SMART WASTE MANAGEMENT SYSTEM FOR METROPOLITIAN CITIES

TEAM ID: PNT2022TMID18889

1. INTRODUCTION

1.1 PROJECT OVERVIEW

Our metropolitan cities don't always have a proper waste management system. It is very important to keep our cities clean so that a healthy lifestyle can be maintained and a major pollution can be prevented. It is very important nowadays to have a regular look of the waste bins and other garbage collecting zones. It is important to alert the local authorities to warn about the level of garbage in the locality and to ensure the levels of garbage of that locality.

The rate at which solid wastes are produced in most developing countries is becoming alarming. This increase may be due to recent population growth and rural-urban migration. Garbage is made up of non-renewable resources used daily to meet our needs then throw away. As increase in consumption of paper, clothing, bottles, and product packaging increases, the generation of garbage also increases significantly. The form and type of solid waste depends on a number of factors which include the living standard and life style of the inhabitants of the region and the natural resources found in the region. There are two categories of Urban waste namely, organic and inorganic. The organic waste category can be further categorized into three units: nonfermentable, fermentable and putrescible. The Putrescible wastes tend to decay faster, and if not cautiously managed, decomposition can lead to an offensive odour with an unpleasant view. Fermentable waste which also tends to decompose rapidly do so without the accompanying of offensive odour. Non-fermentable waste most times do not decompose or do so at a very slow rate. Unless organic waste is managed appropriately, the stricken negative effect it has will continue until full decomposition or stabilization occurs. Decomposed products which are poorly managed or uncontrolled can and often times lead to contamination of air, water and soil resources.

1.2 PURPOSE

The purpose of the project is to find a smart way to manage the solid wastes in the metropolitan cities. The waste management system can be made simple and effective with the application of the IOT devices and developing a web application to develop a smart waste management system to monitor and to dispose the waste in metropolitan cities. It is a very effective way of managing waste. The main objective of the smart waste management system in metropolitan cities is to watch the level of garbage in the bins of a particular locality and to watch their weight of the garbage bins when the garbage bins attains the threshold level of garbage, the local authority is alerted about the level of the garbage as weight in kilograms and the location of the bin in that locality using Global positioning system to obtain the location of that particular bin and the waste is evacuated from that area. This system will help the authorities from preventing the overflow of the garbage which further prevents the spread of diseases and bad odor from that garbage bin this is a modern solution to prevent the evil effects of the unavoidable disposal of the garbage in the metropolitan cities. This smart waste management system prevents involves some of the major leading technologies such as the Internet of Things, Embedded System and Web app development. The usage of Cloud in involved to take care of various parameters which are used to measure the garbage waste in that locality and to update the local authorities about the garbage levels in the bins which are in that locality and to warn the local authorities about the garbage level and the location of the overflowing bin. When the local authorities are warned with the garbage levels the local authorities can take some precautionary measures to evacuate the solid waste from that particular bin.

2. LITERATURE SURVEY

2.1 EXISTING PROBLEM

According to the Challenges and opportunities associated with waste management in India by Sunil Kumar, Stephen R. Smith, Geoff Fowler, Costas Velis, S. Jyoti Kumar, Shashi Arya, Rena, Rakesh Kumar and Christopher Cheeseman-2017

Population growth and particularly the development of megacities is making SWM in India a major problem. The current situation is that India relies on inadequate waste infrastructure, the informal sector and waste dumping. There are major issues associated with public participation in waste management and there is generally a lack of responsibility towards waste in the community. There is a need to cultivate community awareness and change the attitude of people towards waste, as this is fundamental to developing proper and sustainable waste management systems.

Sustainable and economically viable waste management must ensure maximum resource extraction from waste, combined with safe disposal of residual waste through the development of engineered landfill and waste-to-energy facilities. India faces challenges related to waste policy, waste technology selection and the availability of appropriately trained people in the waste management sector. Until these fundamental requirements are met, India will continue to suffer from poor waste management and the associated impacts on public health and the environment.

