# PROJECT REPORT

**IOT BASED SMART WASTE MANAGEMNET FOR METEROPOLITAN CITIES**


**TEAM ID : PNT2022TMID34106**

**TEAM LEADER :ARJITHA.S**

**TEAM MEMBERS :ANUSHA.M**
**AKSHAYA.A**
**ABINA.S**
**ANUSHA.A**

**DEPARTMENT :ELECTRONICS AND COMMUNICATION ENGINEERING**

**COLLEGE NAME :ARUNACHALA COLLEGE OF ENGINERING FOR WOMEN**

# CONTENTS

## 5. PROJECT DESIGN

1. Data Flow Diagrams

2. Solution & Technical Architecture

3. User Stories

## 6. PROJECT PLANNING & SCHEDULING

1. Sprint Planning & Estimation

2. Sprint Delivery Schedule

3. Reports from JIRA

## 7. CODING & SOLUTIONING (Explain the features added in the project along with code)

1. Feature 1

2. Feature 2

3. Database Schema (if Applicable)

## 8. TESTING

1. Test Cases

2. User Acceptance Testing

## 9. RESULTS

1. Performance Metrics

## 10. ADVANTAGES & DISADVANTAGES

## 11. CONCLUSION

## 12. FUTURE SCOPE

## 13. APPENDIX

Source Code

GitHub & Project Demo Link

# INTRODUCTION

## Project Overview

Internet Things refers to the network of connected physical objects that can communicate and exchange data among themselves without the desideratum of any human intervention. It has been formally defined as an “Infrastructure of Information Society” because IoT sanctions us to amass information from all kind of mediums such as humans, animals, conveyances, kitchen appliances. Thus, any object in the physical world which can be provided with an IP address to enable data transmission over a network can be made part of IoT system by embedding them with electronic hardware such as sensors, software and networking gear. IoT is different than Internet as in a way it transcends Internet connectivity by enabling everyday objects that utilizes embedded circuits to interact and communicate with each other utilizing the current Internet infrastructure.

## Purpose

Smart waste management is about using technology and data to create a more efficient waste industry. Based on IoT (Internet of Things) technology, smart waste management aims to optimize resource allocation, reduce running costs, and increase the sustainability of waste services.Smart waste management is characterized by the usage of technology in order to be more efficient when it comes to managing waste. This makes it possible to plan more efficient routes for the trash collectors who empty the bins, but also lowers the chance of any bin being full for over a week!

# LITERATURE SURVEY

| S. No | Year | Authors | Title | Methodology | Advantages | Disadvantages |
|---|---|---|---|---|---|---|
| 1 | 2019 | W. A. L. Gayanthika, | Efficient Waste with | Use of RFID tag to | The technology | Direct handling of |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | G. K. C. D. Madurang a, A. I. S. Silva, S. D. H. S. Wikramarat hn e, R. M. I. S. Ranasing he | anIntellige nt Trash Can. | validate the ID of the user and open the lid of the dustbin. If indeed the trashcan is overflowin g, send an sms to the administrat ion. | used here is both user-friendly and environme ntally beneficial, as it runs entirely on solar energy. | overflowing waste exposes for health risk. |
| **2** | 2016 | Meghana K C and K R Nataraj | Automated Garbage building Green Infrastruct ur e iot | Used IR sensor to sense the garbage level when it reaches the threshold. Location of the bin, date and current time are obtained. | Low-Cost. | Encourage recycling-onthe-go. |
| **3** | 2015 | Suyog Gupta and Dr.Pradeep Kumar | A case Study of Kanpur City's IOTBased | Used RFID systems along with GSM networks | No Water Bills | Drive down our carbon emissions. |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | Intelligent Bin for Smart Cities Real-Time Planning and Forecasting Strategy for Trash | to collect data and generate reports about solid waste collection. | | |
| **4** | 2020 | Ms. Akhila Joseph, Ms. Anjali, Ms. Suhaila B.M and Mr. | Implementing Intelligent Bins in Transport Systems | The refuse collectors were fixed along an ultrasonic sensor that collected garbage level data and uploaded it to the main server. | Reduction in stops and delays at intersections. | Garbage contaminates surface waters, which affects all ecosystems. |
| **5** | 2015 | Narayan Sharma, Nirman Singha and Tanmoy Dutta | Implementing Intelligent Bins in Transport Systems | Text messages indicating the levels were sent to the central office and the | Keeps the environment clean and fresh. | Overflowing waste causes air pollution and respiratory diseases. |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | updated values of the dustbin level are taken to form the real time report. | | |
| **6** | 2013 | Lilliana Abarca Guerrero, Ger Maas, William Hogland | Municipalities in emerging economies have a number of sewerage difficulties | Information was collected about the solid waste management system and segregation of waste | Reduces environmental pollution. | Bacteria, insects and vermin thrive from garbage. |
| **7** | 2020 | Telugu Maddileti ,Harish Kurakula | Iot Based Smart Dustbin | Smart Dustbin was created using ultrasonic sensors, Arduino, NodeMCU that opens the lid, when a biological | To earn money | Practices not done uniformly. |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | hand is found, and when garbage is detected and also sends the notification in the form of LED | | |
| **8** | 2015 | K. Vidyasagar, M. Sumalatha, K. Swathi and M. Rambabu | Refuse Picking Robotics in an Environm en tally Atmosphe re using RFID Connection | A mobile robot was created using IR sensors, RFID technology to collect the waste materials from a particular table. | Creates employme nt. | Waste manageme nt can cause more problems. |
| **9** | 2016 | Vishesh Kumar Kurre | Internet - of - things Intelligent Trash Collection Container Defendant and the plaintiff | Use Raspberry Pi,ARM Microcontr oller to absorb content from trash bin, | Practice is highly lucrative. | The resultant product as a short life. |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | Warning | process the data and finally share mail/message with Municipal Corporation. | | |
| **10** | 2021 | Srinivasan P, Thiyaneswara n B, Jaya Priya P, Dharani B, andKiruthiga V | Smarter Trash cans Leveraging Wifi | Such as a sensor and a node that senses and transmits the waste level in the trash can, and sent it onto such a webpage if the trash can is 70% full. | Saves the Earth and conserves energy. | Needs more Global Buy - in. |

# Existing problem

Waste management has become an alarming challenge in local towns and cities across theworld. Often the local area bins are overflowing and the municipalities are not aware of it. Thisaffects the residents of that particular area in numerous ways starting from bad odour tounhygienic and unsafe surroundings. Poor waste management - ranging from non-existingcollection systems to

ineffective disposal -causes air pollution, water and soil contamination.Open and unsanitary areas contribute to contamination of drinking water and can cause infectionand transmit diseases. Toxic components such as Persistent Organic Pollutants (POPs) poseparticularly significant risks to human health and the environment as they accumulate through the food chain. Animals eating contaminated plants have higher doses of contaminants than if they were directly exposed. Precipitation or surface water seeping through waste will absorb hazardous components from landfills, agricultural areas, feedlots, etc. and carry them into surface and groundwater. Contaminated groundwater also poses a great health risk, as it is often used for drinking, bathing and recreation, as well as in agricultural and industrial activities.

# References

[1]Hitesh Poddar, Rituraj Paul, Sourangsu Mukherjee & Budhaditya Bhattacharyya. (2017). Design of smart bin for smarter cities. In. IEEE Proceedings of Innovations in Power and Advanced Computing Technologies (i-PACT), Vellore.1-6.

[2]Rajkumar Joshi & Sirajuddin Ahmed. (2016). Status and challenges of municipal solid waste management in India: A review. Cogent Environmental Science, 2: 1139434, 1-18.

[3]Eunice Likotiko, Dmitry Petrov, Joseph Mwangoka & Ulrich Hilleringmann. (2018). Real time solid waste monitoring using cloud and sensors technologies. The Online Journal of Science and Technology, 8(1), 106-116.

[4]Sreejith S, Ramya R, Roja R. & Sanjay Kumar A. (2019). Smart Bin for Waste Management System. In. Poceedings of the IEEE 5th International Conference on Advanced Computing & Communication Systems, Coimbatore, India, 1079-1082.

[5]Hassan, S. A., Jameel, N.G.M. & Boran. S. (2016). Smart Solid Waste Monitoring and Collection System. International Journal of Advanced Research in Smart Solid Waste Monitoring and Collection System, 6(10), 7–12.

