DIGITAL WASTE MANAGEMENT SYSTEM

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AIM, VISION AND MISSION

➢ AIM:

To reduce the consumption of plastic by recycling them and to create awareness on other alternatives of plastic.

➢ VISION:

To make our country be one of the least producers of plastic by inculcating people with other alternatives.

➢ MISSION:

To collect plastic waste personally from households, recycle them and by providing the households with other alternatives to plastic, based on the reward points earned by them.

INTRODUCTION

➢ *WHERE IS THE PLASTIC IN YOUR LIFE?*

If you answered everywhere, you're probably not far off. This versatile material is in our appliances, computers, clothing, and so much more. Some of the most common places we find plastic is wrapped around the things we buy every day. After all, it's an effective way to keep food and cosmetics clean and fresh.

But plastic is also lurking in some little-known places. When you take a careful look around your home, the sheer number of things you'll find containing plastic may surprise you. Let us take a look on some of the major contributors:

- **Food packaging**.
- **Milk cartons**.
- **Personal care products**.
- **Dental floss** and **disposable razors**.
- **Synthetic fabrics.**
- **Baby wipes and diapers.**
- **Feminine hygiene product.**
- **Wrapping paper**
- **Chewing gum**
- **Cigarette filters**
- **Glues**
- **Coffee cups.**

The above-mentioned list is absolutely zilch compared to the actual amount of plastic one sees or uses in their day to day life.

➢ *PLASTIC WASTE - A GLOBAL CONCERN*

- **Plastic never goes away.**

Plastic is a material made to last forever, yet 33 percent of all plastic - water bottles, bags and straws - are used just once and thrown away. Plastic cannot biodegrade; it breaks down into smaller and smaller pieces.

- **Plastic affects human health.**

Toxic chemicals leach out of plastic and are found in the blood and tissue of nearly all of us. Exposure to them is linked to cancers, birth defects, impaired immunity, endocrine disruption and other ailments.

- **Plastic spoils our groundwater.**

There are thousands of landfills in the United States. Buried beneath each one of them, toxic chemicals from plastics drain out and seep into groundwater, flowing downstream into lakes and rivers.

- **Plastic attracts other pollutants.**

Chemicals in plastic which give them their rigidity or flexibility (flame retardants, bisphenols, phthalates and other harmful chemicals) are oily poisons that repel water and stick to petroleum-based objects like plastic debris. So, the toxic chemicals that leach out of plastics can accumulate on other

plastics. This is a serious concern with increasing amounts of plastic debris accumulating in the world's oceans.

- **Plastic threatens wildlife.**

Wildlife become entangled in plastic, they eat it or mistake it for food and feed it to their young, and it is found littered in even extremely remote areas of the Earth.

- **Plastic piles up in the environment.**

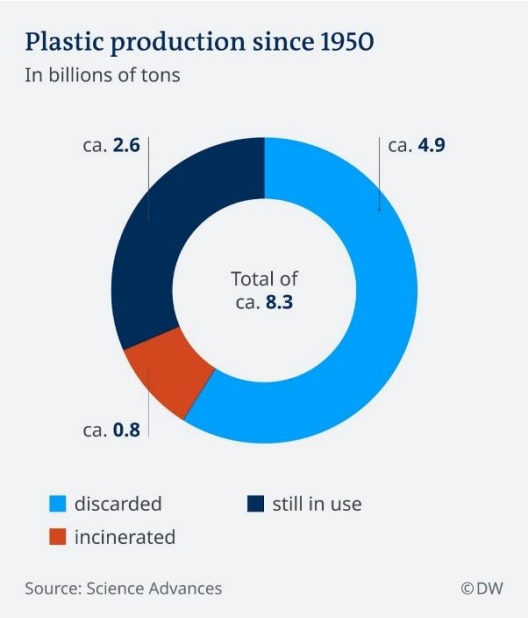
  Only 60% of the plastic produced is recycled, balance 9400 Tonnes of plastic is left unattended in environment causing land, air and water pollution. 70% of Plastics packaging products are converted into plastic waste in a short span.

