# Smart Child Borewell Robot Rescue System

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***Abstract*— This paper is generally based on the child rescue in the bore well. Nowadays child falls into an abandoned bore well, which is left uncovered and get trapped. Normal operation to rescue the child is to pit a dig nearer to the bore well. That logic is difficult and also risky to rescue the trapped child. It takes extra time to recover the child from the bore well. Here we are proposing a robotic system which will attach a harness to the child using pneumatic arms for picking up. A teleconferencing system will also be attached to the robot for communicating with the child. The mechanical system moves inside the uncontrolled bore well. Accordance with the user command given to the Arduino, the mechanical setup is controlled. The hardware is attached to the PC, to stimulate the DC motor. This kind of system can release trapped baby from the bore well securely within lesser time. In order to implement this we are using IP camera, Bluetooth, Microcontroller 8051(newton),.**

***Keywords—IP camera, Bluetooth, Microcontroller 8051***

## I. INTRODUCTION

The expected number of wells and bore wells in India is now around twenty-seven million, with bore wells accounting for more than 50 percent. Growing water scarcity is being standard as the most important problem in India. Since the water level is decreasing day by day so more number of people are affected. Bore wells are constructed to fulfill the needs. These bore wells are left unclosed after finding that ground water is not abundant in the place.

Bores yielded water and subsequently got depleted are left uncovered. The bore wells in turn have started to take many innocent lives. Small children without noticing the bore well slip inside and get trapped. There is no proper technique to rescue method for such accidents. In most cases a parallel hole is dug up and then a horizontal path is made to reach to the baby. It takes nearly 30 hours to dig the parallel pit, by that time the child would have died.

It is a time taking process, and also risky in various ways. Moreover, it requires lots of energy and expensive resources which are not easily available everywhere. There is possibility of injuries to the child inside the well.

In most of the cases the child rescue operation was ended with failure. To lift the child out the narrow confines of the bore well is also not very easy. In some other methods a kind of hooks and grapes is employed to hold the child's clothes and body. This may cause wound on the body of the child.

Bikaner district (Rajasthan),we witnessed the death of a two year-old girl named Sarika who had fallen in a 155-feet deep open bore-well and on the same day, a two-year-old girl, Kinjal Man Singh Chauhan, fell in an open bore-well in village Madeli (Gujarat) and died. On February 6, 2007, a two-year-old boy, Amit, fell in a 56-feet deep well in a village near Katni (MP) and died. On March 9, 2007, in Karmadia (Gujarat) three year-old died due to same. On June 17,2007 an open bore-well in village Shiroor (Pune, Maharashtra) claimed the life of a five-year-old child. Six-year old Suraj lost his life when he fell in a 180-feet-deep bore-well in village Nimada (Jaipur, Rajasthan) on July 4th,2007. On August 4,2007 six-year-old Kartik died when he slipped in a 200-feet-deep open bore-well in village Botala Gudur (Andhra Pradesh). This was the year of sorrow as small accidents were taking the lives of innocent children. The most common thing in those incidents was a fact of lack of technology. This didn't stopped hear yet.

Fig. 1. Image of a bore-well .Image taken during the rescue operation[2]

On March 25, 2008 a three-year-old girl, Vandana, fell in a 160-feet-deep open bore-well in village Tehra near Agra. 2-year old Sonu fell in 150 feet deep bore well pit in the northern state of Uttar Pradesh. He was brought out dead after

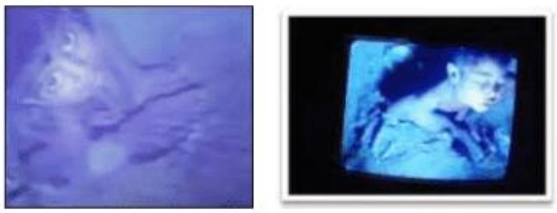


Fig. 2 Image of the boy named Prince felt in the bore-well. Image Courtesy Zee News[2][3]

four days of rescue operation.In 2009, Kirtan Pranami, an 11-year-old boy from Palanpur in Gujarat died after he fell into a 100ft (30m) bore-well. Within months, two-year-old Darawath Mahesh fell into a 35ft (10m) bore-well in

Warangal in Andhra Pradesh and died. Five-year-old child who fell into a 250-feet deep bore-well in Jaipur in 2009 was also saved. Four-year-old Anju Gujjar was rescued also from a 50-foot deep open bore-well in Rajasthan.

