

1. INTRODUCTION

This project proposes the introduction of a smart bin system or an electronic dust bin that automatically updates data into the mainframe as to the identification of the individuals who put the waste in the bin, whether the bin is full or empty, and it also runs on renewable energy.

the bin consists of a proximity sensor installed in its storage chamber that senses the input of waste. It then sends a signal to a microcontroller that activates the barcode reader. The barcode reader then reads the barcode provided by the individual and feeds it into the server mainframe.

The smart in will also have the ability of giving out certain audio output regarding the user(like thanking him for using the dustbin).

This apparatus is designed to generate awareness between individuals and encourage them to drop garbage in the dustbin specifically and keep the environment clean.

2. LITERATURE SURVEY

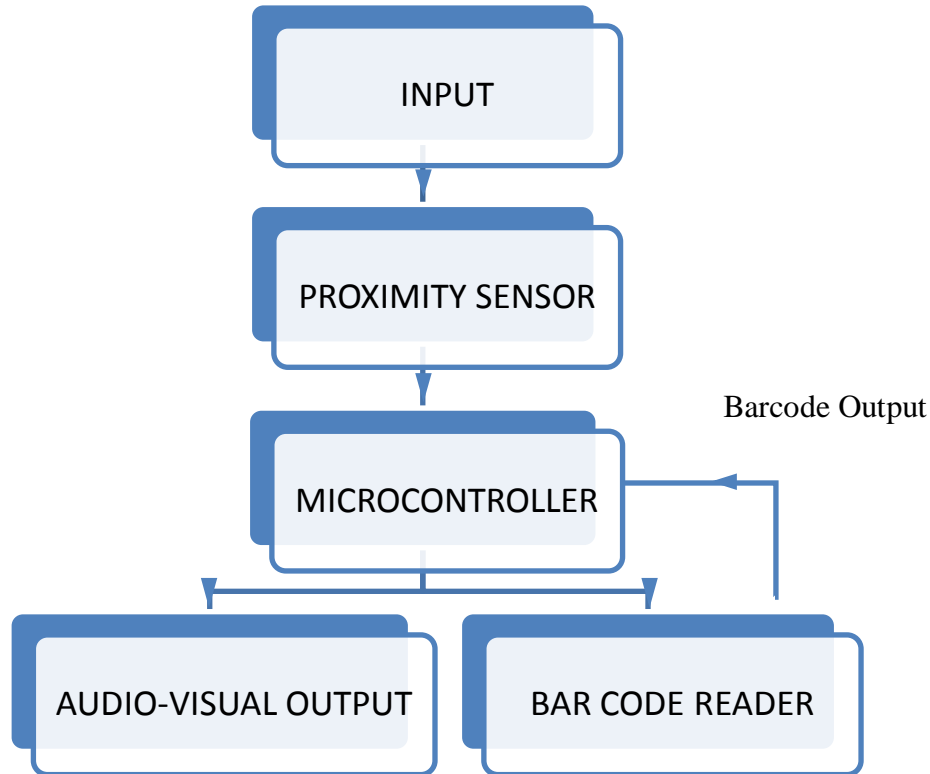
In this modern world, clean environment is the most hospitable and efficient way of living. There are many institutions in any political infrastructure that take care of the cleaning systems. But still many countries across the world (especially India) face a catastrophe in waste management. This is not due to the working efficiency of the waste management systems, but the problem lies in the ignorance of the citizens itself.

Basically people would rather throw waste where they produced it than find a nearby dustbin to dispose it. In a world where entertainment is the outmost attraction, a recent workshop conducted by Volkswagen ltd. Called "The Fun Theory" indicates that any social element can be made more productive by an interactive medium for the society.

This is where the smartbin is applicable. The smartbin is a waste storage device which apart from storing waste, keeps account of the individuals disposing it and also encourages them to put the waste in the bin specifically.

PIC is a family of [modified Harvard architecture microcontrollers](#) made by [Microchip Technology](#), is originally developed by [General Instrument](#)'s Microelectronics Division. The name PIC initially referred to "**Peripheral Interface Controller**" now it is "**PIC**" only.

