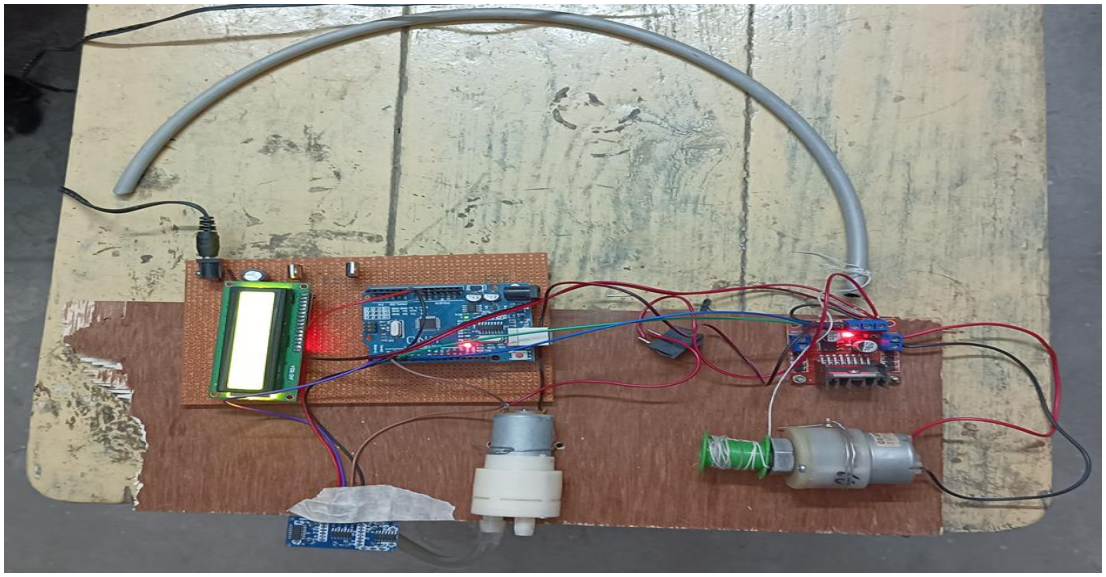
an echo signal, which the Arduino measures. and hence the level of the water within the well is computed using the Echo method. In the Echo method, Arduino reads the time between triggering and receiving ECHO. The speed of sound is around 340 m/s. As a result, the formula is used to compute distance: (travel time/2) * sound speed = distance Where the sound travels at a speed of around 340 meters per second. By using this method, we compute the distance from the sensor to the water surface. Later the same information is computed as a percentage of water available in the well and overhead tank. If the level of the water within the well is at a lower level than the threshold value programmed then the motor will be driven by the controller via motor driver circuit and the pump will be adjusted at a particular height computed by the Arduino, however, if the level of water in the well is greater than the threshold value programmed then the motor will drive again and will set the water pump to a higher height in the well. The amount of water in the tank is constantly monitored and shown on the LCD. The motor/driver will not turn on if the water pump is below the threshold level to protect the motor and machine from getting wet and off-dry running. Before switching ON and OFF the motor and the driver used is being indicated by different tones of the buzzer.

EXPECTED RESULT

The experimental system for managing the water level has been successfully devised and built. The two-level system was successfully developed utilizing an Arduino Uno microcontroller. The water pump level (low level and high level) in the well has been controlled by an automated control system. The control system will be constructed and tested using LabVIEW software. The Internet has altered the dynamics of virtual engagement in everyday life. The Internet of Things (IoT) has the potential to open up new dimensions by allowing intelligent devices to communicate with one another. This idea provides a straightforward water pump level adjustment and monitoring system with several level indicators. It also indicates when the water level falls below or rises over the necessary level. The design of the system and architecture are explained, resulting from
a cost-effective and simple approach for monitoring pump shifting and crop water delivery. Future work might include analyzing levels of water in a specific location to reduce water waste.

EXPERIMENTAL SETUP



The experimental setup consists of a ultrasonic sensor, a Arduino Uno microcontroller, a Gear motor, a Gear motor driver, a water pump and a LCD Display to show the height of the water pump to the user. The Ultrasonic sensor will sense the level of water in the well and will send the input signal to the Arduino microcontroller and the Arduino will give the signal to the motor driver according to the programming written in the microcontroller with respect to the input signal sent from the ultrasonic sensor. The gear motors will then move the water pump to the height programed in the microcontroller and the LCD display will show the height of the pump.

