IOT BASED CHILD RESCUE SYSTEM FROM BORWELL

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ABSTRACT

More occurrences are occurring on open borewells today, which are quickly becoming death traps. Many kids drown when they fall into these borewells. While saving lives is the major reason for borewells, many children's lives are affected when they are left open. That reasoning is perilous and difficult to use to free the captive youngster. The process of removing the youngster from the bore well requires more time. Here, we suggest a robotic device that will pick up the child and use pneumatic arms to pick him or her up while fastening a harness to them. The robot will also be equipped with a teleconferencing device for use in speaking with the child. Inside the uncontrolled bore well, the mechanical system is in motion. The mechanical arrangement is managed by the Arduino in response to user commands. To activate the DC motor, hardware is connected to the computer. With this kind of device, imprisoned infants in the bore well can be safely released in less time. We are utilising an ESP 32 camera, Bluetooth, and an Arduino UNO to do this.

KEYWORDS: BLUETOOTH MODULE, BUZZER, GAS SENSOR, L293D MOTOR DRIVER, POWER SUPPLY, LCD, ESP 32 CAM, LEDS.

I. INTRODUCTION

Since agriculture is the main industry in India, groundwater is the main source of water for farmers. Bore wells are borrowed increasingly frequently for groundwater analysis due to population growth, a decrease in the amount of land people own, and urbanisation. The borewells would leave uncovered after dispensing water, which allowed most kids to stumble onto the well and fall into it, which is currently the only cause of these tragic issues. Rescue efforts are frequently more challenging for the rescue team members themselves. The likelihood of preserving the infant may be diminished by a slight delay in the entire process. The likelihood of saving the infant decreases if there are rocks close to the borehole.

There is currently no effective way to deal with this issue. The borewell holes were dug to a depth of roughly 700 feet. A bore well is an earthen well with a diameter of 4.5 to 12 inches that is drilled for water. These bore wells can range in depth from 150 feet to 1500 feet and are primarily utilised for agricultural purposes. Water scarcity was the main issue the population was dealing with. The borewell holes are about 700 feet deep since there is a lack of water. In this situation, rescuing children from such deep borewells is quite difficult and takes more time to complete. Children stuck in a situation require risky and difficult rescue.

- The major goal of this project is to develop and build a portable system that is accurate, rapid, and cost-effective, and that can perform life-saving functions like giving oxygen.
- The Borewell Rescue System may move about inside the well and execute tasks as directed by the user.
- The system is managed by personal computers in accordance with the continual observations made by CCTV cameras.

A quick child rescue system was developed by Vijay Murugan.S. and Vishnupriya K [1] utilising an Arduino ATMEGA328 Microcontroller, an ultrasonic sensor, a GPS neo6m, and a GSM module. The project was released in April of 2021. Due to the usage of an hourglass-shaped pipe and the inclusion of an ultrasonic sensor inside the pipe, this project is expensive. Although this project takes less time, saving the youngster was not safer.

A sophisticated child rescue system based on a Zig-bee application was put into place by Deepika D. and Apoorva D. [2]. The project was released in April 2021. This undertaking demands more Although this project requires a large number of expensive and time-consuming components, such as UART, LCD, PIR

sensor, CO2 sensor, and pumping motors, it can lift children safely to the top of the borewell.

A strategy for kid rescue employing the balloon and umbrella technique is described by Bijith P. and Midhun C. Baiju [3]. The project was released on September 7, 2020. The apparatus for this project rotates in the desired direction using gears and a tripod support. The more expensive Rasp-berry PI is utilised as the system's microcontroller, and both a computer and a mobile device are needed for setup and use.

Manoj E. and Monish S. [4] offer a system for keeping an eye on the youngster that uses a gripper, rope, and bearing. This project was released on March 3rd, 2020. Using bearing A gripper is utilised to capture the youngster inside the borewell after rotating the apparatus in the necessary direction. Less safety is offered by this approach when lifting the youngster to the top of the borewell. Since the child fell into the borewell, this project has taken longer to install.

An arm and belt mechanism-based kid rescue device was created by Jayasudha M. and Sarvanan M. [5]. This project was released on October 12th, 2019. The robotic arm used in this research It is inserted into the borewell, and the child's belt is adjusted so the youngster is raised to the top. Although this approach is safer, it takes longer to use the robotic arm to put the youngster inside the borewell with the belt.

Ravinder Ashok Using a Raspberry Pi, Gilke, Kalpesh, and Anil Dahake [6] implanted an autonomous robot to rescue the child from the borewell. This work was released on February May 2019. In this project, the wireless robot is supervised and controlled by an Android app. Due to the use of Rasp-berry PI and video monitoring, this project has a high implementation cost and takes a long time to set up.

A robotic arm with a camera system is used in a rescue system described by Nithin Agarwal and Hitesh [7]. June 2019 saw the publication of this project. It is not more secure to lift the since it ascends to the top of the Borewell using the child's arms. Because children's arms are so delicate, using them could result in damage. It is simple to install, but it takes longer to attach a child's arms to a robotic arm.

