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FOOD WASTE MANAGEMENT SYSTEM USING DJANGO

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ABSTRACT

Food waste is a major global problem that causes pollution, depletion of resources, and economic losses. The Food Waste Management System with Django addresses this challenge by providing an effective, user-friendly platform for tracking, managing, and reducing food waste in households, restaurants, and other food-related businesses. This system integrates modern technologies such as data analytics, machine learning, and real-time monitoring to optimize food inventory, predict consumption patterns, and recommend waste reduction strategies. Users can log their food inventory, track expiration dates, and receive notifications for items that are about to spoil using the proposed system's web-based interface. In order to reduce food waste, sophisticated algorithms examine user consumption patterns and provide meal planning and portion control recommendations. The platform also features a collaborative component, allowing businesses and consumers to donate surplus food to local charities, thus reducing waste while supporting the community.By fostering awareness, encouraging responsible consumption, and providing actionable insights, the Food Waste Management System helps users make informed decisions to reduce waste, conserve resources, and promote sustainability. The system's integration with various food-related businesses and organizations further amplifies its impact, creating a collective effort to tackle food waste on a larger scale.This project demonstrates the potential of leveraging technology to create sustainable solutions for one of the world's most pressing environmental challenges food waste. • Food waste contributes to greenhouse gas emissions (methane from landfills), water and land resource depletion, and the overall environmental burden of food production. Food waste leads to wasted resources (water, land, energy, labor) and increased

food costs. The system aims to support environmental conservation, reduce hunger, and promote sustainable living. • The process's verification and smooth operation are overseen by an admin module. By facilitating real-time communication between donors and receivers.

KEYWORDS:Depletion,Economic,Providing,Tracking,Households,Food-Related,Consumption.

1. INTRODUCTION:

Increased generation of food waste is both a global and national problem, with an estimated 50 percent of food being wasted. Data on food waste generation and its ultimate fate—whether landfill, recovery, or charitable redistribution—is scarce, fragmented, and disaggregated, according to studies conducted in Australia on various aspects of food waste, such as the

proportion of put rescible waste in residential solid waste streams. While there are numerous studies and reports that highlight the need to address food waste, actual data on food waste generation, avoidance, and management remain sparse and difficult to verify, due to a range of factors tied to the context and process of solid waste data generation.Food waste is currently considered as general waste which has no value and is therefore not separated or measured in a consistent way Where food waste and other organic waste (such as green waste) are differentiated from other general wastes they are often considered together, making it difficult to calculate the proportion of this waste that is food only Physically measuring food waste can pose practical difficulties, as well as health and safety risks Mandatory reporting of waste generally only applies to mixed solid waste streams at the point of disposal, or, in the case of controlled or hazardous wastes, transport and disposal. In the past, the costs of waste management have been the most frequently asked questions, and cost studies have typically focused on recovery costs in comparison to disposal costs. Such conversations have encouraged a range of initiatives to assess options for cost effective waste management, but the true cost of waste at the national level is difficult to determine on the basis of existing data. Greenhouse gas emissions (methane from landfills), the depletion of water and land resources, and the overall environmental burden of food production are all caused by food waste. Wasted food results in the loss of resources like water, land, energy, and labor, as well as higher food costs.

2. LITARATURE REVIEW

Food waste is an important concern because it threatens the environment and sustainability. In fact, it is a serious concern in the hospitality and tourism domain (Okumus et al., 2020). Close to 1.3 billion tonnes of edible food is wasted annually, leading to severe financial, environmental and health outcomes (Gustavsson, 2011). Past research has identified several adverse outcomes of food waste, such as threats to food security (Wang et al., 2018), climate change and greenhouse gas emissions (Kallbekken and Sælen, 2013; Katajajuuri et al., 2014) and monetary loss (Hennchen, 2019). For instance, the annual emissions because of food waste in Finland constitute more than 1% of the country's yearly greenhouse gas emissions (Katajajuuri et al., 2014). Similarly, scientists found the ecological impact of food waste in hotels, cafés and restaurants nearly twice the size of the arable land in Lhasa (Wang et al., 2018). Notably, sustainability has come under intense focus in the hospitality industry in the wake of the COVID-19 pandemic (Jones and Comfort, 2020). In addition, studies have underscored the nutritional loss associated with food waste. For instance, Blondin et al. (2017) revealed that, in the USA, fluid milk waste results in 27% and 41% losses, respectively, of the vitamin D and calcium required under school breakfast programme meals. Consequently, scholars argue that reducing food waste is critical from financial (e.g. food cost) and non-financial (e.g. sustainability) standpoints (Okumus, 2019). In fact, research reports suggest that, by saving one-fourth of the food being wasted, we can feed 870 million hungry people (Khadka, 2017). Similarly, the sustainable development goals of the United Nations (UN) have also emphasized responsible production and consumption, underscoring the importance of mitigating food waste (Gustavsson, 2011).