- **Plastic poisons our food chain.**

Even plankton, the tiniest creatures in our oceans, are eating microplastics and absorbing their hazardous chemicals. The tiny, broken down pieces of plastic are displacing the algae needed to sustain larger sea life who feed on them.

- **Plastic costs billions to abate.**

Everything suffers: tourism, recreation, business, the health of humans, animals, fish and birds—because of plastic pollution. The financial damage continuously being inflicted is inestimable.



➢ *OUR INITIATIVE*

We at *Feel Green* mainly focus on the health of our environment. Our aim is to reduce, reuse and recycle most of the plastic laying around us with your help. We encourage people to donate plastic to recycle and volunteer to raise awareness on harmful effects of plastic and its better alternatives to keep the environment plastic free.

➢ *THE PLAN*

- A person can either **donate plastic or can volunteer** to raise **awareness** on the harmful effects of plastic and to collect plastic from their neighbourhood.
- ➢ For each donation/volunteering **reward points are given**.
- For every donation/volunteering we will **plant a tree**.
- People can buy our **eco-friendly products** with your earned rewards

WHAT DOES OUR WEBSITE OFFER?

➢ *Safe Waste Disposal*

There are four major options for disposal of plastics: landfilling, incineration, recycling, and biodegradation. All plastics can be disposed of in landfills or incinerated. But **landfills require space and the chemical constituents** and energy contained in plastic articles typically is lost in this disposal route. The second option, incineration, returns some of the energy from plastic production but is known to produce negative environmental and health effects. Many **plastics can be recycled**, and some of the materials used to make plastics can be recovered. However**, this method is not fully utilized, due to difficulties with the collection and sorting of plastic waste.** Finally, certain polymers are designed to biodegrade, thereby preventing long-term environmental damage from pollution. However, many **biodegradable plastics may not biodegrade rapidly** enough under ambient environmental conditions to avoid accumulation from continuous inputs; and biodegradable

plastics also can contaminate and disrupt the current recycling stream, due to their similar appearance, yet distinct makeup.

From above we see that Recycling plastic is the best option and **our team makes sure of collecting plastic waste from households, sort and recycle them** to avoid any kind of pollution or harmful effects.

➢ *Recycle the collected plastic waste*

Recycling and re-utilization of waste plastics have several advantages. It leads to a **reduction of the use of virgin materials and of the use of energy, thus also a reduction of carbon dioxide emissions.** Benefits of Recycling:

1. Reduces Environmental Pollution
2. Energy savings: 40 - 100 MJ/kg (depends on the polymer)
3. Economic Benefits
4. Reduces demand for virgin polymer
5. Preferred to Land Filling
6. Generates Employment
7. Reduces depletion of Fossil fuel reserves

- ***We organize community cleanup***

A community **cleanup brings volunteers together to clean, repair, and improve public spaces or other areas** (such as vacant lots or abandoned properties) that have been neglected, vandalized, or misused. Cleanup projects involve all kinds of public spaces like parks, riverbanks, schoolyards, sidewalks, playing fields and even parking lots to name just a few.

- ***Awareness campaigns- Raising awareness about plastic pollution and inculcating people with other alternatives***

By making small changes to your everyday habits, you can make a huge difference. Individual action is a great place to start but the best option is to stop plastic use. We need to take action together to change the system to make doing the right thing, the easy thing. During the campaigns we will be inviting our community to take escalating actions to help get plastic out of their life, their community and eventually the whole economy.

Plastic pollution is today one of the most serious environmental problems affecting the oceans. Once in the natural environment, plastic can take up to 500 years to disappear and impacts wildlife on a daily basis. Drifting between two bodies of water it can strangle or smother any number of animal species. The danger goes further: under the influence of the sun, it fragments into microplastics that are ingested by fish and so enter the food chain. It is therefore also a potential threat to human health.