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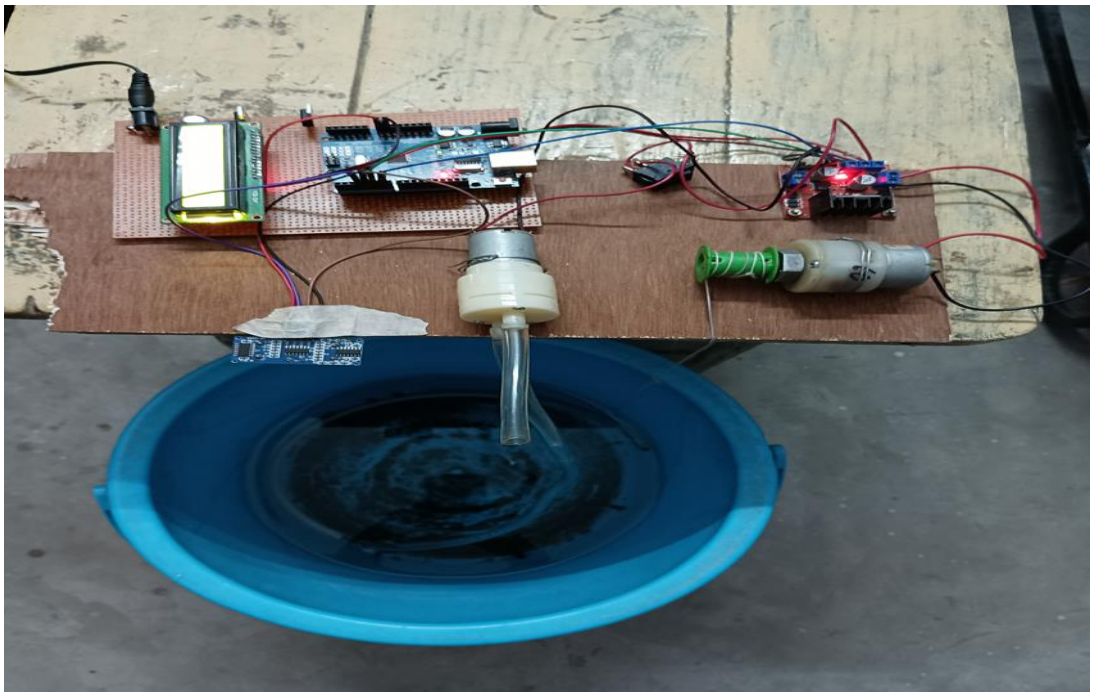
RESULT



This bankruptcy carries the snapshots of the graphical person interface (GUI) of the proposed device showing the interface and the intermediate results. The water stage 1 illustration via way of means of the ultrasonic sensor and the Arduino interface. When the sensors detect water stage 1, it enables in robotically turning the pump ON. The water stage 6 illustration via way of means of the ultrasonic sensor and the Arduino interface. When the sensor detects water stage 6, it enables in robotically turning the pump OFF. Automation of the diverse additives round us has been broadly elevated to lessen human intervention and store time. The water tank overflows because the peak of water withinside the tank cannot be randomly guessed. This leads to more power consumption, that's a excessive challenge in the present. People additionally want to attend and prevent doing their different sports till the tank is full. Hence, right here is an idea which senses and shows the water stage in order that the pump may be switched off on suitable time and store water, strength and time as well. Therefore "Automatic Water Level Indicator and Controller Using Arduino" task can simply be beneficial on a massive scale foundation due to minimal requirement of guy energy and additionally the set-up procedure being simpler making extra compatible for anybody to use.

CONCLUSIONS

The experimental system for managing the water level has been successfully devised and built. The two-level system was successfully developed utilizing an Arduino Uno microcontroller. The water pump level (low level and high level) in the well has been controlled by an automated control system. The control system is successfully constructed and tested using LabVIEW software. The Internet has altered the dynamics of virtual engagement in everyday life. The Internet of Things (IoT) has the potential to open up new dimensions by allowing intelligent devices to communicate with one another. This idea provides a straightforward water pump level adjustment and monitoring system with several level indicators. It also indicates when the water level falls below or rises over the necessary level. The design of the system and architecture are explained, resulting from
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