2.2 REFERENCES

[1] "IoT-Enabled Smart Waste Management Systems for Smart Cities: A Systematic Review",INNA SOSUNOVA 1 AND JARI PORRAS , https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=9815071

[2] Manju Mohan, Kuppan Chetty Ramanathan, Vijayram Sriram,"IOT Enabled Smart Waste Bin with Real Time Monitoring for efficient waste management in Metropolitan Cities" http://www.kscst.iisc.ernet.in/spp/39_series/SPP39S/01_Seminar%20Projects/068_39S_BE_0321.pdf

[3]"IOT Enabled Smart Waste Bin with Real Time Monitoring for efficient waste management in Metropolitan Cities" https://www.researchgate.net/publication/338342002_IOT_Enabled_Smart_Waste_Bin_with_Real_Time_Monitoring_for_efficient_waste_management_in_Metropolitan_Cities

[4]Joel Rodrigues,Sergei Arkadevich Kozlov,Neeraj Kumar,"Actuator Networks Sensor and IoT-Based Solid Waste Management Solutions: A Survey" https://www.researchgate.net/publication/330038645_Actuator_Networks_Sensor_and_IoT-Based_Solid_Waste_Management_Solutions_A_Survey

[5]**Harit Priyadarshi**, **Sarv Priya**, **Ashish Jain**, **Ashish Jain**,"A Literature Review on Solid Waste Management: Characteristics, Techniques, Environmental Impacts and Health Effects in Aligarh City", Uttar Pradesh, India. Gary Davidson Waste Management Projects Officer Office of Sustainability – Dalhousie University,June 2011

[6]**Krishna Murali**, **K K Baseer**, **Thirumalakonda**, **Abbas Ali Poralla**"Smart Garbage Monitoring System using IoT" https://www.researchgate.net/publication/353234708_Smart_Garbage_Monitoring_System_using_IoT

2.3 PROBLEM STATEMENT DEFINITION

With the existing methods of collecting and disposal it is nearly imposible to manage such amount of waste in future.Around 30% of waste endup on roads and public places due to ineffective disposing and collecting methods.Waste management suffers from a pervasive under-pricing which means that the costs of waste management are not fully appreciated by consumers and industry and waste disposal is preferred over other options. Few waste treatment options are available than landfill costs.

The transformation of an urban habitation into a smart zone consists of multiple parameters for optimal implementation, where primary parameters include technology, data, and people. The genesis of smart cities has evolved from the need of sustainable development and a better future for humankind. The shortcomings and issues associated with the current urban waste management practices can be suitably dealt through the integration of tools such as the ‘internet of things’ (IoT)

Recycling not only saves energy but also prevents the materials from going to landfills & incineration, and provides raw materials for new products. Installing more bins for collecting recyclables like paper, glass, plastics, etc., and then recycling them can be a huge step. The biggest challenge in the direction of Effective Waste Management is to educate and aware of the masses because in a country with a huge population, the waste management issues can’t be resolved without the proper contribution of its population. Some of the possible measures in this direction could be establishing a proper awareness system, developing policies related to the throwing of waste, etc.

3. IDEATION AND PROPOSED SOLUTION

3.1 EMPATHY MAP CANVAS

AIM:
Garbage level detection and weighing
Alerts to authorized persons to empty the bin
Monitoring the bins using web app with GPS
Can view the bin levels

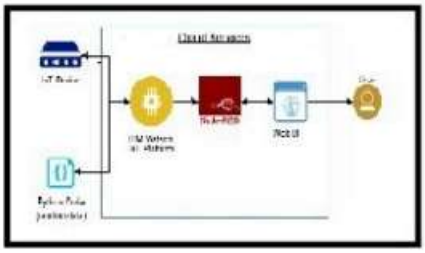
PAINS:
Uncertainity in the garbage levels may lead to false predictions.
Uncertainity in the GPS location may lead to false predictions.
Receiving late notification can create a huge discomfort.
Cannot be accessed by all the lower level of employees.
When monitoring over a large area GPS may not be a good idea.

