TRACKING OF FOOD CONSERVATION FOR PRODUCTIVE USAGE

Dr.N.Ananthi Mythiresh G
Professor and Head of the Information Technology Department
Easwari Engineering CollegeChennai, India
Chennai, India
nandhura@gmail.com

Department of Information Technology
Easwari Engineering College

mythiresh@gmail.com

Rahul C
Department of Information Technology
Easwari Engineering College.Easwari Engineering College
Chennai, IndiaChennai, India
rahulcr171001@gmail.comrashivmathesh120@gmail.com
.

RashivMathesh P K
Department of Information Technology

Abstract-

One of the main problems that has to be brought to society's notice is food waste, which calls for careful planning and management of its effects. Depending on its quality, wasted food may be controlled. If the food is safe to eat, it can be given to NGOs or orphanages, who would subsequently distribute it to other areas suffering from hunger. If the food cannot be consumed, it may be given to an agriculturalist who can compost it. The android application will fill the communication gap between these parties and give them a channel to use as needed.

Keywords- Food, waste, tracking, location, web app, React JS, Mongo DB, Node JS

I INTRODUCTION

The food waste that occurs in homes can be broken down into three distinct categories: waste that is avoidable, waste that is possibly avoidable, and waste that cannot be avoided. The components that can be avoided, as well as those that might be avoided, are sometimes referred to as "edible waste." Generally speaking, avoidable waste consists of "food and liquids that, at some time before they were thrown away, were edible." Potentially avoidable kinds of waste include "food and beverages that some people consume and others do not" (e.g., bread crusts) or "food and drink that can be eaten when food is cooked in one way but not in another" (e.g., potato skins). Waste that "arises from food preparation but is not, and has not been, edible under normal conditions" is considered inevitable. This class of stuff includes things like eggshells and bones.

However, even with this universal definition, the individual's idea of what constitutes an edible substance and the various cultural norms play a significant part in classifying the many forms of food waste.

Management being waste is one of the important and fundamental prerequisites for environmentally responsible growth in smart cities. One of the most significant problems that the world is dealing with in the present day is the waste of food.

A third, or 1.3 billion tons, of the world's food supply is lost or squandered every year, according to the United Nations' Food and Agriculture Organization (FAO). This statistic, despite the fact that it portrays the gravity of the issue pretty accurately and sufficiently, is merely a piece of the puzzle. It is unknown how much pollution is caused by this garbage because inefficient waste management, and it is also unknown how many resources were wasted while generating this quantity of food. Food is lost or wasted at many different stages, from the harvesting of food grains to the supply chain, storage, and finally the

stages of consumption and disposal. It is important to address this issue on every front in order to achieve the desired result of a large cutback in waste. Our focus here is on the problem when it reaches its pinnacle, when individuals throw away food that they haven't finished eating.

The buffet system is a major factor in the quantity of food that is thrown away in university and college messes. A research investigation found that on average, more than one thousand kg of food were thrown out each day in the dining halls of Indian university hostels. People are ignorant of the amount of food they are throwing away since there is not an adequate accounting and reporting system in place, which makes the issue much worse. This means that neither the mess administrators nor the customers (the students) receive any feedback for the garbage that they are producing, making it difficult for both to plan accordingly. This is due to the fact that it is impossible to know how many people will be dining at the mess in advance, both on the part of the mess staff and the students.

A novel automated measurement and accounting system is proposed in this research, with a focus on the situation of a college dorm room kitchen. The amount of food waste is correlated with other criteria such as the number of individuals producing that food, the day of the week, and the time of day, allowing this method to aid in the discovery of patterns in food waste. Our attention in this study is directed specifically at the clutter and disarray that characterizes a college dorm room. The kids who are eating in the mess are provided with helpful insights gleaned from the data that we collect as part of another component of this system, with the goal of motivating them to alter their behavior. In this area, an LED board tally-ups the wasted food and displays the corresponding costs. Additionally, this section includes an online portal through which individuals can access additional information that is presented in the form of graphs and charts that are simple to understand.

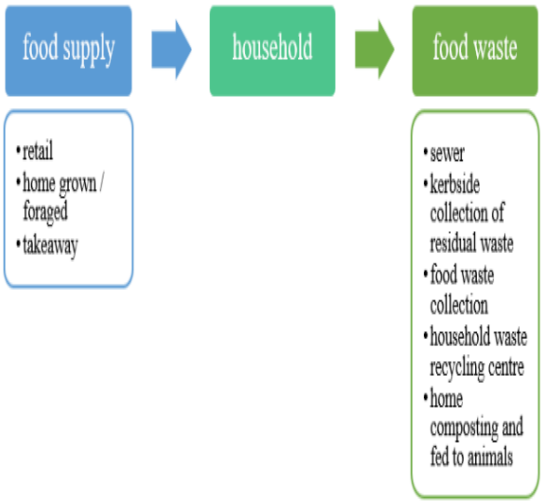

Figure 1: Food Wastage in Households

The software is a web application with the goal of connecting eateries with food banks and other organizations that can use donated food. The purpose of the software is to facilitate improved dietary administration.

