



**JIGNASA STUDY PROJECT**  
**E-WASTE RE-CYCLING SERVICE SYSTEM**  
**(2021-22)**

Submitted  
by

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## 1.INTRODUCTION

E-waste or electronic waste is created when an electronic product is discarded after the end of its useful life. The rapid expansion of technology means that a very large amount of e-waste is created every minute.

### 1.1 WHAT IS E-WASTE

Electronic waste or e-waste may be defined as discarded computers, office electronic equipment, entertainment device electronics, mobile phones, television sets, and refrigerators. This includes used electronics which are destined for reuse, resale, salvage, recycling, or disposal as well as re-usables (working and repairable electronics) and secondary scraps (copper, steel, plastic, etc.). The term "waste" is reserved for residue or material which is dumped by the buyer rather than recycled, including residue from reuse and recycling operations, because loads of surplus electronics are frequently commingled (good, recyclable, and non-recyclable). Several public policy advocates apply the term "e-waste" broadly to all surplus electronics. Cathode ray tubes (CRTs) are considered one of the hardest types to recycle. CRTs have relatively high concentration of lead and phosphorus (not to be confused with phosphorus), both of which are necessary for the display.

### 1.2 TYPES OF E-WASTE

- Large household appliances (refrigerators/freezers, washing machines, dishwashers)
- Small household appliances (toasters, coffee makers, irons, hairdryers)
- Information technology (IT) and telecommunications equipment (personal computers, telephones, mobile phones, laptops, printers, scanners, photocopiers)
- Consumer equipment (televisions, stereo equipment, electric toothbrushes)
- Lighting equipment (fluorescent lamps)
- Electrical and electronic tools (handheld drills, saws, screwdrivers)
- Toys, leisure and sports equipment
- Medical equipment systems (with the exception of all implanted and infected products)
- Monitoring and control instruments
- Automatic dispensers.

### **1.3 QUANTIFICATION OF ELECTRONIC WASTE WORLDWIDE**

Rapid changes in technology, changes in media (tapes, software, MP3), falling prices, and planned obsolescence have resulted in a fast-growing surplus of electronic waste around the globe. Technical solutions are available, but in most cases, a legal framework, a collection, logistics, and other services need to be implemented before a technical solution can be applied.

### **1.4 e-WASTE IN VARIOUS COUNTRIES**

Display units (CRT, LCD, LED monitors), processors (CPU, GPU, or APU chips), memory (DRAM or SRAM), and audio components have different useful lives. Processors are most frequently out-dated (by software no longer being optimized) and are more likely to become "e-waste" while display units are most often replaced while working without repair attempts, due to changes in wealthy nation appetites for new display technology. This problem could potentially be solved with smartphones or Phonebloks. These types of phones are more durable and have the technology to change certain parts of the phone making them more environmentally friendly. Being able to simply replace the part of the phone that is broken will reduce e-waste. An estimated 50 million tons of E-waste are produced each year. The USA discards 30 million computers each year and 100 million phones are disposed of in Europe each year. The Environmental Protection Agency estimates that only 15–20% of e-waste is recycled, the rest of these electronics go directly into landfills and incinerators.

In 2006, the United Nations estimated the amount of worldwide electronic waste discarded each year to be 50 million metric tons. According to a report by UNEP titled, "Recycling – from E-Waste to Resources," the amount of e-waste being produced – including mobile phones and computers – could rise by as much as 500 percent over the next decade in some countries, such as India. The United States is the world leader in producing electronic waste, tossing away about 3 million tons each year. China already produces about 2.3 million tons (2010 estimate) domestically, second only to the United States. And, despite having banned e-waste imports, China remains a major e-waste dumping ground for developed countries.



Society today revolves around technology and by the constant need for the newest and most high-tech products we are contributing to mass amount of e-waste. Since the invention of the iPhone, cell phones have become the top source of e-waste products because they are not made to last more than two years. Electrical waste contains hazardous but also valuable and scarce materials. Up to 60 elements can be found in complex electronics. As of 2013, Apple has sold over 796 million iDevices (iPod, iPhone, iPad). Cell phone companies make cell phones that are not made to last so that the consumer will purchase new phones. Companies give these products such short life spans because they know that the consumer will want a new product and will buy it if they make it. In the United States, an estimated 70% of heavy metals in landfills comes from discarded electronics.

While there is agreement that the number of discarded electronic devices is increasing, there is considerable disagreement about the relative risk (compared to automobile scrap, for example), and strong disagreement whether curtailing trade in used electronics will improve conditions, or make them worse. According to an article in *Motherboard*, attempts to restrict the trade have driven reputable companies out of the supply chain, with unintended consequences.

## 1.5 E-WASTE IN INDIA

Electronic waste, or e-waste, is one of the fastest-growing waste streams worldwide. Increasing industrialisation, standards of living and disposable income have prompted a surge in the volumes of electrical and electronic equipment (EEE) in the market – and a concomitant increase in e-waste as well.

According to 'Global e-waste monitor 2020', 53.6 million tonnes of electronic waste was generated worldwide in 2019, of which only 17.4% was recycled. India is the world's third biggest contributor – with 3.2 million tonnes of e-waste generated a year, after China and the US. So for India to transition from a linear to a circular economy vis-à-vis electronics, policymaking and better legislative enforcement have to play catalysts.