GAINS:
Waste management system can be monitored remotely.
Much efficient system for managing the smart bins.
Easy to locate the smart bins and their levels of garbage in it.
Notifications are made to the officials to dump the trash and to clean the specific area.
Can be split into divisions to maek the best use of the smart waste management.

USAGE:
Waste management system can be made easy by making a mobile applocation and using GPS to locate the smart bins.

Smart bins can be made easily and of low cost.

Can be notified to the officials about the levels of the trash in the particular locality.



OUTCOME:
Waste management can be done in a much efficient manner.
Using GPS the waste management the location and the level of the trash in the particular location can be easily identified.
Can be operated remotely.
Easy to replace and relocate the bins if necessary.
Low cost of production.

3.2 IDEATION AND BRAINSTROMING

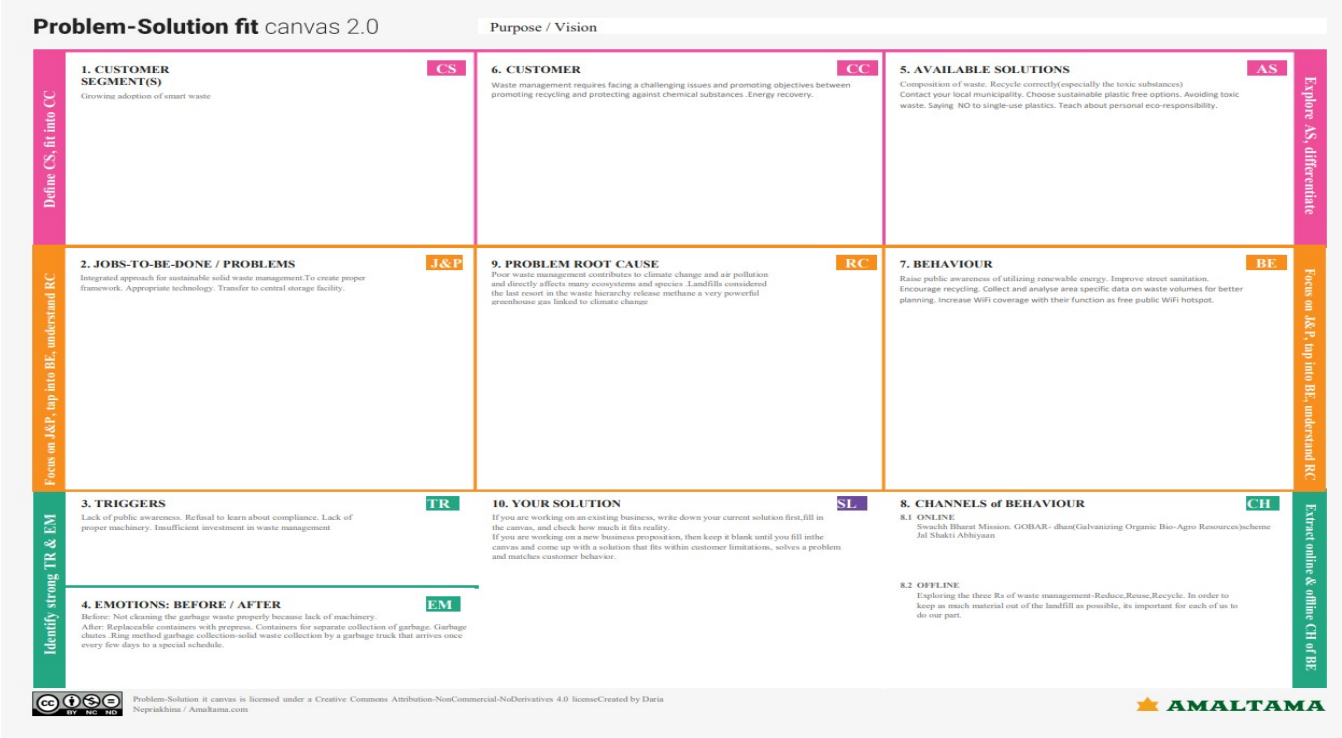
3.3 PROPOSED SOLUTION

Recycling not only saves energy but also prevents the materials from going to landfills & incineration, and provides raw materials for new products. Installing more bins for collecting recyclables like paper, glass, plastics, etc., and then recycling them can be a huge step. The biggest challenge in the direction of Effective Waste Management is to educate and aware of the masses because in a country with a huge population, the waste management issues can't be resolved without the proper contribution of its population. Some of the possible measures in this direction could be establishing a proper awareness system, developing policies related to the throwing of waste, etc.

The Proposed system consists of main subsystems namely Smart Trash System(STS) and Smart Monitoring and Controlling Hut(SMCH). In the proposed system, whenever the waste bin gets filled this is acknowledged by placing the circuit at the waste bin, which transmits it to the receiver at the desired place in the area or spot.
In the proposed system, the received signal indicates the waste bin status at the monitoring and controlling system.

When left to their own device people don't always bother to sort their waste into the proper waste or recycling bins .To help reduce improper recycling sorting. This can lower waste management costs by as much as 80% and drastically improve employee efficiency.

3.4 PROPOSED SOLUTION FIT



Problem-Solution fit canvas 2.0

Purpose / Vision

Define CS, fit into CC

1. CUSTOMER SEGMENT(S) — CS

Growing adoption of smart waste