Figure 2: Food Wastage Statistics

Food is occasionally wasted by producers owing to overproduction or unanticipated crop deterioration. The first four are examples of wasted food, while stages five and six are losses. The sixth tier of this study is titled "Food Preparation, Consumption, and Disposal," and it focuses on how people's actions contribute to food waste.

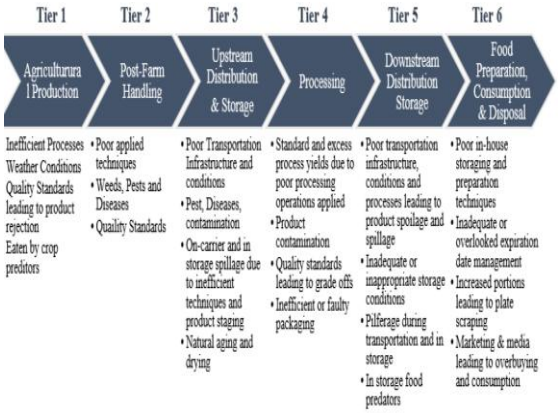

Figure 3: Key Sources of food wastage

The software is a web programmed with the goal of connecting eateries with shelters and low-income families, so that extra food may be donated. The purpose of the software is to facilitate more efficient handling of food.

The primary goal is to facilitate the uploading of stock information by food enterprises, therefore allowing charitable organizations to gather and distribute any extra food. The suggested approach has two primary goals: I reducing the enormous amount of food that goes to waste every day in restaurants and (ii) making better use of the surplus of food that is regularly generated in bars and other social settings. This method links eateries with shelters in need of assistance in launching a food waste control initiative. Wasted food can be any kind of edible substance, whether it's uncooked or cooked, whether it's been eaten or left uneaten.

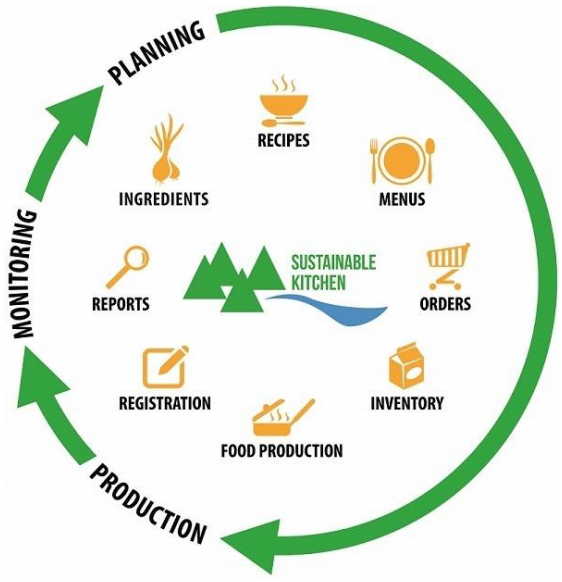

FIGURE 4: Food waste tracking system in Restaurants.

(b)

FIGURE 5: Food Services.

Professional organizations and governing agencies both broaden the definitions to include a variety of categories and ramifications, including the type of food waste, the way it is created or generated, the materials used, and the waste's source. The charitable organizations and other welfare groups wait till a visitor brings extra food.

In a densely populated Indian city, an idea for waste collection using bins is described in the study. It builds a dynamic multi-hop network that offers real-time data to local authorities. The system can monitor and view the state of the bound online for future use thanks to capacity sensors and ad-hoc transceivers incorporated within the bin.

Before it reaches the customer, food is lost in the food supply chain following harvest. Food loss results from handling, storing, moving, processing, and distributing postharvest (Parfitt et al. 2010; Schuster and Torero 2016). Problems with agricultural processes or processing technology are typically to blame for these losses (i.e., food spoiling due to poor storage). Contrarily, food waste refers to high-quality food that is discarded before to consumption, either by the retailer or the client. Here, food waste is a result of

retail operations and consumer behavior. The term "potential food loss and waste" also refers to pre-harvest losses caused by pests and illnesses, price drops, unfavorable weather, or unappealing look.

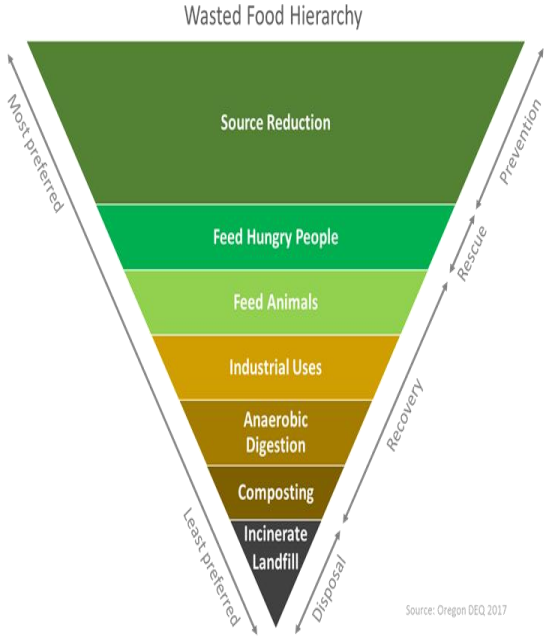

FIGURE 6: Prevention of Food Waste.

