



Project Hotel Leftover

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Abstract: It is anticipated that 40% of all of the meals manufacturing made in India are wasted as meals leftover. Out of the whole meals, leftover wasted yearly, 23% comes with inside the shape of eateries leftovers, and 7% comes in the form of stores leftovers [1]. The quantity of meals wasted from eating places and meals stores is enormous, and if, somehow, the meals this is being wasted in those eating places and meals chains are furnished to the needy, then it could be a supply of meals for lakhs of human beings daily. The key concept in the back of the idea is to digitalize the method of leftover meals management.

Currently, the leftover meals from meals stores more often than not finally end up in landfills, which becomes a supply of world warming gases emission.[2] To upload to the problem, if the eating place attempts to donate the leftover meals to the needy, it has to take in the duty of transportation and dispensing. On the opposite hand, NGOs which can be operating difficult to offer meals to the terrible and the needy, locate it difficult to return back with the aid of using resources. We recommend creating software so as to act as a bridge between the NGOs and the eating places. We motive to contain the not unusual place human beings withinside the method of imparting meals to the needy with the aid of using imparting a software to the customers as well, in which they are able to donate any quantity to the particular eating place, and the eating place in going back will offer the meals same to the quantity donated.

Keywords – Food Management, AWS Cognito, AWS SQS, Android Application, Leftover Food

I. INTRODUCTION

Since the food wastage of food can be easily stopped if it reaches the needy via organizations that are willing to take up the responsibility of distributing food, we can solve a major problem of food wastage crisis. The task can without delay be used inside the present chain of restaurants because it does now no longer require any records approximately the stock or the menu of the restaurant. The most effective required files are the registration files. The same is going for the NGOs as well. Normal end-customers want to sign in at the utility via way of means of the use of email/telecall smartphone range. Therefore, it's miles glaring that this system has no dependency on any utility and consequently may be improved or scaled to any range of customers beneath the most useful conditions.

II. LITERATURE REVIEW

- **Food Loss and Waste In India: The Knowns and The Unknowns**
This working research paper states the poor management of food wastage in India which includes not reporting sustainable development's goal after post-harvest loss surveyed. Thus, the proposed system for managing food waste is:
 - Identify the hotspots of food loss and waste in India.
 - Adopt harmonized yardstick to measure the wastage.
 - Build a Coalition for guiding research.
- **Food waste in hospitality and food services: A systematic literature review and framework development approach**
The food waste management system uses a systematic literature review approach to analyze the food waste from hospitality and food services. The steps included are:
 - Data extraction using RQs.
 - Selection of studies.
 - Research Profiling
- **Food Waste Management with Technological Platforms: Evidence from Indian Food Supply Chains**
Food loss can occur at several stages in the supply chain, including raw material procurement storage, production dispatch logistics, and retail. Moreover, different products have different requirements for processing and storage that may demand different forms of technologies. Based on preliminary interviews and prior literature, this paper states factors that determine the need for technological platforms in the supply chain to prevent food loss.[3]

III. ENTITIES INVOLVED

Common People:

By not unusual place human beings we confer with the clients of the restaurants, withinside the cutting-edge scenario, the clients don't have any say in supplying meals to the needy at once thru restaurants. Through the clients' software, you possibly can without problems pick what he/she desires to donate on the naked minimal prices. These donations could be furnished to the NGOs, therefore in the long run it reaches the needy.

The Donors (Restaurants, etc.):

These are the supply of left-over right first-rate meals. In the cutting-edge scope of the project, we've blanketed Restaurants, meals-chain shops, and caterers in this category. These donors also can get hold of donations from the clients, with the aid of using donation, it approaches that the consumer can pick objects to be donated from the listing of services furnished with the aid of using the restaurant. All of those donations together with the left-over could be furnished to the middleware.