3. BLOCK DIAGRAM& WORKING:

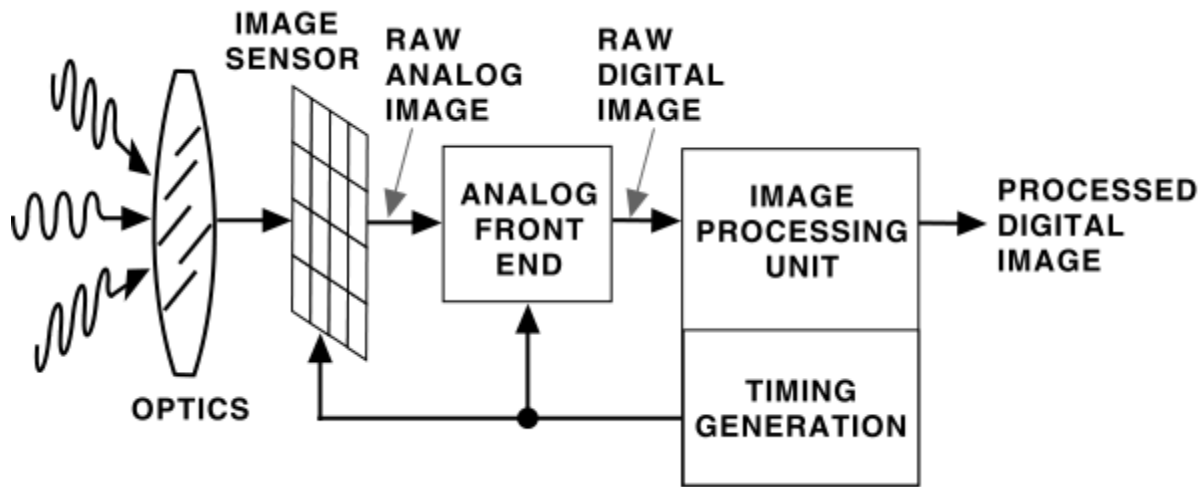


(Fig.3.1). Block diagram for Automated Smart Bin

In the figure 3.1 the operation of the smartbin is represented as an organized flow chart. It consists of the following Steps:

- STEP1. Input(waste object) is supplied to the smartbin
- STEP2. The proximity sensor detects the presence of waste being dumped in the bin and sends a signal to the microcontroller.
- STEP3. The microcontroller activates the soundbox and bar-code scanner(for 10 seconds) Simultaneously
- STEP4. The soundbox gives out an audio message fed by the microcontroller.
- STEP5. The bar-code reader reads the individuals identity bar-code and sends it back to the microcontroller for logging.

➤ **BARCODE READER:**



(Fig.3.2)

A **barcode reader** (or **barcode scanner**) is an electronic device for reading printed [barcodes](#). Like a [flatbed scanner](#), it consists of a light source, a lens and a light sensor translating optical impulses into electrical ones. Additionally, nearly all barcode readers contain *decoder* circuitry analyzing the barcode's image data provided by the sensor and sending the barcode's content to the scanner's output port.

➤ **PROXIMITY SENSOR:**

A **proximity sensor** is a [sensor](#) able to detect the presence of nearby objects without any physical contact.

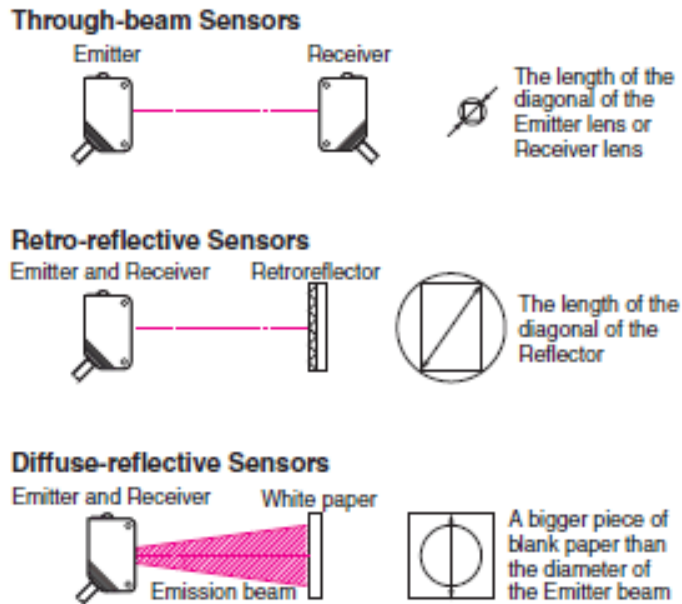
A proximity sensor often emits an [electromagnetic](#) field or a beam of [electromagnetic radiation](#) ([infrared](#), for instance), and looks for changes in the [field](#) or return signal. The object being sensed is often referred to as the proximity sensor's target. Different proximity sensor targets demand different sensors. For example, a [capacitive](#) or [photoelectric sensor](#) might be suitable for a plastic target; an [inductive](#) proximity sensor always requires a metal target.