According to a 2020 report by the Central Pollution Control Board, India generated 1,014,961 tonnes of e-waste in FY 2019-2020 – up 32% from FY 2018-2019. Of this, the report found that only 3.6% and 10% were actually collected in the country in 2018 and 2019, respectively.

## **1.6 E-WASTE- Producer Responsibility in INDIA**

India is the only country in South Asia with a specific e-waste law in place, since 2011. The e-waste rules, formerly the E-waste (Management and Handling) Rules, provide guidelines for the transportation, storage and recycling of waste, and also introduced the concept of extended producer responsibility (EPR).

EPR is a known policy tool that requires makers of electronics to take financial and/or physical responsibility for managing the disposal of their products after the end of their lives. In 2016, the rules were broadened to introduce a ‘Producer Responsibility Organisation’ (PRO) to help collect and recycle e-waste, and brought buy-back, deposit refund and exchange schemes under the EPR.

Under the EPR mechanism, either the producer or a delegated third party – the PRO – must collect the waste for recycling or refurbishing. A 2018 amendment to the rules introduced year-on-year collection targets for producers under the EPR. From 2023 onwards, for example, producers/PROs are to collect at least 70% of the waste vis-à-vis their products from 2023.

## **1.7 Benefits of E-waste Recycling**

### **Electronics Recycling Conserves Natural Resources**

There are many materials that can be recovered from old electronics. These materials can be used to make new products, thus reducing the need to mine for new raw materials. For instance, various metals can be recovered from computer circuit boards and other electronics, and the plastics and glass found in computer monitors and televisions can be recycled.

### **Electronics Recycling Supports the Community**

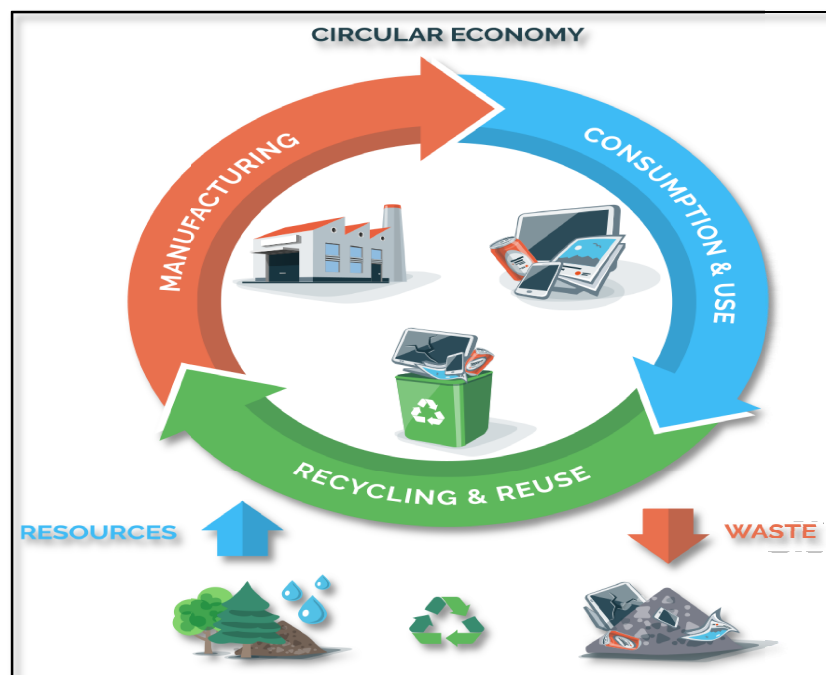
Donating your old electronics plays an important role in the provision of refurbished products such as computers and mobile phones, which can be of great help to low-income families, schools, and not-for-profit organizations. It also helps individuals gain access to technology that they could not have otherwise afforded.

### **Electronics Recycling Creates Employment Locally**

Considering that around 90 percent of electronic equipment is recyclable, electronics recycling can play a significant role in creating employment. This is because new firms dealing with electronics recycling will form and existing firms will look to employ more people to recover recyclable materials. This can be triggered by the increase in the demand for electronics recycling.

### **Electronics Recycling Helps Protect Public Health and the Environment**

Many electronics have toxic or hazardous materials such as mercury and lead, which can be harmful to the environment if disposed of in trashcans. Reusing and recycling electronics safely helps in keeping the hazardous materials from harming humans or the environment. For example, televisions and computer monitors are hazardous since they have lead in them. Printed circuit boards contain harmful materials such as cadmium, lead, mercury and chromium also, batteries in computers and other electronics may contain hazardous materials such as cadmium, mercury and lead. Instead of keeping old electronics in the house or dumping them in landfills, recycling or reusing them is an appropriate option that should be supported by individuals and organizations. Considering the benefits of electronics recycling, it is very important that people in various parts around the world embrace this concept.



## **1.8 Collection Mechanism of e-waste:-**

### **The company had planned to adopted the Buy-back Scheme**

Under Buy back Scheme, in cases where the customer wants to discard their old product, they may call at the Toll Free number and our representatives shall approach to the customer and buy the said discarded product from the customer and in consideration.