[6]Bhor, V., Morajkar, P. & Amol Deshpande. (2015). Smart Garbage Management System. International Journal of Engineering Research & Technology (IJERT), 4(3), 1117–1120.

# Problem Statement Definition

| Problem Statement (PS) | I am (Customer) | I'm trying to | But | Because | Which makes mefeel |
|---|---|---|---|---|---|
| PS-1 | Municipal corporation authority | Get notified when the trash cans are full and be made aware of where the full cans are located. | Don't havethe facilities atthe moment | There is no toolavailable to determine the level of bins. | Frustrated |
| PS-2 | Individual working for a private limited corporation | Get rid of the example of a surplus of waste | The trash cans are always filled | I occupy a metropolitan where there is acity is invariably crowd. | Worried |

# IDEATION & PROPOSED SOLUTION

## EmpathyMapCanvas

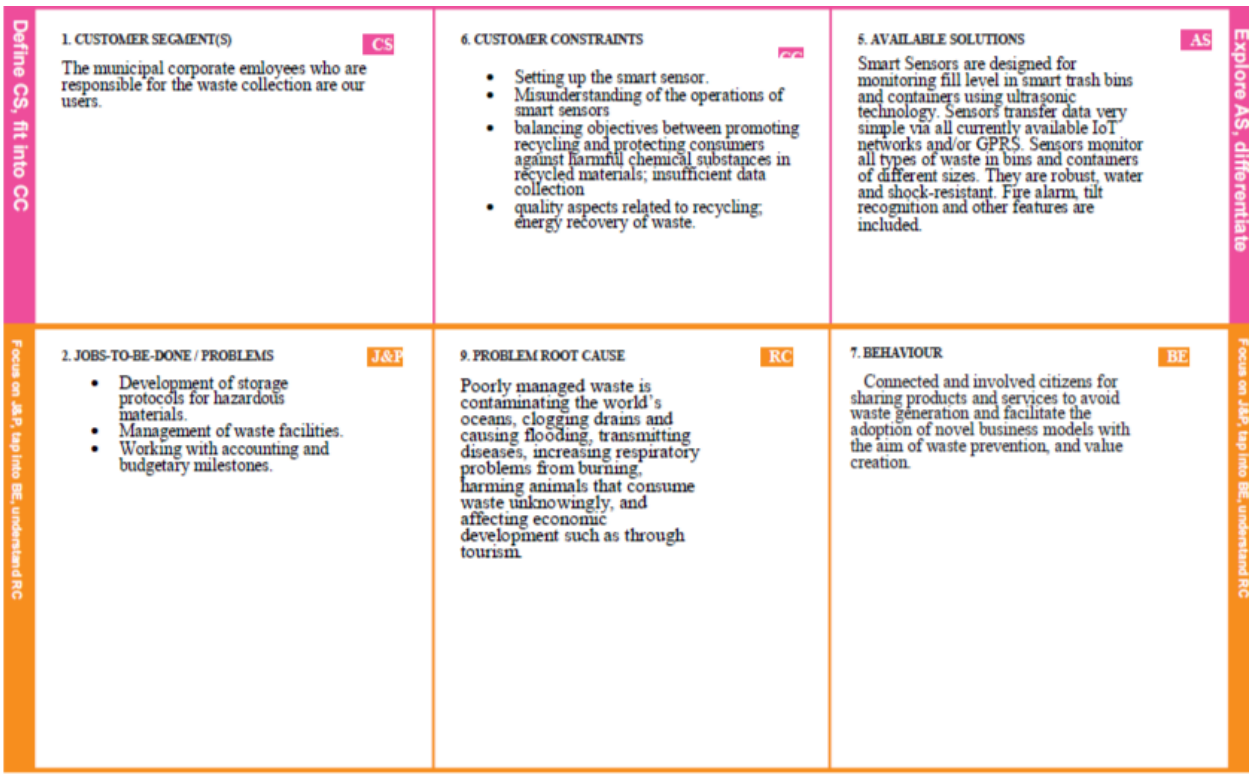

## Ideation & Brainstorming


# Proposed Solution

| S.No. | Parameter | Description |
|---|---|---|
| 1. | Problem Statement (Problem to be solved) | In accordance with the Waste Act, waste holders, such as private individuals, property owners or companies, are primarily responsible for the management of waste. An exception to this rule is the responsibility municipalities and certain manufacturers may have for organising waste management. |
| 2. | Idea / Solution description | GPS enabled to track the location<br>Solar panels that can power the trash function<br>IoT platform to manage the waste management solution networks<br>Data analytics to understand the usage<br>A powerful network that manages the network and trash bins to transmit the data. |
| 3. | Novelty / Uniqueness | In an effort to increase collection efficiency and reduce trips to and from the dump,manufacturer Ecube Labs created solar-powered trash compactor that can hold up to five times more than the traditional trash bins.These machines compress trash as it accumulates to increase bin capacity,and they collect and transmit data on fill and collection times to help streamline the collection process. |
| 4. | Social Impact / Customer Satisfaction | Bin-e is a smart waste bin that uses IoT technology to improve waste management.these smart bins use sensors,image-based trash recognition technology,and artificial intelligence,enabling them to automatically sort and categorize recycling litter into one of its small bins. |
| 5. | Business Model (Revenue Model) | The growth of IoT in our daily life, smart devices, and machine connectivity can reduce the expenses and operational costs in the process. In addition, companies can install the revolutionizing technology like IoT fleet management solutions that increase operational efficiency and customer satisfaction. |
| 6. | Scalability of the Solution | Scaling for Waste-Bin Geometry and Sensor Type<br>The scalability of waste-bin size and shape is made possible based on the following design choices: |

| | | |
|---|---|---|
| | | Each sensor has its own independent area of responsibility. The way the system was designed, each sensor is responsible for a specific area of the waste-bin and there is no overlap between areas of various sensors.<br>The chosen ultrasonic sensor comes in multiple versions of beam range and width. The type of sensor that was chosen is very versatile because a wide range of models exist with different characteristics concerning their beam width, detection range and resolution. All these models provide the same basic functionalities and logic of measurement. |

# Problem Solution fit




# REQUIREMENT ANALYSIS

## Functional requirement

| FR No. | Functional Requirement (Epic) | Sub Requirement (Story / Sub-Task) |
|---|---|---|
| FR-1 | User Registration | Registration through Form<br>Registration through Gmail<br>Registration through LinkedIN |
| FR-2 | User Confirmation | Confirmation via Email<br>Confirmation via OTP |
| FR-3 | User login | The user has to login by using valid user name and password.<br>After login successful he can do some operations such as add contents, view all contents, list all searching history, list ranking of images, list of all personalized search, attacker details, recover contents, list of all user and logout. |
| FR-4 | User add content | The user can add n-number of contents.<br>If the user want to add a new content, then user will enter a URL, domain, title, description, uses, related images of the particular content, then submit and that data will stored in data base. |
| FR-5 | User view | The user can view list of all users.<br>The user can view the attacker details. If admin clicks on attacker details button, the admin will get attacker information.<br>The user can view the comparison between greedy DP & greedy IL. |

## Non-Functional requirements

| FR No. | Non-Functional Requirement | Description |
|---|---|---|
| NFR-1 | **Usability** | Product simple and easy to install. |
| NFR-2 | **Security** | All communication must use end to end encryption. |
| NFR-3 | **Reliability** | The system should be reliable and must not degrade the performance of the existing system and should not lead to the hanging of the system. |
| NFR-4 | **Performance** | A reduction in the number of waste collections needed by up to 80%, resulting in less manpower, emissions, fuel use and traffic congestion. |
| NFR-5 | **Availability** | Easily integrated into your current waste management software system. |
| NFR-6 | **Scalability** | Capable of incorporating a large number of garbage sensors. |

