**Embedded Systems and IOT**

**Embedded Systems:**

An embedded System is a microprocessor -or microcontroller-based system of hardware and software designed to perform dedicated functions within a larger mechanical or electrical system.

**IOT:**

IOT stands for internet of things.

The internet of things is a system of interrelated computing devices, mechanical and digital machines, objects and other things that are provided with unique identifiers and the ability to transfer data over a network without requiring human to human or human to computer interaction.

**What’s an embedded system in IOT?**

An embedded system in IOT is still an embedded system. What makes it different is that it happens to also connect to the internet, or another network like home network, in order to perform functions that go beyond what’s happen on the system itself.

For example: Smart refrigerator. It may have sensors inside the fridge that can detect levels of produce. Through its connection to the internet (like smartphone), it can order produce from a store when levels of a certain item fall by a certain amount.

**Note:**

All IOT devices have embedded systems, but not all embedded systems are part of the IOT.

**How does Smart Water Tank works?**

This system consists of two devices and a application. The first device, smart level device, measures the height of water tank to control the level and upload the real-time data to cloud.

Another device, motor controlled device, switches on/off the motor automatically by receiving the signal from the smart level device through GSM module. The relay is used to control the motor once they receive the signal.

1.The Smart level device uses the ultrasonic sensor to sense the tank height and uploads the sensed data to the cloud every minute. The cloud is used for storage and analysis purpose; the GPRS/GSM module has been used configured with Arduino and UR sensor to upload the data to the cloud.

2.The smart level device sends the signal to the controlled motor device to ON and OFF the motor at the specified time(when tank height reaches top and it reaches bottom) automatically.

3.controlled motor device uses the relay connected with a motor to get on/off automatically. The motor and relay are configured with Arduino and GSM module to receive the signal and perform the specified operation to make motor on/off.

4.The application is used to monitor the current level of the water tank automatically; it fetches the data from cloud with an interval continuously. The app will be able to force on or force off the motor by signaling the controlled motor device.

5.The signal will be in the form of text SMS sent from the app to the GSM module in the controlled motor device which will automatically turn on/off the motor using relay.

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data is used for leakage detection and proposed system architecture. In Sect. 3,we

discuss about the smart water level device and motor controlled device, how they

function and provide data for automatic tank system and leakage detection. In Sect. 4,

we discuss the hybrid app architecture, system ﬂow information, and the leakage

detection/dimension algorithm of the water tank. In Sect. 5, we discuss the issues

faced by the Smart system and ﬁnally we will draw conclusion and future works.

2 Related Work

In [1] this project, we are presenting the idea of smart water tank management system

which is operated with Arduino microcontroller. By using this microcontroller, we

are preventing the manual intervention for continuous water supply.

It can be also used for other industries. The main focus of this project is to provide

the optimal water distribution, and it also reduces the man power which is involved

in operating the water management manually. We can easily see that many of water

resources are wasted because of lack of inefﬁcient and poor water allocation and lack

of integrated water management system. Measuring the level of water manually is a

big task for government and residential people.

Our project helps us to automatically measure the level of water in the tank and

prevent the wastage of water resource available. We all know that water is very

essential for each and every living creature in this world so, wasting water is not

good for anyone. So monitoring the water management system automatically helps

us to reduce the wastage of water.

The system is made using the ultrasonic sensor which will sense the accurate level

of water and according to that we can smartly manage our system through the mobile

app which is used by each and every person in today’s world.

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The Microgrid system consists of two devices and a hybrid application. The ﬁrst

device, smart level device, measures the height of water tank to control the level and

uploads the real-time data to cloud. Graph below shows how the data is stored in the

cloud from smart level device