WEB APP DEVELOPMENT FOR WASTE MANAGEMENT SYSTEM

PROJECT PHASE 1 REPORT

Submitted by

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to

The APJ Abdul Kalam Technological University

in partial fulfillment of the requirements for the award of the Degree of

Bachelor of Technology

In

Computer Science and Engineering

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Sree Narayana Gurukulam College of Engineering
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JANUARY 2023

DECLARATION

We undersigned hereby declare that the project phase 1 report "**Web app development for waste management system**", submitted for partial fulfillment of the requirements for the award of the degree of Bachelor of Technology of the APJ Abdul Kalam Technological University, Kerala is a Bonafide work done by me under supervision of Prof. (Dr.) Smitha Suresh This submission represents our ideas in our own words and where ideas or words of others have been included, we have adequately and accurately cited and referenced the original sources. We also declare that we have adhered to the ethics of academic honesty and integrity and have not misrepresented or fabricated any data or idea or fact or source in my submission. We understand that any violation of the above will be a cause for disciplinary action by the institute and/or the University and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been obtained. This report has not been previously formed as the basis for the award of any degree, diploma, or similar title of any other University.

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CERTIFICATE

This is to certify that the project phase 1 report **"WEB APP DEVELOPMENT FOR WASTE MANAGEMENT SYSTEM"** submitted by **AISHA M.A, ANDRIYA JAYAN, ARDRA BIJU, C.M THAJUDHEEN** to the APJ Abdul Kalam Technological University in partial fulfillment of the requirements for the award of the Degree of Bachelor of Technology in Computer Science and Engineering during the year 2023.

Head of the Department	Project Coordinator	Guided by
(Dr.) Smitha Suresh	**Anil C.B**	**Anil C.B**
(Prof., CSE Dept)	(Assoc.Prof., CSE Dept)	(Assoc.Prof., CSE Dept)

Submitted for the University Evaluation…… University Register No……

Internal Examiner External Examiner

CONTENTS

ACKNOWLEDGEMENT

Dedicating this project to the Almighty God whose abundant grace and mercy enabled its successful completion, we would like to express our profound gratitude to all the people who had inspired and motivated us to undertake this project.

We wish to express our sincere thanks to our Head of the Department, **Prof. (Dr.) SMITHA SURESH**, for providing us the opportunity to undertake this project. We are deeply indebted to our project guide **PROF. (Dr.) SMITHA SURESH**, and project coordinator **Mr. Anil C.B, Associate Professor** in the Department of Computer Science and Engineering for providing us with valuable advice and guidance during the course of the project.

Finally, we would like to express my gratitude to Sree Narayana Gurukulam College of Engineering for providing me with all the required facilities without which the successful completion of the project work would not have been possible.

ABSTRACT

The modern ways have shown a new pathway to seamless information flow and smooth interconnectivity that opens the door to new opportunities to collaborate and perform jobs efficiently. An app comprising waste management features is the waste management app. Such apps provide a medium to access local details and waste management policies. The waste management app permits users to monitor and track waste pickups and a lot more. Such apps are not only useful for users and waste management organizations to ease their waste management business. Our project aims to build a web application for making waste collection easier. Considering the waste disposal problems faced by our society nowadays, certain improvisations are to be made in the field of waste management with the help of technology. This project sets out to implement a web app that helps in the advanced governance of waste management systems. As of now, waste is being collected from each house by the concerned panchayat workers. But this method of collecting waste makes it more difficult as well as time-consuming for the workers who are entrusted with the job. So, we intend to develop a system that makes the path of collecting wastes expedited and objective. The System will be issued with 6 interfaces. This system is designed to provide a user-friendly environment benefiting both parties. Also, the users are allowed to choose the preferred date for the waste collection and are given the authority to file complaints if any. A payment option is also implemented in our system, which is beneficial for both parties involved. This system also comes with the advantage of reporting the issue of waste disposal in our nearby areas by providing a facility to upload photos of colossal waste in our surroundings, so that the authorized parties can take measures to address such issues. The proposed system helps to provide an efficient and innovative way for making jobs easier, finely tuned, and systematic.

LIST OF FIGURES

ABBREVIATIONS

No	Title	Expansion
1	MSW	Municipal Solid Waste
2	IPCC	Intergovernmental Panel on Climate Change
3	QR	Quick Response
4	ML	Machine Learning
5	AI	Artificial Intelligence
6	CNN	Convolutional Neural Network
7	IoT	Internet of Things
8	WMC	Waste Management Cycle
9	ANN	Artificial Neural Networks
10	GBRT	Gradient Boosting Regression Tree

CHAPTER 1
INTRODUCTION

1.1 GENERAL BACKGROUND

Waste management includes the processes and actions required to manage waste from its inception to its final disposal. This includes the collection, transport, treatment, and disposal of waste, together with monitoring and regulation of the waste management process and waste-related laws, technologies, and economic mechanisms. Waste can be solid, liquid, or gas and each type have different methods of disposal and management. Waste management deals with all types of waste, including industrial, biological, household, municipal, organic, biomedical, and radioactive wastes. In some cases, waste can pose a threat to human health. Health issues are associated throughout the entire process of waste management. Health issues can also arise indirectly or directly: directly through the handling of solid waste, and indirectly through the consumption of water, soil, and food. Waste is produced by human activity, for example, the extraction and processing of raw materials. Waste management is intended to reduce the adverse effects of waste on human health, the environment, planetary resources, and aesthetics. The aim of waste management is to reduce the dangerous effects of such waste on the environment and human health. A big part of waste management deals with municipal solid waste, which is created by industrial, commercial, and household activities. Waste management practices are not uniform among countries (developed and developing nations); regions (urban and rural areas), and residential and industrial sectors can all take different approaches. Proper management of waste is important for building sustainable and livable cities, but it remains a challenge for many developing countries and cities. A report found that effective waste management is relatively expensive, usually comprising 20%–50% of municipal budgets. Operating this essential municipal service requires integrated systems that are efficient, sustainable, and socially supported. A large portion of waste management practices deals with MSW which is the bulk of the waste that is created by household, industrial, and commercial activity. According to the IPCC, municipal solid waste is expected to reach approximately 3.4 Gt by 2050; however, policies and lawmaking can reduce the amount of waste produced in different areas and

cities of the world. Measures of waste management include measures for integrated techno-economic mechanisms of a circular economy, effective disposal facilities, export and import control, and optimal sustainable design of products that are produced.

1.2 OBJECTIVE

Waste Management is the most challenging issue in modern society. Fast growth in population, increased factory presence, and modern lifestyle has contributed to a large amount of waste. An efficient waste management system mainly revolves around waste segregation and processing. Segregation makes it effective to recycle and reuse waste conventionally. This research proposes a novel and efficient waste management system. The prototype of the proposed system is a web application in which Android acts as a mobile developer, and webpages to govern the entire process with comfort and simplicity. The most important part of the proposed system is that it is advantageous to both parties involved. It contains 7 interfaces. It provides different functionalities like path optimization for employees, payment option for both parties, assigning dates that are chosen by the users, a complaint registration facility, QR code scanning, option for uploading public wastes.

