



INDIAN INSTITUTE OF TECHNOLOGY ROPAR

HS202 Project Report

Human Geography & Societal Needs

**“Open Forum Discussion and educational Platform for
Waste Management Techniques”**

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Abstract

In this project report, we have modelled an open discussion platform for discussing the various waste management techniques. We have managed the different sections for the different types of waste as recyclable and non-recyclable, biodegradable and non-biodegradable wastes, etc. We have categorized the techniques based on sources of the waste such as domestic waste, industrial waste, office waste, laboratory waste, etc. on this platform, if people have some waste material and he/she is willing to manage it in the best possible way. Then, on this platform, he/she can get to know the different techniques to manage this waste. If it is a recyclable waste he/she will get to know how to reuse it in the best possible way. And if a person has invented a very new technique he/she can post/discuss it on this platform and if more and more people upvoted it and liked it then it would be promoted to a large scale.

Definition of the problem

Problem statement:

The problem which we are dealing with is a serious environmental issue. That is the waste mismanagement issue. As we know, some kind of waste is created in every human activity. And if this waste will not be managed properly, it will be piled up on a large scale this will create pollution which is one of the major problems nowadays that results in infectious diseases and loss of biodiversity. As some people are willing to manage their waste but they are not aware of the techniques to manage it properly, they don't mind it and simply throw it.

Identification of problem:

To identify the problem we survey our locality, we met many peoples in our locality, we found that most of the people in their old age have some creative ideas for the waste management as we saw that they are busy creating some new things from the pre-existing wastes as:

Some old women were weaving some mats and ropes from the old clothes and polythene. That mats were looking like the new ones.

Some of them planted the flowerings in the large plastic bottles after cutting them in the middle.

Some girls were using the designed polythene wastes for the decoration of the almirahs in their homes.

Some of them were using the wrappers of the gadgets such as refrigerators and washing machines etc for covering the windows from the sunlight.

And on the other side when we see some of the other people who were throwing their waste in open areas when we ask them why are throwing it so, they told us what will they do with it. So, we found that there is a gap between the people as there are some people who know the good techniques of the waste management and also implement that but on the other side there are some people who want to manage their waste but don't know the appropriate techniques for that. So we thought that there should be a platform where people can share their ideas about waste management and also can find the appropriate techniques for the existing waste they have.

Detailed description of the problem:

What is waste?

Unwanted or useless resources are referred to as waste. Waste is defined as any substance that has served its original purpose but is now worthless, defective, or useless.

Waste management

Waste management refers to the procedures and actions required to manage waste from its conception through final disposal. Waste collection, transportation, treatment, and disposal, as well as waste management process monitoring and control, waste-related legislation, technology, and economic systems, are all included.

Waste Mismanagement Problem



Fig: Waste mismanagement consequence

As we know that waste is now a major global concern. Almost all human activity produces some kind of waste like household waste, agricultural waste, municipal waste, industrial waste, etc.

According to stats, In 2020 the amount of waste generated in India per day was about 143,500 Metric tonnes which is a huge amount. The COVID-19 pandemic also had a significant Contribution to waste generation we can see a big rise in plastic and fibre waste due to widespread use of face masks, Personal protection equipment, disposable gloves and changes in lifestyle, such as an increase in-home delivery service lead to increase in paper and plastic waste from packaging. There is an exponential increase in glass, plastic and metal waste during vaccination against SARS-COV-2. In this online era, the amount of electronic waste generated in India was 1014960 Tonnes in FY 2019-2020.

The waste generated by humans must be properly managed. Otherwise, there will be serious environmental and health hazards. In India, approx. less than 70% of waste is collected out of which hardly 20% is treated and the remaining is disposed of in landfills. This is not only the blunder of government organizations but individual people are also responsible for this.

Some organizations like “Carbonite” are working on managing kitchen waste by using organic waste like vegetables, food scraps, shaded leaves, etc., to generate biogas and fertilizer. To achieve this, organic waste should be separated from other waste and put in a separate bin. But we see that the majority of people don't have enough understanding and often put all kinds of waste in a single

dust bin. People also want to keep the environment clean but can't do it properly as there is an education gap among people in managing waste. There is an urgency to make people aware of proper waste management techniques.

