Food Waste Management

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Abstract - There is growing evidence that a significant share of global food is thrown away, with concomitant detrimental repercussions for sustainability. A major sustainability issue for the food service sector is reducing food waste. The relationship between innovation practices and food waste management hasn't gotten much attention in the academic literature, despite the importance of this problem to the global foodservice industry. The interrelationships between innovations in waste management and food service provisions are examined in this study using innovation management and social constructionism. It is founded on an assessment of waste management strategies and innovations, including incremental (processes and technologies) and radical innovations, that combine strategic waste management elements with practice-driven initiatives.

INTRODUCTION

Food "loss" happens due to problems in the production, storage, processing, and distribution stages before the food is consumed. Food that is appropriate for consumption but is knowingly thrown away during the retail or consumption phases is referred to as "waste." Food waste management is the process through which food and other agricultural products are recovered or redirected for human consumption, animal feed, industrial uses, or environmental benefits food that is fit for human consumption that is thrown, whether it has been held over its expiration date or allowed to expire, is referred to as food waste. Food spoilage is the usual culprit, however other factors like market oversupply or specific customer shopping/eating habits may also be at play.

Main cause of “Pariposhnam” is made because of the survey that makes the important role for not having any mediums of food to prevent hunger.

Ending hunger isn't about supply. The world produces enough food to feed everyone on the planet. The problem is access and availability, both of which are disrupted by things like extreme weather, food waste, one's gender and – worst of all – conflict. Hunger and malnutrition mean less productive individuals, who are more prone to disease and thus often unable to earn more and improve their livelihoods. There are nearly 800 million people who suffer from hunger worldwide, the clear majority in developing countries After steadily declining for a decade, world hunger is on the rise, affecting nearly 10% of people globally. From 2019 to 2022, the number of undernourished people grew by as many as 150 million, a crisis driven largely by conflict, climate change, and the COVID-19 pandemic.

We will examine the factors that contribute to food waste, its effects, and several strategies for controlling it. As we work to create a more robust and sustainable food system for the future, we'll also talk about the part that people, companies, and governments can play in encouraging sustainable methods of managing food waste.

In order to solve these concerns and build a more sustainable and just food system, effective food waste management is essential. Food waste management is the process of reducing, reusing, and recycling food waste along the entire food supply chain, from food production to food consumption.

This has an impact on our environment, economic, and social well-being. The United Nations estimates that 1.3 billion tonnes of food are lost or wasted annually, or about one-third of all food produced globally. This food waste represents a missed chance to feed the 690 million people who are hungry worldwide and contributes significantly to greenhouse gas emissions and the degradation of natural resources affecting the environment. Wastage of rice is a serious issue as, decaying of rice inhibits Methane, which is most potent global warming gas.

According to National Resource Defense Council (NRDC), 40% of food is not eaten out of all which is produced in the US; whereas in South Asia, India, China 1.3 billion tons of food wasted every year.

In terms of food wastage (agriculture, poultry, dairy)

India ranks 7th with the Russian Federation. The foremost reason for being on the lower part of the scale is the utilization of land. In India major chunk of land is utilized in agriculture and this, in turn, explains the wastage of cereals, pulses, fruits, and vegetables occurring in India.

Fig-1: Introduction

2. LITERATURE SURVEY

"Research on the Systematic literature review of food waste in educational institutions". As got reference through [1,2,4,7].The major discussion is shared from the authors

are as follows- **"**This study has key theoretical and practical implications. From the perspective of research, the study revealed various gaps in the extant findings and the suggested potential areas that can be examined by academic researchers from the perspective of the hospitality sector. From the perspective of practice, the study recommended actionable strategies to help managers mitigate food waste".

"India is one of the top most countries that wastes huge quantities of food every day". As got reference through

[8.9.10] The major discussion is shared from the authors are as follows-"we investigate whether this is an applications provide measure for user adoption, awareness and same knowledge, needs, engagement and attitude and over a behavior change their approaches to fight food waste. We analyze if these applications motivate users be more than responsible and they use persuasive techniques to promote their waste behavior. Moreover, whether they focus on their preventing waste rather than managing it".

The Survey Researches

According to food and agriculture organization, a prodigious 1.3 billion tons of food is being wasted annually. One third of total global food production is wasted [reference taken through 1], costing world economy around Rs 47 lakh Crore. This formidable acceleration in food wastage is breeding nearly 3.3 billion of tons of greenhouse gases, thereby it is taken from [11,12].

Food waste is the most challenging issue humankind is facing in today's world. Nowadays food systems are extremely inefficient. With largest agricultural sector in the world and population more than 1.3 billion people, India's farming output has a significant impact on global food security.

Application belongs supervised food map technique which can be used for classification and regression problems. It focuses on ensemble learning. Which combines multiple classifier to solve a complex problem.

Accuracy Pie Chart following table shows the accuracy of the results.