1.3 SCOPE

Waste management is an important element of environmental protection. It can be harmful to the environment if not done properly. Our solution was developed through a series of group projects and includes:

i) Proposal to a path optimization facility, so that time can be saved and the work can be done more efficiently.

ii) Facilities for QR code scanning, thus the security of user and employee can be ensured.

iii) Facilities for complaint registration.

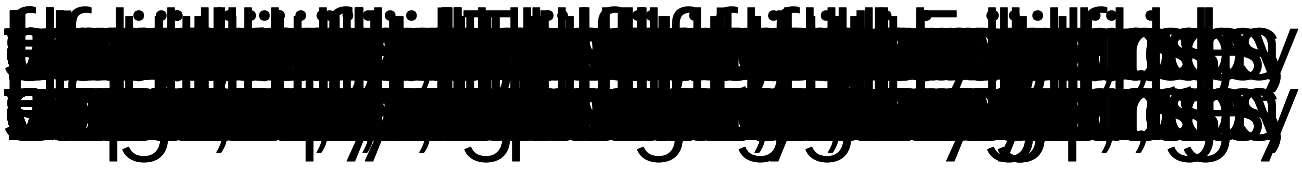
iv) Payment option for employees and also for users.

v) User can choose the preferred date for waste collection.

vi) Facilities for uploading public waste so that the concerned authorities can make action for its clearance.

1.4 INTRODUCTION TO TOPIC

In an era of rapid urbanization and population growth, solid waste management is critical for sustainable, healthy, and inclusive cities and communities. If no action is taken, the world will be on a dangerous path to more waste and overwhelming pollution. According to the Environmental Protection Agency, roughly 75% of the waste stream is recyclable, but only about 30% of recyclable materials actually get recycled. Considering humans produce just over 2 billion tons of waste each year, that's a lot of unnecessary trash ending up in the world's landfills and waterways. The world's trash problem isn't going away any time soon, and traditional waste management systems aren't equipped to deal with the extra trash produced by growing populations. To help bridge the gap, communities need to adopt smart waste management technologies that increase efficiency, lower collection costs, and divert more trash away from landfills. New technology is emerging every day, too. As more people adopt these technologies, additional research and development will be funded. Tech's impact on waste management will grow exponentially as a result. The complexity of waste management has never been so extreme before. But, today the waste disposal has tremendously increased. To overcome these challenges and to counteract the negative impacts of landfill waste on the environment, the waste management industry is rethinking strategies and revamping waste handling and disposal systems for superior efficiency and enhanced environmental protection. Hence, waste management technology comes into the picture



CHAPTER 2
LITERATURE SURVEY

The purpose of a literature review is to, as the name suggests, “review” the literature surrounding a certain topic area. The word “literature” means “sources of information” or “research.” The literature will inform us about the research that has already been conducted on our chosen subject.

This paper manages down a smart garbage monitoring framework [1] based on IOT that uses web application PHP programming, Kodular, NodeMCU, Ultrasonic sensors and GPS for communication is proposed to ensure this problem. In the proposed method, the ultrasonic sensor tracks and tests the amount of garbage in the garbage bins, and if a person wants to throw the garbage, an android app is programmed to direct the user to the bin that is not complete using GPS and also sends a warning message to the municipal department authorities concerned about bin status using cloud (Firebase), NodeMCU. The proposed system is more effective than the current system as it simplifies the human effort, saves time, and is more cost-effective. This paper [2] proposed a system which aims to schedule trucks by finding the shortest path between the almost-filled waste bins and bins which have produced harmful gases and gives a route for collection. The system will consist of setting up smart waste bins/ trash cans per society, which will be IoT enabled. These smart bins will transmit information about its fill status and harmful gas levels. The proposed system provides efficient and optimized routes to collect maximum waste with less cost and fuel. The system provides estimated dates for the collection of waste, real time bin status, expected fill up dates for the bins, and

optimized shortest path for waste collection. The system will summarize the collected information and generate reports. This paper [3] proposed a system, garbage bins equipped with low-cost embedded device are located at various places in entire city. Real time status of garbage level along with garbage bin location is sent to cloud. We have designed a cloud-based system for organizing solid waste management process and mobile application for waste collection drivers and Municipal Corporation to monitor and control solid waste collection as a service. Mobile application facilitates the waste collection drivers to go to the garbage bins using dynamic and shortest route. A smart solid waste management system [4] is designed that will check status and give alert of dustbin fullness and more significantly system has a feature to literate people to use dustbin properly and to automatically sense and clean garbage present outside the dustbin. Thus, presented solution achieves smart solid waste management satisfying goal of making Indian cities clean, healthy and hygienic. This paper [5] proposes an IoT based efficient waste collection system with smart bins. It does real-time monitoring of the waste bins and determines which bins are to emptied in every cycle of waste collection. The system also presents an enhanced navigation system that shows the best route to collect wastes from the selected bins. Four waste bins are assumed in the city of Mount Pleasant, Michigan at random location. The proposed system decreases the travel distance by 30.76% on an average in the assumed scenario, compared to the traditional waste collection system. Thus it reduces the fuel cost and human labor making the system optimized and efficient by enabling real-time monitoring and enhanced navigation. This study [6] proposed an online waste management system to monitor the status of generated trash all-around smart cities then distribute and schedule available garbage trucks accordingly. The proposed solution provides a web-based system and a mobile application to manage the organization of these wastes and facilitate the garbage collection by the drivers. The proposed solution provides an 80% faster convergence system in comparison with traditional garbage collecting method. The mobile application makes the waste pick up easier for the drivers and enable them to use better roads. Therefore, garbage collection costs and efforts have been saved, while less consumed energy is required. This study [7] identified artificial intelligent-based smart waste management systems. The main goal of this study is to summarize the findings of selected research papers, provide comprehensive analysis and identify the future research avenues for waste management. This chapter has addressed various

waste management domains like municipal solid waste management, smart bin management, domestic waste management, medical waste management, construction and industrial waste management, and so on. Furthermore, categorical representation of the most extensively used machine learning and deep learning algorithms along with their contribution has been elaborately discussed as well. This paper [8] reflects a capable architecture of the waste management system based on deep learning and IoT. The proposed model renders an astute way to sort digestible and indigestible waste using a convolutional neural network (CNN), a popular deep learning paradigm. The scheme also introduces an architectural design of a smart trash bin that utilizes a microcontroller with multiple sensors. The proposed method employs IoT and Bluetooth connectivity for data monitoring. IoT enables control of real-time data from anywhere while Bluetooth aids short-range data monitoring through an android application. To examine the efficacy of the developed model, the accuracy of waste label classification, sensors data estimation, and system usability scale (SUS) are enumerated and interpreted. The classification accuracy of the proposed architecture based on the CNN model is 95.3125%, and the SUS score is 86%. However, this smart system will be adjustable to household activities with real-time waste monitoring. This paper [9] presented a survey of machine learning works that attempt to organize the process flow of waste management in smart cities. Unlike past reviews, they focused on the waste generation and disposal phases in which citizens, households, and municipalities try to eliminate their solid waste by applying intelligent computational models. Next, this researcher's deployed a comprehensive data extraction strategy focusing on the objectives of studies, trends of ML adoption, waste datasets, dependent and independent variables, and AI-ML-DL predictive models of waste generation. Their analysis revealed that most studies estimated waste material classification, amount of generated waste per area, and waste filling levels per location. Demographic data and images of waste type and fill levels are used as features to train the predictive models. Although various studies have widely deployed ANN and convolutional neural networks (CNN) to classify waste, other techniques, such as GBRT, have also been utilized. Critical challenges hindering the prediction of solid waste generation and disposal include the scarcity of real-time time series waste datasets, the lack of performance benchmarking tests of the proposed models, the reliability of the analytics models, and the long-term forecasting of waste generation. The survey concludes with the implications and