The customer shall also be free to deposit the discarded product at the nearest collection point and he will get the discount voucher and shall be eligible for the discount on purchase of selected new product of the Company. The company will coordinate with other independent vendors who may sale the e- waste/EOL product collected by them. The company will furthermore elaborate its scheme and shall keep updating the same based on the experience faced while implementing the said schemes on a quarterly basis.

### **Direct Collection from Customer's premises**

For collection of e-waste The Company has setup toll free number where any customer may call and register itself for either depositing its old product as free of cost or otherwise under buy-back programme initiated by company. The company shall give its toll free number on their product manuals, website, and social networking platforms and at its various connected premises for its Customer information for disposal of their e-waste. The customer can directly call on these numbers and the e-waste will be directly collected by the company or by its recycler partner. The company has recycler partner who has manage logistic service through Professional logistics Pvt. Ltd. Available at most of the locations at its collection centers.

### **Waste Management Agency:**

For collection of e-waste Agency has setup toll free number or website where any customer may call and register itself for either depositing its old product as free of cost or otherwise under buy-back programme initiated by agency. The customer can directly call on these numbers and the e-waste will be directly collected by the company or by its recycler partner. The company has recycler partner who has manage logistic service through Professional logistics Pvt. Ltd. available at most of the locations at its collection centers.

## 2. Proposed System

### 2.1 Our Project

E-Waste Re-Cycling Management system is used for the collection of the electronic waste material from the customer, local collector, and so on.. the customer can define the detail about which type of waste is having. the customer can get the money by giving the waste material online e-waste collection system is for deplorers and recycling it in the company.

### 2.2 Aim

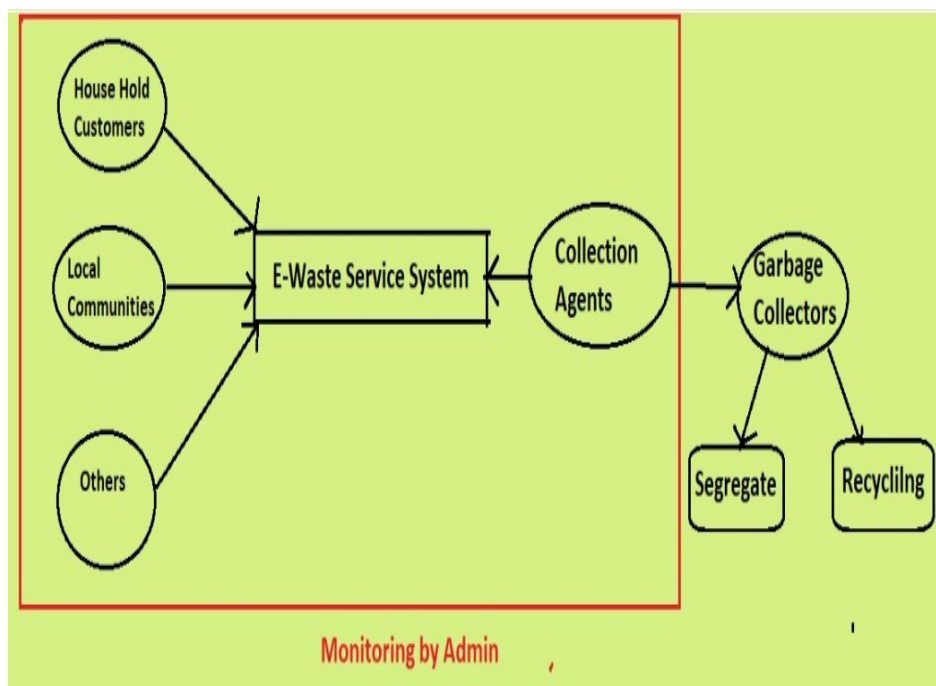
The main purpose of the E-Waste collection system is to provide another way for the customer to giving the e-waste material. The E-Waste collection system is an internet based application that can be accessed throughout the net AND can be accessed by any one who has a net connection. It is an automatic system, where they will automate the selling the waste material and enquires about which waste equipment are collection. After inserting the data to database and staff need not to worry about the orders received through the system and hence reduces the manual labour. one of the best features of the system is to deploy are recycling the electrical and electronic equipment from the customer house and city.

### 2.3 Objectives:

- The major purpose of project is to build capacity of practitioners and decision makers to guide and handhold them to plan, design and implement Online WEEE/E-waste Collection System including policy, collection, transportation and treatment in a city/ geographical area and country.
- Encourage and promote the development and progress of Online E-waste Collection System towards achieving in the field of computer sciences and technology for Theater applications both for recycling and deployment of electronic waste.
- E-waste Re-Cycling Management System amongst clients for awareness and recycling of the waste material by using latest system. Simulate and offer aid for system for the benefit of manufacturers and users. Help in the improvement of standards, terminology equipment's, methods and implementation practices in the field of Online E-waste Re-Cycling Management System.

## 2.4 Purpose

The main purpose of the E-Waste collection system is to provide another way for the customer to giving the e-waste material. The E-Waste collection system is an internet based application that can be accessed throughout the net AND can be accessed by any one who has a net connection . It is an automatic system , where they will automate the selling the waste material and enquires about which waste equipment are collection. After inserting the data to database and staff need not to worry about the orders received through the system and hence reduces the manual labour . one of the best features of the system is to deploy are recycling the electrical and electronic equipment from the customer house and city.