The maximum distance that this sensor can detect is defined "nominal range". Some sensors have adjustments of the nominal range or means to report a graduated detection distance.

Proximity sensors can have a high reliability and long functional life because of the absence of mechanical parts and lack of physical contact between sensor and the sensed object.

Proximity sensors are commonly used on smartphones to detect (and skip) accidental touchscreen taps when held to the ear during a call.^[1] They are also used in machine vibration monitoring to measure the variation in distance between a shaft and its support bearing. This is common in large steam [turbines](#), [compressors](#), and motors that use sleeve-type [bearings](#).

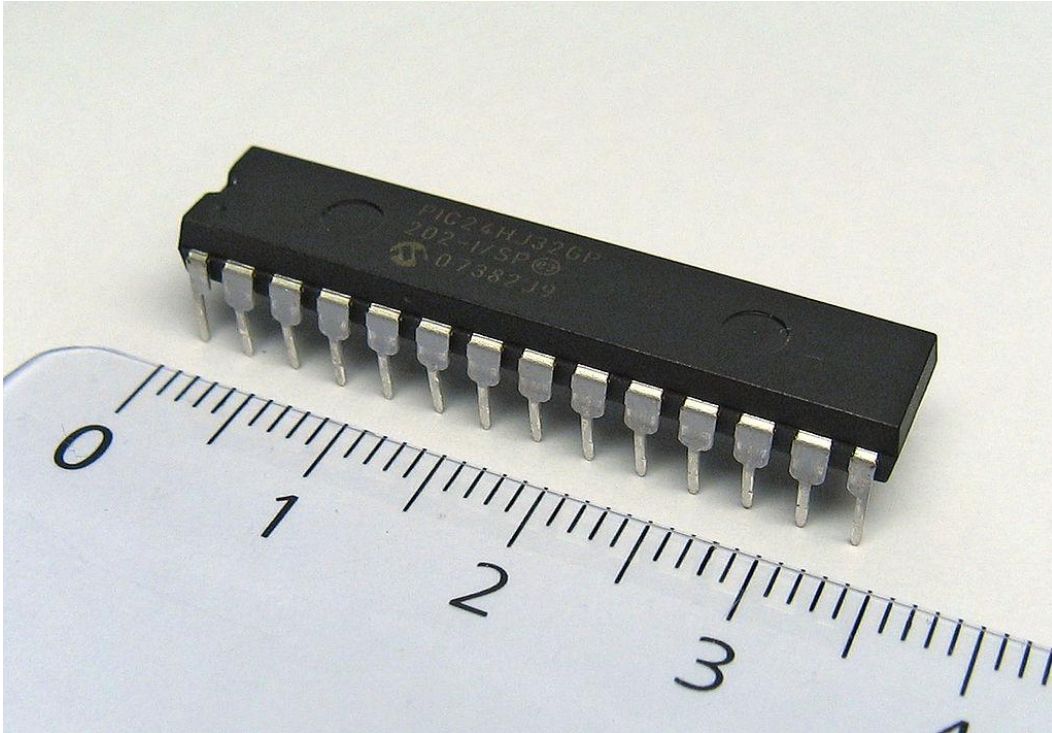
In this project, the retro-reflective type of sensor is utilized due to its optimal efficiency.