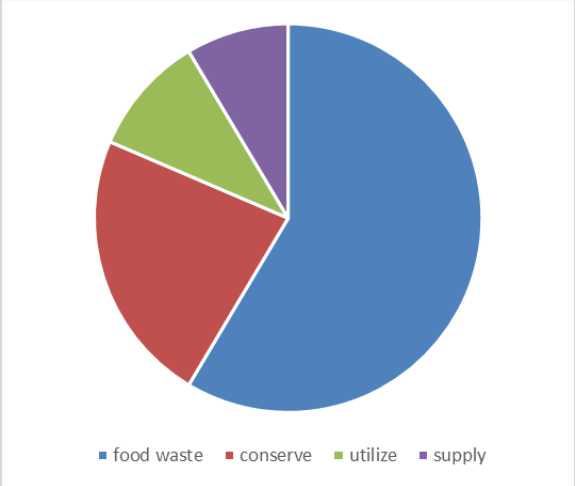


Fig :- Pie Chart of Food management

The pie chart of food waste management is referred from [3,5,6,11,12] that shows the ratio of foods that utilize ,supply, also conserve and most important is food waste.

Paper1:Food Waste Management

Major observation:

- It is used to prevent the food waste, so it will be easier to use as a medium to contact the hunger people and feed them easily.
- Extracting the hidden personal information, it is lot easier to store database.

Paper2: Food Waste Management made with the help of android development and used fire base as a database.

Major observation:

• Various functions are used as photo function and food map to easily analyze how much food is remained to feed and locate the receiver and donator or how much we can request, all these functions are used in applications are made to use easily and the data base authentication we used is fire base .

Modules Selected:

The system is made to help the prevention of food waste with these modules:

1. Login &Registration
2. Notification
3. Admin Module
4. Donator Module
5. Receiver Module

III.METHODOLOGY

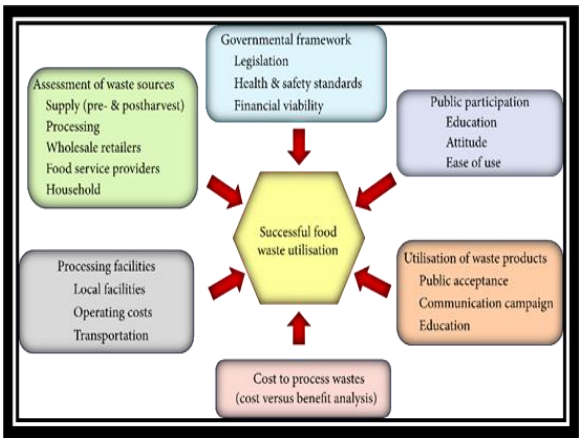


Fig -1: Workflow

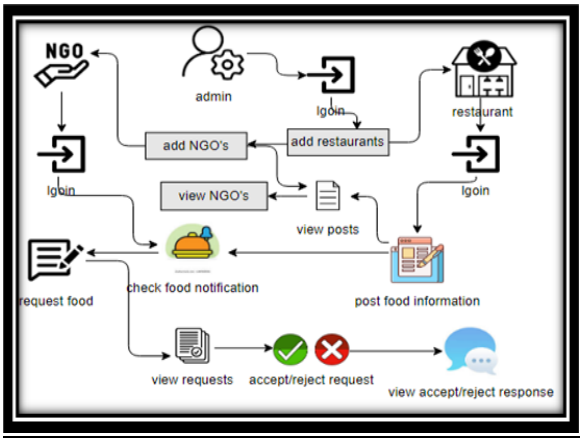


Fig 2 *: Implementation of work Interface*

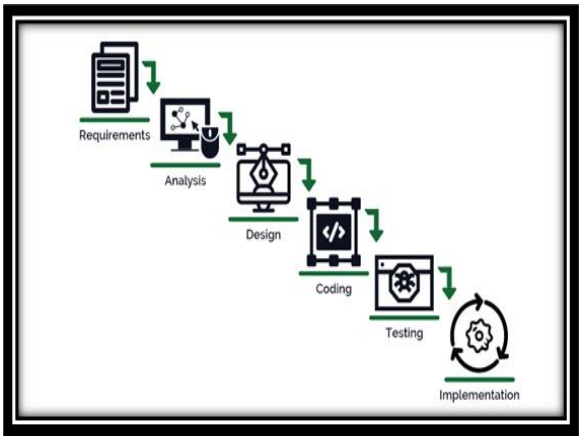


Fig -3Analysing of Implementaion process

As a reference (in Fig. 1, Work flow), the utilisation of food waste is successful because there are so many flows of work by the facilities and benefit analysis and financial support with the help and safety conditions.

In the implementation of the graphical user interface (GUI), by entering the interface with the help of the login page (as shown in fig. 2), intent to the admin dashboard, it gives the option of either donating or receiving the food that is going to waste. We are preventing this, or we are connecting as a medium in between restaurants and orphanages or NGO's, and by accepting it, it works in a flow. As a design and the requirements that fulfil the implementation process with the analyzation of process in Fig. 3, where coding and testing are suitable as a requirement need in a work of medium

IV. RESULT AND DISCUSSION.

1)

An app login interface typically consists of a screen

or a page that allows users to enter their credentials. To build an app login start interface, developers may use a combination of programming languages xml, Java, as well as user interface design tools such as Sketch or Figma.