Here we created a website for Waste Management Agency which collects the data regarding their E-waste . Our Electronics Recycling Process includes

**Schedule a Pickup:** Log into your account, give us some details and we'll handle the rest.

**Pickup and Collection:** Whether you have small quantities or an entire truck, or if you require something more specialized like white glove service, we have you covered.

**Data Destruction:** We offer multiple data eradication services. Your data is safe with us.

### **The Goals of the System are:**

- To provide any time any place service for the customer.
- To reuse electronic waste material by recycling or deploy
- To decrease the E-waste material from house hold.
- To obtain statistic information about the problems effect by the E-Waste material
- To provide the awareness about electrical and electronic material using for house hold.

## **2.5 Requirement of New System**

The waste collection system is now on online waste collection website. The public get the information about the e-waste material and aware about the waste. We will collect the household electronic and electric equipment form the public and which will recycle or deploy waste. The recycling waste will be used in the other equipment's, and industries can use the recycling equipment's for new material, etc

### **The goals of the system are:**

- To provide anytime anyplace service for the customer.
- To reuse electronic waste material by recycling or deploy.
- To decrease the electronic waste material from household.
- To reduce the child labour in the society.

### **Scope**

The scope of the project is to provide approaches and strategies which have proved to be the suitable when assessing the e-waste system of the defined region. This collection will reduce the e-waste from the household, company, industries, city, etc. The Environment pollution will reduce and the electronic waste will recycle or deployed. The fundamental aims of the Basel Convention are the control and reduction of trans boundary movements of hazardous and other wastes including the prevention and minimization of their generation, the environmentally sound management of such wastes and the active promotion of the transfer and use of technologies.

This technique could eliminate waste disposal costs, reduce raw material costs and provide income from a salable waste. Waste can be recovered on-site, or at an off-site recovery facility, or through inter industry exchange. A number of physical and chemical techniques are available to

reclaim a waste material such as reverse osmosis, electrolysis, condensation, electrolytic recovery, filtration, centrifugation etc. For example, a printed-circuit board manufacturer can use electrolytic recovery to reclaim metals from copper and tin-lead plating bath.

### 3. System Analysis

#### 3.1 Existing System

- The existing system has one ways of waste collection system:
- The waste collection system is offline which is done by the government, like the waste material with all the mixture with solid and liquid waste. The waste is send to the garbage factories for the deployment of the waste.

#### 3.2 Weakness of Current System

- The waste collection system is offline which is done by the government. The electronic and electric waste are deploy and recycling is less than 30%, the awareness between the public is none by the waste collection in the household. We are define the new system as online e-waste collection system. Requirement of New System

- The waste collection system is now on online waste collection website. The public get the information about the e-waste material and aware about the waste. We will collect the household electronic and electric equipment form the public and which will recycle or deploy waste. The recycling waste will be used in the other equipment's, and industries can use the recycling equipment's for new material, etc.

- The goals of the system are:
  - To provide anytime anyplace service for the customer.
  - To reuse electronic waste material by recycling or deploy.
  - To decrease the electronic waste material from household.

#### 3.3 Feasibility Study

- Whenever we design a new system, normally the management will ask for a feasibility report of the new system. The management wants to know the technicalities and cost involved in creation of new system.

- **Technical feasibility**

Technical feasibility involves Collection of E-waste Collection to establish the technical



capability of the system being created to accomplish all requirements to the user. The system should be capable of handling the proposed volume of data and provide users and operating environment to increase their efficiency. For example, system should be capable of handling the proposed volume of data and provide users.

- **Economic feasibility**

Economic feasibility involves E-waste Collection to establish the cost benefit analysis. Money spent on the system must be recorded in the form of benefit from the system.

## 4 SYSTEM MODELS

### 4.1 e-waste management system

The e-waste management system is to be done in a panchayat or a residence association. A member of the panchayat / residence association will be the admin. Admin should be able to view the attendance of the staff, maintain the payment list of both customer and staff. The member of the panchayath / residence association will be the customer. The persons who view and purchase products will be consumers.

The people who collect waste according to admin's instruction will be the collection agents/staff/employee. Functionalities of each user are described below

#### Functionalities of the System

##### Admin

- ✓ login/logout
- ✓ view products uploaded by the customer
- ✓ add/remove products
- ✓ upload products
- ✓ view weekly/daily reports
- ✓ maintain the allocation of staff
- ✓ view the attendance of staff
- ✓ payment list of staff
- ✓ payment list of customer
- ✓ add/remove customer
- ✓ add/remove staffs
- ✓ send messages to staff about the e-waste and location
- ✓ informs the date on which staff come to collect waste

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- ✓ informs the customer when the date is preponed or postponed
- ✓ view feedback
- ✓ approval of products uploaded by the customer
- ✓ verification(if both customer and staff send confirmation message)

### **Consumer**

- ✓ login/logout
- ✓ registration
- ✓ view products
- ✓ purchase products
- ✓ view description of product