In order to identify the victims, Prakash S. and Narmada Devi designed a rescue system using various sensors, including LDR sensor, temperature sensor, and pressure sensor child. In May 2019, this project was published. In this project, the youngster is raised from the borewell to the top using graspers and Zig-Bee technology. Due to the enormous number of components in this project, its implementation will be expensive.

II. EXISTING METHOD

Robots are now made to assist human operators in rescue operations. Typically, the parallel pit approach is used by the rescue crew to free the kid who has become trapped in the borewell. If a child accidentally enters the borewell and becomes stuck, the rescue crew must first determine the depth at which the child became trapped and whether the child is still alive. They will dig a parallel pit next to the borewell if the depth of the trapped youngster is smaller. The parallel pit approach does not function if the depth of the trapped child is greater since it takes more time and men to do the rescue operation. When that happens, the rescue crew will dig a parallel pit using earth moving equipment.

FIG 1: OLD RESCUE METHOD

This procedure is rather time-consuming. The infant may suffer throughout this procedure from a lack of oxygen, and the rescue team's condition could become worse from a lack of visualisation. The suggested procedure involves sending a small machine within the bore well pipe to hold the trapped body methodically. Using wireless technology, a PC controls the robot. The robots for rescue are also deployed in a few instances. Even though all these innovations and techniques already exist, only 25–30% of them have a chance of

surviving.

III. PROPOSED METHOD

Even though there are numerous ways to save a child from an open borewell, there is still a need for both basic and advanced rescue tools. In this case, we're employing a technique known as an Arduino-based child rescue device from borewell. In this approach, it is not necessary to dig the parallel pit next to the bore well all the way down to the child's trapped depth. As a result, this procedure does not require additional machinery or human resources. As a result, there may be less of a delay caused by the gathering of resources and a lower likelihood of saving the child's life. There may be fewer resources accumulated, which would decrease the likelihood of saving the child's life. This technique uses an extremely sophisticated microprocessor, a well-designed, precise hand gripping mechanism (capable of supporting loads of roughly 20 kg), and a visual feedback system using a high-resolution camera.

In this project, the gripper mechanism will be coupled to DC motors, allowing us to move the gripper mechanism up and down with the use of switches. Outside the borewell, the entire system is manually operated utilising Utilising a pulley and rope mechanism, a system is placed within the borewell so that the infant may be observed through a camera. Through a webcam, a child's live location is captured. Two very gentle arms make up this system so that the youngster cannot be injured when grasping. A DC motor is then used to spin the system in accordance with the child's position. The apparatus is then removed from the borewell by pulling the rope after the youngster has been secured in an appropriate posture.

IV. BLOCK DAIGRAM

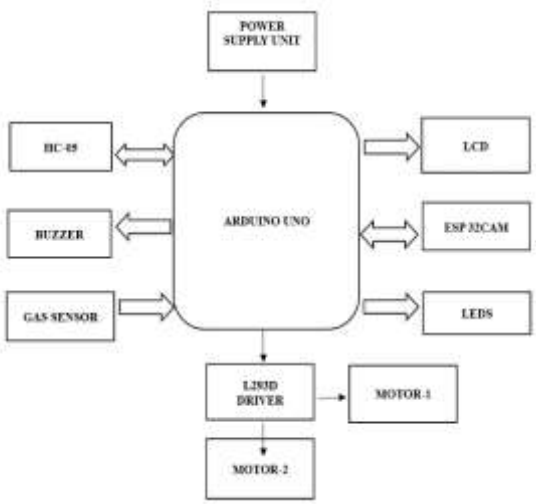

FIG 2: BLOCK DAIGRAM OF RESCUE ROBOT

The rescue system in this proposed system consists of an LCD display, servo motors, Gripper, and Arduino. The Gripper will be sent into the borewell with the help of servo motors in order to capture the child. After the child has reached the bottom of the borewell, a gripper is used to grasp him by opening and closing his arms. When the dangerous gas is found, the buzzer sounds. The borewell rescue robot's operating method is displayed via an LCD display. In the event that a child accidentally falls down the borewell, this proposed mechanism is employed to elevate the child from bottom to top.

V. FLOWCHART

This project begins by turning on the system, after which the servo motor, which is connected with a

Gripper via thread, begins to operate. As soon as the servomotor stops once it reaches the bottom of the borewell, the gripper opens to grasp the youngster, closes the arms with a buzzer, and shows "catched" on the LCD display. Following the catch, the servo motor begins to operate once more, moving the gripper upward so that the youngster may easily reach the top. The youngster can be saved in this way if they unintentionally fall into the borewell.