For various food waste management states, a lot of food research has been conducted in recent years. No single study has proposed the notion of utilizing blockchain to identify food items and allowing contributors to speak directly with restaurant owners. This research is unique in this environment due to its architecture and methods.

The loss and disposal of edible food is a major issue worldwide. In point of fact, if wasted food were its own nation, it would be the third-largest producer of greenhouse gases, directly after the United States and China (FAO). Every link in the food chain experiences this loss and waste of food. We frequently hear stories about food being wasted, whether it's in our own kitchens or on the farm. Surprisingly, however, there is little mention of the food that is lost during the selling and purchasing process.

A technique to record bin fill level and identity information was developed by Semicopulas et al. The system has active RFID tags and ultrasonic sensors on containers known as filed units, and RFID readers placed in any authorized person or a vehicle of a company's transportation system known as mobile sink. Numerous drawbacks to the aforementioned strategy prevent effective and thoughtful trash management. incomplete system design, inadequate data, expensive network architecture, etc. Additionally, none of the studies look at food waste and management in university dorms in impoverished countries. Internet of Things and other emerging technologies can help students live more environmentally conscious lives in situations like the hostel mess at Indian universities.

The following outline outlines the structure of the current study: The introduction was summarized in the first section. In Section 2, we will discuss the scope of this evaluation. In the third section, the study technique and the research profiles are discussed. In Section 4, the topic themes are discussed, whilst in Section 5, research gaps and potential future study pathways are presented. In Section 6, we will focus on the construction of the framework. In section 7, the findings, consequences, and restrictions of the study, as well as the recommendations for future SLRs, are presented.

Though scientific evaluation is inadequate, food waste solutions can help lessen the amount of biowaste produced by consumers. In order to address this problem, collaborators from both academia and industry installed a sensor-based intelligent self-serve lunch line in one of the university's cafeterias. Depending on the day, the cafeteria here may have anywhere from 700 to 1000 customers, giving it a perfect location to collect data on bio-waste. Insights gained from the lunch line's documentation of patrons' food selections, dietary preferences, and bio-waste can improve cafeteria management and influence diners' habits. Both registered and anonymous users can be monitored. In this paper, we show the Heiner design science-guided system design and implementation. Therefore, we include a technical description of the lunch line as well as a description of its use as a place to do research. Finally, we analyze consumer food waste using information from the self-serve lunch line.

Food waste is becoming a growing issue for world leaders. An estimated one-third of the world's food supply is lost or squandered every year, according to research by Gustavsson et al. (2011). According to a study conducted by Buzby et al. (2014), 31% of retail and consumer food in the United States was wasted in 2012. This equates to a loss of $161 billion and 141 trillion calories annually (enough calories to feed 193,000,000 people a diet of 2,000 calories per day for

an entire year), as well as the waste of valuable inputs such as land, water, and energy.

II LITERATURE REVIEW

[1] After enrolling in to the Android app "Aahar," donors and NGOs can distribute and collect food supplies. Donors, NGOs, and administrators comprise the system. Donors register, log in, and add things to a wish list for others to see. The receiver requests, posts wish lists, and reports presents. The manager monitors and adjusts the collection. Administration and giver assess recipient status. Donated items and messages are archived in the backend folder to remind users of the donor's generosity.

[2] In order to encourage students to reduce food waste, an automation is constructed with four modules that account for the amount of food wasted, raise awareness by feeding the live data on how much food is being wasted daily, store the quantity of food wasted each day in a database, and finally present the presented data in graphs.

[3] It creates a city that is free from hunger by fusing client-server GIS and mobile applications. The client-side application offers the choice of providing food donations to those in need. Donors input simple details like the amount of food donated, the sort of food donated, and their respective contact information. NGOs or any other social service provider can pick up such food and give it to the hungry. Once the registration is complete, it will be added to a server-side database where organizations can store donor information. The most direct route from the donor's location to the closest NGOs or other establishments will also be displayed, along with directions. so that hungry individuals might promptly receive food.

[4] a fresh internet tool that offers a platform for giving excess food to anyone or any group who needs it [4]. It describes the current donation system, the rationale for coming up with such an application, and how the suggested product contributes to societal progress. The number of people experiencing food poverty has increased recently, particularly in developed nations. Give the option to contribute food to a charity for the benefit of the hungry on the client-side app.