Almost everyone has had a creative waste management idea at some point in their lives like my mom uses our old clothes to make carpets and door-mat. Like this, many peoples have creative ideas to manage waste. On the flip side, there is a person who has some waste product and wants to reuse or manage it but due to a lack of ideas, he will just simply throw it. But if these ideas could be shared among people then it will help greatly in reducing waste.

As most of the population in our country has access to the internet. We are going to develop a dedicated digital platform to tackle these problems.

Current Developments in this domain

As we all know that waste is a major problem today .so, there are many national and international organizations working in this field. A lot of new technologies are being developed for the waste management:

- **Effective Utilisation of Kitchen Waste to Biogas by Anaerobic Co-digestion**

This experiment's main goal is to manufacture biogas from kitchen waste using an anaerobic fermentation process that involves co-digestion with cow dung. In mesospheric conditions, an anaerobic floating-type digester is used for this purpose, with a temperature of 32–38 °C and a pH of 6.9–7.2 inside the reactor for optimal methane production².

- **Recent developments in waste tyre pyrolysis and gasification processes**

Waste tyres contain a diverse range of recyclable materials (steel, fibres, energy, shredders, oils, activated carbon, carbon filer, etc.). Various processes have been devised to save existing resources, recover useful products, address disposal issues, and reduce pollution¹.

- **Spectroscopy: A promising tool for plastic waste management:**

Using IR spectroscopy, we can identify the chemical composition of the plastic and which polymer it contains and accordingly we can categorize it and find the best possible technique to manage it.

Need and significance

As described earlier there is a need to educate people about waste and its severe environmental and health hazards. And educate them about how to manage it properly. We see most people burn waste containing a variety of waste like plastic, fibres, polymers, etc. Which led to air pollution

The most effective way to manage waste is to reuse it. Almost everyone has a new idea to make new things by reusing the waste products. These new ideas will play an important role in reducing the waste if these ideas are shared among the people then others will also reuse waste. But they can't do it as there is no dedicated platform for discussion on this topic.

So, there is a need to make a platform where people can get information about Waste and its management and the adverse effects of mismanagement. And where people can discuss and exchange their ideas to manage waste.

Aim and Objectives

We have three primary goals:

1. To create a platform where people can share their creative ideas to manage waste as well as ideas seekers can get ideas to manage waste.
2. Through this platform we also want to make people more educated and aware of waste management techniques in simple language.
3. To make aware of the adverse effects of mismanagement of the waste and pollution. As there are many new kinds of diseases spread out due to environmental pollution.

Tools and Techniques

We have discovered an innovative idea to make a digital platform in this digital era to solve this problem. People can share their innovative ideas to manage waste on this digital platform. And we will also provide some educational content to make people aware of what is waste, the harmful effects of mismanagement, and how to manage it properly. Users can also post their educational content there. People can post their ideas and educational content like articles, pictures, video clips or audio clips.

Detailed work plan

After analysing these problems, we observe that most people have devices and internet connectivity and they spend a good time there, that's what we are planning to model a digital platform that will help to solve the above mention problem.

We are going to make an application as well as a website which has two main objectives-

1. To make people informed and aware of waste management and the most recent and innovative waste management techniques.
2. To make the people look at their surroundings with an innovative and smart point of view. they will try to find out very new and interesting techniques to manage their surroundings in the best possible ways.

The main features of our Application are:

Open discussion platform

Our platform will have the main feature that it will have an open platform to discuss innovative ideas of waste management for any kind of waste. As we know that some people have come up with very great ideas for waste management but these ideas are not promoted to a large scale as they don't get a good circle where they can meet with the same kind of people to share their ideas due to which their ideas are confined to very limited space. But our application will provide a very good platform for these enthusiastic people to share their creative ideas with other people and can get feedback and reviews of their ideas. And he can also get some very important suggestions for improving his ideas from the viewers. If his idea is found very helpful in solving the problem and it gets very good

reviews from the people then it will be saved to the managed sections of the waste management according to the category of the waste.