6. CUSTOMER — CC

Waste management requires facing a challenging issues and promoting objectives between promoting recycling and protecting against chemical substances .Energy recovery.

5. AVAILABLE SOLUTIONS — AS

Composition of waste. Recycle correctly(especially the toxic substances) Contact your local municipality. Choose sustainable plastic free options. Avoiding toxic waste. Saying NO to single-use plastics. Teach about personal eco-responsibility.

Explore AS, differentiate

Focus on J&P, tap into BE, understand RC

2. JOBS-TO-BE-DONE / PROBLEMS — J&P

Integrated approach for sustainable solid waste management.To create proper framework. Appropriate technology. Transfer to central storage facility.

9. PROBLEM ROOT CAUSE — RC

Poor waste management contributes to climate change and air pollution and directly affects many ecosystems and species .Landfills considered the last resort in the waste hierarchy release methane a very powerful greenhouse gas linked to climate change

7. BEHAVIOUR — BE

Raise public awareness of utilizing renewable energy. Improve street sanitation. Encourage recycling. Collect and analyse area specific data on waste volumes for better planning. Increase WiFi coverage with their function as free public WiFi hotspot.

Focus on J&P, tap into BE, understand RC

Identify strong TR & EM

3. TRIGGERS — TR

Lack of public awareness. Refusal to learn about compliance. Lack of proper machinery. Insufficient investment in waste management

4. EMOTIONS: BEFORE / AFTER — EM

Before: Not cleaning the garbage waste properly because lack of machinery.
After: Replaceable containers with prepress. Containers for separate collection of garbage. Garbage chutes .Ring method garbage collection-solid waste collection by a garbage truck that arrives once every few days to a special schedule.

10. YOUR SOLUTION — SL

If you are working on an existing business, write down your current solution first,fill in the canvas, and check how much it fits reality.
If you are working on a new business proposition, then keep it blank until you fill inthe canvas and come up with a solution that fits within customer limitations, solves a problem and matches customer behavior.

8. CHANNELS of BEHAVIOUR — CH

8.1 ONLINE
Swachh Bharat Mission. GOBAR- dhan(Galvanizing Organic Bio-Agro Resources)scheme Jal Shakti Abhiyaan

8.2 OFFLINE
Exploring the three Rs of waste management-Reduce,Reuse,Recycle. In order to keep as much material out of the landfill as possible, its important for each of us to do our part.