limitations of the selected models to inspire further research efforts. This research [10] focuses on AI (Artificial Intelligence)-driven smart waste bin that can classify the most widely available solid waste materials namely Metal, Glass, and Plastic. The smart waste bin performs the separation of waste using image processing and machine learning algorithms. The system also performs continuous monitoring of the collected waste level by using ultrasonic sensors. A dedicated mobile application will generate the optimal routes for the available waste collectors to collect the filled bins. Moreover, with this smart bin, the challenge of recognizing each waste item is overcome by using visual data as the source. Therefore, the usage of expensive sensor devices and filtration techniques to determine the category is disregarded. The smart bin can recognize the category of solid waste, collect it to the specified container, and notify the garbage level in each container. So, it is a portable waste management system. This paper [11] presents a comparative study of the artificial intelligence/machine learning based techniques, and potential applications in the COVID-19 WMC. A general integrated solid waste management strategy is mapped for both short-term and long-term goals of COVID-19 WMC, making use of the techniques investigated. By aligning current health/waste-related guidelines from health organizations and governments worldwide and contemporary, relevant research in area, the challenge of COVID-19 waste management and, subsequently, slowing the pandemic down may be assisted. This research [12] developed a solid waste collection management model with the aim to design a Mobile Application model for solid waste collection management which will help to improve the quality of management in Solid Waste collection and impacting positively the environment by reducing the quantity of Solid waste. This model put the solid waste generators on the central of the solid waste collection system because they are the principal actors producing solid waste, helping Solid waste companies during their solid waste collection process and provides an efficient tool to the municipality council to have an overview to the all activities concerning solid waste collection and oriented their decisions. In this research we provided all necessary and recent mobile technology and a model can be applying to achieve efficient solid waste collection system for household. In this paper [13] they developed a low cost, low power waste management system which will be applicable in regions which are not economically sound. This system enables us to collect the trash as and when the can is full or when the trash inside is decomposed compared to daily collection. This has been designed

using an Arduino Uno board incorporating additional modules such as a GSM module to send messages. This paper [14] deals with the concept of waste management and the smart system for waste management with higher benefits to the society. The proposed system for waste management will use various sensors for sensing the type of waste and separate the waste in different categories and actuator to inform the management to collect the waste container. This system will save money and time compared to the already available process of waste management and also improves society's cleanliness. This paper [15] employs on monitoring of various dustbins located at different residential societies. Dustbin is equipped with sensors which monitors for dustbin capacity, metal level and poisonous gas level. The machine learning classification technique such as SVM, NB, RF, DT and KNN are used to test their ability to predict the accuracy of sending alert messages to third party in order to manage the waste of the society. In addition, results suggest that RF algorithm produced the most accurate forecasts of the alert message. The accuracy of RF algorithm is 85.29 %. The overall impact of this research is in the upliftment of the green technologies by reducing pollution of the smart city.

CHAPTER 3
EXISTING SYSYTEM

3.1 INTRODUCTION

Waste management refers to those activities and actions which are required to

dominate from its inceptions to demolition. Existing research studies was done with an aim to bind the waste management system and technology together. Many researchers have proposed different models for proper waste management. Combining Machine learning with IoT was one such model. ML refers to a significant function of AI that allows a system the ability to learn and make the decision automatically without being explicitly instructed. Machine learning is a scientific study of some statistical models and algorithms. Due to offering the most exceptional features in computing, the popularity of ML has reached the highest peak. Similarly, deep learning is an essential part of machine learning. The CNN is a momentous class of deep neural networks, more specifically, deep learning. CNN presents tremendous progress in image recognition. In general, they are applied to evaluate visual imagery and often worked beside image classification. On the other hand, the Internet of things (IoT) refers to a system of interconnected devices, digital or often some analog machine that enriches the ability to transfer data over a network beyond demanding human-to-computer interactions. The proposed system implements a smart system where users can take necessary precautions on the waste management system.

The contributions of the paper are as follows:

- A unique way to combine two technologies namely IoT and deep learning paradigms is to ensure an optimal solution in the field of garbage management.
- An intelligent way to classify bio waste and non-bio waste through image classification using deep learning.
- An architectural development process of a smart trash box using an ultrasonic sensor, load measurement sensor, and microcontroller.
- A smart way to monitor waste in real-time conducted by Bluetooth communication for short-range, and IoT technology for long-range using an Android application.

