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IOT Based Child Rescue System in Open Bore-Well Using MSP 430

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ABSTRACT: This project is based on rescuing infants who have fallen into the bore-well. An abundance child death reports have been reported so far. Due to scantiness of water level, bore well are dig to more depth. Due to scanning a system that is capable of rescuing the child with ease, safe, and within less time. There are methods of water level, bore well are dig to more depth. The basis of this project is to rescue the infant. The rescue is done by digging a parallel pit, which takes more than a day and even have not found a genuine result. The high point of this project is that the child will be rescued before it reaches high depth, which is based on communications using Infra-Red Signals. The basis of this project is to rescue the infant. This system is adaptable to the diameter of the bore well which varies from 8 inches to 12 inches. Project aims at design techniques which can save the child from the bore well. But it may be impractical to do it with a single method. Therefore, this project consists of providing the provision for the inclusion of multiple rescue methods, which provides the possibility of choosing the best method to save. The rescue is done by digging a parallel pit, which takes more than a day and even have not found a genuine result. The high point of this project is that the child will be rescued before it reaches high depth, which is based on communications using Infra-Red Signals. When the IR signal, placed two inches diametrically under the ground surface of bore-well, breaks due to any obstructing object, a buzzer starts sounding as an alert in mobile phone. After a stake that is kept a few feet lower in the bore-well, closes the bore in order to prevent the infants falling deeper into the well. These accidents are substantially found in agricultural bore-well. The various risks associated with the rescue of infants can be minimized using this system. There is a risk that children or animals fall down into the bore well. The depth and the diameter of the bore-well is the main obstacle to rescue the child safely. A small delay in rescue system will take the life of the child or permanent physically handicap.

I.INTRODUCTION

In current framework, growing water scarcity is the major problem which people come across in day to day life. Small children without spotting the hole dug for the bore-well slip in and get trapped. These accidents are mainly happened due to inattention or playful activities of the child. The occurrence of latest technique provides pragmatic opportunity for new robot power and awareness of new methods of control theory. The presented robot control system can be used for different enlightened robotic applications. Robots have been very successful at manipulation in simulation and controlled environments.

The child fall into open bore-wells and rescue operations was almost end with failure. They develop a robot machine that can take out the trapped body in a systematic way. It will also perform various life saving operations for the sufferers such as oxygen supply. It will be a light weight machine that will be setup easily into bore-well and hold the trapped body systematically. In this technology, there will be no requirement of digging any hole parallel to the bore-well. With this machine, there is no chance of damaging victim's body and other slight damages and we name that machine as "Child Rescue System in Open Bore-Well"

Open bore wells are always a trap. And the accidents can't be avoided till now. Therefore, a practical, safe, and efficient rescue system becomes necessary. But still, the techniques are impractical. This system is adaptable to the diameter of the bore well which varies from 8 inches to 12 inches. Project aims at designing a system that is capable of rescuing the child with ease, safe, and within less time. There are methods or techniques which can save the child from the bore well. But it may be impractical to do it with a single method. Therefore, this project consists of providing the provision for the inclusion of multiple rescue methods, which provides the possibility of choosing the best method to save. In our project, we plan to combine the various methods of rescuing, some of which do exist today.

A water well or Bore well is an excavation or structure created in the ground by digging, drilling, etc. to access groundwater in underground aquifers. Most bore wells that are constructed for pure water extraction are found in areas

where there are human activities.

These bore wells are often left open which has been known to be hazardous to human life. Children of very tender age tend to fall into these open bore wells and get trapped inside. Rescuing these trapped children is both difficult and risky for everybody involved in the operation. A borehole generally is a confined shaft excavated into the ground. It is built for many uses including withdrawal of water, petroleum or natural gases, mineral extraction, temperature measurements, and other investigation and assessment purposes. They provide details about the soil and ground quality. Over a period of time as the water level falls, bore wells dry up causing them to be abandoned. These abandoned bore wells are a major accident site since there are no measures taken to cover them up. Several cases have been reported of children accidentally falling into these bore wells, ultimately leading to their death. This is mainly due to the absence of communication between the child and the rescue operators. This work addresses these problems so that the rescue process of the child becomes easier and faster. Water scarcity is a major problem faced by human society currently. After drying the bore wells people are not closing them. There is a risk that children or animals fall down into the bore well. The depth and the diameter of the bore-well is the main obstacle to rescue the child safely. A small delay in rescue system will take the life of the child or permanent physically handicap. To solve this problem, we have designed our project "CHILD RESCUE SYSTEM IN OPEN BORE WELL". This project saves the child's life before it reaches the depth of the bore-well. To construct this project, we have used Msp 430; board IR Sensor, GSM System etc.