Extract online & offline CH of BE

AMALTAMA

4. REQUIREMENT ANALYSIS

4.1 FUNCTIONAL REQUIREMENTS

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Detailed Explanation of bin	You can see bin details in the Dashboard – capacity, waste type, last measurement, GPS location and collection schedule.
FR-2	Monitoring using real time examples	Displays real-time data on fill-levels of bins monitored by smart sensors. With real-time dataand predictions, you can eliminate the overflowing bins and stop collecting half-empty ones
FR-3	Cost of bins	It helps to identify bins that drive up your collection costs. The tool calculates a rating foreach bin in terms of collection costs.
FR-4	Adjusting level of garbage	Identify areas with either dense or sparse bin distribution. Make sure all trash types are represented within a stand.
FR-5	Eliminate unsufficient garbage	Eliminate the collection of half-empty bins. By using real-time data on fill-levels and pick recognition, we can show you how full the binsyou collect are.
FR-6	Planning for waste collection	The tool semi-automates waste collection routeplanning. Based on current bin fill-levels and predictions of reaching full capacity, you are ready to respond and schedule waste collection.

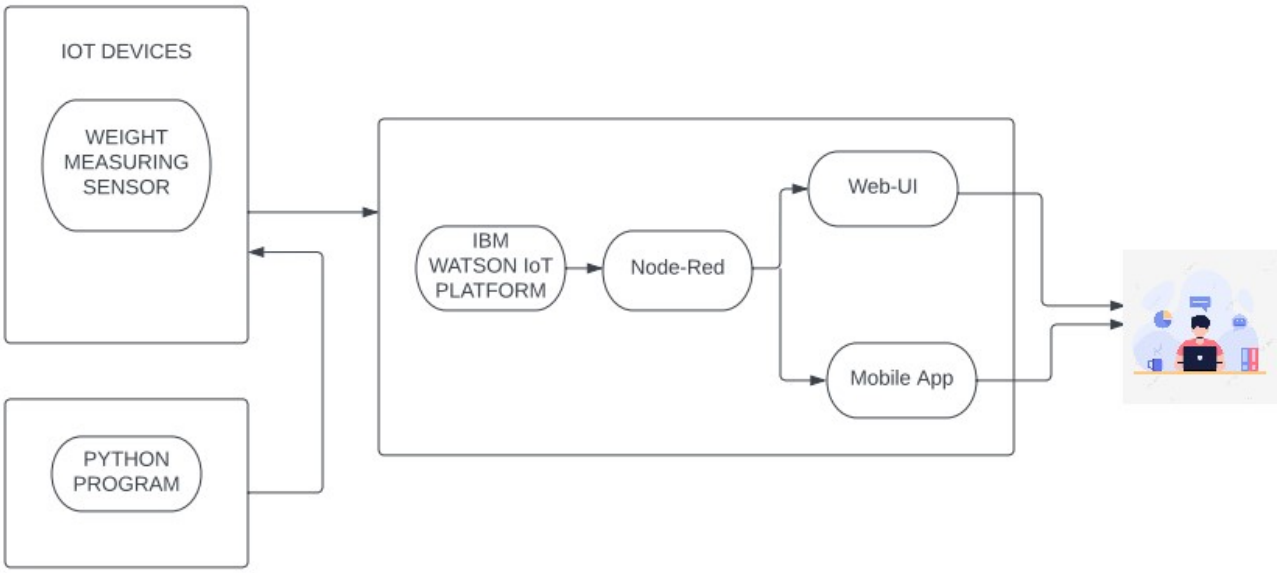
4.2 NON FUNCTIONAL REQUIREMENTS

Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	In the design process with user experience as thecore, the analysis of users' product usability can indeed help designers better understand users' potential needs in waste management, behavior and experience.
NFR-2	**Security**	Use a reusable garbage Purchase wisely and recycle Avoid single use food and drink containers
NFR-3	**Reliability**	Smart waste management is also about creating better working conditions for waste collectors anddrivers.
NFR-4	**Performance**	Using a variety of IoT networks ((NB-IoT,GPRS), the sensors send the data to Sensoneo's Smart Waste Management Software System, a powerfulcloud-based platform, for data driven daily operations, available also as a waste management app.
NFR-5	**Availability**	Another purpose of this project is to make the proposed waste management system as cheap aspossible. By developing & deploying resilient hardware and beautiful software we empower cities, businesses, and countries to manage wastesmarter.