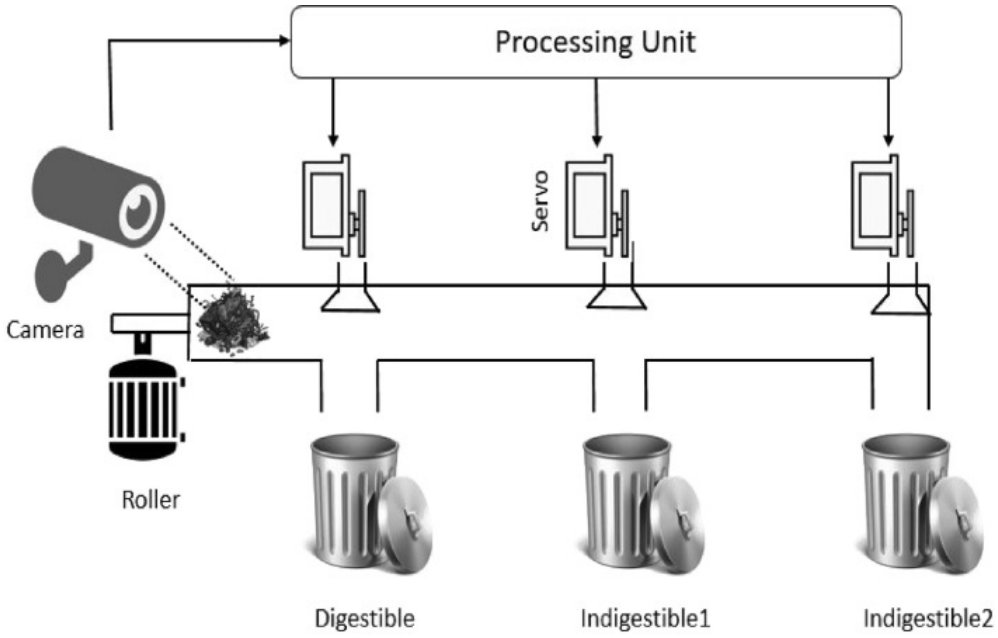


Fig 3.1 Block diagram of the proposed system

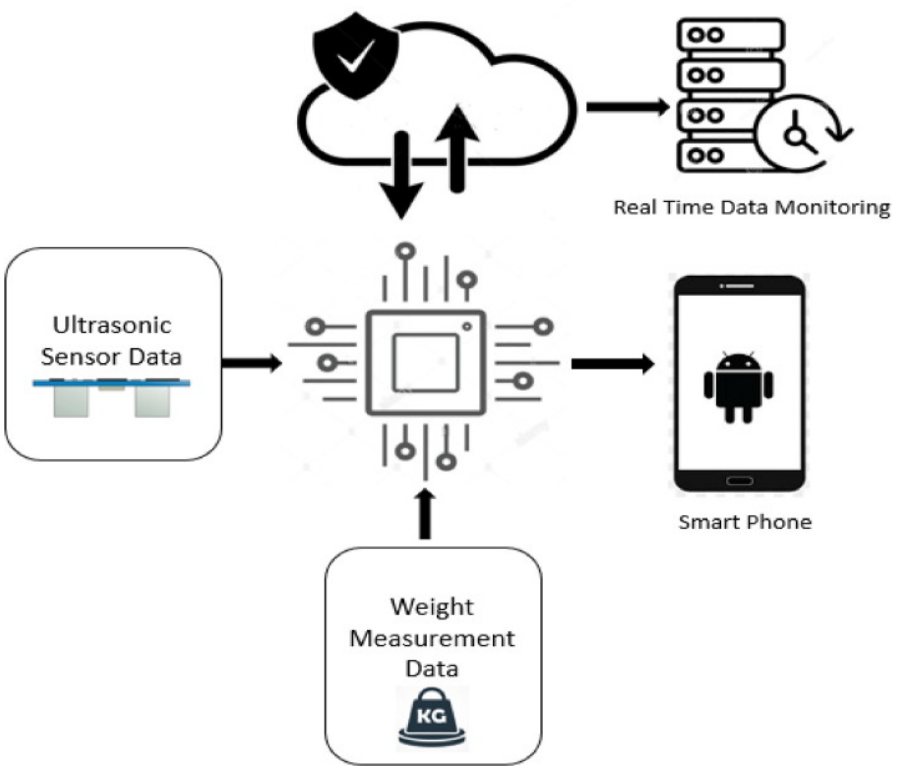


Fig 3.2 Block diagram and working principle of smart trash bin

3.2 METHODOLOGY

The proposed methodology is a combination of two parts, namely, waste classification through convolutional neural network and architectural design of smart trash boxes, which aids real-time data monitoring using IoT. Two structural models are merged to find excellent results in the field of waste management. Classifying wastes into proper categories helps to identify reusable waste. Identifying recyclable wastes let us utilize them without deteriorating. In the extent of image classification, deep learning algorithms acquire peerless results. The scope of minimizing the misuse of recyclable components inspires authors to add deep learning for waste classification while monitoring waste to differentiate recyclable wastes. In this article, we have divided the wastes into two broad categories named digestible and indigestible. Lack of sufficient data for waste classification, we have used finetuned models for waste classification. The waste classification using deep learning technology helps to attain categories of wastes from images. The architecture of trash boxes enables multiple sensors to take readings and data transmission for monitoring. Fig. 3.1 shows a block diagram of the system. In this proposed scheme, a camera module will scan the waste materials. After successfully finishing the waste scanning and image capturing process, a pre-processing component for the captured images taken by the camera in real-time is performed. The model utilizes the only image resizing due to ensure less complexity. After that, the pre-processed images are processed by a microprocessor (Raspberry pi). The microprocessor will classify the image using a classifier and sends a command to a servo motor to put waste into the corresponding trash box. The microcontroller of the trash box will send data to an android application for real-time monitoring. This system also includes a roller which is capable of carrying the waste according to the instructions from the processing unit. Whenever the processing unit classifies waste, it sends a signal to the roller to carry that waste to the servo motor. Afterward, it stops rolling and waits for the next command from the processing unit.

CHAPTER 4
PROPOSED SYSTEM

We intend to develop a web application for waste management system. It is a free open source application that attracts more customers of all categories by providing a platform for waste management. As a concern to the dilemmas faced by the employees of this sector, we propose a system which eases the workload of employees. Functionalities are specified below:

- A free open-source application, code that is designed to be publicly accessible, developed in a decentralized and collaborative way, relying on peer review and community production.
- It is necessary for the employee to reach the user in way which saves time, so a path optimization is implemented for the employee, so that the employee can reach the user using the shortest distance available.
- A date system is implemented, so that the user can chose the preferred date for waste collection. It also helps the employee as it saves time by only visiting customers who need services on the date specified. So, it is beneficial for both the parties.
- In today's system only plastic wastes are collected, but our system enables the user to provide waste of any type.
- This system also allows uploading pictures of public waste. So that the concerned authorities can take action for cleaning waste in our surroundings. Thus, it ensures a clean surrounding.
- A payment system is introduced which is for both users and employees If the waste is of recycling type the payment is given to users and if the waste is not of recycling type the payment is given to the employee.
- An option is given for the user which allows filing complaints regarding the authority. The

complaint is filed to the agency if the user is not satisfied with the service provided by the user and agency.

- It provides an easy way of communication between the user and the local body.
- QR code scanning is implemented for ensuring that the employees are from an authorized organization so that it guarantees the safety of users. It also ensures the job security of the employee, since it acts as evidence for proving that the employee had done his work accurately
- Rating feature is added to share the experience of customers. So that improvement can be done to the suggestions provided by the user.
- Easy administration is possible since all the procedures are in an online mode

CHAPTER 5
DESIGN DETAILS

5.1 USE CASE DIAGRAM

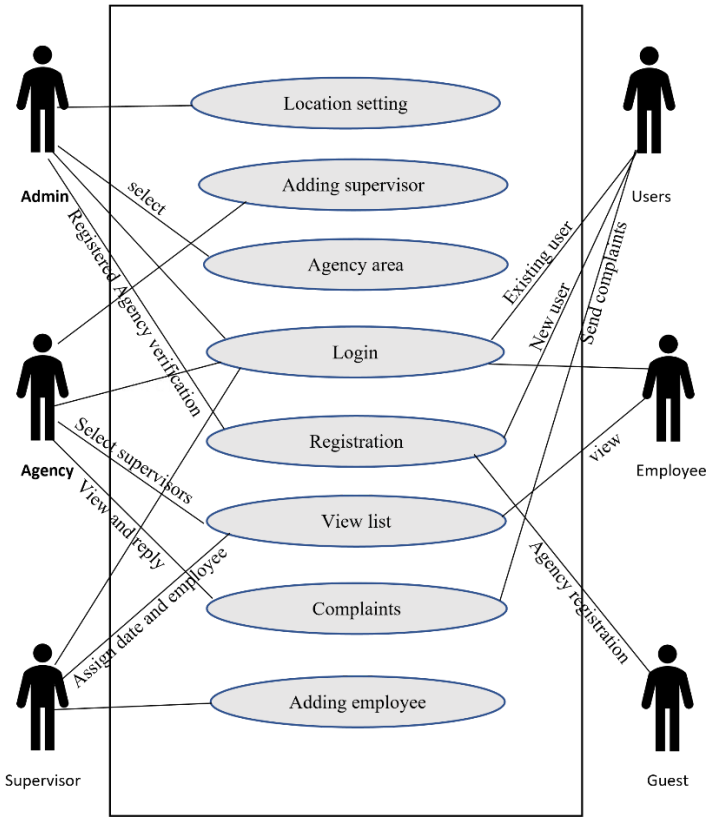


Figure 5.1: Usecase diagram

There are six actors, admin, agency, supervisor, employee, guest, and user. Each actor have their own functionalities. All five actors excluding guest can log in to the system. A guest section is provided for the registration of all the actors involved.

