Food Web-A food waste management system for a better sustainable future

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Abstract---As the lifestyle of people is updating more, everyone prefers to eat more delicious and different every time of the day. But as convenience increases it also brings some problems. This paper deals with the problem that arises due to leftover food i.e. food wastage. This introduces food waste management system which helps the user to donate the food while sitting at home with their own convenience. Once the food is donated by any donor, his/her photo will be uploaded on the website.

Key Words: donation, food waste, food, tips, management

I. INTRODUCTION

There is a need to augment the socio-emotional skills of the people so as to foster awareness for less food wastage among them and provide joyful experiences to the needy people who cannot afford food on their own.

Also, people should show their human values by helping others in their emergencies situations. So, there should be any source by which people can show their human values. In 2020, due to coronavirus many people have lost their jobs due to which they were unable to get food even of one time [15]. Also, in many houses food was left over but cannot be donated because no one was allowed to go out. And after this epidemic, still many are unable to get food. So, the basic idea of this paper is to focus on donating food for the people who are unable to get it. Also, it is for those who want to get rid of wasted food [1].

The system "**Food Web**" deals with the online website for connecting the donor and the receiver for food exchange so that the food that were to be wasted can be used by needy people. One of the biggest issue in the current food waste management is that it connects only donor and receiver. This system provides the facility for joining more communities so that the food which cannot be used for donating, can be used for making biogas and manure or by factories. Our system can be used from anywhere with the help of any device. The donating and receiving information of the user is stored in database [2]. With the help of this, we will maintain a page on the website to show the donors picture and name so that it will motivate others to donate the food.

II. BACKGROUND AND MOTIVATION

Many of the work that is done for the food donation and waste management system is present. One such method for food donation is the manual donation done by the people. This relied on the people who wanted to donate food. They have to decide where to donate the food. It was much time consuming due to which the food was wasted till that time [14]. It has a hole in the system because its ability was not dependable as someone had to do it by themselves. Also, this method incorporates delays and inaccuracies.

We propose a system that will allow people to donate from their doorstep. Along with this, the user can also donate the wasted food for the animals or to factories for making biogas of it and helping in reducing the more usage of fossil fuels so that they can be prevented for the future use. Pros of the suggested system are: Faster response to donations, wasted food used for making chemicals and biogas

and also for feeding animals, donation made easy by just clicking a button.

III. LITERATURE SURVEY:

Around tierce of the food that is harvested in the world is for human usable but around 1.3 billion tonnes gets wasted or lost. The food losses and wastage of the food estimates around 690 billion cost in modern countries and around 320 billion in growing countries. Modern and growing countries vanish nearly same amount of food respectively 680 and 640 million tonnes. The most wasted food in the countries are fruits and vegetables, and roots. They can be used in many forms but are wasted because people do not know how they can be saved or managed. Around 35 percent of cereals, 41-52 percent of root corps, fruits and vegetables, 21 per cent of oilseeds, meat and dairy products as well as 30 per cent for fish products are wasted all around the world per year. Buyer in modern countries waste almost as much food as the whole food production of a poor country every year. The quantity of food drained annually is approximately equal to half of the whole world's every year's cereals crop. Consumers in Europe and North America waste around 90-115kg per capita in a year, while other country consumers throw 5-10 kg a year [3]. Total per unit of food produced in rich countries for human eating is about 950 kg, while in the poorest countries it is half of the rich countries. In developing countries like India,40 per cent of wastage happen at before harvesting and processing levels while in developed countries more than 45 per cent of losses happen at retail and consumer levels. Large amount of food is wasted due to their poor quality standards at retail level. Food loss and waste also harm the environment, resources which includes water, land, labour, capital and it produces greenhouse gas emissions, which further lead to temperature change and global warming [4]. If only one-fourth of the food which is lost or wasted could be saved globally, then it would be sufficient to feed 871 million hungry people all around the world. This could lead to remove hunger from a country. In the industrialized countries, food wastage is occurred at the first stages of the food chain and it is due to the lack of information of harvesting techniques, tools, financial, and managerial constraints during the harvesting as well as in the storage techniques of the food. Making the chain stronger of supply, through the aid of farmers and investments in architecture, transportation, as well as in an expansion of packaging and food industry can help to reduce food wastage at the early stages [5]. In countries where people with medium and high income live, food is wasted more and lost mainly at the after stages of the food supply chain. The behaviour of the consumers also decide the food wastage quantity. The study found out that there is a lack of collaboration between suppliers in the supply chain as well as consumers in the food chain. Farmer-consumer linking can be very useful to increase the coordination between the two. Also, raising awareness among people could be a very useful feature to protect the food from getting wasted [6].

