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SHARE EATS - A FOOD REDISTRIBUTIONPLATFORM BASED ON AZONE ALGORITHM

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Abstract: One-third of the world's food production,1.3 billion tons of food is wasted. The report statesthat as wealth increases, people are becoming less concerned about food. According to a report by theWorldFoodOrganization,20,000childrenareforced to go hungry every day worldwide, when infact the figureis much higher. According to a survey done by the world bank, 48countriess how a significant number of people running out of food or reducing their consumption. Another survey by the UN shows that, nearly 2.37billion people (or30%oftheglobal population) lacked access to adequate food in 2020–arise of 320millioninjustoneyear.Unequalfooddistributionisseenasaproblemresultingfromwealth imbalance and rapid population increase. In order to balance this abnormal situation, we are trying to buildaFood Redistribution Platform calledS HAREEATS.

keywords: *Food, Redistribution, Algorithm, zone.*

1. Introduction:

AccordingtoareportbytheWorldFoodOrganization,20,000childrenareforcedtogohungryeverydayworldwide,wheninfactthefigureis much higher. Moreover,basedonasurveydoneby the worldbank,48countriesshowasignificant number ofpeoplerunningoutoffoodorreducingtheirconsumption. To make the situation better, we triedto create a platform where excess food, excess fruitsand vegetables, and spoiled food can be distributedto the needy. The needy can be an Orphan Animalfarmorcompostsystemtoeffectivelyconvertspoiled food into compost.To have an in-housedelivery system (if possible) to quickly deliver thefoods in time to ensure food quality. Collaborativeconsumption and peer-to-peer exchange of food arestill not as developed and popular[1].

2. LITERATURESURVEY:

2.1 In this article, the concepts like food reuse andshared food use are explained and also the featuresof food sharing and existing models are analyzed.Community-basedguidelinesfor the developmentofthisprojectwerealsoadded.Thecompleteanalysis is based on the open-source knowledge andthe studies are published in both the business andthescientificjournalsandtheideasare gatheredfromvariousmediaandactivefoodsharingwebsitesandservices.Atlast,theresultswerecompared to the existing research publication.

2.2 Food-sharing in the distributed use economy:

1
Inordertoreducefoodwasteandlossesintheindustry,severalchangesweremade.Nowadaysmobileapplicationsandweb-basedfoodsharingsystems are the currently used models in the foodindustry.Itwillreducefoodwaste and also helpsthe users to share the food. The massive amount offoodwasteleadstomajoreconomicalandenvironmentalproblems.Theconceptoffoodsharing has several processes such as storing andredistributingfood.Incommonfood,sharingincludespeer-to-peerexchangesandalsointhebusiness charities, and entities.

2.3 Foodsharingasasolutiontoasociallysignificantproblem :

Asthepopulationincreased,the food productionand also the growth of consumption also increased.Most people and companies buy excess food thatthey cannot eat, so instead of disposing of it in thegarage, they can send it to any charitable trust or tosomeone who is in a needy situation. Also, severalrestaurantsandhotelsshoulddelivertheunusedfoodtosomeonefreeofcostorwithsomediscounts,andhencethisisthepurposeof foodsharingandredistributing. It will also reduce thevarious pollution. some people have the capacity tobuy some nutrients food and others don't have thesufficientmoneytobuythem,henceitleadstoirrational use of waste.

2.4 Food-sharing models :

Onsitesoffoodsharingrelatedplatformsandservices,therearethreefoodexchangemodelsrevealed [12]:

1. Cash trading compensation.
2. Funds transferred for unnecessaryreasons(charity).
3. Foods are shared in surrounded community

The initial model highlights that foods are used as akey for non-profits and types of trading. Here trade means that the transfer of food only satisfies thebenefit of one another or covers the cost of food. IntheB2Cplatforms,thecompaniesproducefoodand they offer to sell the food products with so on expiration dates or at a good amount of discount. Inorder to sell the food, they are using websites and mobile applications. In these applications, they postthe food items and they sell those. The application for this business is created by some sensible companies in order to make people more attractiveandmaketheirbusinessprofitablebyprovidingoffers.

