

# Smart City Using IOT

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**Abstract—** Most of the world's population today lives in cities. By 2030, the population of the cities around the world is expected to grow from 3.3 billion to 5 billion people. Smart city is an urban development vision to integrate multiple Information and Communication Technology (ICT) and Internet of Things (IOT).

Due to resource constraints, there will be a problem in the future to provide all the services to the residents. To continue to serve and improve the standard of living of the growing population, it is necessary to develop smart cities. The Smart City aims to make optimal and sustainable use of all resources, while maintaining an appropriate balance between social, environmental and economic costs. In the Smart City, maximum use is made of ICT to improve the functioning, management, and supervision of the variety of systems and services, with an emphasis on saving energy, water, land and other natural resources. The IoT is a modular approach to merge various sensors with all the ICT solutions. With over 50 billion objects will be connected and deployed in smart cities in 2020. The heart of smart cities operations is the IoT communications. IoT is designed to support Smart City concept, which aims at utilizing the most advanced communication technologies to promote services for the administration of the city and the citizens.

**Keywords—** Internet of Things (IOT), ICT, communication technologies

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## I. INTRODUCTION

We come across the situation where we need to keep a watch over abnormalities like pipeline leakage, garbage overflow, water supply problems etc. Now keeping human labor for this purpose is not so effective for keeping a watch an area 24x7. The purpose of this project is to serve and improve the standard of living of the growing population, it is necessary to develop smart cities. The smart city aims to make optimal and sustainable use of all resources, while maintaining an appropriate balance between social, environmental and economic costs.

This system of consists of ultrasonic sensor that continuously monitors the target, solenoid valve for water supply through web, ESP266 Wi-Fi module used for internet. Upon detecting the target, it alerts a buzzer and displays on LCD and the information of all activities is stored in a AWS web page for the track of the system. The main advantages of the proposed system are maintenance cost reduction, wireless communication, reduction of manpower. The programming of Microcontroller is done using C OR C# Programming.

## II. SIGNIFICANCE OF WORK

An embedded system is a special-purpose computer system designed to perform one or a few dedicated functions, sometimes with real-time computing constraints. It is usually embedded as part of a complete device including hardware and mechanical parts. In contrast, a general-purpose computer, such as a personal computer, can do many different tasks depending on programming. Embedded systems have become very important today as they control many of the common devices we use.

Since the embedded system is dedicated to specific tasks, design engineers can optimize it, reducing the size and cost of the product, or increasing the reliability and performance. Some embedded systems are mass-produced, benefiting from economies of scale.

Physically, embedded systems range from portable devices such as digital watches and MP3 players, to large stationary installations like traffic lights, factory controllers, or the systems controlling nuclear power plants.

Complexity varies from low, with a single microcontroller chip, to very high with multiple units, peripherals and networks mounted inside a large chassis or enclosure.

In general, "embedded system" is not an exactly defined term, as many systems have some element of programmability. For example, Handheld computers share some elements with embedded systems — such as the operating systems and microprocessors which power them — but are not truly embedded systems, because they allow different applications to be loaded and peripherals to be connected.

An embedded system is some combination of computer hardware and software, either fixed in capability or programmable, that is specifically designed for a particular kind of application device. Industrial machines, automobiles, medical equipment, cameras, household appliances, airplanes, vending machines, and toys (as well as the more obvious cellular phone and PDA) are among the myriad possible hosts of an embedded system. Embedded systems that are programmable are provided with a programming interface, and embedded systems programming is a specialized occupation.

Certain operating systems or language platforms are tailored for the embedded market, such as Embedded Java and Windows XP Embedded. However, some low-end consumer products use very inexpensive microprocessors and limited storage, with the application and operating system both part of a single program. The program is written permanently into the system's memory in this case, rather than being loaded into RAM (random access memory), as programs on a personal computer are.

### III. METHODOLOGY

The flow chart describes the process of working of the project. At first ultrasonic sensor starts sensing the level of dustbin and also the water level is sensed using two wires. Then, if in the dustbin the trash is more than 75% and if the leakage is detected then the LCD will display that the bin is full and leakage detected. Buzzer also starts beeping and this gives indication to authorities to empty the dustbin and repair the pipeline. At all the time the data is sent to server using wi-fi module.