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II.LITERATURE SURVEY

DEVOLOPMENT OF ROBOT TO SAVE CHILD FROM OPEN BORE-WELL [BHARATHI.B AND MANISH RAJ]

This depicts the plan of a robot for saving the kid from bore well. This robot is fit for moving underneath the drag well, as per the human comment by Pc, it will pick and spot dependent on the arm structures. It is worked through Pc with the assistance of remote zigbee innovation and remote camera which is used for video surveillance. The main drawback is that the arm structure can't give adequate security to the child while lifting. It depicts as the dimension of the drag well is slender for any grown-up in difficult and bright goes dim inside it, the rescuing task in that circumstance is very difficult. The automated framework which will join an outfit to the child utilizing inflated arms for rescuing the child. The video chatting method is also available for speaking with the child. The robotic arm is like clipper, so that the lifting mechanism is very difficult.

DEVELOPMENT OF ROBOT USING THREE ENGINES [GIRIDHARAN.M]

This described about designing a robot consists of three engines to save a child on the drag well. The primary engine is used for movement which is up and down by using screw bar. Second engine is utilized for grabbing reason with the surface of lead screw arrangement. Another engine is used to rescue the child through rack and pinion arrangement. Based on the location of the child, the whole arrangement can be pivoted. Then the child is lifted from the bore well.

DEVELOPMENT OF ARM COMPRESSION AND EXPANSION [ARTHIKA.S]

This described about the mechanism of safeguarding child from the bore well. The temperature sensor is used to detect the temperature and similarly gas sensor is used to detect the gas spillage in the specific region. ARM compression and expansion method is used for roper up and down movement. The robotic arm is using relay operation for picking and placing the child. This method provides safeguarding activities in less time. The major drawback is lifting of child is very difficult by using gripping arm. Major problem faced by the human society was water scarcity which is analyzed by Bharathi and Suchitha. Due to drought and depletion of underground water, more bore wells are drilled on the surface of the earth. In many areas, the bore wells are drilled and left open without any proper covering. These bore wells became death pits and started taking many lives especially small children. Now a day's falling of children in bore wells are increasing due to carelessness and playful activities of the children. The hole dug for the bore wells are deep around 700 feet. In these cases, the rescue of child from such deepest bore well is quite challenging.

DEVELOPMENT OF ROBOT WITHOUT HUMAN INTERVENTION [MADHI.R]

This is described the design of a robot for rescuing the child from bore well. This robot is capable of moving inside the bore well, according to the human comment by PC and also pick and place based on the arm design. This robot is operated through PC with the help of wireless Zigbee technology and wireless camera which gives both the audio and video signals on the TV. The high power LED in the robot acts as a light source in the pipe where the light intensity is low. It is a low cost human controlled robot used to monitor and gives an insight view of rescuing the child safely.

DEVELOPMENT OF ROBOT USING TELECONFERENCING METHOD [PALWINDER KAUR.S]

This describes the rescue operation without human intervention. Here the wheeled leg mechanism is designed to go inside the pipe and the legs are circumferentially and systematically spaced out apart. The robot can adjust its legs according to the pipeline dimensions. The robot has consisting of power supply, switch pad and gear motor. The child International Journal of Pure and Applied Mathematics Volume 119 No. 15 2018, 861-865 ISSN: 1314-3395 (on-line version) url: http://www.acadpubl.eu/hub/ Special Issue http://www.acadpubl.eu/hub/ 861 position is captured from the bore well with USB camera and monitored on PC. The LM35 temperature sensor and 16*2 LCD are interfaced with pic 6F877A microcontroller to sense and displays on LCD. Manish Raj describes as the diameter of the bore well is narrow for any adult person and light goes dark inside it, the rescue task in that situation is challenging. The robotic system which will attach a harness to the child using pneumatic arms for picking up. A teleconferencing system is also attached to the robot for communicating with the child.