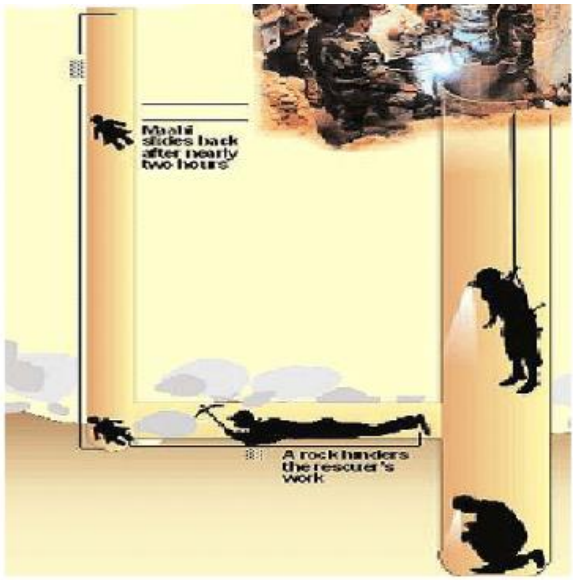



Fig. 3 .Graphical representation of the rescue task by the Indian Army Jawans[4]

The redemption of 4-year old Mahi (2012) took army experts 86 hours ordeal combat which led to the death of the poor kid. Other sad incidents in 2012 was the deadly incidents of 4-year old boy of Tamil Nadu (2011), 1-year old Payal of Indore (2012), 12-year old Bakul of Gujarat (2012), or 17-year old Roshan of Howrah, West Bengal (2012).

Fig. 4. The child (Mahi) found dead after 86 hours of operation. Image taken during the rescue task[5]

The sadness caries out even now after 6 years from the first case that gain huge limelight and support from the media. Each time something happens we find ourselves ill-equipped to deal with the crisis and the precious time elapses. We first observed an extensive approach [5] from the Indian Army military jawans (L&T ,GMR) in the case of Mahi (2012). As the rescuer team found that the task of picking up the kid in a straight path is not possible, they started to dig up another well in form of a well in not so far distance from the accident spot. An army man was been lowered into the new parallel pit where he started to dig a vertical lane to reach Mahi. The rescue operation is graphically illustrated in the Fig. 3.The operation lasted for around 86 hours and at last what her parents got was the body without internal soul.

### 1.1 Microcontroller 8051(NEWTON)

The microcontroller incorporates all the features that are found in microprocessor. The microcontroller has built in ROM, RAM, input output ports, serial port, timers, interrupts and clock circuit. A microcontroller
is an entire computer manufactured on a single chip. Microcontroller are usually dedicated devices embedded within an application. For example, microcontrollers are used as engine controllers in automobiles and as exposure and focuse controller in cameras.

### 1.2 Camera

Closed-circuit television (CCTV), also known as video surveillance, is the use of video cameras to transmit a signal to a specific place, on a limited set of monitors. It differs from broadcast television in that the signal is not openly transmitted, though it may employ point to point (P2P), to multipoint, or mesh wireless links. In industrial plants, CCTV equipment may be used to observe parts of a process from a central control room.

### 1.3 HC-05-Bluetooth to serial port module

HC-05 module is an easy to use Bluetooth SPP( serial port protocol) module, designed for transparent wireless serial connection setup.
Serial port Bluetooth module is fully qualified Bluetooth v2.0+EDR(Enhanced DataRate) 3Mbps modulation with complete 2.4GHz radio transceiver and baseband. It uses CSR Bluecore 04-External signal chip Bluetooth system with CMOS technology and with AFH(Adaptive Frequency Hopping Feature).
It has the footprint as small as 12.7mmx27mm.Hope it will simplify your overall design/development cycle.

### Display(PC)

Display is a thin, flat electronic visual display that uses the light modulating properties of liquid crystals (LCs). LCs does not emit light directly. They are used in a wide range of applications including: computer monitors, television, instrument panels, aircraft cockpit displays, signage, etc. They are common in consumer devices such as video players, gaming devices, clocks, watches, calculators, and telephones. LCDs have displaced cathode ray tube (CRT) displays in most applications. They are usually more compact, lightweight, portable, less expensive, more reliable, and easier on the eyes. They are available in a wider range of screen sizes than CRT and plasma displays, and since they do not use phosphors, they cannot suffer image burn-in. LCDs are more energy efficient and offer safer disposal than CRTs. Its low electrical power consumption enables it to be used in battery-powered electronic equipment. It is an electronically-modulated optical device made up of any number of pixels

filled with liquid crystals and arrayed in front of a light source (backlight) or reflector to produce images in colour.