To find the best possible technique to manage a particular waste

In our application, we categorize different types of waste management techniques according to the waste properties. We will create different categories like biodegradable or non-biodegradable, hazardous or non-hazardous, organic waste or inorganic waste, domestic or industrial waste, etc. we will also create subcategories like if the waste is household waste then is it plastic or organic waste? So that if someone has a waste material and he wants to find the best ways to manage this waste then he can quickly find the best possible solution. The techniques will be shown in the decreasing order of the priorities based on the reviews and feedback of the viewers. From here he can choose the feasible techniques for the waste.

Weekly competition to create enthusiasm among the people

To create enthusiasm among people and to encourage them to find new and creative ideas. We will conduct weekly quizzes and competitions and the winners will be rewarded. We will also conduct long project submission type competitions to encourage people to present their creative ideas and some of the top ideas will be taken if these are found very good then these would be promoted and will be presented to the experts of the famous organizations working in this domain. And appropriate funding would be provided to these people to continue with their work. This will encourage more and more people to work in this domain and to come up with more creative ideas.

The novelty of the proposed interventions

- The unique feature of our application is that it will have an open discussion platform for enthusiastic people who have some ideas and want to share them with people of the same interest.
- Another unique feature of our platform is that we have also provided a platform where people can participate in the competitions and come up with the projects and get rewarded and recognized. It will encourage people to work in this domain enthusiastically.

Approaches to be taken to implement our intervention

There are two types of approaches taken to implement:

- **Qualitative approach**

how effective our platform is in solving the problem. it should be covering every kind of waste generated. There should be some techniques available for each kind of waste.

- **Quantitative Approach**

how much of the population can reach out to our platform. We aim to connect the maximum possible portion to connect and contribute to the solution of this major problem.

Possible Constraints and Design issues

There may be some possible constraints in fulfilling the goal. Some of the constraints are mentioned below.

- In our country and also some parts of the world there are some communities of the people who are still not facilitated with the internet and digital devices. So, it will be very difficult to involve such people. Although if these people have some great ideas still their ideas will only be confined to their locality. It will not be shared worldwide.
- Initially there may be a problem to seek the attention of the people and make them conscious about waste management. as we all know that in this era more and more people are interested in the applications of entertainment, not in such kind of informative applications.

Expertise available to each student to contribute to the development of the interventions

- **Mohit Kumar** - Programming, Problem-solving, Android development and web development.
- **Neeraj Kumar** - Web Development and Web application development
- **Vaibhav** - programming and UI designing

Expected Outcomes

If people use our platform, then they will have a better understanding of waste management and will have more innovative ideas to manage waste. As people will also aware of the adverse effect of waste on health and the planet so they will try to minimize their unnecessary waste generating activities this will help in an overall reduction of new waste

As more and more creative ideas are shared and promoted in the future people will come up with more and more brilliant ideas or even they can develop a new scientific process to manage waste more efficiently.

Suggested plan of action utilization of outcome expected from the work

We will use our application to connect common people and waste management organizations or companies through which common people can easily give them their recyclable waste to make it easy for organizations to collect the waste. They can also teach people about what type of waste they collect, how to separate them, etc. so that waste management and recycling become more efficient.

Conclusion

Through this report, we have proposed an online application base platform for the waste management techniques where there will be an open discussion platform where the people can share their innovative ideas of waste management with the other people and if they already have some waste and they are willing to find the techniques for its management, they can search accordingly and they can also take part in the various quizzes and competition and get recognition and through their innovative ideas, the major problem of the world i.e. waste mismanagement will be solved up to a large extent.

Contribution of each student to completing the assignment

- **Mohit Kumar:** conducting the survey, defining the problem, helps in finding the solution and helps in observing some recent developments.
- **Neeraj Kumar:** helps in conducting the survey, helps in finding some extension to the solution and analysing the possible future outcomes
- **Vaibhav:** finding some other aspects of the problem and identifying some possible constraints.

References

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