2.5 Problemsanddirectionsoffoodsharingdevelopment :

Fooddistribution platforms based on P2P forumsandapplicationsareeffectivelyincreasingtheirpopularity these days. This is only because food isinterpersonallyconnectedtoeverypeople[12].Manyanalyseshaveproventhat although peopleshow a positive view of the distributed economicplatform. But many people are not using those. Thisindicatesthatthereisabigdifferenceinthebehavior of both attitudes and actual. Publicationsrelatedtoscientificstudiespingthatresponsetargets consumer perspectives based on beliefs andvalues.Environmentalawareness,sustainability,and corporate social responsibility are the value ofcunsumners [15]. In summation of distributing foodandcookedfood,afoodsharingsystemcanimplemented.Thisbuildsanopportunitytopickmany fruits and vegetables, alert lands for growingnutritiousvegetables,educatevegetableandfruitplanting, and arrange trading[13].

3. IMPLEMENTATION:

3.1 ZONEALGORITHM:

Wecameacrossaproblemwhiletryingtoimplement our solution. It was the location-basedfiltering to reduce the data set the user has to workwith. The basic idea is that a person who needs foodwillnotcareaboutfoodthatisavailable500Kilometres away from him.

ThemoststraightforwardsolutionwastouseGoogleMapsAPItofilteroutpostsusingthelocationcoordinates.But,thisstraightforward solution brings two problems along with it. One is,thefactthatitinvolvesabunchofcalculationswhich directly increases the time-complexity of theapplication and also the mere time is taken to loaduptheposts.Thesecondproblemisfinancial.Every API call to Google APIs costs money. So, thedecisionwasmadetocome up with an in-houseZoningalgorithmtomakethejobseasierandcost-effective.

The idea is to divide the whole active space intomultiple zones. In our case we decided to go with 2different zonings. One with 5 km width and anotherwith25kmwidth.Calculatingthedistanceiscomplex, so we decided to filter out all the postsfrom the 5km zone and then we also go through the25km zone if there aren't enough posts in the 5kmzone.

Todividethezonesinto5kilometerzones,theexact latitude value is 0.04521858664 and for thelongitude,thevalueis0.04491515527.Now,wehave the top-left point outside of India and we willsubtract the current value with the top-left value togetarelativelatitude and longitude value. Theserelative values are just to make the longitude andlatitude value smaller. Now, we divide the relativevalues with the corresponding 5 kilometers valuesandwestorethereminder values. This remindervalues of longitude and longitude uniquely identifyeveryzone.Weusetheseremindervaluesalsoknown as hash values to filter out the posts in thatzone.

3.2 Formula

3.2.1 Reducing coordinate values

latitude = 37.893995 - position.coords.latitudelongitude=longitudecoordinates-66.804471

3.2.2 Finding bucket coordinate

latitudeBucket = latitude / 0.04521858664longitudeBucket=longitude/0.04491515527

Note:

- The values 37.893995 and 66.804471 are pointsoutside the top-left Indian border and are usedto reduce the coordinate values for easiercomputation.

- The values 0.04521858664 and 0.04491515527are equivalent to 5 Kilometers in coordinatevalues.

4. Our Implementation:

4.1 Architecture Diagram:

Figure 1 Architecture diagram explains theTechnological Architecture of the project. Weused Firebase as our backend infrastructure andit takes care ofAuthentication and Database.
The client side for the product is built on ReactJs.

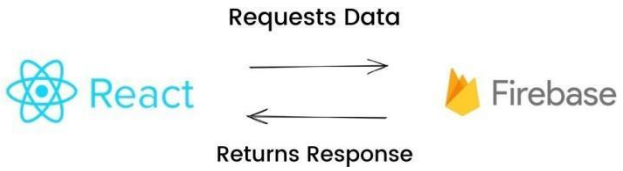


FIGURE 1:ArchitectureDiagram

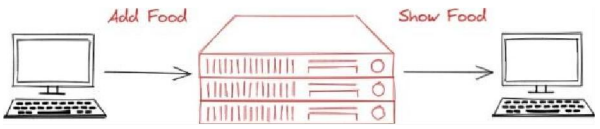


FIGURE 2: Data Flow Diagrams

Data Flow Diagram explains the flow ofinformation starting from donors adding food data,those data listing to food needs. Once the receiversaccept the food, log is added. There are 2 types oflog, small and large. Also the delivery status isobtained from the receiver and food is successfullydelivered.