[5] Wasted food is a major issue in today's society. According to the Food and Agriculture Organization (FAO), over half of all food produced will never be consumed, making this a severe problem in our society that affects "poor and affluent nations" equally in recent years. It is not only wasteful of the "time and energy" spent on food production, but also of the "natural resources" and "limited accessible agricultural land" that we might be using in a more efficient and environmentally friendly manner if we didn't squander so much of it.

[6] This study presents a novel automated measurement and accounting method that may be used to identify patterns of food waste by comparing the amount of food wasted to other factors such as the number of persons responsible for its production, the day of the week, and the time of day. Another component of this approach provides students dining in the mess with helpful tips from the data we collect in an effort to alter their behavior. This section includes an LED board that shows the total amount of food thrown away and the cost of that waste, as well as a website where users may access further information in the form of easily digestible graphs and charts.

[7] Addressing food waste has the potential to make a major contribution toward attaining sustainability goals and serve as an important supplementary strategy in redressing the global food supply and distribution gap. This document attempts to provide a high-level overview of the global, national, and local food waste scenarios based on the available data. This article outlines a study carried out by students in a local community to identify and measure avoidable food waste at the consumer level, with a focus on food waste due to "over consumption" as one of the high potential sources for reduction and the behavioural aspects and habits as barriers to the goal of sustainability.

[8] Bangladesh, which is mostly an agricultural nation, has an inadequate system for producing power. All of the professional organisations are working to improve our system for producing power and to expand its potential. We are thus providing a grid-connected food waste-based biomass power plant since we produce a lot of waste, the most of which is food and vegetables. We suggested a power station based on renewable energy since it is more environmentally friendly than other conventional power plants, emitting roughly 2% less carbon. Because there is a lot of food waste in Chittagong, we picked Chittagong City Corporation for our design and study. Moreover, the

system is linked to the national grid to help modernise our country.In addition to being an essential complementary approach in closing the global food supply and distribution gap, reducing food waste has the potential to make a significant contribution toward achieving sustainability goals. Based on the information at hand, this document aims to present a summary of the several potential outcomes for food waste on a global, national, and local scale. This paper explains a community-based student survey that aimed to identify and quantify consumer-level food waste, with a focus on "overconsumption" as one of the most significant implicit sources for reduction and behavioural factors and habits as barriers to sustainability.

[9] The concept of this paper is based on the idea of raising public consciousness about the need to waste less food by tracking and showing the total quantity of wasted food and reusing or repurposing the leftovers via the use of embedded technologies. The discarded food is recycled into plant fertilizer using the FWDM.

[10] There is a surplus of food in general restaurants, stores, and even our homes, which might be used by non-profit organizations to feed the hungry. We suggest an android app in which registered users may advertise surplus food in their area so that other users can come and make use of it by distributing it to those in need.

[11]It's standard practice for lunch cafeterias to frequently dump unused food. Both over production in cafeterias and food waste by customers are major contributors. Lunch cafeterias may keep tabs on any leftovers and provide discounts the following day. Preventing food waste at the household level is more challenging. Quantifying and publicizing food waste data has been shown to influence eating patterns and reduce food waste. A university cafeteria installed an intelligent self-serve lunch line. A specialized mobile app displays consumer food waste statistics from sensors in the lunch line.

[12]Throughout 2017, garbage production averaged 2,215 tons daily. There is an annual growth of almost 12% in the overall volume of trash. There's a significant environmental cost associated with the 56.4 percent of wasted food in that statistic. The purpose of this study is to conduct research in order to determine what variables most affect food waste management in Phnom Penh, Cambodia. Bio-digester, family size, pack size, population expansion, marketing, shelf life, shopping frequency, and tax payment are only some of the eight predicted elements used to design the interview survey.

[13]eBin is a social persuasion method that aims to get college-aged students in developing and underdeveloped countries to change their food waste and recycling habits. This study introduces a novel automated measurement and accounting system that correlates food loss with other characteristics patterns of food waste may be revealed by considering factors such as the number of people responsible for its production, the day of the week, and the time of day. To encourage them to change their habit, this method also includes giving the youngsters who eat in the mess beneficial statistics.

[14]Pervasive computing ignores food waste. This paper discusses past work that emphasizes the need to understand how intelligent technologies might wasting less food at home. EUPHORIA is a social network that monitors its users' potential for food waste and encourages them to alter their eating habits through peer pressure. The system suggests communal recipes based on users' food to save waste and create a unique dining experience. Three steps will create a mobile app.

[15]Food waste is a serious problem, and the number of food products that are wasted is influenced in part by the behaviors that are prevalent in our society. As a result, if there were an effective system to alert consumers about high-waste tendencies, it may potentially help reduce the total quantity of food wasted.