### **Employee / Staff**

login/logout

## **4.2 Front End & Back End**

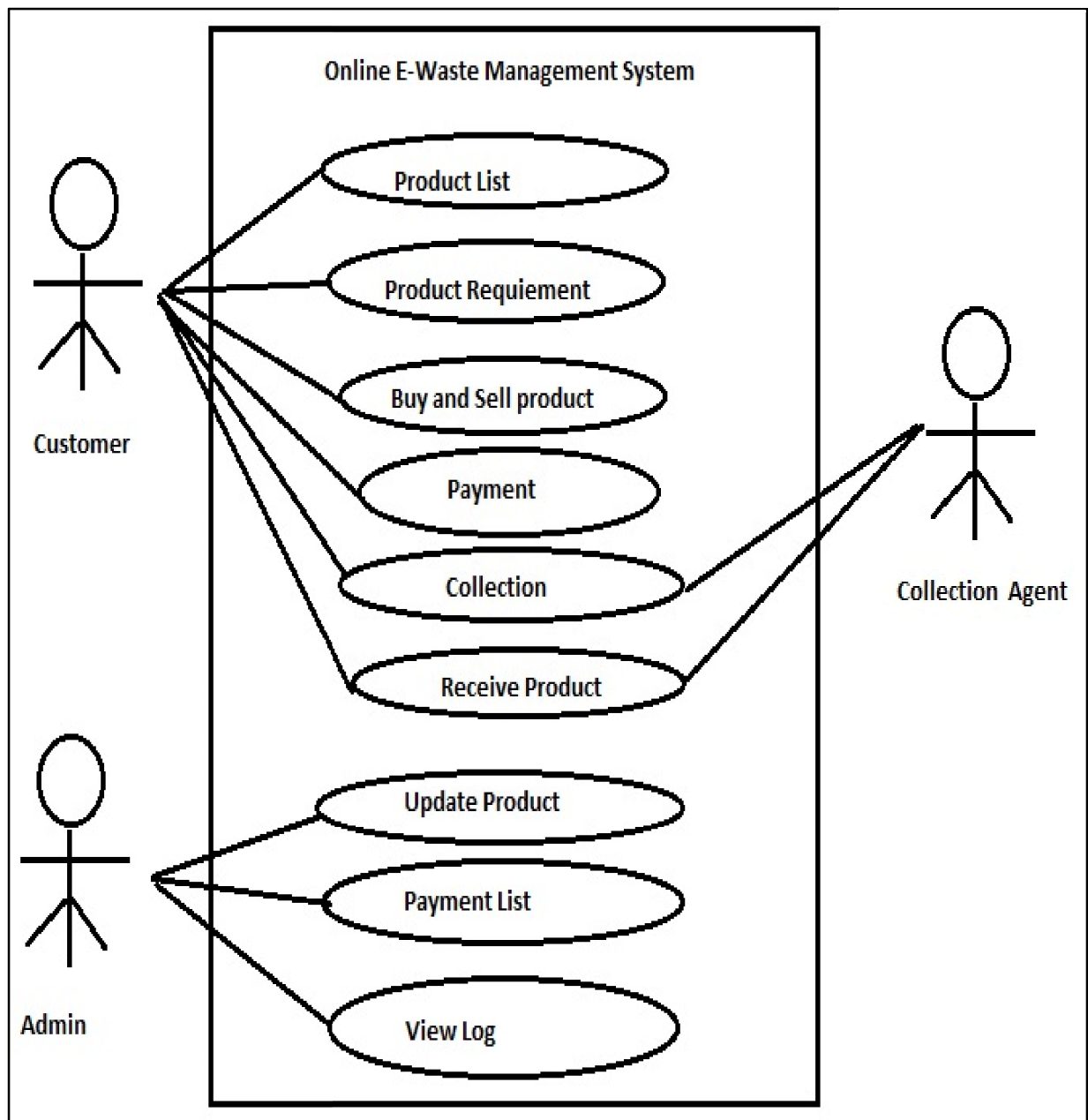
### **• Front End Tools :**

- HTMLS,