DEVELOPMENT OF CYLINDERICAL COMPACT SIZE ROBOT [JOHNJOSE PATTERY]

This describes the facility that monitors the trapped child, supplies the oxygen and provides a supporting platform to lift up the child. The first motor placed at top turns a gear mechanism which in turn pushes 3 blocks arranged at 120 degree from each other towards the side of the bore well. The bottom shaft is turned by 130 degrees with the help of second motor, thus helping to locate the gap through which the lifting rod is adjusted by third motor. When the diameter is adjusted, the forth motor helps the lifting rod to screw its way through the gap towards the bottom of the child. Once lifting the rid reaches a safe position under, an air compressor is operated to pump air to the bladder attached to the end of lifting rod through an air tube that runs downwards inside the lifting rod. The presence of the child in the bore well is not identified by the rescue workers. So it's the time consuming process and the oxygen present in the bore well is very low. This may lead to death of the child. To overcome this automation system is implemented. The bladder provides a safe seating to the child. Them the first motor is reversely operated so as to unclamp the system. Simultaneously it is lifted out of the well using a chain or rope.

DEVELOPMENT OF ROBOT AT MONITORING USING ARDUINO [CHANDRA KAUR AND VENMATHI.S]

This describes the rescue operations without human intervention. Here the wheeled leg mechanism is design to go inside the pipe and the legs are circumferentially and symmetrically spaced out 1200 apart. The robot can adjust its legs according to the pipeline dimensions. The robot has consisting of power supply, switch pad, and gear motor. The child position is captured from bore well with USB Camera and monitored on PC. The LM35 temperature sensor and 16*2 LCD are interfaced with PIC 16F877A microcontroller to sense and displays on LCD. This describes the facility to monitor the trapped child, supply oxygen and provide a supporting platform to lift up the child. The 1st motor placed at top turns a gear mechanism which, in turn, pushes 3 blocks arranged at 120 degrees from each other towards the side of the bore well. The 2nd motor placed below the plate turns the bottom shaft by 360 degrees, the helping to locate the gap through which the lifting rod passes. This is done with the help of a wireless camera attached to the lifting rod. The 3rd motor adjusts the radial distance of the lifting rod.

III.METHODOLOGY

In recent days, child rescue is not possible under the bore-well condition. There is not possible to save the child when they fall under the dig or hole. Over a period of time as the water level falls, bore wells dry up causing them to be abandoned. These abandoned bore wells are a major accident site since there are no measures taken to cover them up. Several cases have been reported of children accidentally falling into these bore wells, ultimately leading to their death. This is mainly due to the absence of communication between the child and the rescue operators. This work addresses these problems so that the rescue process of the child becomes easier and faster. It will also perform various life saving operations for the sufferers such as oxygen supply. It will be a light weight machine that will be setup easily into bore-well and hold the trapped body systematically. These accidents are mainly happened due to inattention or playful activities of the child. The occurrence of latest technique provides pragmatic opportunity for new robot power and awareness of new methods of control theory. The presented robot control system can be used for different enlightened