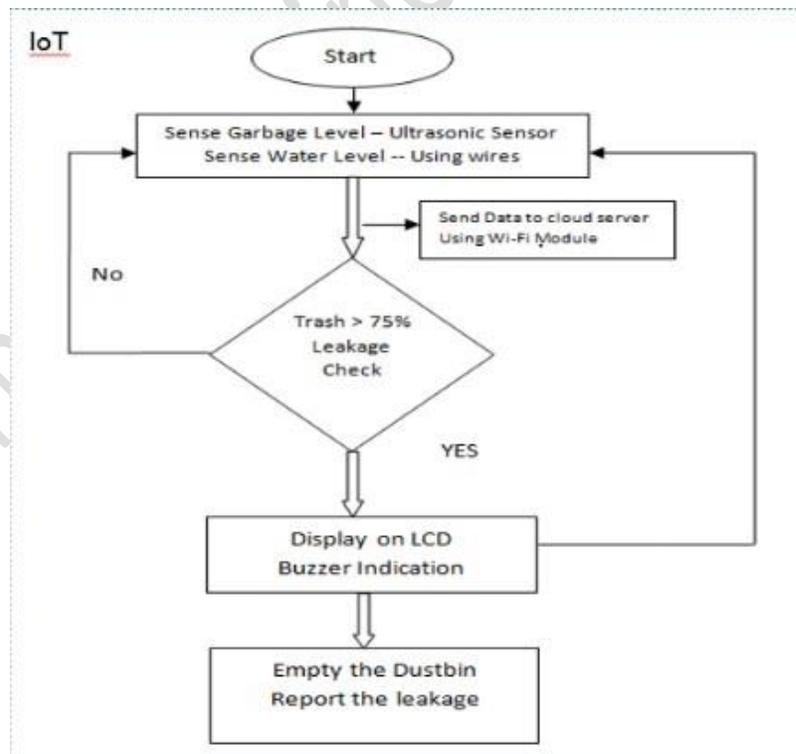


Fig 1: Block Diagram

**IV. RESULT**

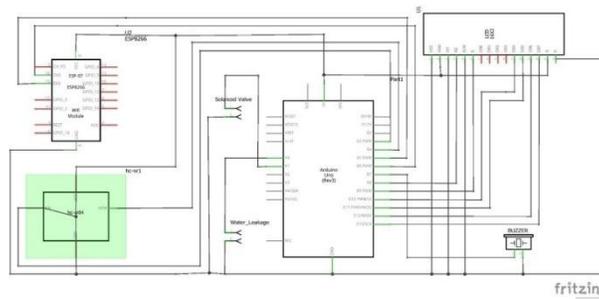


Fig 2: Pin Diagram

Below shown is the web page which displays the level of trash in the bin in the range from 0 to 100%. If the bin is above 75% then on the LCD it will be printed that “Bin is Full” and also buzzer will beep. For every 15 seconds the sensor data will be updated in the server.

It also shows the status of the solenoid value, at what time it is off and ON, including the date. Also it depicts the status of water pipe line leakage, whether there is leakage or not at given point of time.

Bin_Level_%	Water_Leakage	Valve_Status	DATE_TIME
25	No Leakage	OFF	09:12:37 18/09/2021
50.00	No Leakage	OFF	09:42:33 18/09/2021
0.00	No Leakage	OFF	09:42:45 18/09/2021
0.00	No Leakage	OFF	09:42:58 18/09/2021
0.00	Leakage Detected	OFF	09:42:21 18/09/2021
0.00	No Leakage	OFF	09:42:44 18/09/2021
0.00	Leakage Detected	OFF	09:42:56 18/09/2021
75.00	Leakage Detected	OFF	09:43:08 18/09/2021
60.00	Leakage Detected	OFF	09:43:21 18/09/2021
0.00	No Leakage	OFF	09:43:45 18/09/2021
0.00	No Leakage	OFF	09:44:01 18/09/2021
0.00	No Leakage	OFF	09:44:16 18/09/2021
80.00	No Leakage	OFF	09:44:41 18/09/2021
77.00	No Leakage	OFF	09:45:01 18/09/2021

Fig: 3:Output

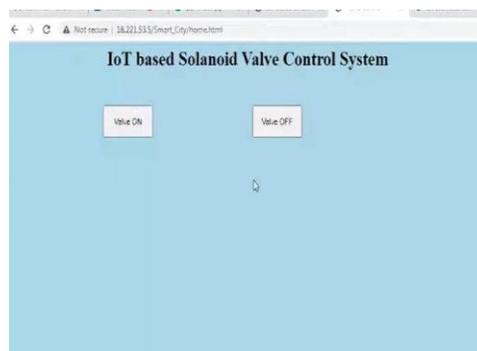


Fig 4: IOT based System

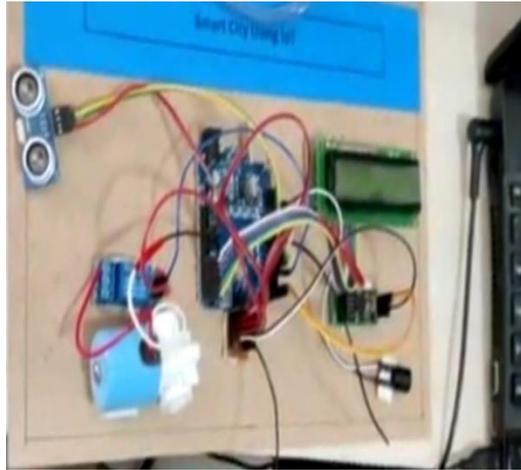


Fig 5: Circuit Design

#### V. CONCLUSION

The Smart City aims to make optimal and sustainable use of all resources, while maintaining an appropriate balance between social, environmental and economic costs. In the Smart City, maximum use is made of ICT to improve the functioning, management, and supervision of the variety of systems and services, with an emphasis on saving energy, water, land and other natural resources. Hence the smart city aims at utilizing the most advanced communication technologies to promote services for the administration of the city and the citizens.

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