- CS S,
- JavaScript,
- PHP

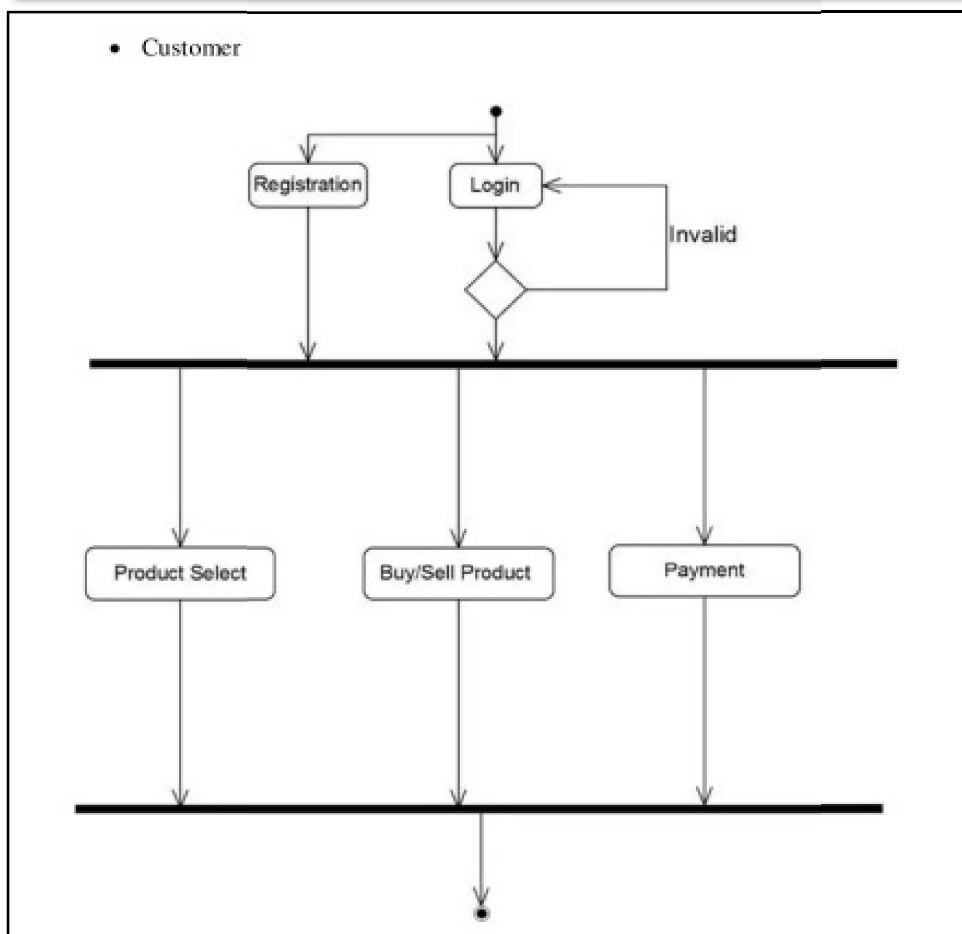
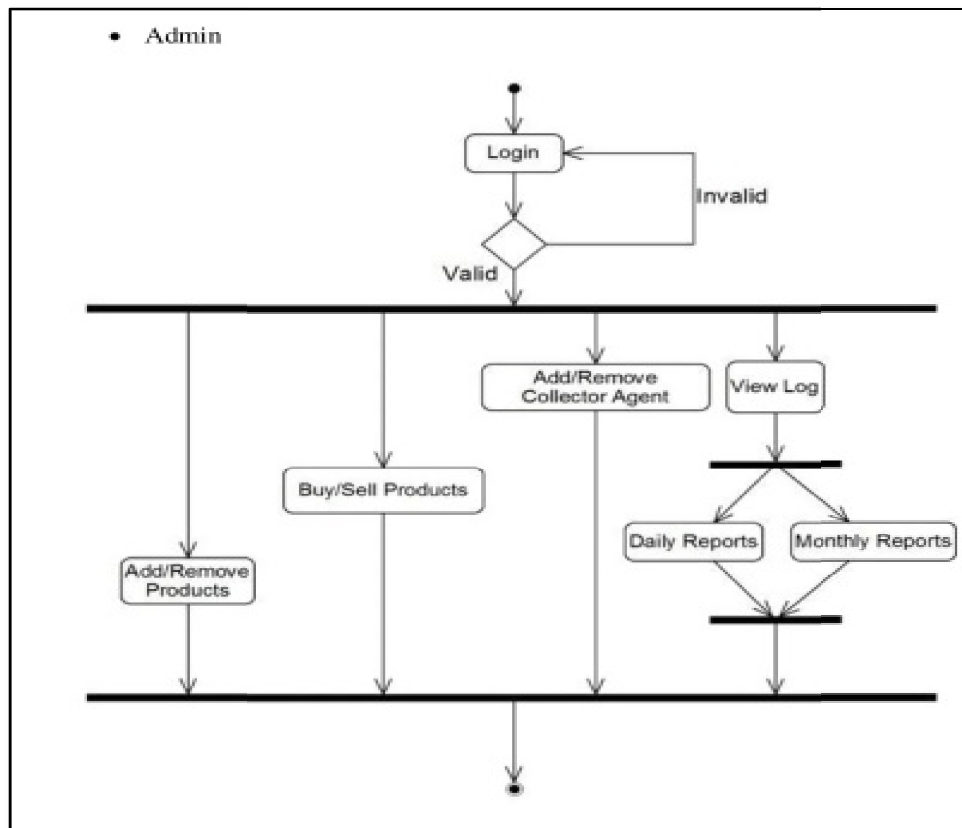
### **• Back End Tools :**