## II. AVAILABLE SOLUTIONS

So far there is no proper solution available for giving relief in such accidents. Generally, a hole parallel to the bore-well is dug up then a horizontal path is created to reach to the subject's body. But it takes too much time to save the life of the sufferer. Moreover, it involves a lot of energy, and expensive resources which are not easily available everywhere. It also involves possibilities of damaging the body of sufferer during the rescue operation loom large.

In some cases makeshift arrangrments are made to pull out the body of sufferer. In such methods some kind of hooks are used and sufferers body organs get caught hold of. This may cause wounds on the affected body.

**Possible aleternative solutions**

To overcome such problems of these rescue operations, we have an alternative proposal. We can develop a robot machine that can take out the trapped body in systematic way. It will also perform various life saving operations for the sufferers such oxygen supply. A video camera to observe the actual situation closely and continuous interaction with the sufferer could also be attached.
It will be a light weight machine that will go down into the bore-well pipe and hold the trapped body systematically. In this alternative scenario, there will be no requirement of digging any hole parallel to the bore-well.

## III.METHODOLOGY

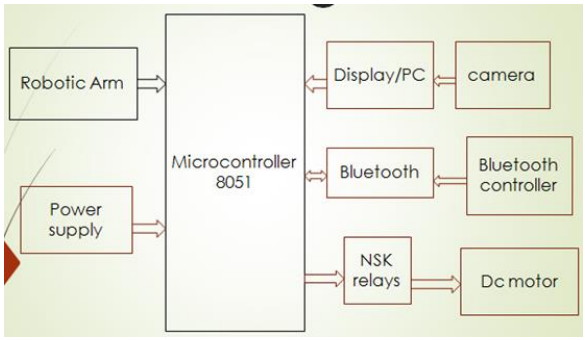
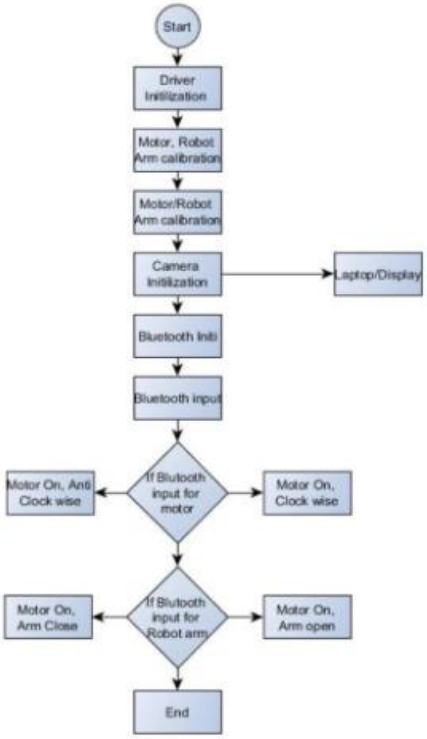



Figure 1: Block Diagram of IOT Based Artificial Intelligence Women Protection Device

When the switch is pressed, the device will get activated automatically with in a fraction of milliseconds. Immediately the location of the victim will be tracked and messages will be sent to emergency Smart Intelligent Security System for Women contacts. The screaming alarm unit will be activated and will produce siren sound to call out for help. electric shock is applied to harm the attacker which may help the victim to escape. Live Streaming Video will make to process the situation of the victim using a preferred IP address so that it help to detects the face of the attacker along with the surrounding environment that helps to figure out easily.

Live streaming video using webcam are incorporated in the system which act as a new weapon for smart technology.

Figure 2: Flow chart




## V. CONCLUSION

A robotic framework for rescue robotics in bore-well environment has been proposed here. Deeply observing those incidents and looking at the current circumstances we feel that we need to develop such framework for saving those innocent lives. In addition there is a whole new research area waiting ahead us which deals with lots of challenges relating to mapping in unknown environment, real-time teleoperation in low lighting conditions, arm manipulation system. Rather than the technical development we would be highly satisfied if it can fulfill the most important aspect of the project, which is to *save a life*.

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