5.2 ARCHITECTURE DIAGRAM

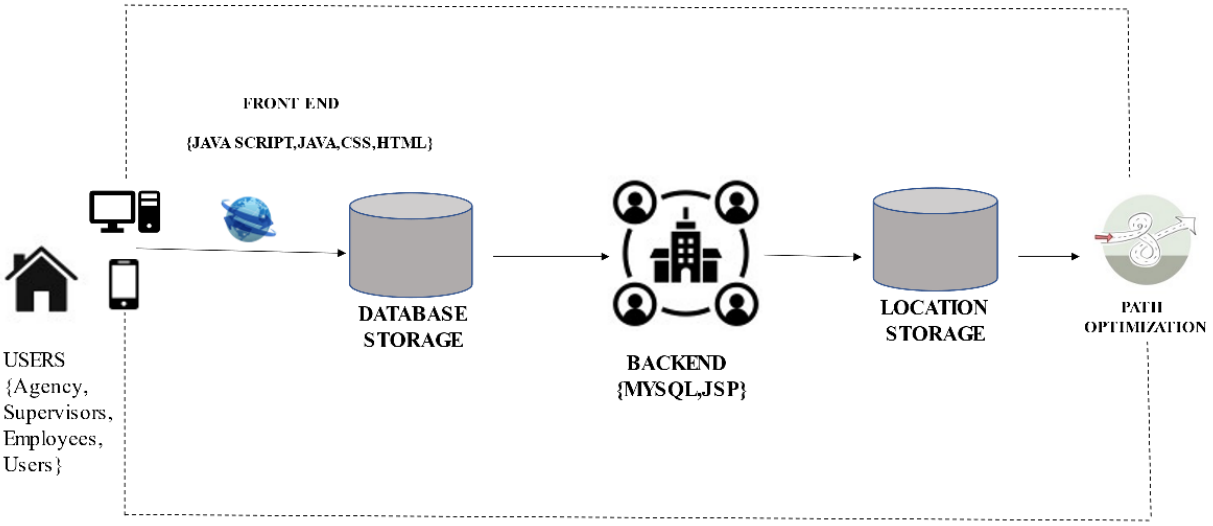


Figure 5.2: Architecture diagram

There are multiple users, those who login via HTML page can be considered as a user. So all the actors except guest can login through HTML page, so the they all can also be considered as a user. For creating an account, we need to provide details of users with details of name, email id and so on. A user can set password for their account. Whenever a user tries to login his/her account, user must provide user name which is his/hers email id and must also provide password which was created at the time of account creation. After login activity is successful a user can access their page and do the required functionality.

5.3 SEQUENCE DIAGRAM

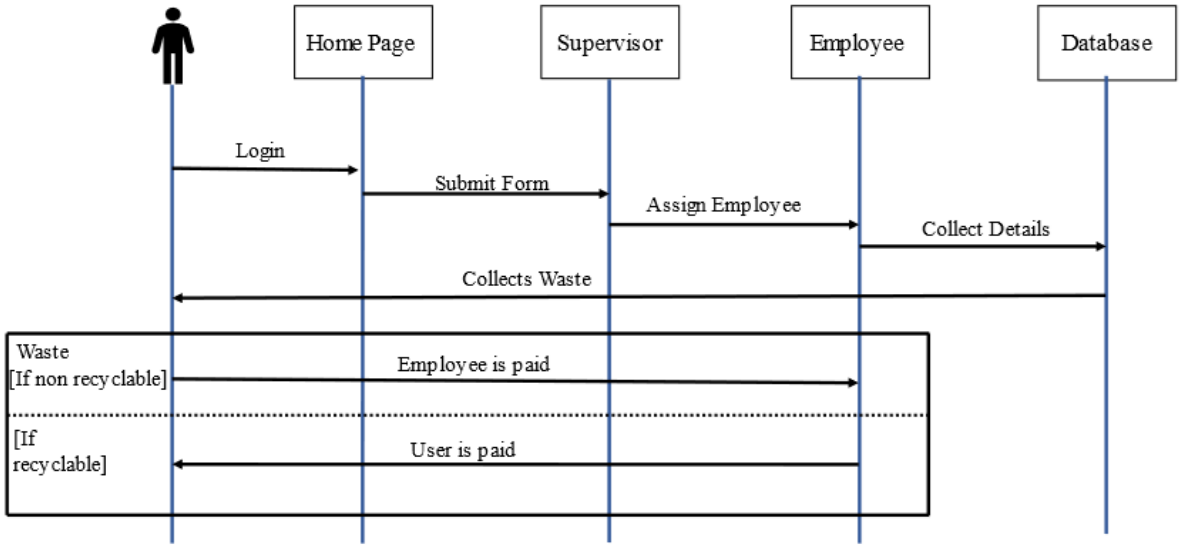


Figure 5.3: Sequence diagram

A sequence diagram simply depicts interaction between objects in a sequential order. i.e., the order in which these interactions take place and also describe how and in what order the objects in a system function. A supervisor add employees, the employees added by supervisor is assigned waste collection specific areas.