To protect the food wastage so many advanced systems are available in now-a-days. In earlier days the food donation was made manually due to which the food was wasted till the time it was donated to the people. Earlier food was donated to the NGOs, temples, madrasas but it was not sure that people were able to find these places near to them or not [7]. But now, it is made easy for people to donate food by just sitting at home. Many other systems have been proposed to donate the food. The existing system deals with donating food to the people but do not tell about nearby donators. The other existing system tells to donate the food material so that the food can be cooked at the spot of donation made. Existing system does not provide tips for the wasted food as well as it does not allow users to donate the food via their location [13].

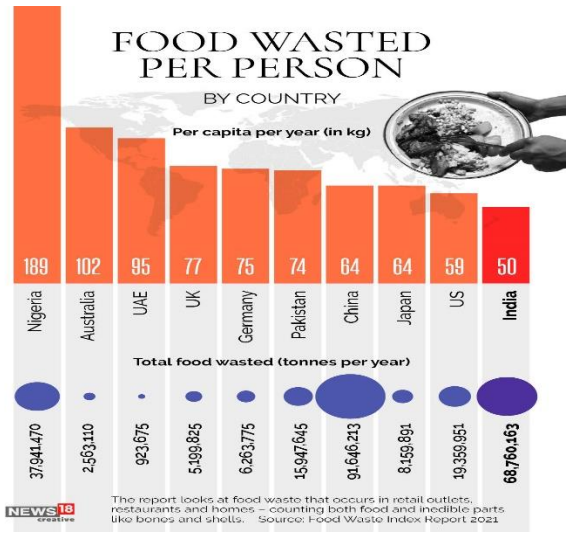

Fig. Food Wastage per person

IV. TECHNOLOGY USED:

VS CODE:

Visual Studio Code, also known as VS Code, is an editor which is a source-code editor which is developed by Microsoft for different operating system like Windows, Linux, MacOS [8]. It includes features like support for debugging, syntax highlighting, intelligent code completion, snippets, code refactoring, and embedded Git.

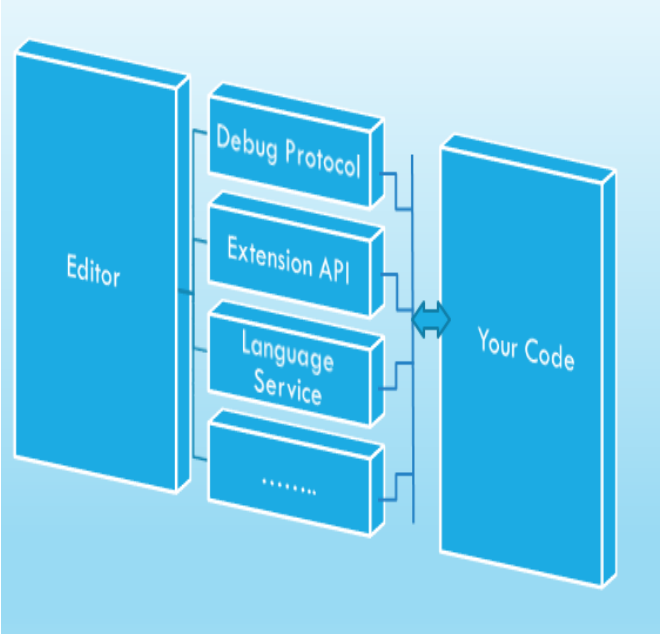

Fig. VS Code architecture

PHP:

PHP is a language which is a scripting language used for web-development. It was initially produced by Danish-Canadian programmer Rasmus Lerdorf in 1994. The PHP recommendation execution is now implemented by The PHP Group.

HTML, CSS, JAVASCIPT:

As a web developer, **the three main languages we use to build websites are HTML, CSS, and JavaScript**. JavaScript is the programming language, we use HTML to structure the site, and we use CSS to design and layout the web page. HTML provides the basic structure of sites, which is enhanced and modified by other technologies like CSS and JavaScript. **CSS is used to control presentation, formatting, and layout. JavaScript is used to control the behaviour of different elements**.

GOOGLE MAPS

Google Maps is a platform offered by Google for which is used for mapping. It provides the user with, aerial photography, 360° interactive panoramic views of streets, satellite imagery, street maps, real-time traffic conditions, and route planning for traveling by foot, car, bike, air and public transportation.

FIREBASE

Firebase is a platform developed by Google for developing web and mobile applications. It was initially a self-reliant company set-up in 2011. In 2014, Google took over the platform and now Google is the front-runner of the platform for app development. Google Firebase is **a Google-backed application development software that allows developers to enhance iOS, Android and Web apps**. It provides us with the tools that are used for reporting and fixing app crashes, tracking analytics, product experiment and creating marketing.