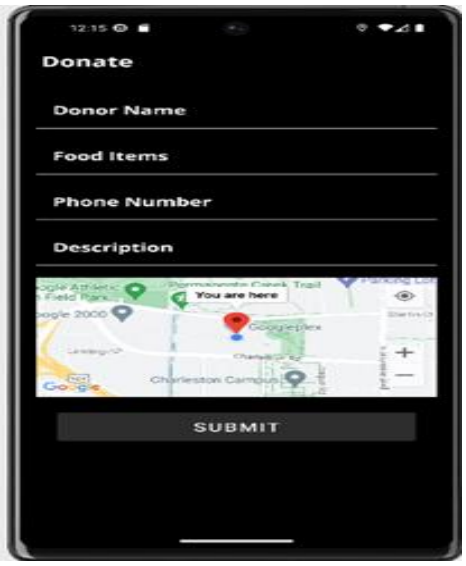
2)

To create an app registration or login page, these developers typically start by designing the user interface using design software such as Sketch or Figma. With the help of intent to create the logic behind the interface, such as verifying user input and authenticating user credentials

3)

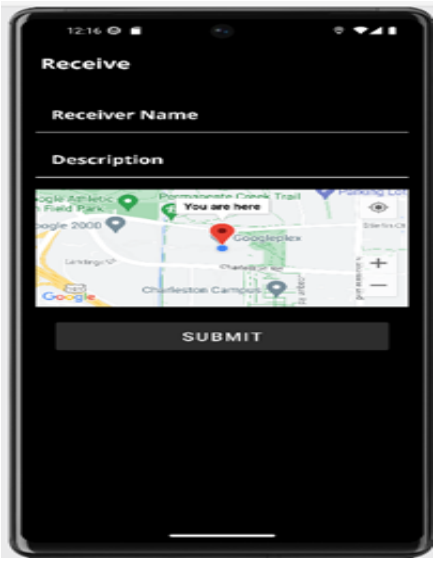
Dashboard interface with back-end and front-end components requires a combination of design skills, programming knowledge, and understanding of user needs and behavior. Developers must work closely with stakeholders to that the dashboard meets their requirements and provides useful and user-friendly experience.

4)



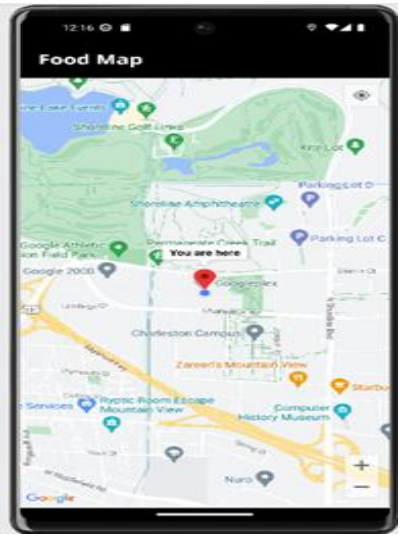
Donator information adding interface with a food map requires such a combination of design skills, programming knowledge, and understanding of a user needs and behavior to get the exact page to fill the information needed as given interface ask.

5)



Receivers information adding interface with a location map we need the Plan that interface, Develop the front-end, Develop the back-end, Integrate the location map to easily connect.

6)



Tracing the location of donators and receivers on a location map typically involves integrating with a location API, such as Google Maps, to retrieve the latitude and longitude coordinates of the donator's or receiver's location. Once the coordinates are retrieved and the location can be plotted on the map using markers or pins.

7)

The history interface requires both front-end and back-end development to display information about past events, actions, or transactions in user-friendly, organized manner and shows the history that we are done on retrieving and formatting the data for a display.

V.FUTURE SCOPE

- Instead of just restaurants/cafés we can also have people register themselves in the application to donate for a leftovers from the parties or weddings. Ability to add non-perishable food. This can then be sent across to other network in case of any disasters resulting in a shortage of food. An ability of 1-1 tie-up between such restaurant, NGO, and Logistics for pickups every day.
- Smart technology: The development of smart way to technology such as sensors and tracking systems will help to reduce food waste by enabling businesses to monitor food quality and inventory more accurately.
- Food recovery networks: The development of food to a recovery networks will help to connect businesses with surplus food to organizations that can redistribute it to people in need.
- Policy changes: Governments may introduce policies to incentivize businesses and individuals to reduce a food waste, such as tax incentives for donating surplus food or penalties for wasting food.

VI.CONCLUSION

In conclusion, food waste management is a complex issue that requires a multifaceted approach to address. This research paper has explored the various causes and consequences of food waste, as well as the strategies that can be employed to manage it effectively. Through a review of the literature and analysis of case studies, we have seen that reducing food waste at the source, diverting surplus food to those in need, and composting organic waste are all effective strategies for mitigating the negative impacts of food waste.

The future of food waste management is likely to involve a combination of technological advancements, policy changes, and shifts in consumer behavior. It will require a coordinated effort from businesses, governments, and individuals to reduce food waste and create a more sustainable food system. By implementing the strategies discussed in this paper and continuing to research and innovate in this field, we can make significant progress towards reducing food waste and its negative impacts on our society, economy, and environment.

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