➢ *Eco-friendly alternatives for plastic*

- **Stainless steel:** Tough and easy to clean, stainless steel options for reusable food and beverage storage. You can replace single-use cups, kitchen storage, lunch boxes, and more with this durable metal.
- **Glass:** Upcycling glass jars into food storage is a no-cost way to give your food packaging new life. They can also be repurposed to store leftovers and homemade drinks, or decorated and turned into homemade gifts.
- **Platinum silicone:** Made primarily of sand, food grade platinum silicone is flexible and durable. It's also heat tolerant, so you can boil, bake, and cook in these products without danger of denaturing. Look for silicone products without plastic fillers.
- **Beeswax-coated cloth:** Used primarily as a replacement for plastic wrap and plastic bags, beeswax-coated fabric is easy to use and easy to clean. It also smells great.

- **Natural fibre cloth:** Natural cloth can replace plastic bags. Sustainable clothing made from organic cotton, wool, hemp, or bamboo won't shed plastic fibres when washed. Felted or recycled wool is a versatile, safe, and compostable material for children's toys, household containers, and more.
- **Wood:** A renewable resource, wood from sustainably-managed forests can replace plastic in household items like cleaning brushes, kitchen utensils, and cutting boards.
- **Bamboo:** This fast-growing renewable resource can replace plastic in items like tableware and drinking straws. It is lightweight, durable, and compostable.
- **Pottery and Other Ceramics:** Pottery and other fired ceramics offer a stable, waterproof alternative that's good for food storage and tableware. Look for non-toxic glazes.
- **Paper:** Paper except the glossy kind is safe to put in your home compost. A great alternative for plastic.
- **Cardboard:** Cardboard is fully compostable at home as long as it's not coated in, plastic. You can also use cardboard boxes to replace storage containers in your home.

Keep in mind that **anything you buy has an environmental footprint**. Though longer lasting than plastic, things made from glass, metal, and so on still take energy to make and transport. For these swaps to make sense, **you need to use them over and over and over again.** Buying well-made, durable products will help ensure you get the most use from whatever you choose.


SAY NO TO PLASTIC!


Garden
Alternatives
to Plastic Pots


Follow these small steps
to create big impact
SAY NO TO SINGLE USE PLASTIC
#BanSingleUsePlastic
USE PAPER OR GLASS BOX
USE GLASS JARS
USE REUSABLE CUTLERY
USE WOODEN COMB
USE REUSABLE WATER BOTTLE
USE METAL STRAW


eco-friendly
PLASTIC WRAP
ALTERNATIVES
for the kitchen

➢ *Rewards*

Login to our website and donate plastic for a good cause. **Earn points and also receive our fine eco-friendly products** which we will come deliver for your donations.

CODE REVIEW

- This is a full-stack website developed using ***ReactJS*** for the frontend of the website. ***NodeJS*** and ***ExpressJS*** for the backend. The database used is ***PostgreSQL***.

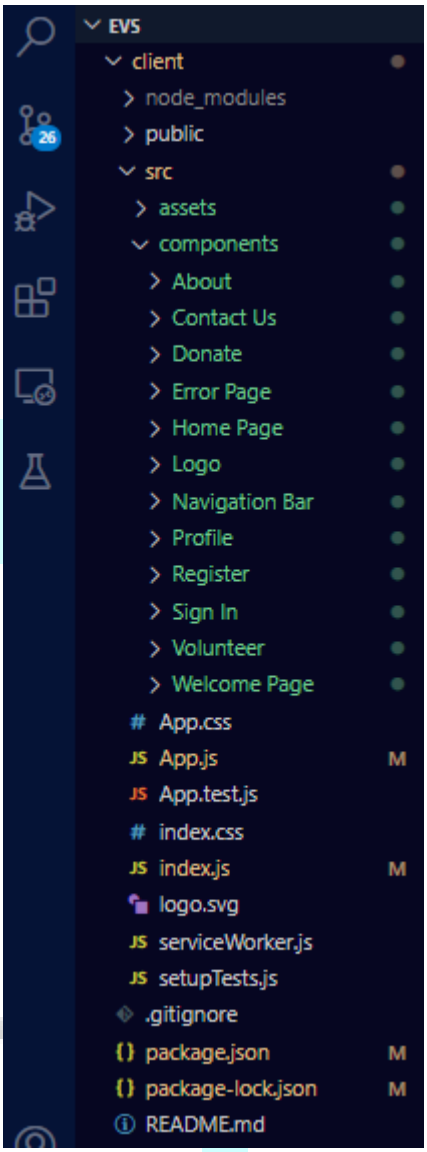
- This website facilitates users to register and login to our website and navigate further to the pages where they could fill forms to donate plastic waste in and around their house or they could offer to volunteer with us for a few hours according to their convenience.