V. WORKING METHOD OF SYSTEM

The system requirements for the proposed system are mentioned as following. Hardware requirements for the system are i3 Processor, 4GB RAM, 50GB Hard Disk, 2.1 GHz+ Speed, Web Services, Impact GPS. Software requirements are Windows 7 or Higher Operating System, Html, Firebase, VS Code Tool. The tools and technology used are VS Code, HTML, CSS, Javascript and Firebase. The system is open source software due to which anyone can use it. Since the system is created for web, so the HTML language is used to implement the code and Firebase is used to add all the data that will be provided by the user like donator and receiver. Firstly, Welcome homepage is created on which the user sees all the available options and welcome page.

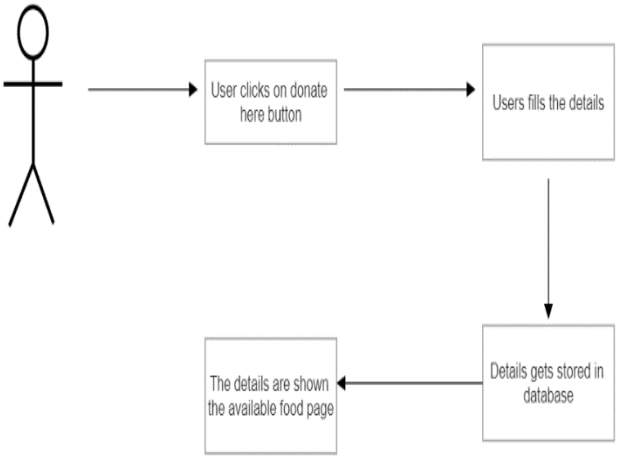

Fig. Process of Food Donation

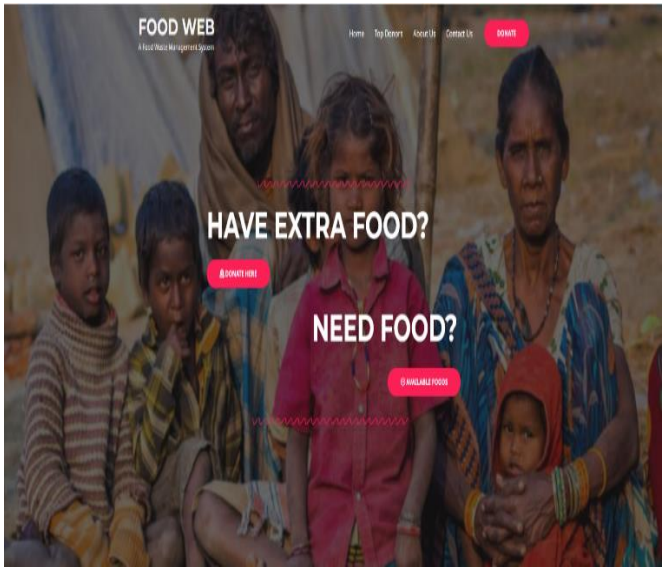

Fig. Home Page of work done

Since this is for everyone so there is no need to create an account as our motive is to provide safety and to take user only necessary information used for making donation. Then the user will land on the homepage where he can see several options. Firstly, the user has to click on the donate here button for making donation. Once the button is pressed, the user will land on the donation page where he can easily fill the form and make donation[16]. Next there is an option to see the available foods that can be used by receivers. Also, if the user wants the food, he/she has to ask for the details from the donor. The user can only contact the donor if the donor wants him to. The geolocator dependency is used to show the google maps in the website so that user can get the location easily when the donor is ready to make the donation. To store the data, Firebase is used so that the data can be stored dynamically, and since it is stored online, if the system crashes it will be stored online.

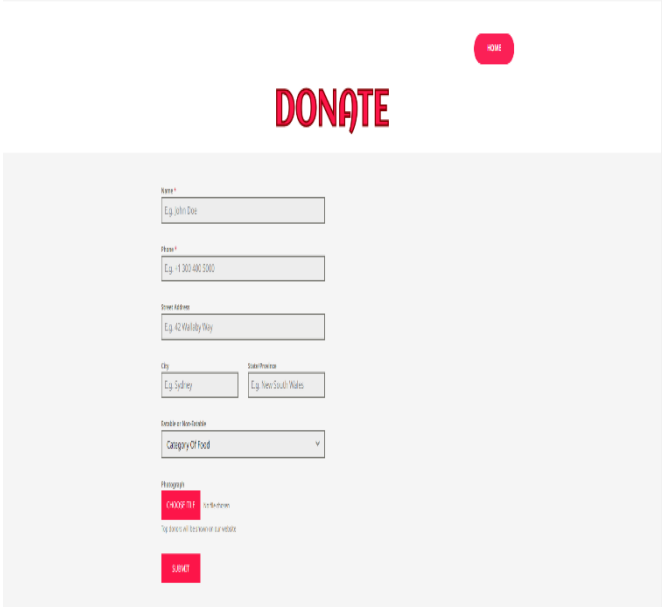

Fig. Donation Page

The factories, farmers, NGOs everyone will be connected to this website so that if food is wasted farmers can use it for their animals and factories can use it for their biogas purpose [11].