[16]The current problem of food waste in the country is becoming worse on a regular basis, and the culprits include restaurants, households, and enterprises connected to the food service industry. On the other hand, a wide variety of approaches from a variety of points of view have been used to limit the amount of food that is wasted. One of the well-known technologies that has recently reached new heights and is exhibiting great growth in all study fields is known as the Internet of Things (IoT) (IoT).Therefore, it would be beneficial if there existed a reliable method to warn customers about their propensity for excessive waste.

[17]In 2018, 820 million people worldwide were undernourished, according to the FAO. There's a lot of

weight on the issue of food waste production. When edible food is thrown away, it's a waste of the time, money, and resources used in growing, preparing, transporting, and consuming it. Companies in the HORECA industry (hotels, restaurants, and caterers) lose a lot of food, and most of them don't realize the opportunities and difficulties associated with innovating in a way that minimizes waste.

[18]Because of climate change, the loss of fertile land area, and the exponential growth of the human population, new and more efficient techniques of producing, converting, and consuming food resources are necessary. To overcome these challenges, we must adopt cutting-edge ICTs like the Internet of Things (IoT), artificial intelligence (AI), and cloud computing to improve the flow of real-time data throughout the entire food production and distribution system ("farm-to-fork" value chain), from primary production to final consumption, and to develop intelligent applications that make use of this consolidated data to monitor, predict, and optimize processes along the entire value chain.

[19]Maintaining food safety and reducing emissions both need close attention to food loss and waste (FLW). Real-time sensing of temperature and humidity has the potential to drastically reduce food waste. We have a lot of data on sensors, but not as much on FLW tracking. This research reviewed 59 sensor technology experiments aimed at cutting down on food waste along supply networks. This piece takes a look at the supply chains that have adopted IoT and the technology that have been used to make it a reality. Product kind, supply chain stage, and geographic location give product attributes, while sensor technology analyzes monitored metrics, communication protocols, data storage, and application layers.

[20]This research looks at food waste and loss (FLW) across the food distribution system (FSC). The authors did an SLR to find important research concerns, research gaps, and potential areas for future FLW research in FSC. This SLR analyzed 152 papers that met the criteria. The literature in the field was highlighted through a presentation of the research profile of the chosen studies and a topic analysis. Eight overarching themes were identified by the authors. Redistribution of food surpluses and digitalization are two of the discussed issues. The results of the research will shed light on the FSC's waste minimization processes and guide strategic and policy initiatives. Flawed food is typically the result of careless handling of perishable goods, negative attitudes among stakeholders, broken buyer-supplier contracts, and interruptions in the supply chain.

III EXISTING SYSTEM

A significant number of food-related studies have emerged in the Internet of Things era for various states. Research using RFID, temperature, humidity, camera, and many more sensors and modules has been done for production monitoring, quality monitoring, and waste management. There is not single research that proposes recognizing food items through the use of low-cost sensors and detecting food items while simultaneously estimating the quantity of food wasted. In this particular setting, the research in question is novel in terms of both its approach and its framework.

LIMITATIONS OF EXISTING SYSTEM.

The aforesaid system's limitations prevent effective and intelligent waste management. Limited system design, data, costly network structure, etc. More crucially, none of the research examine food waste and management in developing nation university hostel mess. Patrons who are made aware of the monetary implications of their wasteful eating habits tend to waste less food overall. With confidence that leftover food may be reused and disposed, people will create more. Social media, e-newsletters, and food store magazines have reduced food waste (self-reported). These findings raise the question of whether the poll or social media ads increased consumers' food waste awareness. Romani et al. suggest that intervention programmed educate users how to shop for and cook their own meals instead of only boosting user awareness. Users who think they can plan their meals make less rubbish.

In summary, there are two primary food waste behavior modification intervention strategies: (1) training consumers on how to better plan and manage their weekly food preparation, and (2) educating people about the connection between trash and the environment. A tax on food waste or reduced-size packaging are two possible solutions. Cafeterias can reduce food waste by selling pre-packaged meals and charging for leftovers.

IV PROPOSED SYSTEM

The suggested software is a web-based service that would connect givers and receivers and hence requires access to the internet. Since a result, this is the ideal solution, as its user interface will be straightforward and intuitive. The user has the option of donating the food or taking it home for himself once he has logged in successfully. The user must provide the following information (name of food, amount of food, location of availability, and user's contact number) if he want to give the extra food. This app provides a channel for donors and recipients to meet and exchange information about excess food. The orphanage will receive the food, and the software is being created to prevent food shortages there.

V DESCRIPTION OF THE PROPOSED MODEL/SYSTEM

Full-stack online applications can be deployed more quickly and easily with the MERN Stack, a JavaScript stack. The MERN Stack is an application development stack that consists of the following technologies: MongoDB, Express, React, and Node.js. The goal is to reduce complexity and speed up development time. Each of these four potent technologies plays a significant role in the creation of web apps and offers developers an end-to-end environment in which to operate. We use the same in our proposed methodology to create the web page.