robotic applications. Robots have been very successful at manipulation in simulation and controlled environments. In this technology, there will be no requirement of digging any hole parallel to the bore-well. With this machine, there is no chance of damaging victim's body and other slight damages and we name that machine as "Child Rescue System in Open Bore-Well. Open bore wells are always a trap. And the accidents can't be avoided till now. Therefore, a practical, safe, and efficient rescue system becomes necessary. But still, the techniques are impractical. This system is adaptable to the diameter of the bore well which varies from 8 inches to 12 inches. project aims at designing a system that is capable of rescuing the child with ease, safe, and within less time. There are methods or techniques which can save the child from the bore well.
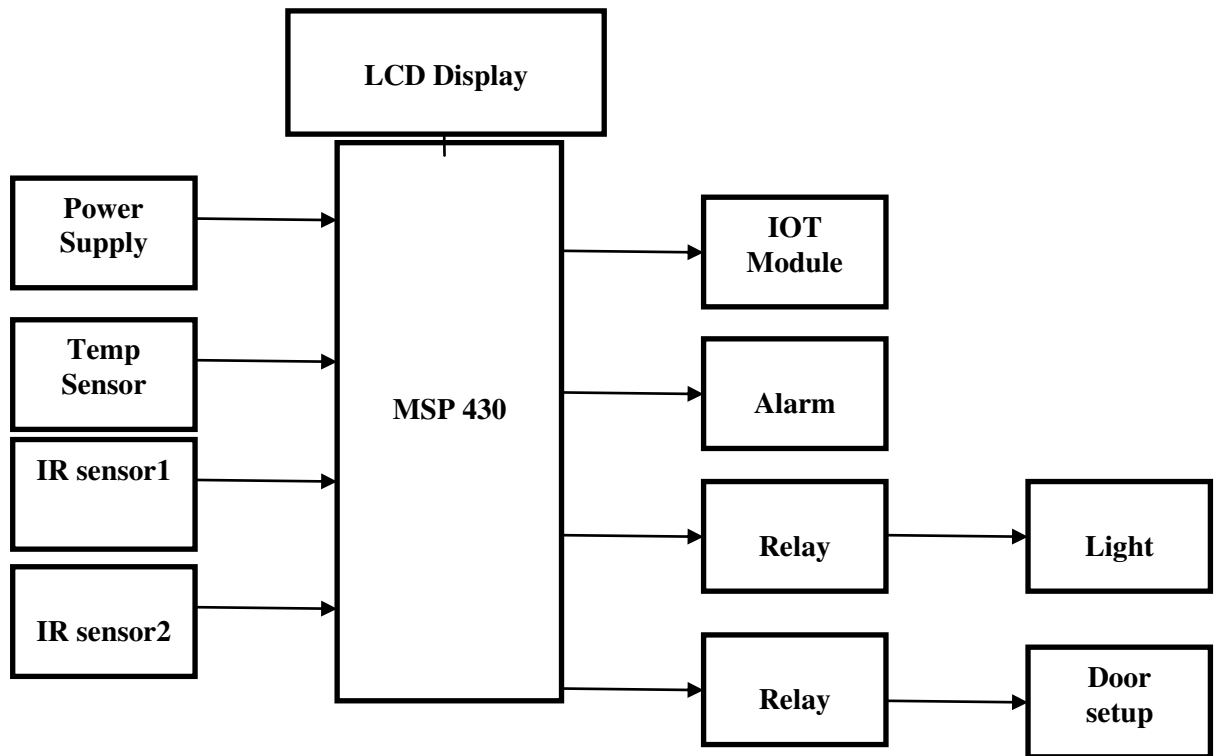
BLOCK DIAGRAM

Figure 1: Block diagram of ensuring child rescue system using MSP 430

IV. PROPOSED SYSTEM

The present child rescue methods have many disadvantages that the child inside bore well even loss their life. But this method helps to rescue the child in a proper time.

Hardware Requirement:
- Power Supply Unit
- MSP 430
- LCD Display
- IOT Display
- IR Sensor
- Temperature Sensor
- Relay
- Alarm
- LED

Software Requirements:
- Laptop/PC (Windows Version)
- Embedded C

Working Principle:

Child Rescue System used if a child falls in a bore-well. In this method a metal plate is placed at a distance below the entrance of the bore-well. IR technology is efficiently used to identify if a child has fallen in to a bore-well. Here, pair of IR sensors is placed in four directions. The IR transmitter and receiver are placed opposite to each other in a line of sight propagation technique. The output of the IR sensors receiver is connected to a comparator. The output of the comparator is given the input pins of the microcontroller. Whenever both the pair of IR sensors line of sight communication is blocked only then the microcontroller sends an SMS via IOT to the child rescue center or to the police station. If one pair of IR sensors line of sight communication is obstructed then no SMS is sent by microcontroller via IOT. As soon as both the pair of IR sensor is blocked, then depending on the program embedded within the microcontroller the D.C motor connected to a metal lid/plate begins to block the passage of the bore well, thus preventing the child from further falling into the depths of the bore well. In the project demonstration LCD is used to display the working of every unit in this project. The ingenious model presented in this work explains the prototype model in handling or rescue the child fell in the deep bore well. Currently, one of the important issues in the society is the water problem, which leads to many bores well being sunk.