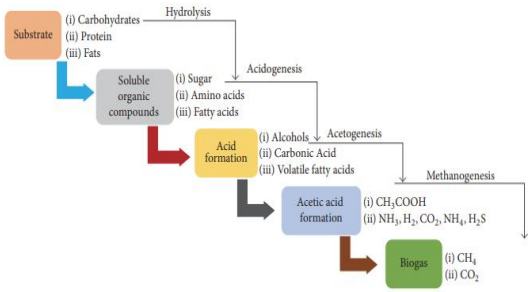

Fig. Biogas Production using wasted food

Next, the system will provide the photo wall service where the user can post his photo after making donation[18]. The photo will be shown to everyone whoever visits the website.

Lastly, the user is provided with some tips and tricks to maintain the food so that it is wasted less and can be reused by the people.

VI. COMPARISON WITH OTHER AVAILABLE SYSTEM

After comparing the existing systems, there are some drawbacks or the cons in the systems which are identified. The system shows that there are few websites available in the market that are similar to the proposed system. The system to be developed provides such type of functionality that is required for each and every online food donation. The research conducted results in the need to features like Connecting various areas people, Push up notification, as well as in Secure database etc. While developing the proposed system, the developer can utilize the information provided by the similar websites and also can integrate own new ideas into the existing ideas. Since the similar websites have proven to be very effective in real world, and the entire research provides support to the developer for better understanding in creating the whole website. The proposed system thus will be efficient in enhancing the donating experience at real time environment.

S. No.	Features	Akshay Patra	Yuva Social Movement	Food Web
1.	Locate Nearest Donor	✓	✓	✓
2.	Select Donor	✓	✓	✓
3.	Search Type of food	✓	✓	✓
4.	Food quantity Information	✓	✓	✓
5.	Wasted food receiver	×	×	✓
6.	Direct Contact to donor	×	×	✓
7.	Filters/Sorting	×	×	✓
8.	Best Donation	✓	✓	✓
9.	Check Validity of Food	×	×	✓
10.	Getting location from GPS	×	×	✓
11.	Requesting for food	×	×	✓
12.	Add photo of donor	×	×	✓

Table: Comparison with other systems

The occurrence of the suggested system for user is investigated so as to come to a remark of what all features are required by the end user so that the developer can enhance the online food donation environment. The literature review produces the preparations so that further research can be carried out which gives an idea about the suggested system. The systems similar to the suggested system have been investigated so that a base line can be created for the system; what problems will come while implementing the system, what are the features that cannot be implemented at all.

The system which are already available in the market do not provide the facility to provide tips on how to save food. But in our system it is provided so that user can easily know the tips and tricks on how to save food for the benefit of everyone. Also, other systems do not provide with the service of donating the wasted food to the farmers or factories, but our system provides it due to which it will be very beneficial to the restaurants, factories etc. because there is a huge wastage of food in

their daily lives. Our system also provides the facility of how we can share the photo of donors which is not done by other system. This will encourage other user to donate food as there will be an appreciation to the users for donating the food. Also, this system will be helpful for everyone as the person who is in need can also ask for food donation in case of emergency. And, it is also a trust worthy system as people today mostly do things for their benefit only, but using this system we can trust the person who is asking for food as we can have direct contact to them using this system. Hence, this system can be very useful in tough times of people.

VII. CONCLUSION AND FUTURE SCOPE

The paper displays the food waste management system. Basically web part is consisted by the suggested system. Web systems are implemented using HTML as it is simple, secure, interpreted, platform independent, robust, object-oriented, portable, dynamic, multi-threaded to create [12]. Data is stored in the database using Firebase. The access to data is authorized by admin only but it is shown relevantly to the user. The website is used by the citizens who wants to donate and by those who wants to take the donated food. Here receivers can use the website as a common citizen also. By using this, one can easily understand the wide range usability. Every day, various research work is being done in this field and various techniques are used to get a more accurate result to avoid the food wastage as much as possible [9]. This system makes the people to be aware of wasting less food so that there is no shortage of food for anyone. It is a cost-effective, easily accessible, usable software that can be used easily by anyone. It suggests a real-time approach for the problem of saving lives that's there in risk due to hunger. The suggested system is working efficiently for food donation purpose. Therefore, it is assured that this project is a good way to help the public to waste less food and donate to the needy people. This system can be boosted by including online transactions for the needy people so that food donation can be done via money. Using the online transaction, the website can be very useful for those who do not wish to give food but wants to make donation [13]. In future, the website can be made to be available at a global scale and people from any area can donate food.

Also, the websites provide tips to people on how can they stop wasting food. In future, volunteers can be arranged to donate the food at the given location so that the donators and the receivers can easily avail the food.

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