To begin, we will make a new folder for the project. After that, on the command prompt or terminal, navigate to the project folder, and then type the following command to initialize a package. Son file. Using the npminit command, we verify that npm has been successfully installed. We install modules (by entering in npminstall module name –save) that will be listed in the package. Son file based on the prerequisites that we have outlined.

On the homepage, users are required to register for one of several positions, such as Donor, NGO, or Logistics Professional. After registering, they will have access to their own logins, where they will be able to make requests along with the availability of donors, needs for NGOs, and vehicle data.

After that, the administrator can sign in to his environment and decide whether or not to comply with the requests made by the NGO and the donor. Using the website's mapping functionality, he will also map the Donor with the NGO in addition to the logistics. This option is available on the website.

There are three modules in our study:

Module 1: Donor/NGO/Logistics Side

Users can sign up with their own individual information. Users with valid id and password can access their own accounts. Get creative in the kitchen and make a brand-new dish, remembering to include its price, where to find it, and how to get in touch with the chef. Insert pictures of the foods into the list. You may book a table and order many dishes at once. Users can log out of the system after entering their meal data.

Module 2: Client Side

Users can sign up with their own individual information. Users with valid id and password can access their own accounts. Do your research according to your location, and make your reservations for the cuisine in good time. In response to the donor's desire The volunteer will evaluate the food's flavor and presentation after eating it. Those who choose to log out of the system may do so.

Module 3: Admin Side

View the request raised by volunteer or donorAccept or deny the request from the users after verify true information or not.Mapping the Logistics with donor or volunteerView the complaints and suggestions about the requests and can reply it.

VI METHODOLOGY

MERN STACK

MERN Stack is a combination of four distinct technologies that work together to construct dynamic web apps and webpages. It is a contraction for four different technologies: It stands for "MongoDB," "ExpressJS," "ReactJS," and "NodeJS. “The MERN stack is comprised of four individual modules. Let's break down each of these points and talk about them separately. MongoDB, a NoSQL database management system, is the first part. ExpressJS is the second part of the MERN stack that is used. It's a framework for building Node.js-based web

applications in the background. Third, we have ReactJS, a JavaScript library for building user interfaces with reusable parts.Node.js rounds out the MERN stack. It's a JS runtime environment, which means it can execute JavaScript files even when the browser isn't open.

Historically, MERN Stack was known as MEAN Stack before changing its name. Like the LAMP Stack, the MEAN Stack has four parts, or four different approaches to a problem: It stands for "MongoDB," "ExpressJS," "ReactJS," and "NodeJS. Close inspection of the MEAN acronym reveals that the letter 'A,' which formerly represented Angular.js, has been replaced with the letter 'R,' which represents React.js.

One explanation for this is that smaller, faster-to-develop apps have traditionally favored MERN Stack, whereas larger, more complex apps have favored MEAN stack. However, development times for smaller applications tend to be longer. Moreover, their internal architectures are very distinct from one another. You may have heard that Angular.js is the backbone of the MEAN stack's front end, whereas React and its ecosystem form the basis of the MERN stack. For this reason, MERN Stack was developed: to facilitate a quicker and more effective construction procedure.

Node.js is an advanced and well-known JavaScript service platform, while Express.js appears to be a server-side website foundation. ME(RVA)N is an excellent way to work with JSON and JavaScript in any manner you choose.

Components of MERN Stack

MONGO DB

The most popular NoSQL (NoSQL as well as Non-Standardized Query Languages) database is Mongo DB, an open-source document-based server. The term "NoSQL" is used to describe any system that does not use a relational database and hence does not rely on predefined table structures to store information. In contrast to traditional tables, which are organized in rows and columns, MongoDB stores its information in a more flexible document-oriented format. This seems to imply that MongoDB does not make use of tables in the same manner that relational databases do. However, it does provide a novel approach to data extraction and storage. The information is stored in the BSON format, which stands for Binary JS Object Notation; its binary structure makes it possible to quickly determine both the data's size and kind. MongoDB employs BSON while storing documents in collections. It allows for a flexible and extensible document format.

EXPRESS JS

Indeed, one of the server-side frameworks for JavaScript that operates in js is called Express.In terms of backend development, this is another top-tier JavaScript framework. It equips the developer with the tools necessary to construct and administer dependable server infrastructure. Express is a platform for developing web and mobile applications quickly and easily. Indeed, Express is the backend logic framework for apps used on mobile devices and the web throughout the world. It simplifies the process of developing complex APIs (Application Programming Interfaces) and web servers. Express simplifies the use of routing and middleware on robust web servers for the purpose of organizing your software's functionality. It also adds practical functionality to Node.js HTTP (Hypertext Transfer Protocol) components.