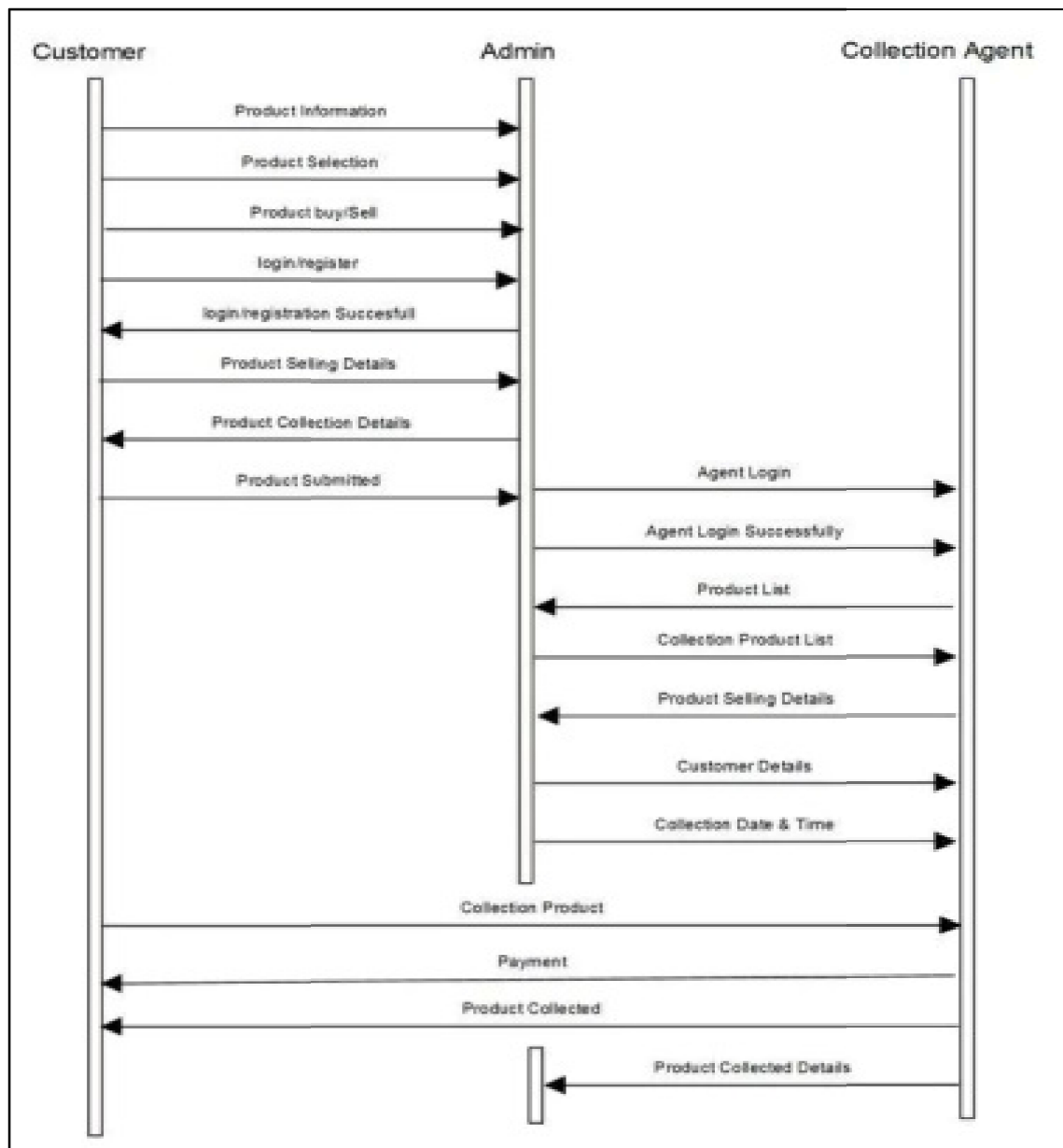
- MYSQL,
- SQL Server 2008,
- SQL Lite

## Use case Diagram



**Activity Diagram:**



**Data Flow Diagram:**

## SCREENSHOTS

# E-WASTE

Home Admin **User**



**E-Waste**

Electronic waste or e-waste describes discarded electrical or electronic devices. Used electronics which are destined for reuse, resale, salvage, recycling, or disposal are also considered e-waste.

PLEASE RECYCLE

## User Login

Flat No

Password

Home   Send Request   **View Status**   Logout



**E-Waste**

Electronic waste or e-waste describes discarded electrical or electronic devices. Used electronics which are destined for reuse, resale, salvage, recycling, or disposal are also considered e-waste.

PLEASE RECYCLE

### View Status

Name	Flat No	Description	Mobile No	Date	Status
nikil	102	about cleaning	9052016340	2017:11:10 03:32:19	To be Picked



## E-Waste

Electronic waste or e-waste describes discarded electrical or electronic devices. Used electronics which are destined for reuse, resale, salvage, recycling, or disposal are also considered e-waste.

### View User Requests

Name	Flat No	Description	Mobile No	Date	Status	Approve
ramu	105	dsfdfd	9052016340	2017:11:10 03:00:37	approved	<b>Approve</b>
nikil	102	about cleaning	9052016340	2017:11:10 03:32:19	To be Picked	<b>Approve</b>