Regarding food waste generation, prior studies have indicated that a large amount of

food waste is generated at the consumption stage, which includes both out-of-home and at-home dining (Martin-Rios et al., 2018). Households represent at-home dining, whereas the food service sector represents out-of-home dining. The food service sector includes both non-commercial and commercial establishments (Betz et al., 2015), such as restaurants, hotels, health-care companies, educational institutions and staff catering. An important subdomain where out-of-home dining takes place is food service establishments at educational institutions. In this context, prior studies have observed that school cafeterias are a major source of unconsumed food (Smith and Cunningham-Sabo, 2014; Adams et al., 2016). For instance, in the National School Lunch Program (NSLP) in the USA, more than 30% of the food served is wasted (Byker Shanks et al., 2017). In fact, food waste in educational settings is a significant issue (Yui and Biltekoff, 2020). What is most worrying in this context is that, in spite of the acknowledgement of such a high quantity of waste generated, the authorities in educational institutions, food service managers in schools and university food service companies' staff are not intent on reducing food waste (Wilkie et al., 2015). Furthermore, the academic research in this area is limited, with most studies in educational settings (particularly in the context of schools) skewed towards using food waste as a measure to estimate the amount of nutrients lost. Food waste does not hold a central place in the existing debate. Other studies have focused on aspects such as the composition of waste generated in the food service operations in schools (Hollingsworth et al., 1995) and the monetary implications of various waste disposal strategies (Wie et al., 2003).

The multiple stakeholders and researchers in this area lack direct attention to food waste. This is quite concerning, given the serious implications of food waste. Deeper insights into food waste at a micro level can help reduce it by documenting the quantity of the food wasted and the causes of such waste. In addition, research inputs concerning possible strategies to reduce food waste without compromising consumer satisfaction can be quite useful for various food service establishments. Correspondingly, we feel academic research on food waste in educational settings must progress beyond an overemphasis on nutrition. More importantly, there is an urgent need to focus on hospitality-related concerns, such as meal production, palatability, dining environment and consumer food choices, as they directly affect food waste at the production and consumption stages.

3. EXISITING METHOD:

Currently, food waste management practices vary widely depending on the region, industry, and the scale at which they are implemented. Existing methods primarily focus on traditional waste disposal and recycling techniques, but they often fall short in addressing the root causes of food waste.existing methods used in food waste management:In many households and businesses, food waste is managed manually, with individuals keeping track of inventory, expiration dates, and consumption. This process is prone to human error, and often leads to food spoilage and wastage before it can be consumed or used. Without a structured approach or automated alerts, it is difficult to optimize food consumption

and waste reduction.Non-profit organizations and charities often play a role in food waste reduction by collecting surplus food from businesses, restaurants, and households for redistribution to those in need. Many cities and regions have food banks and donation programs that aim to divert edible food from landfills and reduce waste. While beneficial, these programs do not address the root cause of food waste at the consumer level, and the logistics of food collection and distribution can be challenging and inefficient.

3.1 DIS-ADVANTAGES:

1. This process is prone to human error, and often leads to food spoilage and wastage before it can be consumed or used.
2. Without a structured approach or automated alerts, it is difficult to optimize food consumption and waste reduction.

4.PROPOSED METHOD

The proposed Food Waste Management System with Django is designed to provide an integrated, user-friendly platform for reducing food waste at both the household and business levels. By leveraging modern technologies such as real- time tracking, machine learning, and data analytic s, the system aims to optimize food consumption, minimize waste, and promote sustainability in a cost-effective manner.manually entering items into a database. Each item is tagged with relevant information, such as expiration date, quantity, and storage instructions. The system sends automated notifications to remind users of items nearing their expiration date, ensuring that food is consumed before it The system allows users to digitally track their food inventory by scanning bar-codes or spoils. This minimizes food waste by encouraging timely consumption of perishable items.Using machine learning algorithms, the system analyses historical consumption patterns and suggests meal plans, portion sizes, and recipes based on available ingredients. The platform also considers dietary preferences, nutritional needs, and seasonal availability of ingredients, offering personalized recommendations to help users optimize food usage.