REACT JS

Indeed, react is a widely-used open-source front-end JS toolkit for developing websites and applications. There are a number of conditions that must be completed before you can start using react, such as updating your Node modules to their most recent stable releases. You should also be proficient in JavaScript, CSS, and HTML.As such, it has been put to use in the development of user interfaces, most notably for single-page web applications. It is not a JavaScript framework. It's nothing more than a simple JavaScript framework developed by Facebook that allows programmers to get around issues that other libraries have had trouble with when making apps for the web and mobile devices.Any view layer in mobile and online apps may be managed using React. It paves the way for creating modular UI (User Interface) elements..

NODE JS

It's true that js is an additional open-source server environment that supports JavaScript outside of a browser. It’s not a programming language, hence it can't be considered a framework. It’s widely employed for the development of back-end solutions, including websites and mobile apps. Large companies like Uber, PayPal, and Netflix utilize it extensively in production.

It might be a universally accessible ASCII text-based storage system. It's compatible with Windows, OS X, Linux, Unix, and other platforms. It's simple to implement, and it works well with agile methods of design and prototyping. It provides users with services that are both high-quality and quick.

Why we use MERN Stack?

Documents with key-value pairs, like JSON objects, are how data is saved in MongoDB, a NoSQL DBMS. Using MongoDB, users may build their own databases, schemas, and tables. The Mongo shell is included, which is a JS frontend for working with the database to do operations like removing, querying, and updating records. A NodeJS framework, ExpressJS makes it easier to write code for the backend. The need to make several Node modules is eliminated. ExpressJS has several options for middleware that help maintain code clarity. To create user interfaces for mobile apps and SPAs, ReactJS provides a JS library. You may use it to create UI elements and write JavaScript. Everything in this JS package is accomplished through the usage of a virtual DOM. To put it simply, NodeJS is an open-source server-side JavaScript runtime environment. It includes npm, the node package manager, which provides access to a library of modules. Node's rapid code execution is a result of its foundation in the Chrome JavaScript Engine.

Because of this mix, JSON data flows easily from front to back, making it quick to build on and relatively easy to debug. Plus, the JSON document structure is the sole language and data format you need to comprehend the entire system. Web developers nowadays, especially those with experience in React.js, like the MERN stack because of its emphasis on speed.

PROS OF MERN STACK

Performance and how the UI looks. When it comes to separating the UI layers, react is a good choice. Software that is free and open source. It's easy to switch between client and server. Appropriate for tiny apps.Make the user's experience better. Use it for Full-Stack Development. It's fast and reliable.

CONS OF MERN STACK

Efficiency. As a library, react relies heavily on other libraries, which might slow down development. Applications on a Massive Scale. It is challenging to manage a large team of developers using MERN. Methods for Minimizing Mistakes.

VII CONCLUSION

These days, food waste is a widely discussed topic. There is a pressing need to use computers to regulate human labor in the present day. In order to accomplish this IoT goal and cut down on wasted food, we came up with a method that works well in this context but doesn't require any more work from human operators. We developed a blockchain-based solution for intelligent food waste management that could record details about each item thrown away. The suggested solution is cutting-edge technologically and addresses a need in the food waste management market.

These days, food waste is a widely discussed topic. There is a pressing need to use computers to regulate human labor in the present day. In order to accomplish this IoT goal and cut down on wasted food, we came up with a method that works well in this context but doesn't require any more work from human operators. We developed a blockchain-based solution for intelligent food waste management that could record details about each item thrown away. The suggested solution is cutting-edge technologically and addresses a need in the food waste management market. Finally, the empirical This study might benefit from a before and after analysis of how the intelligent self-serve lunch line affects customer behavior, given the data from the system was preliminary.

VIII FUTURE WORK

We need a mobile app for this in the future. This is why the modern world would be lacking without smartphones. Therefore, we intend to mobilize our system so that all users may access it from their mobile devices at any time and from any location. The suggested system's precision, durability, dependability, and efficiency might all benefit from this. The lunch line platform could be used to look into the following topics: (1) consumer behaviour before and after the lunch line was introduced; (2) a comparison between those using the lunch line and receiving feedback about generated food waste and those not using the

lunch line; (3) how cafeteria operations could be improved with data from the lunch line; and (4) the impact of food waste intervention strategies. The cafeteria's self-serve lunch line makes it easier to study customer habits and test interventions aimed at altering those habits. We're working with the eatery to build data-driven technology for reducing food waste and gathering data over time to see how the system affects patron behavior. Food waste and demographic differences in cafeteria behavior are also investigated in these research.

The system itself should be tested, and it presents chances for study beyond just making use of data supplied by the system. The computers located between the weight sensors and displays are able to work in humid and hot environments because food containers are kept heated with nearly boiling water. They must undergo further endurance testing.

The system mobile app might be improved by adding gamification features like rating users by quantity and kind of food discarded. Our system and surveys might be used to evaluate this strategy.