NFR-6	**Scalability**	By using smart waste bins, we able to monitor the garbage frequently and number of bins will be reduced.

5. PROJECT DESIGN

5.1 DATA FLOW DIAGRAMS



5.2 USER STORIES

User Type	Functional Requirement (Epic)	User story number	User story/Task	Acceptance criteria	Priority	Risk
Admin	Login	USN-1	Admin gives user id and password for each and every workers and helps to manage.	I can access my account / dashboard	Medium	Sprint-2
Assistant Admin	Login	USN-2	They help us to monitor the garbage level once it is filled alert message will be thrown with location.	I can manage and monitor the garbage level	High	Sprint-1
Driver	Login	USN-3	They will follow the location where the garbage is filled and collect them in the truck.	I can drive to reach the garbage where it is filled using location and collect them	Medium	Sprint-2
Garbage Collector	Login	USN-4	It will collect the trash and load it into the garbage truck and send to landfill.	I can collect the trash and load them in truck	Medium	Sprint-2
Government Municipality	Login	USN -5	It will check the Process without Involving any issues	I can manage the process smoothly	High	Sprint-1

6 PROJECT PLANNING AND SCHEDULING

6.1 SPRINT PLANNING AND ESTIMATION

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Login	USN-1	As an Administrator, I need to give user id andpasscode for municipality workers & control the waste level by monitoring them via real time web portal. Once the filling happens, I'll notify trash truck with location of bin with bin ID.	20	High	Cherina Williams Paul
Sprint-2	Dashboard	USN-2	As a Truck Driver, I'll follow Co-Admin's Instruction to reach the filling bin in short rootsand save time	20	Low	Dena Dinesh
Sprint-3	Dashboard	USN-3	As a Local Garbage Collector, I'll gather all thewaste from the garbage, load it onto a garbage truck, and deliver it to Landfills	20	Medium	Dharshini Priya
Sprint-4	Dashboard	USN-4	As a Municipality officer, I'll make sure everything is proceeding as planned andwithout any problems	20	High	Kaarunya

6.2 SPRINT DELIVERY SCHEDULE

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date(Actual)
Sprint-1	20	6 Days	24 Oct 2022	29 Oct 2022	20	29 Oct 2022
Sprint-2	20	6 Days	30 Oct 2022	05 Nov 2022	20	05 Nov 2022
Sprint-3	20	6 Days	05 Nov 2022	11 Nov 2022	20	11 Nov 2022
Sprint-4	20	6 Days	13 Nov 2022	19 Nov 2022	20	19 Nov 2022