(Fig.3.3)

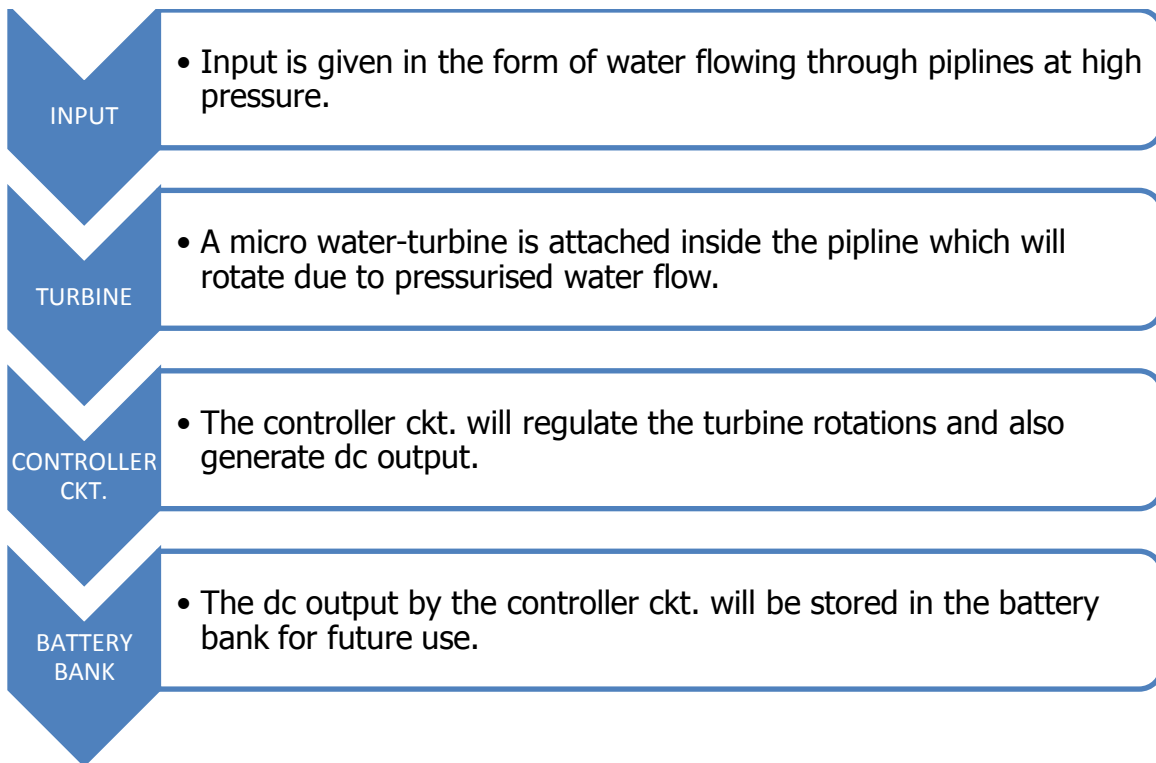
➤ P.I.C. MICROCONTROLLER:

PICs are popular with both industrial developers and hobbyists alike due to their low cost, wide availability, large user base, extensive collection of application notes, availability of low cost or free development tools, and serial programming (and re-programming with flash memory) capability.



(Fig.3.4)

➤ **POWER SUPPLY:**



The micro-turbine is expected to generate approximately *15v dc*, which is sufficient to run the smartbin.

4. ADVANTAGES:

- It has a user friendly interface for interacting with individuals.
- It encourages individuals to use the smartbin for waste disposal thereby making the environment clean.
- It runs on clean energy(Self powering Hydroelectric generation system)
- It is in compliance with development of the society.

5. APPLICATION

This device can be used in any *private or govt. institution* with infrastructural advancement.

Common institutions where this device is applicable are:

- Educational institutes
- M.N.C.s
- Corporate sector
- Banking institutes

6. REFERENCES

- Funthoery.com
- Accurate sensor technologies pvt. Ltd.
- PIC technocraft.com
- <http://sensordrain/barcodesensor/blockdiagram/>