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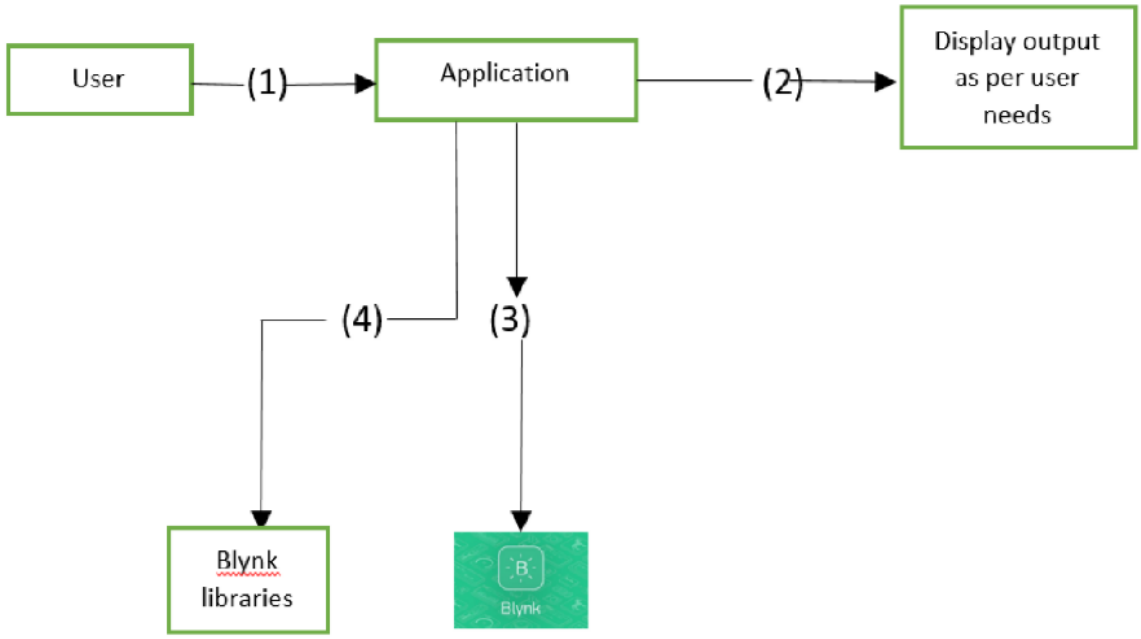
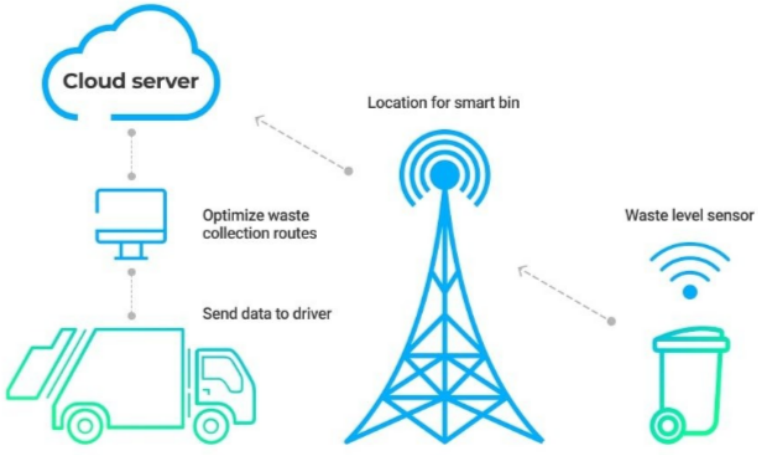
# PROJECT DESIGN

## Data Flow Diagrams




## Solution & Technical Architecture



# User Stories

| User Type | Functional Requirement (Epic) | User Story Number | User Story / Task | Acceptance criteria | Priority | Release |
|---|---|---|---|---|---|---|
| Customer (Mobile user) | Registration | USN-1 | As a user, I can register for the application by entering my email, password, and confirming my password. | I can access my account / dashboard | High | Sprint-1 |
| | | USN-2 | As a user, I will receive confirmation email once I have registered for the application | I can receive confirmation email & click confirm | High | Sprint-1 |
| | | USN-3 | As a user, I can register for the application through Facebook | I can register & access the dashboard with Facebook Login | Low | Sprint-2 |
| | | USN-4 | As a user, I can register for the application through Gmail | | Medium | Sprint-1 |
| | Login | USN-5 | As a user, I can log into the application by entering email & password | | High | Sprint-1 |
| | Dashboard | USN-6 | As a user,I can view the garbage | I can use this dashboard | High | Sprint1 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | storage level. | to see th garbage level as it provides genuine result for our clean environmen t. | | |
| | | USN-7 | As a user,I can see the nearer garbage collectors location phone number for any queries contact, notification bar. | I can view the nearest garbage collector loaction. | High | Sprint1 |
| | | USN-8 | As a user ,I can view the contact number of nearest garbage collector and wanted garbage location areas contact number also available for | I can access the contact number . | Low | Sprint-2 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | any queries . | | | |
| | | USN-9 | As a user ,I can view the notification bar if I missed to consider the garbage activities. | I can view the notification they will notify real time datas | High | Sprint1 |
| Customer (Web User) | | USN-10 | As a user,I can make a query or related doubts to the web developer as message option is available | I can make query related issues | High | Sprint1 |
| Customer care executive | | USN-11 | Customer care number is provided in the dashboard | I can make a call to customer care | Low | Sprint2 |
| Administrator | | USN-12 | As a admin, I can view the attacker details | I was notified at the time of admin dealing with attacker. | High | Sprint1 |

# PROJECT PLANNING & SCHEDULING

## Sprint Planning & Estimation

### Product Backlog, Sprint Schedule, and Estimation

Use the below template to create product backlog and sprint schedule

| Sprint | Functional Requirement (Epic) | User Story Number | User Story / Task | Story Points | Priority | Team Members |
|---|---|---|---|---|---|---|
| Sprint-1 | Registration | USN-1 | As a Administrator, I need to give user id and passcode for ever workers over there in municipality | 1 | high | |
| Sprint-1 | | USN-2 | As a Co-Admin, I'll control the waste level by monitoring them vai real time web portal. Once the filling happens, I'll notify | 1 | high | Akshaya.A |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | trash truck with location of bin with bin ID | | | |
| Sprint-2 | Login | USN-2 | As a Truck Driver, I'll follow Co-Admin's Instruction to reach the filling bin in short roots and save time | 2 | high | Arjitha.S |
| Sprint-3 | Dashboard | USN-3 | As a Local Garbage Collector, I'll gather all the waste from the garbage, load it onto a garbage truck, and deliver it to Landfills | 2 | Medium | Anusha.A |
| Sprint-4 | Blynk-App | USN-4 | As a Municipality officer, I'll make sure | 2 | High | Anusha.M<br>Abina.S |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | everything is proceeding as planned and without any problems | | | |

# Sprint Delivery Shedual

**Project Tracker, Velocity & Burndown Chart**

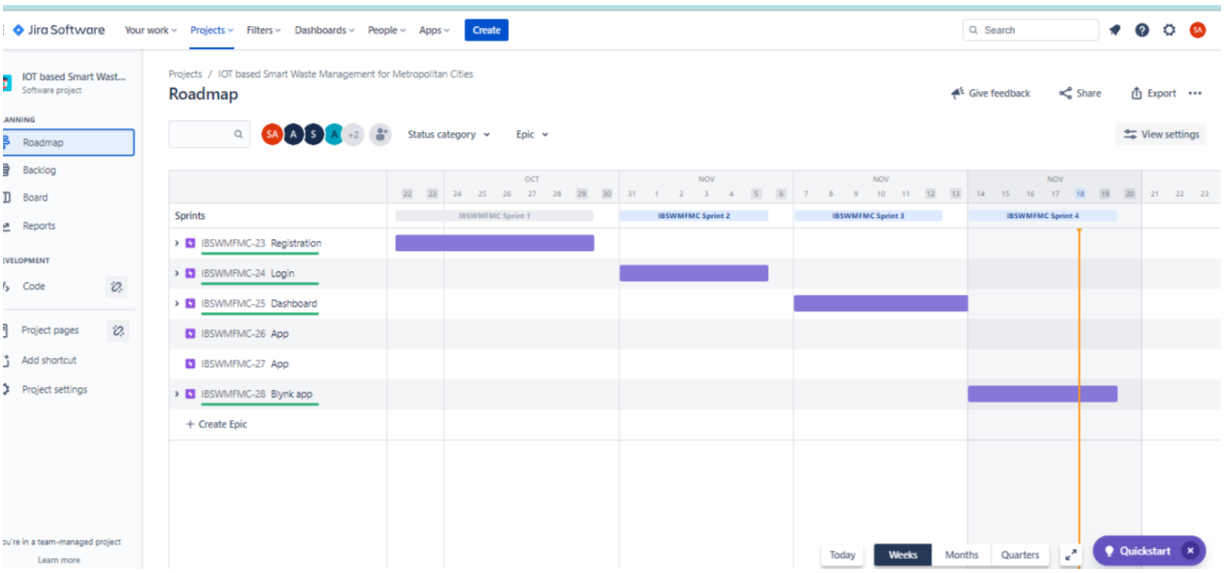
| Sprint | Total Story Points | Duration | Sprint Start Date | Sprint End Date (Planned) | Story Points Completed (as on Planned End Date) | Sprint Release Date (Actual) |
|---|---|---|---|---|---|---|
| Sprint-1 | 20 | 6 Days | 24Oct 2022 | 29Oct 2022 | 20 | 29Oct 2022 |
| Sprint-2 | 20 | 6 Days | 31Oct 2022 | 05Nov2022 | 20 | 05Nov2022 |
| Sprint-3 | 20 | 6 Days | 07Nov2022 | 12Nov2022 | 20 | 12Nov2022 |
| Sprint-4 | 20 | 6 Days | 14Nov2022 | 19Nov2022 | 20 | 19Nov2022 |