HardwareRequirements:

- Desktop/LaptopwithabrowserthatsupportsJavascript

SoftwareRequirements:

- VSCode
- FireBase
- NodeJS
- React.JS

5. RESULTSANDDISCUSSION:

FIGURE 3: Food ReceiverDashboard

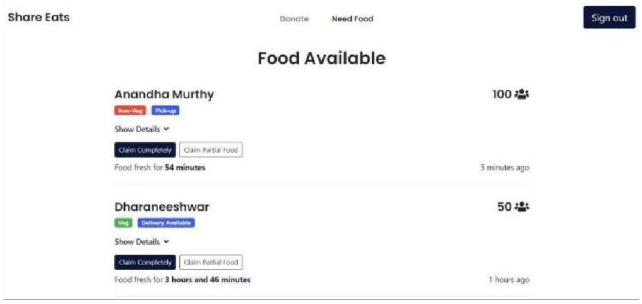


Figure 3 Food Receiver Dashboard is the dashboardofFoodReceivers.TheFooditemsaddedbydonors within 5 to 10 kms are listed to thembasedon the **zone algorithm**. Accordingly they select thefood and get delivered.

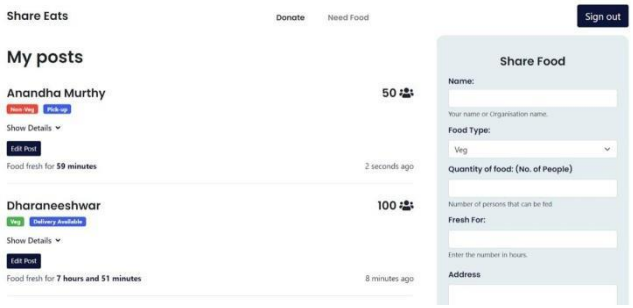
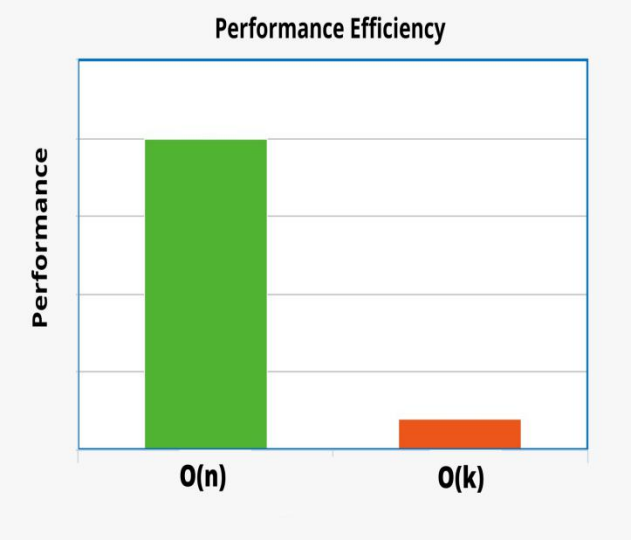


FIGURE 4: Food DonorDashboard

Figure 3 Food DonorDashboard is the dashboardof Food Donor. The Food items which are excess isadded by donors using the form on right hand side.The form contains basic information like FoodName, Food Type (Veg | Non Veg), Food Quantity,Freshfor (inHrs)andAddressfordeliverypurpose.Once the form is submitted, the food item will belisted for receivers within 5 to 10 kms based on the**zone algorithm**.



The typical algorithm to filter the availability offood can by done by calculating the distancebetweenuser's locationand postlocation.

Our zone algorithm increases the efficiency of thealgorithm by reducing the number of posts we workon.