5.4 ACTIVITY DIAGRAM

5.4.1 ADMIN

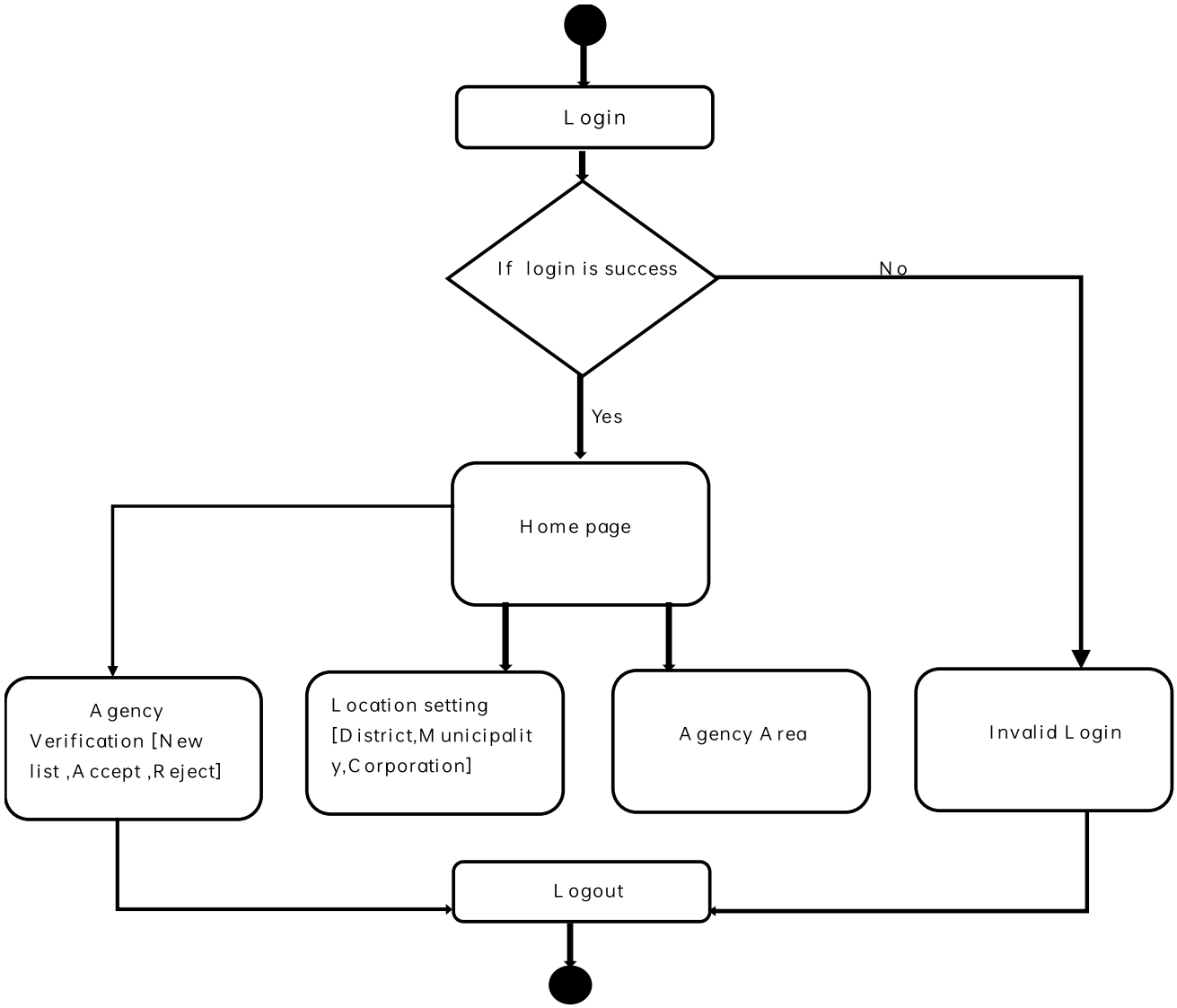


Figure 5.4.1: Admin

An activity diagram visually presents a series of actions or flow of control in a system similar to a flowchart or a data flow diagram. Activity diagrams are often used in business process modeling.

The admin can login to the system and can manage agency verification, location setting is done by admin, area for a particular agency is decided by admin.

5.4.2 AGENCY

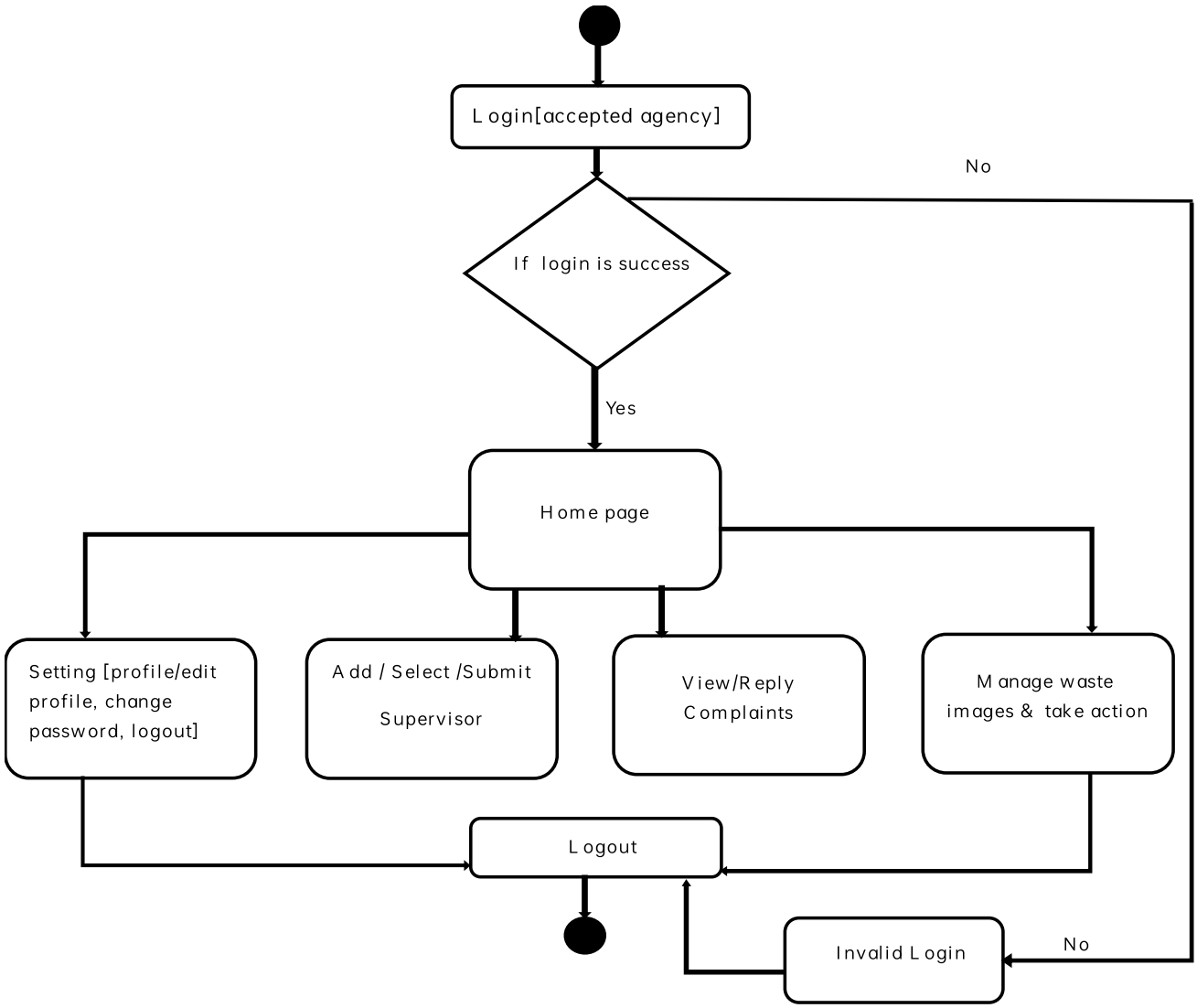


Figure 5.4.2: Agency

The agency can login to the system and can add or select supervisor, can also view or give reply to complaints of a user. Public waste images uploaded by user is managed by agency.