**Velocity**: Imagine we have a 10-day sprint duration, and the velocity of the team is 20 (points per sprint). Let’s calculate the team’s average velocity (AV) per iteration unit (story points per day)

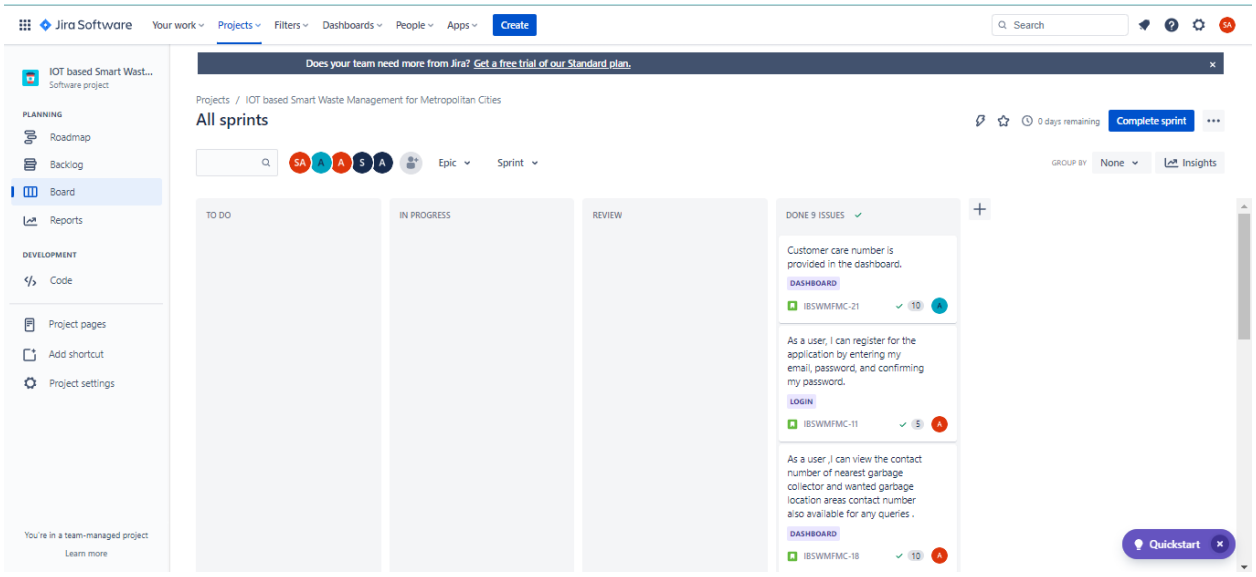
$$AV = \frac{sprint\ duration}{velocity} = \frac{20}{10} = 2$$