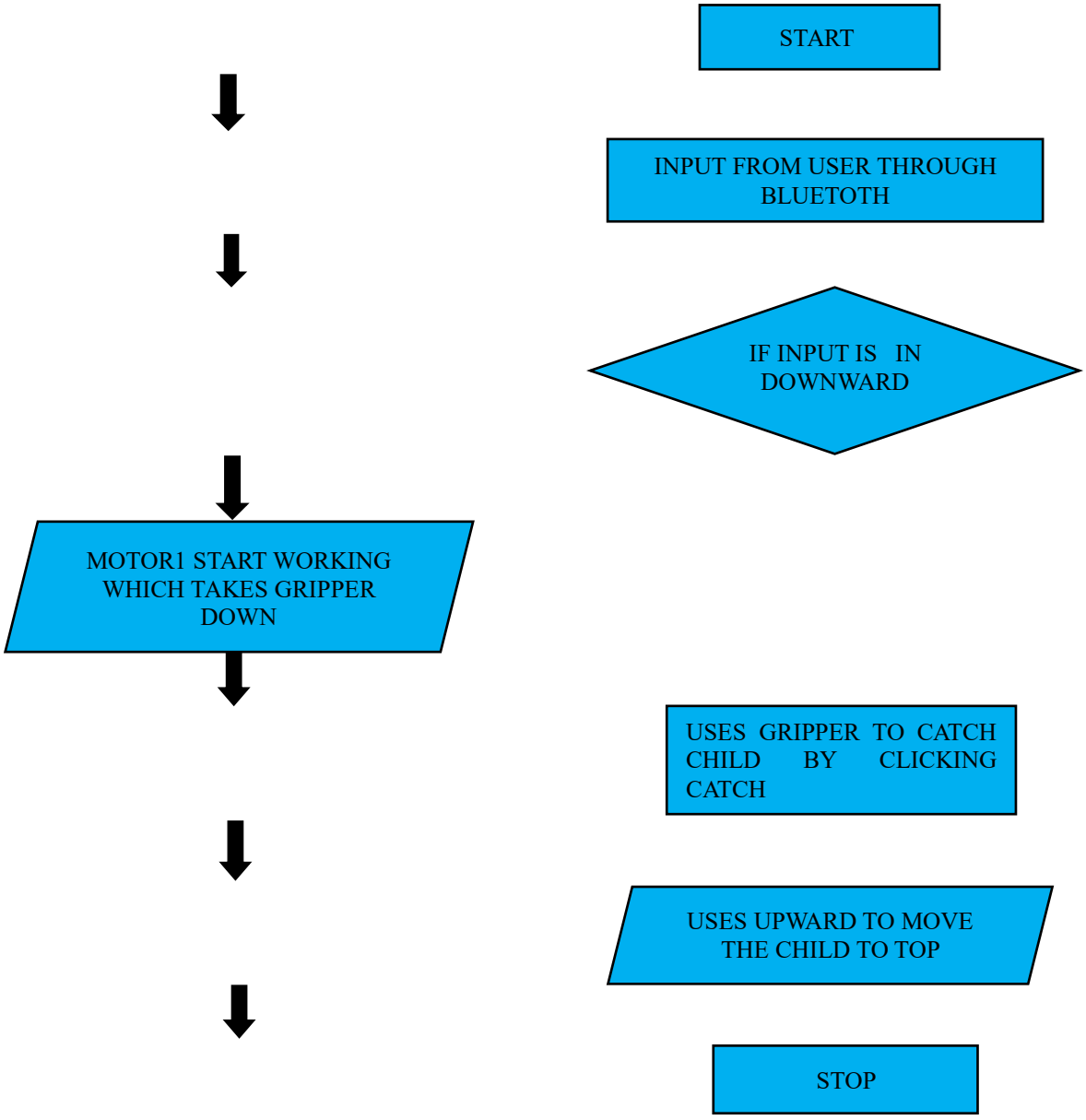

FIG 3: FLOW CHART OF RESCUE ROBOT

VI. RESULTS OF RESCUE SYSTEM

Since all the goals had been met, we were able to build a mechanism to save lives by rescuing children. The two-armed child rescue device has an integrated camera, LED lighting, audio, and video. The technology has the ability to undertake the rescue operation while travelling within the borewell from the same hole. The camera's digital integration makes it easier to see where the child is. The camera has a microphone that makes it easier to converse with the child.

Fig 4:(a)

Fig4:(b)

In figure (a) and figure (b), a picture of our project is displayed. As a result, the technique is useful in saving the kid trapped in the borewell. It can replace all current technology because it is safer and uses a less time. A life is worth saving, and we have made this project effective in order to save children in the future in less time. The cost of the current technology was significantly more than the cost of our project. To make the system both lightweight and precise, we used lightweight servo motors.

VII. CONCLUSION

In order to save the lives of as many children as possible who fall into bore wells, the "Smart and Safe Child Rescue System" was developed. Many lives have been lost by falling into the pit during the previous 10 years as a result of the laborious and time-consuming process of digging one adjacent to the bore well. The employment of proper motors, arms, and cutting-edge technology ensures the success of this project. We can infer that the suggested method will be effective in preventing many children from dying when they eventually fall into the bore hole.

VIII. FUTURESCOPE

We can utilise this project for a variety of purposes in the future by adding new components. In addition to being versatile enough to withstand a wider range of bore diameters and any changes in bore diameter, the construction is built to be study enough to support all potential loads. We can learn more about the amount of smoke or gases present in the relevant fields by mounting a smoke sensor on the robot. When a sensor detects harmful gases, it will send information to the microcontroller, which will then pass it on to the transceiver, which will then allow us to access the data on the PC side.

IX. REFERENCES

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