5.4.3 SUPERVISOR

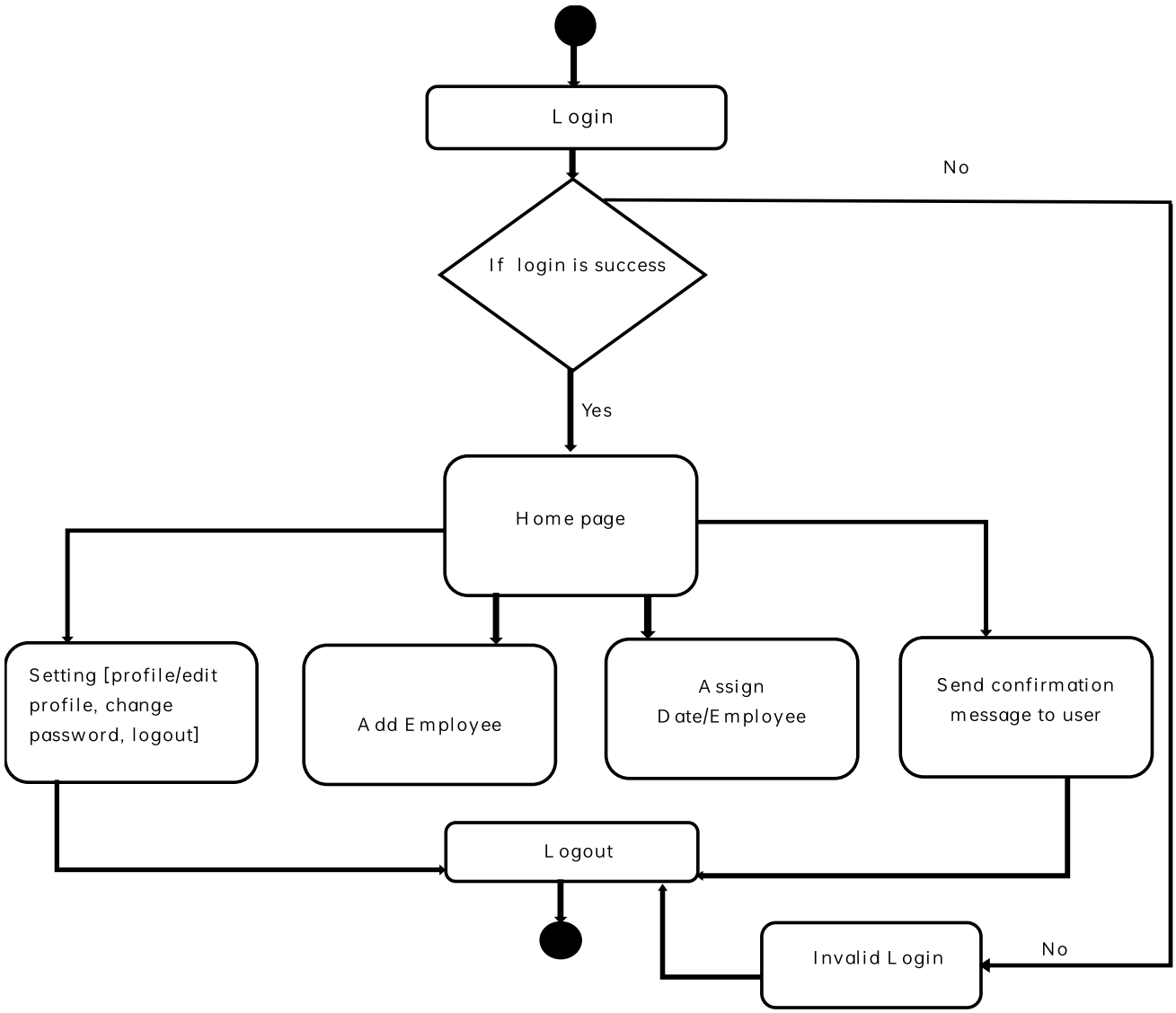


Figure 5.4.3: Supervisor

The agency can login to the system and can add employee, date of work for a

particular employee is assigned by supervisor, a confirmation message regarding waste collection is send to user is also the duty of a supervisor.

5.4.4 EMPLOYEE

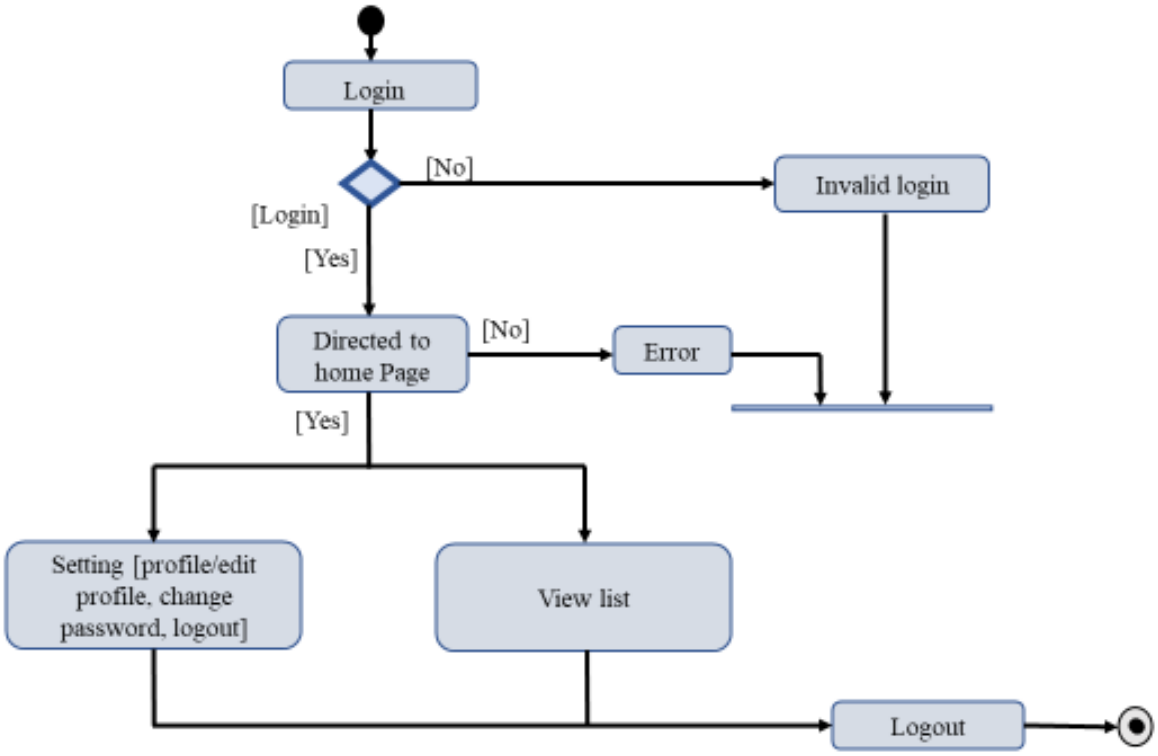


Figure 5.4.4: Employee

The employee can login to the system and view list of the users assigned to him/her. So that he can reach the user in an accurate as well as shortest way possible.