# Reports from JIRA

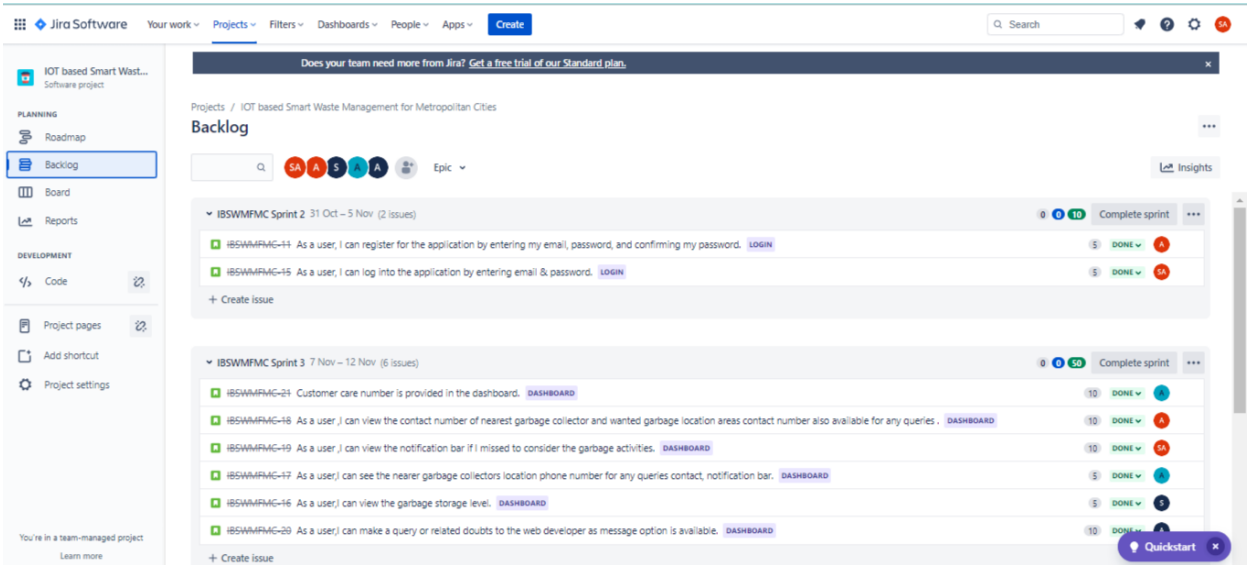
## ROADMAP



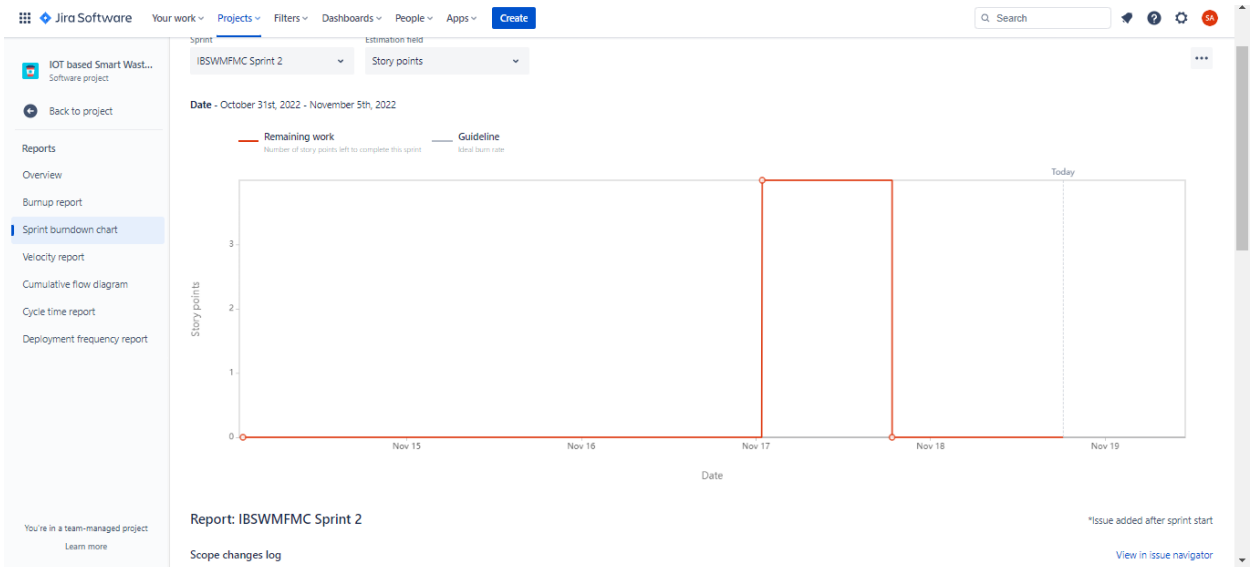
# SPRINTS




# BACKLOG



# BURNDOWN CHART

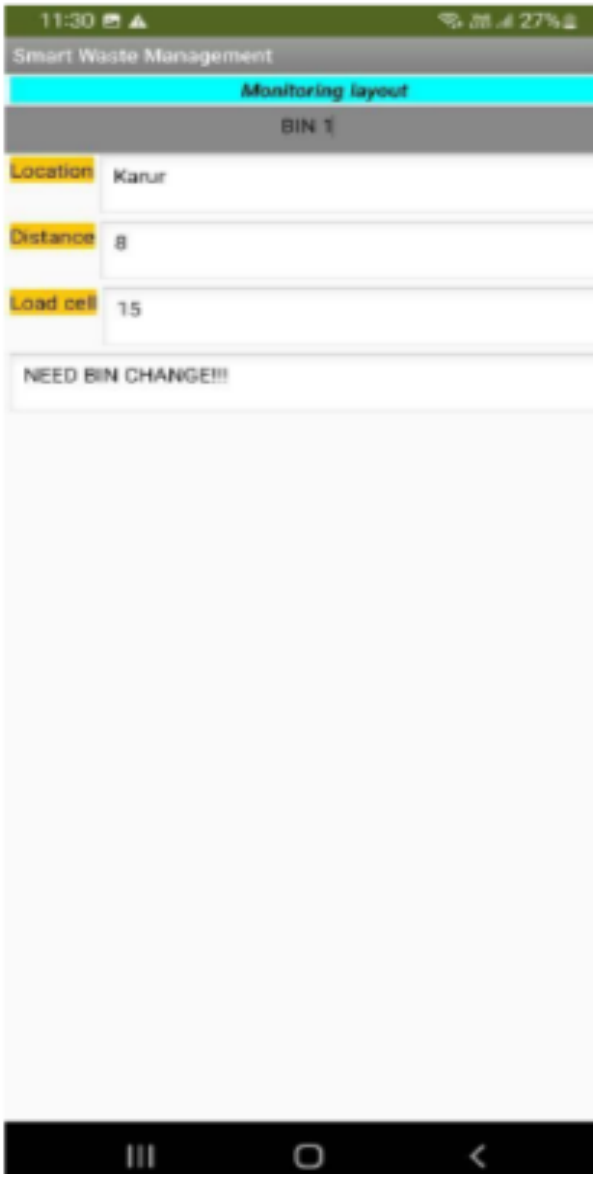



# CODING & SOLUTIONING

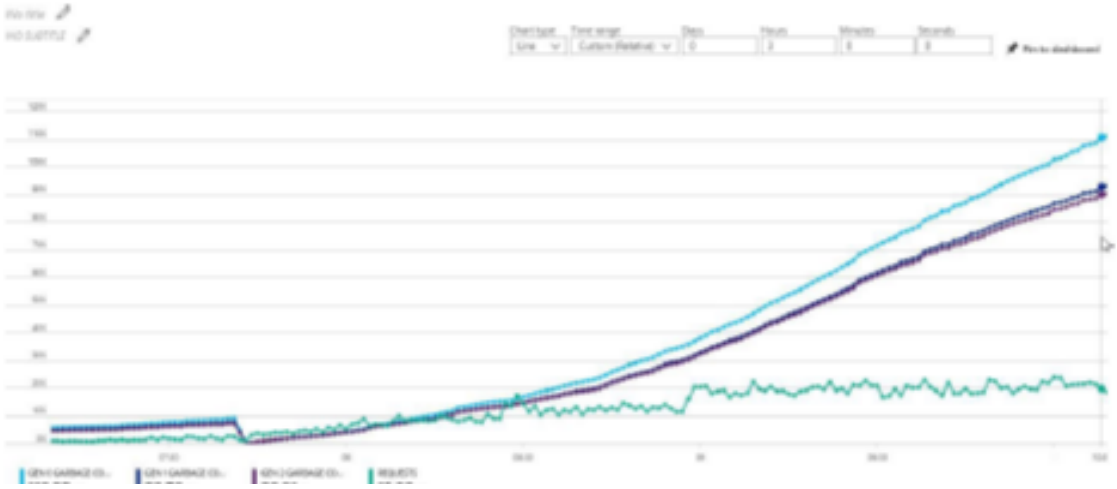
## FEATURE-1

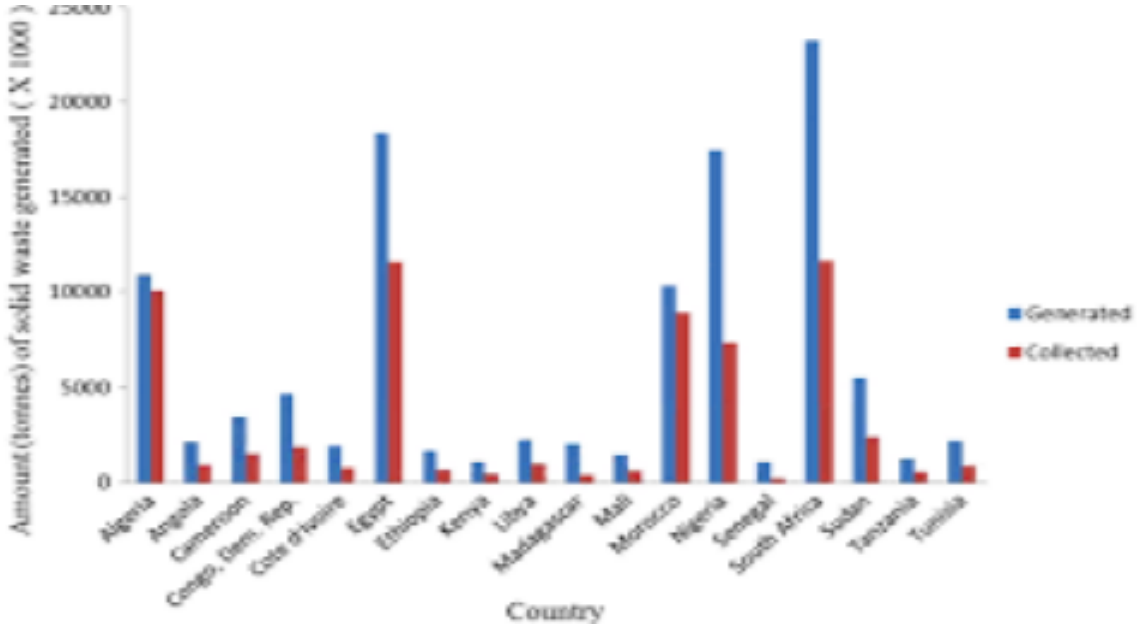

DUMPSTER
20 %
8 %
LEVEL : 60.25cm
WEIGHT : 0g
LIVE LOCATION
No need to collect right now!