The Middleware's (NGOs, etc.):

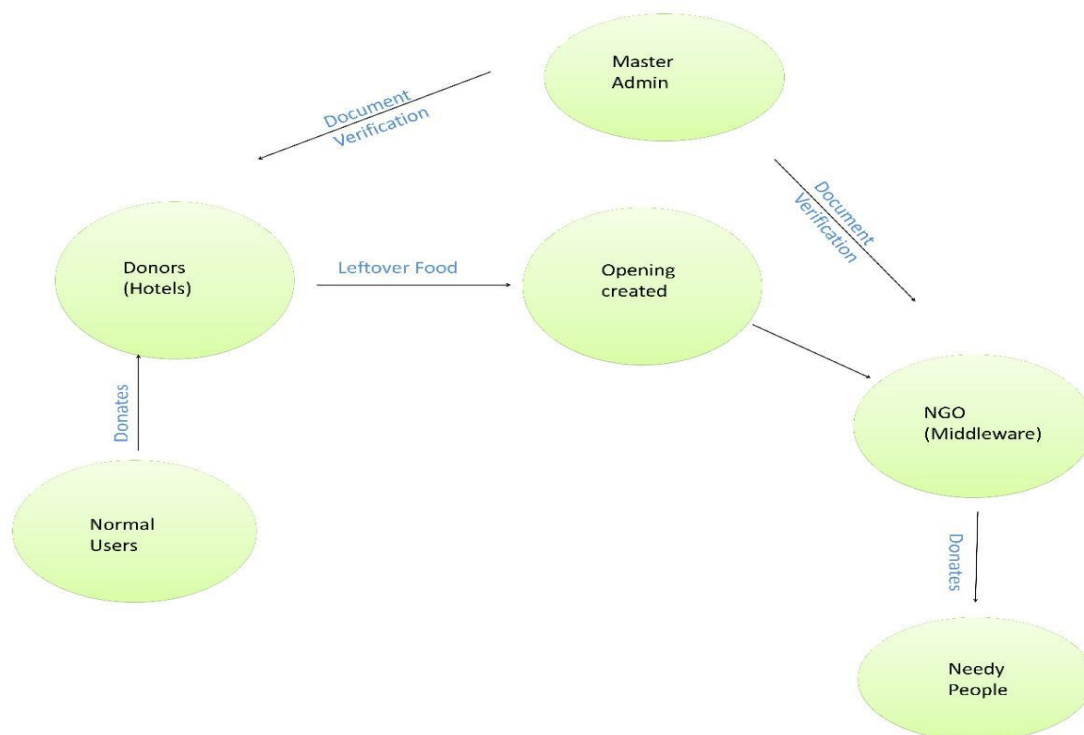
Middleware refers back to the social agency which attempts to offer to assist the needy. These businesses could be first tested with the aid of using the software admin, and after that their account could be activated. Apart from this, the middleware' may even add the photographs of the meals being disbursed to the needy, to accumulate greater credibility for themselves at the software.

The Master Admin:

This refers to the entity that will be looking after the entire functioning of the system. The primary purpose of the master admin is to verify the documents uploaded by the NGO's [Middleware] and Hotels [Donors]. Apart from this, the master admin can also remove any content uploaded in the system. The master admin has the dashboard to check the total amount of food donated and related attributes.

IV. SYSTEM OVERVIEW

As discussed earlier, the primary entities using the application will be The Donors, NGOs', Master Admin, and the Normal/Common People. The Donors will be able to create an opening for the leftover food, and that opening will be listed on the application used by the NGOs (according to the location).



Now the NGO can send a request to the Hotel to pick up the left-over food. Once accepted, the NGOs' can pick up the food and deliver it to the needy. The common people or customers of the restaurants can create a donation request and once the payment for the same is made, the hotels will add the equivalent amount of food corresponding to the donated money, to the left-over food delivery.

V. IMPLEMENTATION

To talk about the software that will be used, there will be a total of three mobile applications and two web applications. The three mobile applications will be for: The Donor, The Middleware, and the Common/Normal People. The two web applications will be for the master admin and the hotel admins. We are referring to these stakeholders as users.

The front-end will be primarily based totally on Flutter, for mobile and React.js for web-primarily based totally applications. The flutter framework will be used because of its high performance as compared to other cross-platform software development frameworks. Along with this, web applications will be based on React.js because of its amazing support for state management, and compatibility with serverless rendering.