The system tracks and records food waste in real time. Users can log food that is wasted, either due to spoilage or due to being uneaten after meals. This data is analyzed to generate insights into consumption patterns and identify areas where waste can be reduced. For businesses, this feature can help improve operational efficiencies by tracking waste in food preparation and service, allowing them to adjust inventory and portion sizes.The system is accessible through both a mobile application and a web interface, offering users the flexibility to manage their food waste from anywhere. The mobile app allows users to easily scan barcodes, log food waste, and receive notifications while on the go. The web interface provides a more detailed view of the user's inventory, waste tracking, and consumption patterns, as well as access to community features such as food donation networks.

4.1 ADVANTAGES:

1. The platform also considers dietary preferences, nutritional needs, and seasonal availability of ingredients,

offering personalized recommendations to help users optimize food usage.

2. The web interface provides a more detailed view of the user's inventory, waste tracking, and consumption patterns, as well as access to community features such as food donation networks.

5.SYSTEM ARCHITECTURE

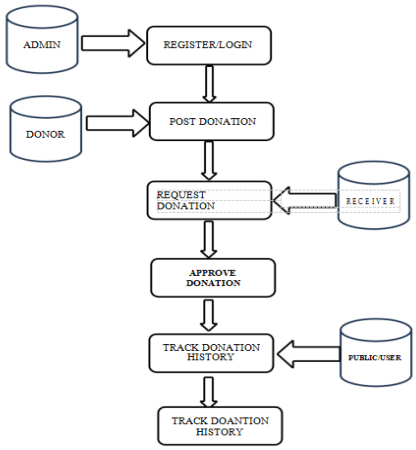

FIG:SYSTEM ARCHITECTURE

6.RELATED WORK:

A Food Waste Management System consists of multiple modules that work together to collect, process, and dispose of food waste efficiently. Below is a detailed description of key modules within the system.

6.1 Waste Collection Module Purpose:

This module handles the collection of food waste from households, restaurants, supermarkets, and industrial sources.

6.1.1 Inputs:

Waste generation data from different locations Collection schedules Sensor data from smart bins

6.1.2 Processes:

Assign collection vehicles to designated areas.

Notify waste generators (households, restaurants) about pickup times.

Monitor waste bin levels using IoT sensors.

Update real-time collection status in the system.

6.1.3 Outputs:

Efficient waste pickup schedules Waste volume reports Alerts for overfilled bins

Dependencies:

GPS Tracking Module Database Module

6.2Waste Segregation Module Purpose:

This module ensures proper sorting of waste into organic and non-organic categories to facilitate recycling and composting.

6.2.1 Inputs:

Collected food waste Sorting guidelines

Manual/automated sorting machines.

6.2.2 Processes:

Separate biodegradable and non-biodegradable waste

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7. RESULTS:

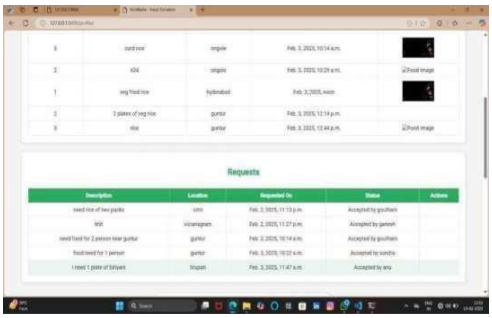

FIG 2.1: USER DETAILS

FIG2.2 : REQUEST

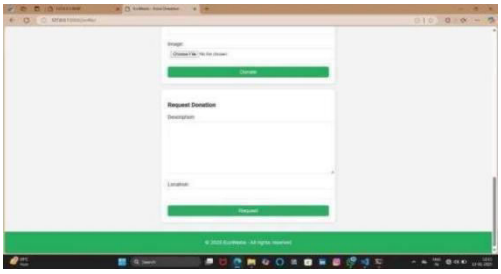

FIG 2.3 : DONATE PAGE

8. CONCLUSION:

The conclusion of a Waste Management project says to reduce the food waste and donate to others. It spotlights the accomplishments of the project, underscoring the significance of the waste management strategies that have been suggested. Here we can donate and request food by using this platform.We distribute the food by using this platform to others.

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