7 CODING AND SOLUTIONING

7.1 FEATURE 1

```
Import requests

import json
import ibmiotf.application
import ibmiotf.device
 import time
import random
import sys

   # watson device details
organization = "4yi0vc"
devicType = "BIN1"
deviceId = "BIN1ID"
authMethod= "token"
authToken= "123456789"

#generate random values for randomo variables (temperature&humidity)
        def myCommandCallback(cmd):global a
        print("command recieved:%s" %cmd.data['command'])
        control=cmd.data['command']
        print(control)
        try:
    deviceOptions={"org": organization, "type": devicType,"id": deviceId,"auth-
    method":authMethod,"auth-
token":authToken}
deviceCli =ibmiotf.device.Client(deviceOptions)except Exception as e:
print("caught exception connecting device %s" %str(e))sys.exit()

#connect and send a datapoint "temp" with value integer value into the cloud as
a type of event for every 10 secondsdeviceCli.connect()
while True:
   distance= random.randint(10,70)loadcell= random.randint(5,15)
```

```
   data= {'dist':distance,'load':loadcell}

        if loadcell < 13 and loadcell 15:
        load = "90 %"
        elif loadcell < 8 and loadcell > 12:
        load = "60 %"
        elif loadcell < 4 and loadcell > 7:
        load = "40 %"
        else:

load = "0 %"
      if distance < 15:
           dist = 'Risk warning:' 'Dumpster poundage getting high, Time to collect :)
90 %'
     elif distance < 40 and distance >16:
        dist = 'Risk warning:' 'dumpster is above 60%'
     elif distance < 60 and distance > 41:
dist = 'Risk warning:' '40 %'
      else:
        dist = 'Risk warning:' '17 %'
if load == "90 %" or distance == "90 %":
        warn   = 'alert :' ' Dumpster

        poundage getting high, Time to

        collect :)'

elif load == "60 %" or distance == "60 %":

warn = 'alert :' 'dumpster is above 60%'

else :

warn = 'alert :'
'No need to
```

```
collect right now '
def myOnPublishCallback(lat=10.678991,long=78.177731):
        print("BUS STAND, SALEM")
        print("published distance = %s " %distance,"loadcell:%s "
    %loadcell,"lon = %s " %long,"lat = %s" %lat)print(load)
        print(dist)print(warn)
        time.sleep(10)
       success=deviceCli.publishEvent
("IoTSensor","json",warn,qos=0,on_publish= myOnPublishCallback)

success=deviceCli.publishEvent ("IoTSensor","json",data,qos=0,on_publish=
myOnPublishCallback)


        if not success:
    print("not connected to ibmiot")time.sleep(30)



    deviceCli.commandCallback=myCommandCallback#disconnect the device
        deviceCli.disconnect
```

8. TESTING

8.1 TEST CASES

- To predict the weight of the garbage bin
- To locate the location of the bin
- To send alerts to the local authorities about the garbage level

8.2 USER ACCEPTANCE TESTING

- To access the dashboard and to login using the login credentials given to particular individuals
- To monitor the garbage level using the mobile web application
- To locate the garbage bin using the global positioning syste
- Collecting the garbage from the garbage bins
- Dumping the solid waste to the scrap yard or other storage area
- Placing the garbage bin again in that same location

9. PERFORMANCE TESTING

9.1 PERFORMANCE METRICES

- The various parameters such as weight are measured and are stored in the cloud.
- The location of the garbage bins are taken into account and are monitored.
- The garbage bin when attains a threshold weight notification is sent to the local authorities about evacuating the waste.
- The accuracy of the sensor placed in the bin helps to maintain a standard threshold value at which the bins should be emptied

10. ADVANTAGES AND DISADVANTAGES

ADVANTAGES

- Overflowing of solid waste is prevented due to regular monitoring of the parameters
- Location of the garbage bins are sent to the local authorities so that it is easy to monitor the bins of that locality.
- Can be easily accessible from any part of the world.
- Easy to debug errors.
- Parameters are more accurate.

DISADVANTAGES

- Displacement of sensor may lead to error in parameters.
- Cannot be installed and repaired easily.

11. CONCLUSION

The solid waste management can be made more effective with the smart waste management system. The smart waste management system reduces the overflowing of the waste from the garbage and these smart waste management systems helps in preventing various diseases which are caused due to the open garbage bins.

The local authorities are also warned about the garbage levels and it is easy for them to evacuate the garbage from that locality using the global positioning system. The sensors are used to measure the weight of the garbage in the particular bin and it can be easily noticed by the local authorities using the web application which is created by the IBM Node RED application.