- The website dynamically renders all details such as the points, displaying the receipt after submitting a form, etc., since all the computational logic happens in the backend which is connected to the database.

- The website uses one database with three relational tables.

    - Table *USERS* – to store the details of the user during registration and for login
    - Table *DONATIONS* – keeps track of all the information from the form users
    - Table *VOLUNTEERS* – stores information regarding a volunteer

➢ *Client Directory Structure*



The client (frontend) directory consists of standard React folders.

Inside the src directory, the assets folder consists of the images used in the website.

Components folder contains the multiple components and models used to render a page of the website.

App.js consists of the routes and integrates all pages.

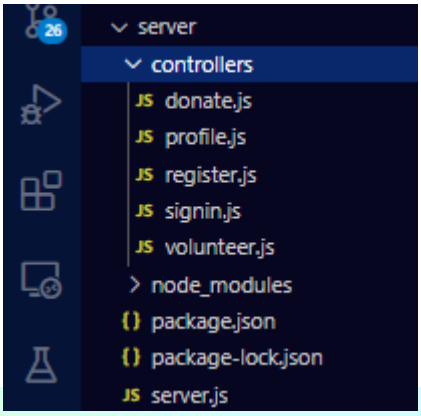
The code makes the appropriate call so that the server returns the right data.

The React state management is utilized to keep the user information updated.

Please note the following.

The code has not been deployed yet. Upon receiving further confirmation, the necessary steps would be taken to do the same.

➢ *Server Directory Structure*



The server (backend) directory responds to the *GET* and *POST* requests made by the client.

The controllers directory consists of the files hat handle each individual request regarding login, registering a user, donating and volunteering.

The server uses ***knex*** to connect with the database and make queries and uses ***bcryptjs*** to hash the passwords.

Controllers folder consists of files that handle each API call separately. This is done so that the main server file looks clean and facilitates separation of concerns.

The file server.js imports the necessary packages and initializes them. It also initializes the port on which the server would run.

Please note the following.

The code has not been deployed yet. Upon receiving further confirmation, the necessary steps would be taken to do the same.

➢ *Database Structure*

The database consists of three tables, their structures are mentioned below.

USERS:

ID	NAME	EMAIL	HASH
Serial primary key	Character varying(100)	Text	Character varying(100)
ID Number unique to a user	Name of the user	Email ID of the user	Hashed password of the user

DONATIONS:

ID	NAME	EMAIL	PHONE	ADDRESS	DATES
Serial primary key	Character varying(100)	Text	BigInt	Text	Text
ID number of Donation Form	Name of the donor	Email ID of the donor	Phone number of the donor	Address of the donor's house	Dates (optional) when the user is free for collection

VOLUNTEERS:

ID	NAME	EMAIL	PHONE	AREAS	DATES
Serial primary key	Character varying(100)	Text	BigInt	Text	Text
ID number of Volunteer Request	Name of the volunteer	Email ID of the volunteer	Phone number of the volunteer	Upto four areas where the user can come to volunteer	Dates (optional) when the user wants to volunteer

Please note the following.

The code has currently been pushed to a GitHub repository in the link mentioned below.

Upon further confirmation from the faculty, the necessary steps will be taken to deploy the server and client side code on Heroku/GitHub pages.

Link: ***https://github.com/s-gayathri/Plastic-Waste-Management-Website***

THANK YOU

DONATE MORE TO SAVE MORE.

Feel Green

— WE CREATE NATURE —