The complete concept can be conceptualized with the aid of AWS (Amazon Web Services) to make the application serverless and noticeably scalable. By being serverless, the application profits the capacity to scale up fast, and to deal with incessant incoming traffic. Since scaling up the system is a horizontal expansion, therefore, the systems' backend will be DynamoDB, which expands fast horizontally.

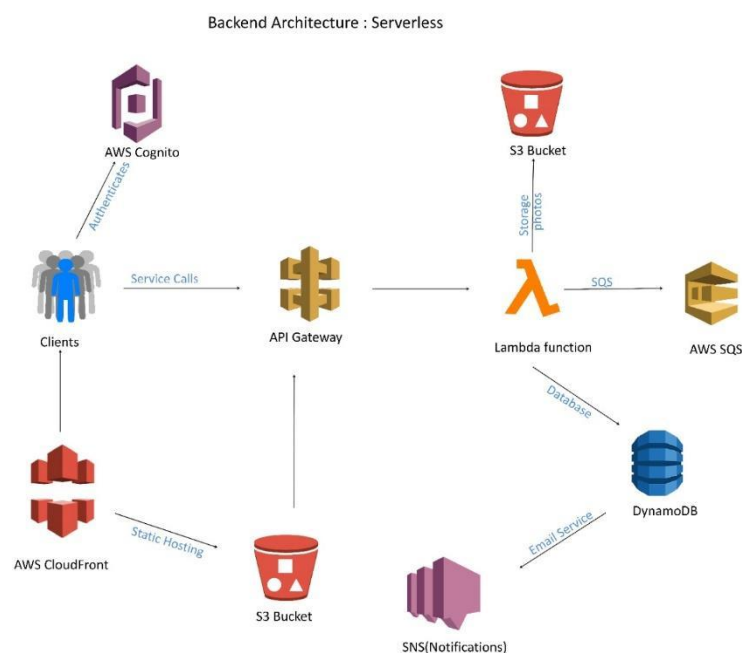
Since security is the foremost priority of any application, the authentication of the user will be done by using AWS Cognito. Without authentication, the user won't be able to access the data from our storage or database. All the images will be stored in the AWS S3 bucket, which is highly reliable storage. These images will include the photos of documents requested for verification, the photos uploaded by NGOs, etc. All the data will be stored in AWS DynamoDB, and the user won't be directly interacting with the database. Rather, the user, or from now, we will refer it to as the client, will be requesting the data via REST API.

The REST API will be set up using AWS API Gateway, and only authenticated users will get a response from the API Gateway. If the authentication is valid, then the API Gateway will forward the request to the AWS Lambda function, where the entire business logic will be executed. The Lambda functions will be responsible to give the necessary data back to the API Gateway, which in turn will give it back to the client. Thus, even the client cannot directly interact with the lambda functions, making the system highly secure.

The notification to the client will be provided by using AWS SNS, which is a notification service. The notifications that the client can receive include, the request from middleware to the donor, the successful acceptance of the request from the donor to the middleware, or even a simple email to the client that their documents have been verified. SNS can also be used to trigger alerts to the master admin if any suspicious activity takes place in the backend.

Any real-time application is prone to situations where two clients request from the same resource, which leads to a deadlock, or worse the failure of the system. The same situation can come up in our application as well, where, if two middleware (NGOs) request for the same opening and the donor. To solve this issue and be serverless at the same time, we have introduced AWS SQS to our system. SQS is a queue service, which will help the lambda functions to process the requests in a FIFO manner (First-In-First-Out).

The web application will be hosted using a static hosting feature of the AWS S3 bucket.



VI. CONCLUSION

The present-day wastage of meals leftover at domestic is difficult to convey [4] into taking a look at, however, the meals leftover of eating places may be introduced into taking a look at with the aid of using supporting the proprietors to discover the suitable manner to by skip at the meal's leftover. This can even assist the NGOs and the Government Authorities who are attempting difficulty to prevent the wastage [5] of meals and seeking to offer meals to the needy [6]. Such tasks will assist India to preserve its financial system within the lengthy run. Thus, with our utility, we're getting into supporting the needy with the aid of using regarding the foremost stakeholders of the meals-chain business, i.e., the proprietor and the consumer, and feature bridged the space among the needy and those human beings with the aid of using regarding NGOs as middlewares.

VII. REFERENCES

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