The smart waste management system helps the authorities to keep a eye on the garbage level in regular intervals. The smart waste management also includes the different waste management in different localities such as medical waste near hospitals and municipal waste in residential areas.

The spread of diseases in the residential areas can be prevented by using these smart waste management systems and it is used to prevent many contagious diseases which can prevent a community from being affected.

These smart waste management systems creates awareness among the people to handle the solid waste in a cautious manner so that it does not cause any harm to the society where they live in.

12. FUTURE SCOPE

The future scope of the smart waste management systems include adding surveillance facilities to that locality so that the waste management system can also include ensuring the security of the society they live in.

The smart waste management can also be upgraded by implementing sensors to recognize the bio degradable waste and non bio degradable waste. The bio degradable waste can be processed and can be used as a fertilizer for the kitchen garden or it can even be provided to the farmers of urban area to facilitate organic farming among the farmers.

The non biodegradable waste can be either disposed by means of land filling or by incinerating so that the waste does not cause any harm to the society by spreading various diseases and by spreading odor in the locality.

13.APPENDIX

SOURCE CODE

```
Import requests

import json
import ibmiotf.application
import ibmiotf.device
 import time
import random
import sys

   # watson device details
organization = "4yi0vc"
devicType = "BIN1"
deviceId = "BIN1ID"
authMethod= "token"
authToken= "123456789"

#generate random values for randomo variables (temperature&humidity)
        def myCommandCallback(cmd):global a
        print("command recieved:%s" %cmd.data['command'])
        control=cmd.data['command']
        print(control)
        try:
    deviceOptions={"org": organization, "type": devicType,"id": deviceId,"auth-
    method":authMethod,"auth-
token":authToken}
deviceCli =ibmiotf.device.Client(deviceOptions)except Exception as e:
print("caught exception connecting device %s" %str(e))sys.exit()

#connect and send a datapoint "temp" with value integer value into the cloud as
a type of event for every 10 secondsdeviceCli.connect()
while True:
   distance= random.randint(10,70)loadcell= random.randint(5,15)
```

```
   data= {'dist':distance,'load':loadcell}

        if loadcell < 13 and loadcell 15:
        load = "90 %"
        elif loadcell < 8 and loadcell > 12:
        load = "60 %"
        elif loadcell < 4 and loadcell > 7:
        load = "40 %"
        else:

load = "0 %"
      if distance < 15:
           dist = 'Risk warning:' 'Dumpster poundage getting high, Time to collect :)
90 %'
     elif distance < 40 and distance >16:
        dist = 'Risk warning:' 'dumpster is above 60%'
     elif distance < 60 and distance > 41:
dist = 'Risk warning:' '40 %'
      else:
        dist = 'Risk warning:' '17 %'
if load == "90 %" or distance == "90 %":
        warn   = 'alert :' ' Dumpster

        poundage getting high, Time to

        collect :)'

elif load == "60 %" or distance == "60 %":

warn = 'alert :' 'dumpster is above 60%'

else :

warn = 'alert :'
'No need to
```

```
collect right now '
def myOnPublishCallback(lat=10.678991,long=78.177731):
        print("BUS STAND, SALEM")
        print("published distance = %s " %distance,"loadcell:%s "
    %loadcell,"lon = %s " %long,"lat = %s" %lat)print(load)
        print(dist)print(warn)
        time.sleep(10)
       success=deviceCli.publishEvent
("IoTSensor","json",warn,qos=0,on_publish= myOnPublishCallback)

success=deviceCli.publishEvent ("IoTSensor","json",data,qos=0,on_publish=
myOnPublishCallback)


        if not success:
    print("not connected to ibmiot")time.sleep(30)



    deviceCli.commandCallback=myCommandCallback#disconnect the device
        deviceCli.disconnect
```

13.2 GITHUB AND PROJECT DEMO LINK

Github link https://github.com/IBM-EPBL/IBM-Project-26372-1660025671

Project demo https://youtu.be/OhRbCmHcz-E