## **Conclusion**

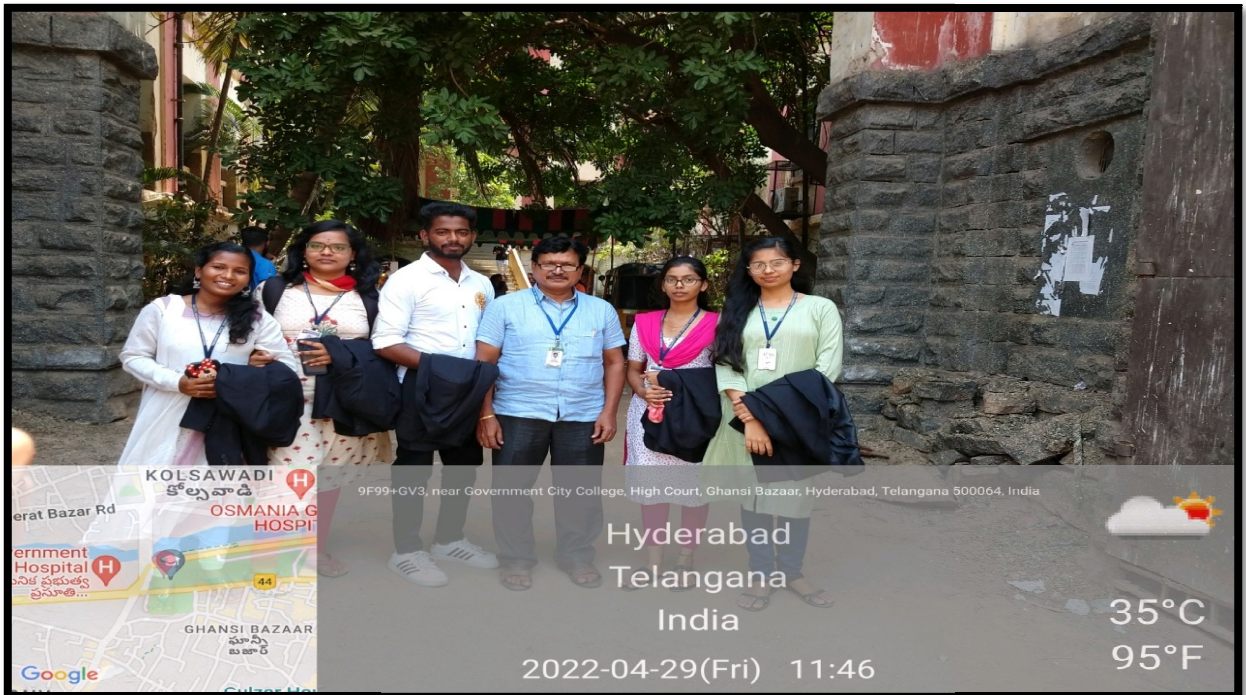
Electronic and electrical equipment's cannot be avoided in today's world. So also is the case of waste electronic and electrical equipment. As long as this is a necessary evil, it has to be best managed to minimize its adverse impacts on environment. Electronic waste piles are growing, as is their pollution potential. Most of these problems have their source in the development and design of the products concerned. Using this type of system we can conclude that using the methodology of Reduce, Reuse and Recycle (3R) decrease the piles of electronic and electrical equipment, and make environment to be cleaned and healthy.



# JIGNASA 2021-22

## KAKATIYA GOVERNMENT COLLEGE

HANAMKONDA, DIST. HANAMKONDA.  
(Affiliated to Kakatiya University)









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Telangana  
India

2022-04-29(Fri) 13:16

36°C  
97°F















## Feedback

### Feedback (JIGNASA-2022)

I'm Snehasri, studying B.Z.CA. final year. I have participated in JIGNASA State level presentation (Subject-Computer) for the topic 'E-waste Recycling Service System'.

As a part of presentation we went to CITY COLLEGE (GOVT.) HYD. I had a wonderful experience as our presentation went well. we learnt many things in this journey. with the support of Sravanakumari Madam we got the better idea about the process and project. This presentation made us better individuals there by building our confidence.

Our throughout our journey we had great experience we got good mentors to guide us. we thank our department for their continuous support. Special thanks to Ramesh V. sir for your care and constant support.

Snehasri



### Feedback (JIGNASA - 2022)

I'm S. Amulya, studying BSC (M.St.CS) final year. I have participated in JIGNASA state level presentation, on our subject computer applications. Our group had collectively worked on the project 'E-waste Re-cycling Service System'.

participating in such competitions boosts our personality individually. I really had a wonderful experience and our presentation also went well. Speaking in front of dignitaries and co-students improved my boldness and strength. I have learnt a lot and gained knowledge. participating in such huge presentations/competitions brings the best in us. It had helped a lot. I really enjoyed and gained knowledge.

Thank you!

S. Amulya.

### feedback (JIGNASA - 2022)

I am S. Rashothen from B.Z.CA final year. I have participated in JIGNASA state level presentation. On our computer application. E-waste recycling Service System.

I have good experience.

Rashothen



Myself bhavya Sri of kakatiya govt college from M.st.cs  
of III year writing this letter to give my feedback  
regarding Tignasa project of 2022.

As we have gave a seminar on a  
topic about E-waste and its management ~~regan~~ through  
a platform. (~~Ex~~ Idea created by us.) As a group.  
we had an idea of creating a impact on this topic.  
It was wonderful experience of learning about so many  
things and projects and sharing our knowledge but  
the only problem faced by us is time limit.

As it was not informed earlier about the  
time limit. we had to make an immediate adjustments in  
our project explanations, spontaneously. It created a little  
chaos in our presentation.

It will be better if time limit is excluded or else  
atleast the information should be given earlier about it  
could help in better presentations.

I am feeling privileged to get this opportunity and  
immensely blessed. but it will be much better if time limit is resolved.

Feedback

I am k. saicharn from kakathiya G.Ovt. Degree college in hanumanakota  
studying in MScs. I have participated in the state level  
programm regarding to Jnana in Hyd. City college. topic is  
E-waste. I have experienced alot in the programme, we had  
given a great perfence in the programme hall. We had a lot  
of fun and enjoy in it. The day to me is unforgetble in my life  
I have good expeience in these. A humble thanking to the  
sir and madam. for give a oppunitiye to particpet in these.  
Thanking madam.....