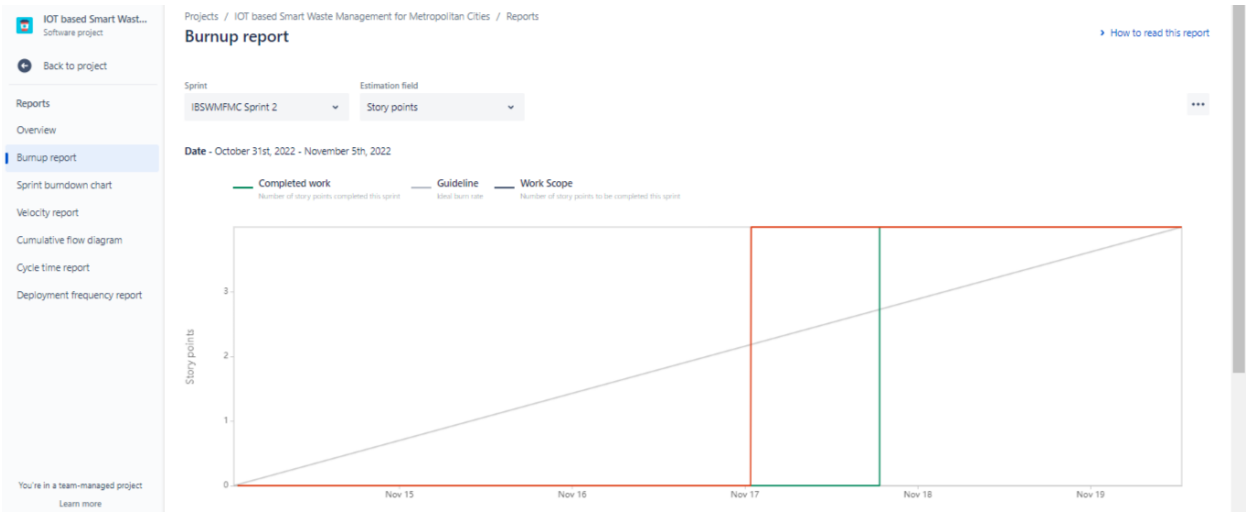
**FEATURE-2**

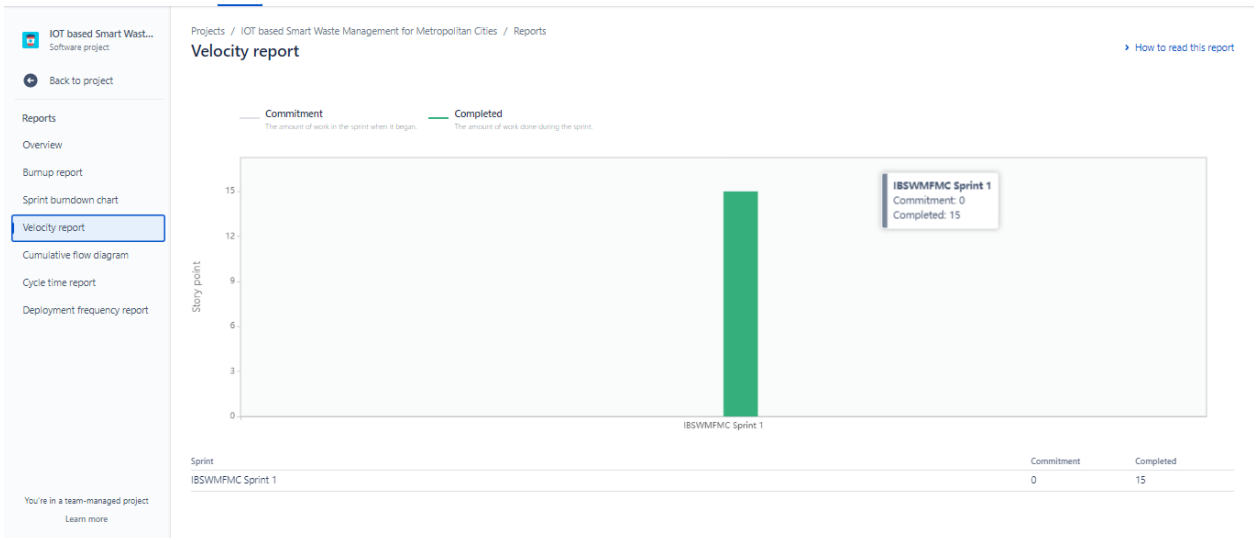



## RESULTS & TESTING




Amount (tonnes) of solid waste generated ( X 1000 )
25000
20000
15000
10000
5000
0
Algeria
Angola
Cameroon
Congo, Dem. Rep.
Cote d'Ivoire
Egypt
Ethiopia
Kenya
Libya
Madagascar
Mali
Morocco
Nigeria
Senegal
South Africa
Sudan
Tanzania
Tunisia
Country
Generated
Collected


IOT based Smart Wast...
Software project
Back to project
Reports
Overview
Burnup report
Sprint burndown chart
Velocity report
Cumulative flow diagram
Cycle time report
Deployment frequency report
You're in a team-managed project
Learn more
Projects / IOT based Smart Waste Management for Metropolitan Cities / Reports
Burnup report
How to read this report
Sprint
IBSWMFMC Sprint 2
Estimation field
Story points
Date - October 31st, 2022 - November 5th, 2022
Completed work
Number of story points completed this sprint
Guideline
Ideal burn rate
Work Scope
Number of story points to be completed this sprint
Story points
0
1
2
3
Nov 15
Nov 16
Nov 17
Nov 18
Nov 19


IOT based Smart Wast...
Software project
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Overview
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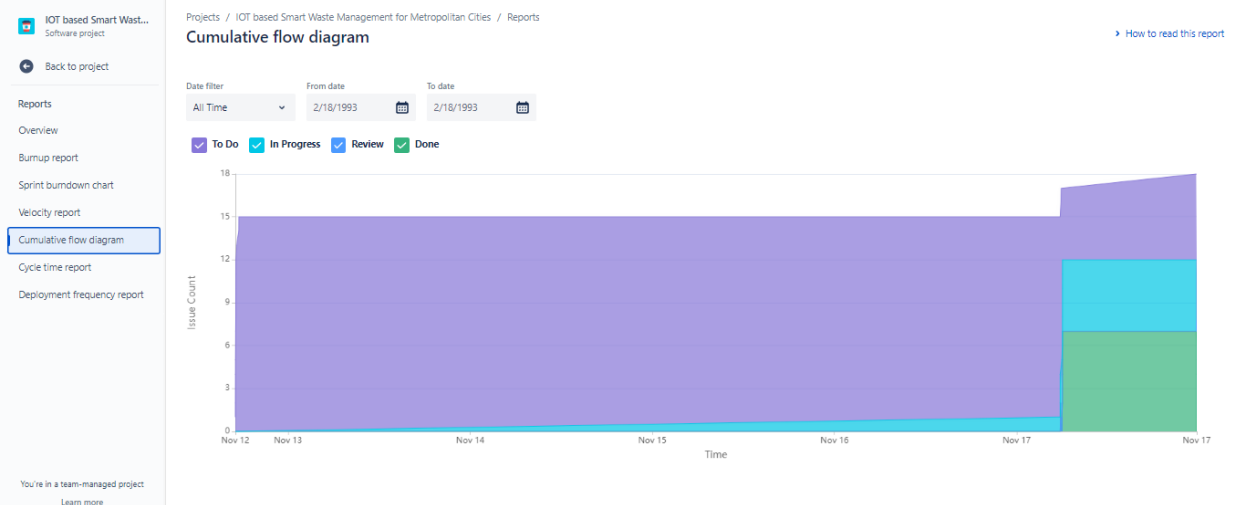
Sprint burndown chart
Velocity report
Cumulative flow diagram
Cycle time report
Deployment frequency report
You're in a team-managed project
Learn more
Projects / IOT based Smart Waste Management for Metropolitan Cities / Reports
Velocity report
How to read this report
Commitment
The amount of work in the sprint when it began.
Completed
The amount of work done during the sprint.
IBSWMFMC Sprint 1
Commitment: 0
Completed: 15
Story point
0
3
6
9
12
15
IBSWMFMC Sprint 1
Sprint
Commitment
Completed
IBSWMFMC Sprint 1
0
15




# ADVANTAGE

A reduction in the number of waste collections needed by up to 80%, resulting in less manpower, emissions, fuel use and traffic congestion. A reduction in the number of waste bins needed.

Analytics data to manage collection routes and the placement of bins more effectively.

Reducing waste will not only protect the environment but will also save on costs or reduce expenses for disposal. In the same way, recycling and/or reusing the waste that is produced benefits the environment by lessening the need to extract resources and lowers the potential for contamination.

# DISADVANTAGE

- High upfront capital costs.
- Recycling sites are always unhygienic, unsafe and unsightly.
- Products from recycled waste may not be durable.
- Recycling might not be inexpensive.
- Recycling is not widespread on large scale.
- More energy consumption and pollution.
- Result in pollutants.
- Increased processing cost and low-quality jobs.

## CONCLUSION

Monitoring the fullness of bins through the use of sensors, it is possible to achieve a more efficient system than the current existing.The behaviour of generating garbage is too dangerous not only for today's generation, but also for future generations. It is critical to educate people and encourage them to practise Recycle,

Reuse, and Reduce instead of producing waste. Waste disposal should be a priority for municipalities and governments.

## FUTURESCOPE

In today's ever-changing and unpredictable world, the waste sector needs a solution that empowers event-driven waste collection. Waste authorities need to move away from relying on historical waste trends and patterns that are no longer applicable to our modern way of life.The entire waste industry needs a solution that utilizes real-time data to make sure that waste containers are only picked up when needed. And this is where smart waste management comes in.Waste Management in India is basically all those activities, which are required to manage waste from its beginning to the final disposal. Waste Management majorly includes things like the collection, transport, treatment, and the ultimate disposal of waste with a high level of monitoring and regulation.