REFERENCES:

[1] Mrigank Mathur, Ishan Srivastava, Vaishnavi Rai,"AaharFood donation App" International Journal of Scientific Research & Engineering Trends May-June2021

[2] R.Adline Freeda1, M.S.Sahlin Ahamed2,"Mobile Application for Excess Food Donation and Analysis" ,April 2018, International Journal Of Innovation Research In Science Engineering & technology(IJIESET)

[3] Mafishan Ali, Sana Sheikh, YumnaSohail," Reduction of Food Wastage through Android Application" International Journal of Scientific & Engineering Research Volume 10, Issue 10, October-2019.

[4] JManikandan1, Mr N Kumar2,"Food waste reduction through donation" International Research Journal of Engineering and Technology (IRJET)Mar2020.

[5] M. Ghazal, S. Ali, F. Haneefa and A. Sweleh, "Towards smart wearable real-time airport luggage tracking",2016 International Conference on Industrial Informatics and Computer Systems (CIICS), 2016.

[6] Betz A., Buchli J., Gobel C. and Mulle C., "Food waste in the Swiss food service industry–Magnitude and potential for reduction," Waste Management, pp. 218-226, January 2015.

[7] Neo Chai Chin, "An 11th Hour answer to cutting down on food waste," 07 November 2016. [Online]. Available: http://www.todayonline.com/singapore/11th-hour-a answer-cutting-down food-waste. [Accessed 14 December 2017].

[8] Paola Garrone, Marco Melacini, and Alessandro Perego, "Opening the black box of food waste reduction.," Food policy, vol. 46, pp. 129-139, 2014.

[9] Kummu M, de Moel H, Porkka M, Siebert S, Varis O, and Ward PJ., "Lost food, wasted resources: Global food supply chain losses and their impacts on freshwater, cropland, and fertilizer use.," A science of the total environment, vol. 438, pp. 477-489, September 2012.

[10] JorisTielens and JeroenCandel, "Reducing food wastage, improving food security?" Food &BusinessKnowledge Platform, 2014.

[11]L. Koivunen et al., "Increasing Customer Awareness on Food Waste at University Cafeteria with a Sensor-Based Intelligent Self-Serve Lunch Line," 2020 IEEE International Conference on Engineering, Technology and Innovation (ICE/ITMC), Cardiff, UK, 2020, pp. 1-9, doi: 10.1109/ICE/ITMC49519.2020.9198571.

[12]S. Thay and T. Chinda, "Factors Influencing Food Waste Management in Phnom Penh, Cambodia: Data Collection," 2018 3rd Technology Innovation Management and Engineering Science International Conference (TIMES-iCON), Bangkok, Thailand, 2018, pp. 1-4, doi: 10.1109/TIMES-iCON.2018.8621700.

[13]V. Jain, "eBin: An automated food wastage tracking system for dormitory student's mess," 2016 International Conference on Internet of Things and Applications (IOTA), Pune, India, 2016, pp. 52-56, doi: 10.1109/IOTA.2016.7562694.

[14]V. Lim, F. Yalvaç, M. Funk, J. Hu and M. Rauterberg, "Can we reduce waste and waist together through EUPHORIA?" 2014 IEEE International Conference on Pervasive Computing and Communication Workshops (PERCOM WORKSHOPS), Budapest, Hungary, 2014, pp. 382-387, doi: 10.1109/PerComW.2014.6815236.

[15]Honee, D., Hurst, W. &Luttikhold, A.J. Harnessing Augmented Reality for Increasing the Awareness of Food Waste Amongst Dutch Consumers. Augment Hum Res **7**, 2 (2022). https://doi.org/10.1007/s41133-022-00057-7

[16]Tbk, Bharath &Prashar, Deepak. (2021). Review on Efficient Food Waste Management System Using Internet of Things. International Journal of Current Research and Review. 13. 142-149. 10.31782/IJCRR.2021.13603.

[17] Ecole Hôtelière de Lausanne, HES-SO, University of Applied Sciences and Arts Western Switzerland, 1000 Lausanne, Switzerlan,2020.

[18]G. Funchal, V. Melo and P. Leitão, "Cloud-enabled Integration of IoT Applications within the Farm to Fork to Reduce the Food Waste," 2022 IEEE 31st International Symposium on Industrial Electronics (ISIE), Anchorage, AK, USA, 2022, pp. 824-829, doi: 10.1109/ISIE51582.2022.9831694.

[19] da Costa, T.P.; Gillespie, J.; Cama-Moncunill, X.; Ward, S.; Condell, J.; Ramanathan, R.; Murphy, F. A Systematic Review of Real-Time Monitoring Technologies and Its Potential Application to Reduce Food Loss and Waste: Key Elements of Food Supply Chains and IoT Technologies. *Sustainability* 2023, *15*, 614.

[20] Chetna Chauhan, Amandeep Dhir, Manzoor Ul Akram, JariSalo,Food loss and waste in food supply chains. A systematic literature review and framework development approach,Journal of Cleaner Production,Volume 295,2021,126438,ISSN 09596526,https://doi.org/10.1016/j.jclepro.2021.126438.