These bore well in turns yielded water and subsequently got depleted are left uncovered and children often fall in bore hole. There are methods or techniques which can save the child from the bore well. But it may be impractical to do it with a single method. Therefore, this project consists of providing the provision for the inclusion of multiple rescue methods, which provides the possibility of choosing the best method to save. In this project, plan to combine the various methods of rescuing, some of which do exist today. The design of a water well or Bore well is an excavation or structure created in the ground by digging, drilling, etc. to access groundwater in underground aquifers. Most bore wells that are constructed for pure water extraction are found in areas where there are human activities. Rescuing the child from the deep hole is really a challenging task. So, we proposed a design to safeguard and the child from the deep bore well. In this model the child will be required amount of light and oxygen will be injected for the survival of the child using technical methods. In our project we use microcontroller which is used to measure the distance at which the victim is present. The presence of the child in the bore well is not identified by the rescue workers. So it's the time consuming process and the oxygen present in the bore well is very low. This may lead to death of the child. To overcome this automation system is implemented. The rescue unit consists of DC motors, a web camera and a LED lights. The web camera relates to the pc to view the status of the victim inside the bore well. DC motor used for movements of the rescue units. Thus, our project is easily portable and less expensive which can be very useful in any situation to rescue the victim easily.
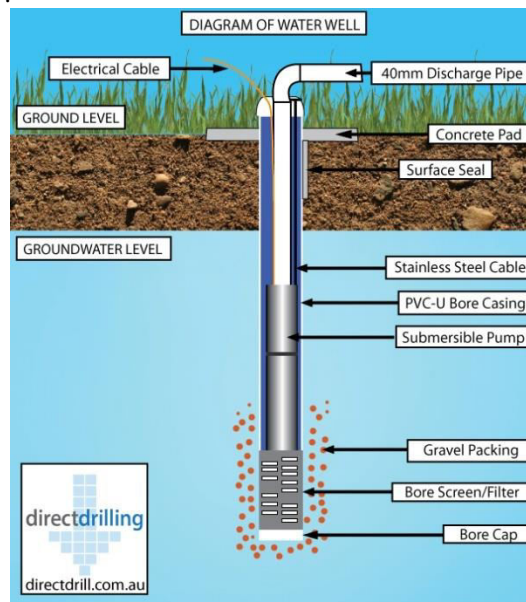

Figure 2: Working Principle of Child Rescue System

IV.RESULT AND DISCUSSION

ADVANTAGES OF THE PROJECT

These Sensors are easily available. It can be Interface any number of sensors to know detail content of all gases present in air. It should Detecting a wide range of gases, including CO, MH4, alcohol, smoke etc. It is Simple, compact and Easy to handle. The Sensors have long life time and less cost. It is a Simple Drive circuit so we can use it easily. So it should be a sufficient one. This System should be used as a Real time system. Its Operating voltage is 5 volt,-20°C to +50°C. Quality of air can be checked indoor as well as outdoor. It has Visual output and it also a Continuous system
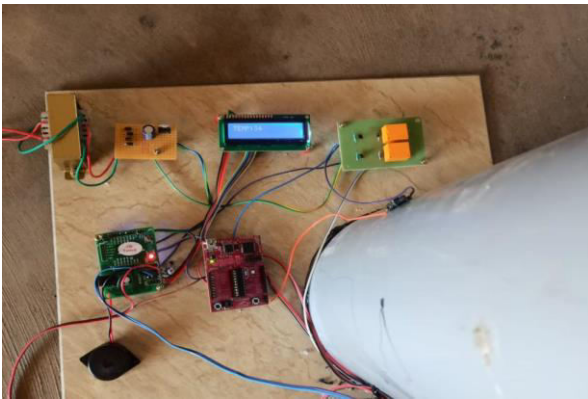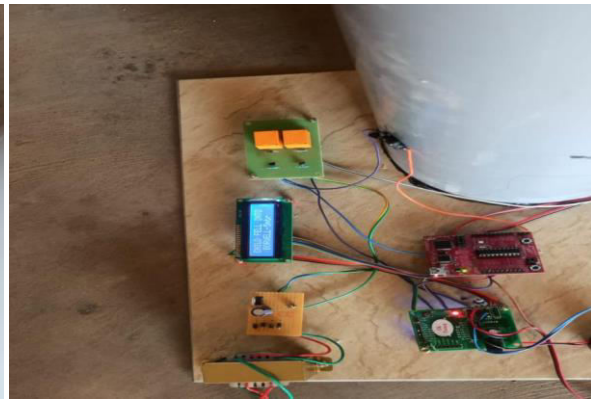
RESULT