## APPENDIX

## SOURCE CODE

**database.js.txt**

```
const cap_status = document.getElementById('cap_status');

const alert_msg = document.getElementById('alert_msg');



var ref = firebase.database().ref();



ref.on("value", function(snapshot)

{

  snapshot.forEach(function (childSnapshot) {

    var value = childSnapshot.val();
```

```
                const alert_msg_val = value.alert;

                const cap_status_val = value.distance_status;



                alert_msg.innerHTML= ${alert_msg_val};`
   });
}, function (error) {
   console.log("Error: " + error.code);
});
```

**index.html.txt**

```
<!DOCTYPE html>
<html>

<head>
  <link rel="stylesheet"
href="https://cdn.jsdelivr.net/npm/bootstrap@4.3.1/dist/css/bootstrap.min.css"
integrity="sha384-
ggOyR0iXCbMQv3Xipma34MD+dH/1fQ784/j6cY/iJTQUOhcWr7x9JvoRxT2MZw1T"
crossorigin="anonymous">
        <meta charset="utf-8">
        <meta name="viewport" content="width=device-width">
        <title>Garbage Management System</title>
        <link rel="icon" type="image/x-icon" href="/Images/DUMPSTER.png">
        <link href="style.css" rel="stylesheet" type="text/css" />
```

```
        <script src="https://www.gstatic.com/firebasejs/8.10.1/firebase-app.js"></script>
        <script src="https://www.gstatic.com/firebasejs/8.10.1/firebase-database.js"></script>

        <script>
            var firebaseConfig =
            {
                apiKey: "AIzaSyB9ysbnaWc3IyeCioh-aJQT_UCMd5CBFeU",
                authDomain: "fir-test-923b4.firebaseapp.com",
                databaseURL: "https://fir-test-923b4-default-rtdb.firebaseio.com",
                projectId: "fir-test-923b4",
                storageBucket: "fir-test-923b4.appspot.com",
                messagingSenderId: "943542145393",
                appId: "1:943542145393:web:9b5ec7593e6a3cbd7966d0",
                measurementId: "G-BN7JNX1Q7B"
            };
            firebase.initializeApp(firebaseConfig)
        </script>
        <script defer src="database.js"></script>
</head>

<body style="background-color:#1F1B24;">
        <script src="map.js"></script>
```

```
                <div id="map_container">
                        <h1 id="live_location_heading" >LIVE LOCATION</h1>
                        <div id="map"></div>
                        <div id="alert_msg">ALERT MESSAGE!</div>
   </div>
        </div>
<center><a href="https://goo.gl/maps/G9XET5mzSw1ynHQ18"
 type="button" class="btn btn-dark">DUMPSTER</a></center>
        <script
                src="https://maps.googleapis.com/maps/api/js?key=AIzaSyBBLyWj-
3FWtCbCXGW3ysEiI2fDfrv2v0Q&callback=myMap"></script></div>
</body>
</html>
```

**maps.js.txt**

```
const database = firebase.database();
function myMap()
{
        var ref1 = firebase.database().ref();

                ref1.on("value", function(snapshot)
                {
```

```
    snapshot.forEach(function (childSnapshot) {
      var value = childSnapshot.val();
                const latitude = value.latitude;
                const longitude = value.longitude;

                var latlong = { lat: latitude, lng: longitude}
                var mapProp =
                {
                    center: new google.maps.LatLng(latlong),
                    zoom: 10,
                };
                var map = new
google.maps.Map(document.getElementById("map"), mapProp);

                var marker = new google.maps.Marker({ position: latlong });
                marker.setMap(map);
    });
  }, function (error) {
    console.log("Error: " + error.code);
  });
}
```

**replit.nix.txt**

```
{ pkgs }: {
```

```
  deps = [
    pkgs.nodePackages.vscode-langservers-extracted
    pkgs.nodePackages.typescript-language-server
  ];
}
```

**style.css.txt**

```
html, body
        {
        height: 100%;
                margin: 0px;
                padding:0px;
        }
#container
{
        display: flex;
        flex-direction: row;
        height: 100%;
        width: 100%;
        position: relative;
}
#logo_container
{
```

```
        height: 100%;
        width: 12%;
        background-color: #C5C6D0;
        display: flex;
        flex-direction: column;
        vertical-align: text-bottom;
}
.logo
{
        width:70%;
        margin: 5% 15%;

/*      border-radius: 50%; */
}
#logo_3
{
        vertical-align: text-bottom;

}
#data_container
{
        height: 100%;
```

```
        width: 20%;
        margin-left: 1%;
        margin-right: 1%;
        display: flex;
        flex-direction: column;
}
#data_status
{
        height:60%;
        width:8%;
        margin:7%;
        background-color: #691F6E;
        display: flex;
        flex-direction: column;
        border-radius:20px;
}
#load_status
{
        background-image: url("/Images/KG.png");
        background-repeat: no-repeat;
         background-size:     170px;
        background-position: left center;
```

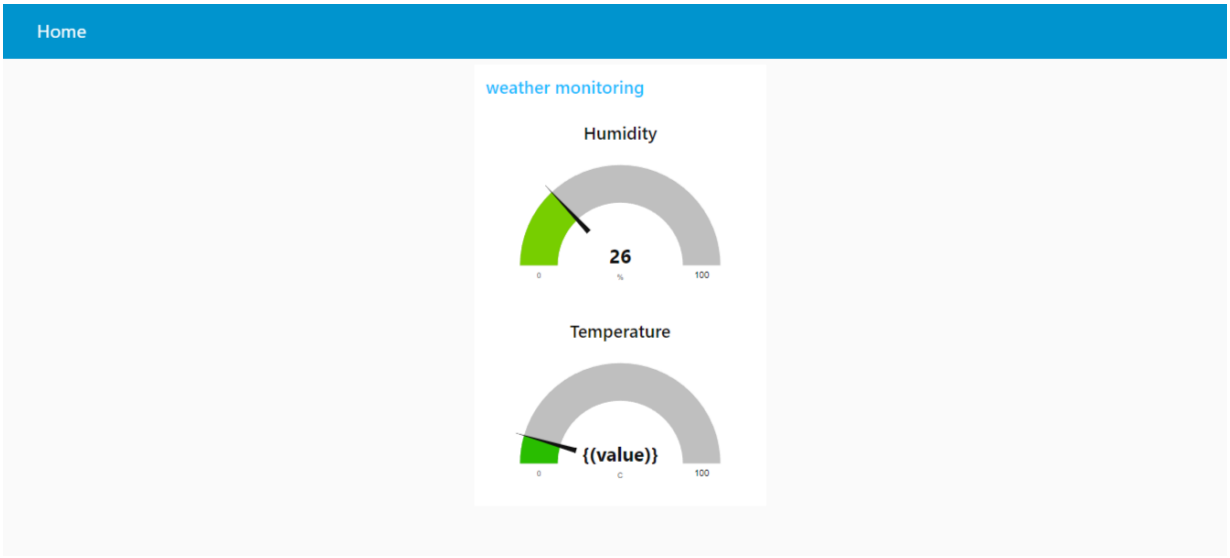
```
}
#cap_status
{
        background-image: url("/Images/dust.png");
        background-repeat: no-repeat;
         background-size: 150px;
        background-position: left center;
}
.status
{
        width: 80%;
        height: 40%;
        margin:5% 10%;
        background-color:#185adc;
        border-radius:20px;
        display: flex;
        justify-content: center;
        align-items: center;
        color: white;
        font-size: 60px;

}
```