5.4.5 USER

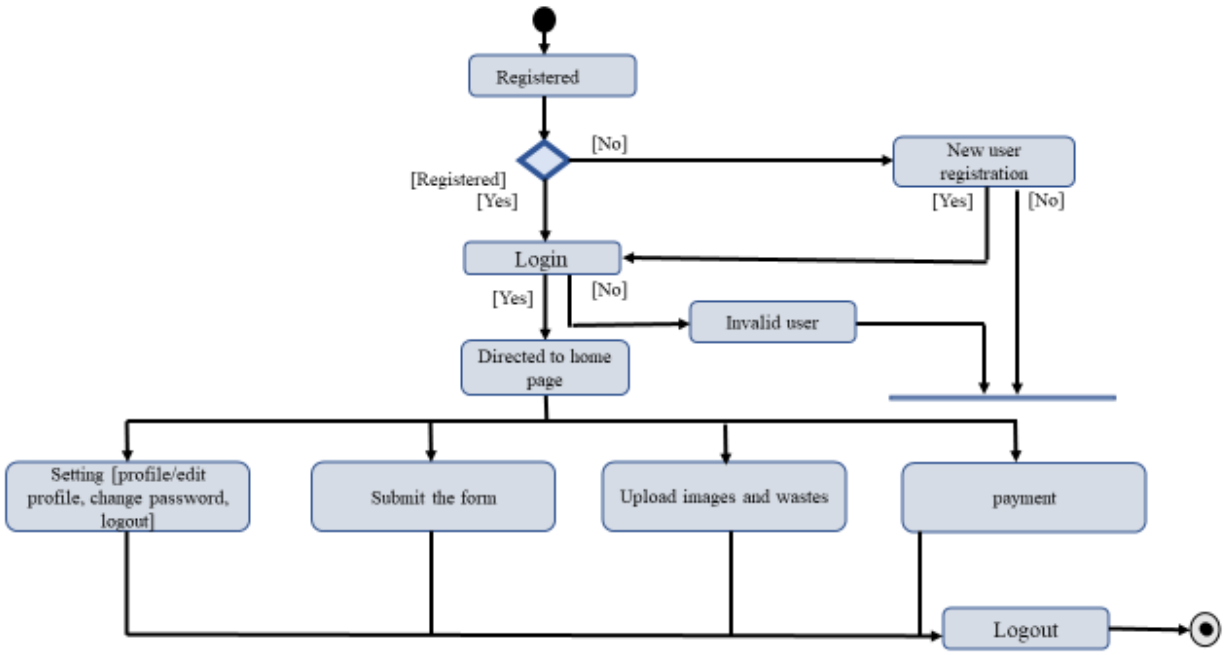


Figure 5.4.5: User

The user can login to the system and give their date of preference for waste collection, they can upload images of public waste, payment can also be done by the user for wastes which cannot be recycled.

5.5 CLASS DIAGRAM

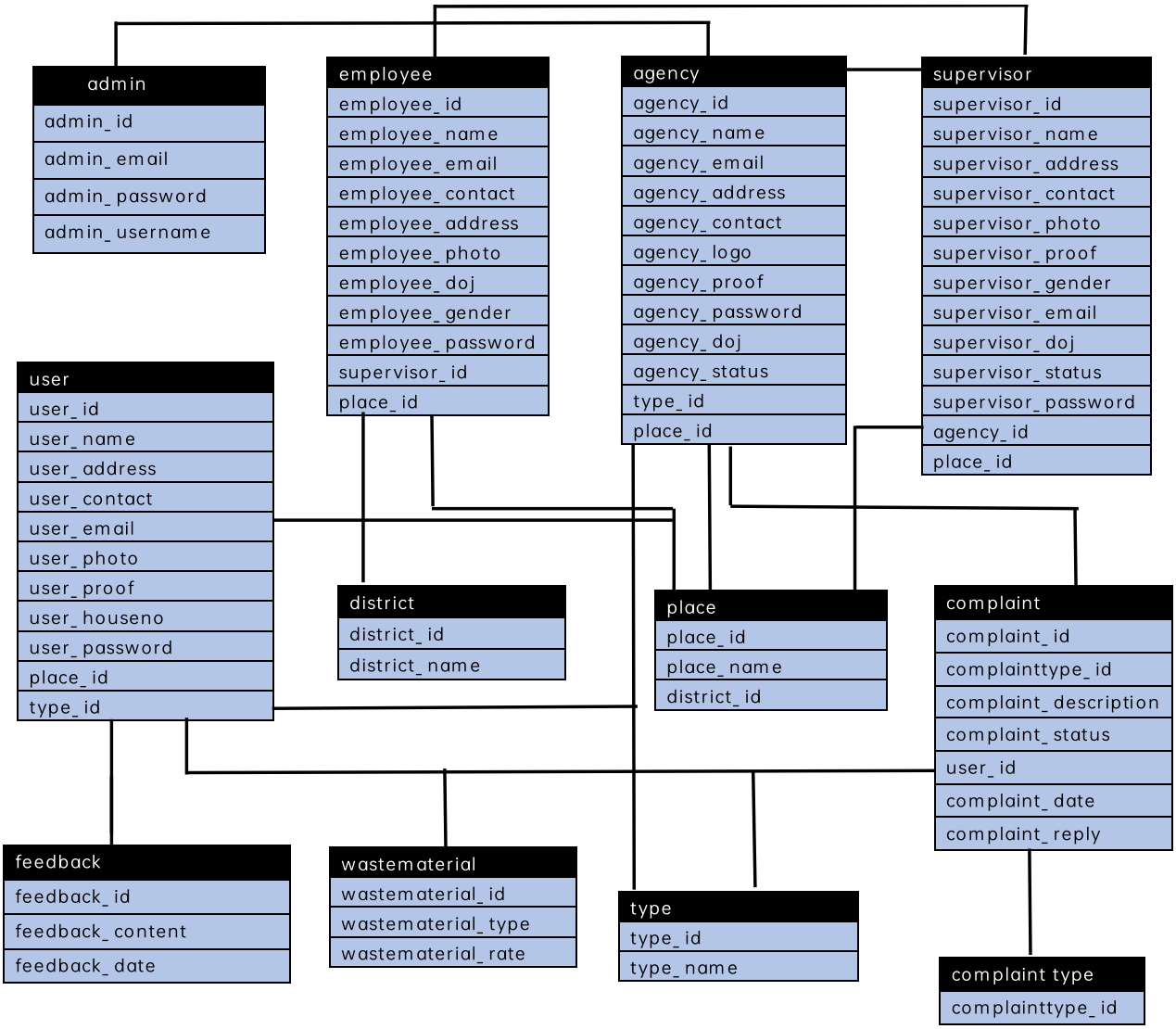


Figure 5.5: Class diagram

Class diagram represents relationship between different classes. In this diagram, Admin adds agency and agency adds supervisors. Agency is registered with various details which ensures the identity of the agency, they manage complaints, type details. Supervisors add employees and employees can view details of user. A user is registered with their personal information it ensure the identity of a user and a feedback form is provided for the user for providing their experience.

CHAPTER 6

PROJECT SHEDULING

Project completion date – march 2023

CHAPTER 7
CONCLUSION

It is suffice to say that we require a more stringent integrated and strategic waste prevention framework to effectively address wastage related issues. There is an urgent need to build upon existing systems instead of attempting to replace them blindly with models from developed countries. To prevent any epidemic and to make each city a healthy city-economically and environmentally, there is an urgent need for a well-defined strategic waste management plan and a strong implementation of the same. To achieve financial sustainability, socio-economic and environmental goals in the field of waste management, there is a need to systematically analyze the strengths and weaknesses of the community as well as the municipal corporation, based on which an effective waste management system can be evolved with the participation of various stakeholders. The behavior 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 practice Recycle, Reuse, and Reduce instead of producing waste. We put forwards a project which aims at planning and developing an android application that will effectively transport the waste from houses and is beneficial for both the parties. Waste management in the present time is known to everyone but unfortunately, it is neglected by numerous people. Illegal dumping has been a constant issue in our society, and it ruins the city and wellbeing of the citizens. So, it is important to develop a system which is both user-friendly and efficient.

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