6. Conclusion:

The idea is to balance society with equal and timelyfooddistributiontoeveryonewhoisstarvingwithoutfood.Therearemanyfooddistributionplatforms like Swiggy/ Zomato/Uber to deliver thefood based on purchases. But there is no one activefoodredistributionplatformtoeffectivelyutilizefood waste considering the number of people whoare suffering from hunger. In a country like Indiawherepovertyandfoodstarvationpeaks,thereisnot even a single Food Redistribution Platform.

So,wewantthisapplicationtobeaone-stopsolutionforcompletefoodmanagementandtrackingonceitisnotconsumedbyitsprimaryconsumer.Futureexpansionsoftheprojectcaninclude a separate dashboard for the delivery andpickup system.

7. References:

1. FoodsharinginthedistributeduseeconomyOlgaSaginova1,DmitryZavyalov1,NataliaKireeva,NadezhdaZavyalova1,andYurySaginov1Plekhanov Russian University ofEconomics, Moscow Russia.

2. O.V.Saginova,Yu.A.Orishko,Modelisovmestnogoispolzovaniyaprodovolstviya[Food-sharing models], Ekonomika,predprinimatelstvoi parvo,11, 2 (2021)

3. Botalova,Fudshering:ekonomicheskie,ekologicheskieisotsialnyeaspektyyavleniya[Foodsharing:economic,ecologicalandsocialaspects of the phenomenon], Vector of economy, 1(43), 69 (in Russian) (2020)

4. J.Harvey,A.Smith,J.Goulding,I.BrancoIllodo,Foodsharing,redistribution,andwastereduction via mobile applications: A social networkanalysis, Ind. Mark. Manag., 88, 437-448 (2020)

5. L.V. Berketova, S.S. Volodina, Fudshering – kakekologichnyysposobispolzovaniyaproduktovpitaniya [Food sharing – as an eco-friendly way tousefood],Bulletennaukiipraktiki[Bulletinofscienceandpractice],1,253-259(inRussian)(2020)

6. J.Rosenlund,Å.Nyblom,H.MatschkeEkholm,
L. Sörme, The emergence of food waste as an issueinSwedishretail,BrFJ,122(11),3283-3296(2020)

7. Yu.L. Saginov, D.V. Zavyalov, O.V. Saginova,Ekonomikaraspredelennogopolzovaniya:osnovnyeponyatiya,opredeleniya,kharakteristiki[Distributeduseeconomy:basicconcepts,definitions,characteristics],RussianJournalofInnovation Economics, 3, 1403-1424 (in Russian)(2020)

8. A.M.Agapkin,N.AIbragimova,Ratsionalnoeispolzovaniepishchevyhproduktovvformatefudsheringa [Rational use of food in the format offoodsharing],JournalofEconomyandEntrepreneurship, 12 (113), 651-653 (in Russian)(2019)

9. S.Yu.Kazantseva,Fudsheringvtorgovleproduktami zdorovogo pitaniya [Foodsharing in thetradeofhealthyfoodproducts],JournalofEconomy and Entrepreneurship, 10 (111), 665- 667(in Russian) (2019)

10. C.doStangherlin,J.L.DuarteRibeiro,M.[Barcellos,isConsumerbehaviourtowardssuboptimal Food products: a strategy for foodwastereduction], Br F J., 121 (10), 2396-2412 (2019)

11. S. Alfiero, M. Christofi, A. Bonadonna, [Streetfoodtraders,farmersandsustainablepracticetoreduce food waste in the Italian context], Br F J.,122 (5), 1361-1380 (2019)

12. L.Michelini,L.Principato,G.Iasevoli,[Understandingfoodsharingmodelstotacklesustainabilitychallenges],Ecol.Econ.,145,205-217 (2018)

13. M.Caraher,S.Furey,[Theeconomicsofemergency Food aid provision: a financial, social,and cultural perspective] (Palgrave Pivot, 2018)

14. P.M. Falcone, E. Imbert, [Bringing a sharingeconomyapproachintothefoodsector:Thepotential of food sharing for reducing food waste,Foodwastereductionandvalorisation],197-214(2017)

15. C.P.Lamberton,R.L.Rose,[Whenisoursbetterthanmine?Aframeworkforunderstandingandalteringparticipationincommercialsharingsystems], J Mark, 76 (4), 109-125 (2012)