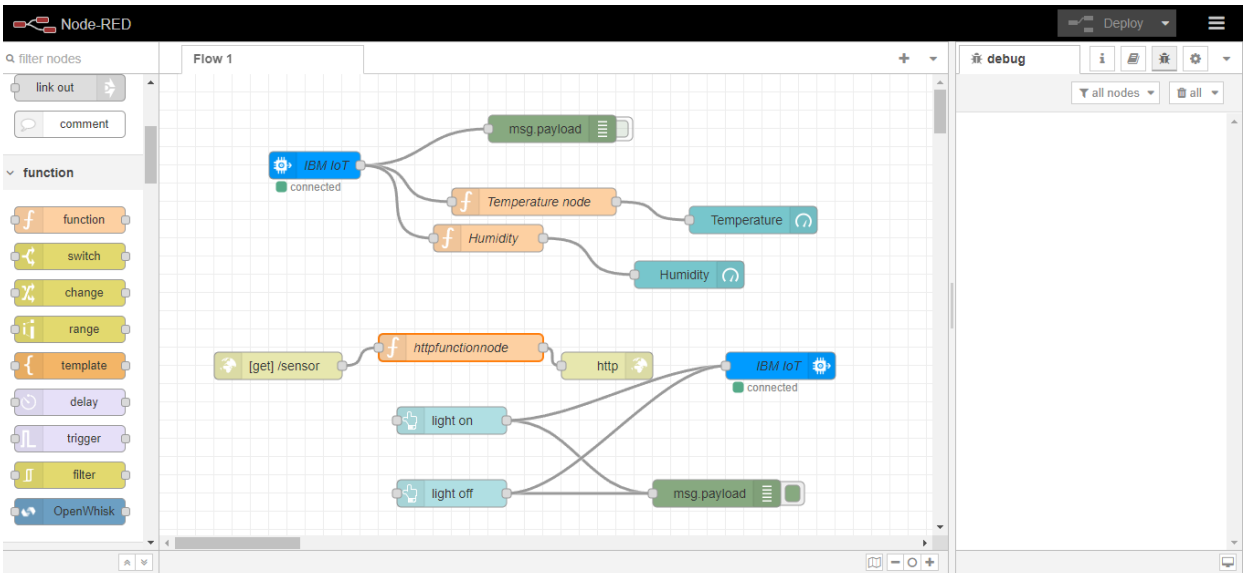
```
.datas
{
        width:86%;
        margin:2.5% 7%;
        height:10%;
  background: url(water.png);
   background-repeat: repeat-x;
   animation: datas 10s linear infinite;
   box-shadow: 0 0 0 6px #98d7eb, 0  20px 35px rgba(0,0,0,1);

}
#map_container
{
        height: 100%;
        width: 100%;
        display: flex;
        flex-direction: column;
}
#live_location_heading
{
        margin-top:10%;
        text-align: center;
```

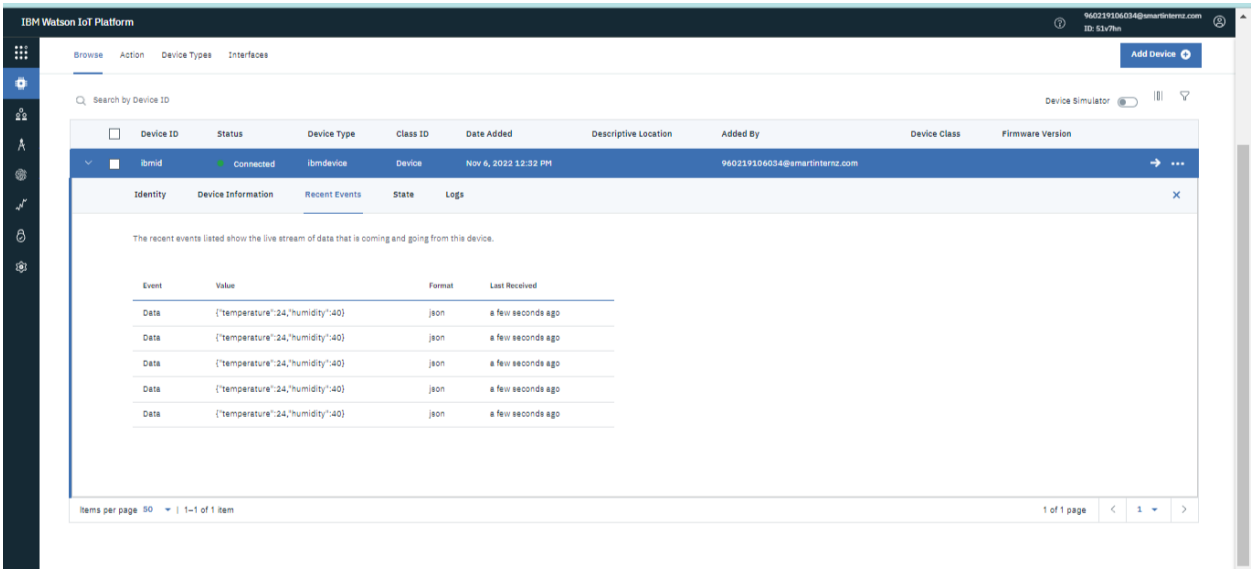
```
  color:  GREY;
}
#map
{
        height: 70%;
        width: 90%;
        margin-left: 4%;
        margin-right:4%;
        border: 10px solid white;
        border-radius: 25px;
}
#alert_msg
{
        width:92%;
        height:20%;
        margin:4%;
        background-color:grey;
        border-radius: 20px;
        display: flex;
        justify-content: center;
        align-items: center;
        color: #41af7f;
```

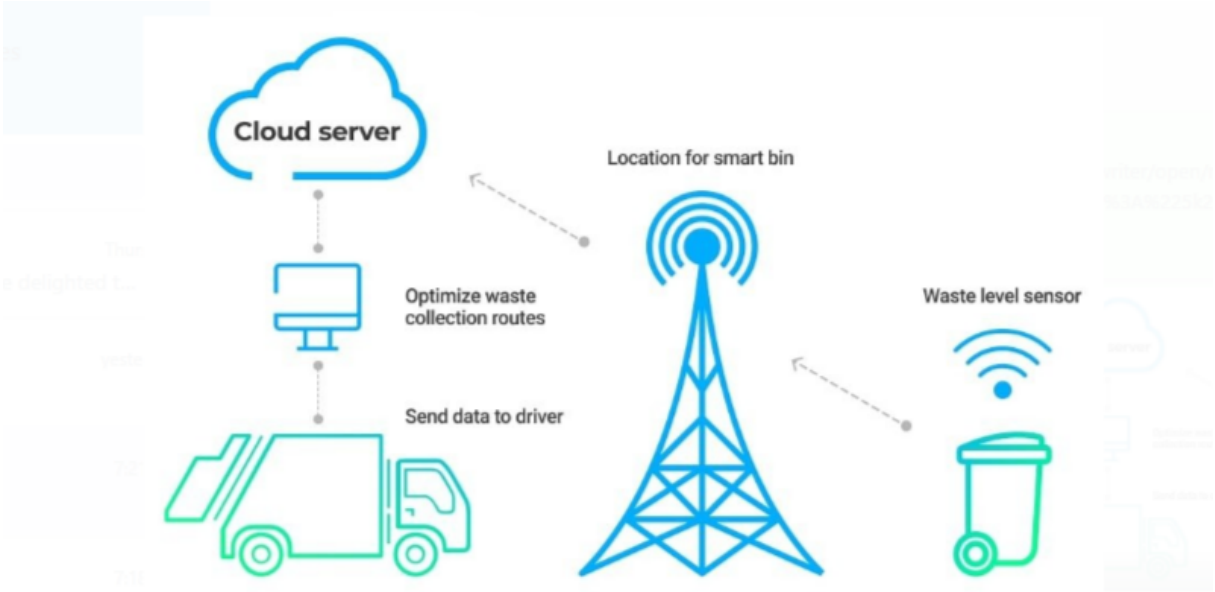
```
        font-size: 25px;
        font-weight: bold;
}
.lat
{
        margin: 0px;
        font-size:0px;
}



@keyframes datas{
  0%
  {
    background-position: -500px 100px;
  }
  40%
  {
    background-position: 1000px -10px;
  }
  80% {
```

```
    background-position: 2000px 40px;
  }
  100% {
    background-position: 2700px 95px;
  }
}
```




IBM Watson IoT Platform
Browse
Action
Device Types
Interfaces
Add Device
Search by Device ID
Device Simulator
Device ID
Status
Device Type
Class ID
Date Added
Descriptive Location
Added By
Device Class
Firmware Version
ibmid
Connected
ibmdevice
Device
Nov 6, 2022 12:32 PM
960219106034@smartinternz.com
Identity
Device Information
Recent Events
State
Logs
The recent events listed show the live stream of data that is coming and going from this device.
Event
Value
Format
Last Received
Data
{"temperature":24,"humidity":40}
json
a few seconds ago
Items per page 50
1–1 of 1 item
1 of 1 page


Cloud server
Location for smart bin
Optimize waste collection routes
Waste level sensor
Send data to driver


DUMPSTER
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## links

## Github link:

https://github.com/IBM-EPBL/IBM-Project-40213-1660625963

## Website link:

https://chettinad.swm5.repl.co/

## Video demo link:

https://www.mediafire.com/file/hq1dfc38sefbtju/IBM+video.html/file