Figure 3: Output Image I

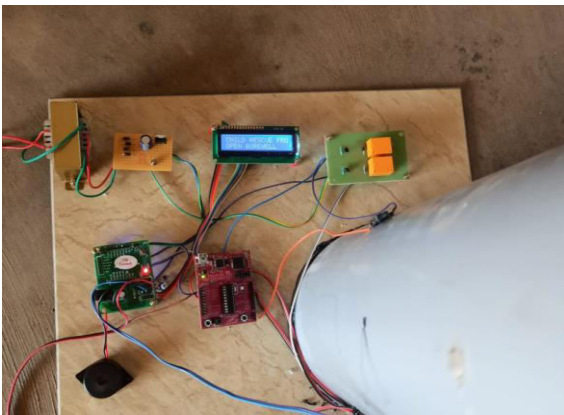**Figure 4: Output Image II**

Figure 5: Output Image III

Figure 6: Output Image IV

V.CONCLUSION

In this paper, we have developed a prototype module to rescue children falling in to bore-wells, this implies a new design which has a sensor kept at top of bore-well hole which helps to sense the child if he falls inside. If the system senses the child the automatic horizontal closure kept at around 5ft dept closes and prevents the children from falling beneath. In future, this paper can be taken to the product level as a project which is user friendly and durable; we need to make it compact and cost effective. Going further, most of the units can be embedded along with the controller on a single board with change in technology, thereby reducing the size of the system.

VI.FUTURE SCOPE

- In future we can use this project in several applications by adding additional components to this project.
- The proposed system is developed in order to rescue children and other small creatures from bore well. This consists of a sensor kept at top of bore-well. Kids are the future builders of the nation; hence accidents faced by them should be immediately handled to save their lives.

REFERENCES

[1] B Bharathi, B Suchitha Samuel, Design and Construction of Rescue Robot and Pipeline Inspection Using Zigbee,International Journal of Scientific Engineering and Research , 1(2), 2013, 42-49.

[2] PalwinderKaur, Ravinder Kaur, Gurpreet Singh, Pipeline Inspection and Bore Well Rescue Robot,International Journal of Research in Engineering and Technology, 2(5), 2014, 04-12.

[3] K Saran, S Vignesh, Marlon Jones Louis, Bore-well Rescue Robot, International Journal of Research Aeronautical and Mechanical Engineering, 1(4), 2014, 61-80.

[4] VVenmathi, E Poorniya, S Sumathi, Borewell Rescue Robot,International Journal of Computer Applications, 1(3), 2015, 14-23. [5] John Jose pottery, "robot for bore well rescue", amaljothi college of engineering, vol. 10, Jun 2009.

[5] S. Gopinath, T. Devika, L. Manivannan, N. SuthanthiraVanitha, "Rescue Child from Bore well using Embedded System", 2015.

[6] V. Venmathi, E. Poorniya, S. Sumathi, "Borewell Rescue Robot", International Journal of Computer Applications, vol. 113, no. 14, 2015.

[7] C.N. Sakhale, 2D.M. Mate, 3Subhasis Saha, TomarDharmpal, PranjitKar, Arindam Sarkar, Rupam Choudhury, Shahil Kumar, "An Approach to Design of Child Saver Machine for Child Trapped in Borehole", International Journal of Research in Mechanical Engineering, pp. 26-38, October-December 2013.

[8] Shuhai Wang, G. Gowtham, G. Venkatachalam, S. Narayanan, "School of Mechanical

[9] Building Sciences" in Design and Simulation of Bore well rescue robot- Advanced ARPN

[10] Journal of Engineering and Applied Sciences, India:VIT University, MAY 2014.

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