Personalized Food Recipe Recommendation And Search.

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Abstract - *Food recipe recommendation- General search for food recipes on various recipe recommending websites does not take into account the food ingredients that are currently present with the user. In such cases, the problem arises to find out recipes by the user himself with the current present ingredients. This paper provides simple but robust solution to this problem with personalized suggestions. It also searches and saves user's valuable time and enjoy cooking food in no time. System has ability to add those ingredients which are not present in essential list of ingredients displayed to the user on the website. This will help all users to take advantage of the system even if they are from diverse region and having different taste.*

*Key Words***:** Personalized Recommendation, Django, PostgreSQL, Food Recipe.

1.INTRODUCTION

For most people today, cooking or experimenting with food is a challenge because there is just not enough time in one's busy schedule to whip together a tasteful meal for the family or loved one in any occasion—and most of the time we don't know what we want in the first place.

1.1 Cost and Convenience

For those who are worried about the cost, a person will not be forced to go grocery shopping for certain ingredients to fulfill a recipe because they can search for recipes based on what is already in their cabinets.

1.2 We care about your time

Users have the option to make an account to store all their information so the next time they want to search for a meal, it will not all have to be retyped or entered in.

This project is a powerful resource that can maximize the cooking experience in an easy, fun, and more personable way.

2. TOOLS AND TECHNOLOGIES

This system uses following technologies:

2.1 Django Framework

Django is fully featured server-side web framework, written in Python. Food recipe recommendation project is created using Django framework. Based on ingredients

user has selected, recipes are queried in PostgreSQL database according to ingredients and is displayed on website.

2.2 PostgreSQL

PostgreSQL is an object-relational database management system. Django framework supports PostgreSQL 9.3 version and higher.

2.3 Nginx

NGINX is open source software. It is used for web serving, caching, reverse proxying, media streaming, load balancing.
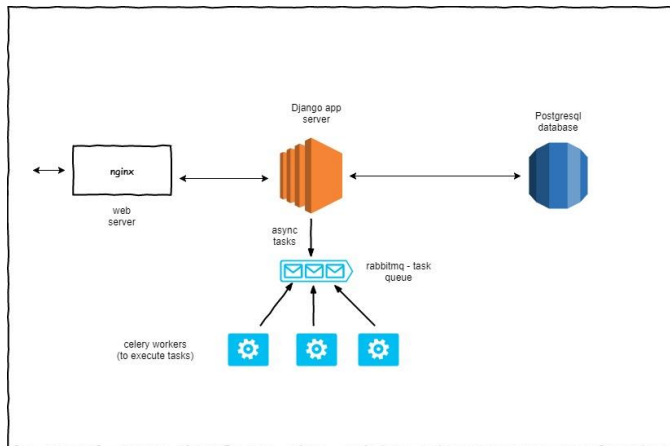
3. ARCHITECTURE

Figure 1 describes client server architecture and its working procedure. The front-end system provides a graphical user interface (GUI) in the form of website where clients interact with the system.
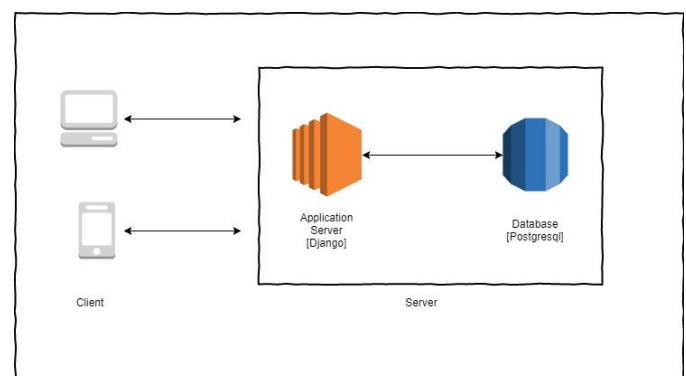
Fig -1: **Client-server (Distributed application)**

Client requests for desired recipe on main website based on ingredients in pantry and query is fired in local database. Client can also search recipes which he wants to explore and bookmark those recipes for future use.

Fig -2: **Server-side internal architecture**

Figure 2 describes Server-side internal architecture which consists of Django app server used for production environment. Celery is an asynchronous task queue based on distributed message passing. Task queues are used as a strategy to distribute the workload between threads or machines. In order to work with Celery, we need also RabbitMQ because it needs an external solution to send and receive messages. Those solutions are called message brokers. Celery supports RabbitMQ as message broker solutions. Web applications works with request and response cycles. When the user accesses a certain URL of your application the Web browser send a request to your server. Django receive this request and do something with it. Usually it involves executing queries in the database, processing data. While Django does his thing and process the request, the user have to wait.

Ideally the request and response cycle from the server should be fast, otherwise such condition would leave the user waiting for way too long. And even worse, our Web server can only serve a certain number of users at a time. So, if this process is slow, it can limit the amount of pages your application can serve at a time.

For the most part, we can work around this issue using cache, optimizing database queries, and so on. But there are some cases that there's no other option: the heavy work has to be done. Video or image processing are some examples of cases where you may want to use Celery.

We use Celery for specific tasks that are time-consuming. The idea here is to give respond to the user as quickly as possible, and pass the time-consuming tasks to the queue so that they can be executed in the background, and always keep the server ready to respond to new requests.

To store recipe information Postgres database is used.

4. WORKING

Users can interact with the system in different roles. They can login or signup to the system. Users can make their pantry that is they can add and save ingredients they currently have with them. They can also remove them from pantry when stock of those gets over. When user search using ingredient items system displays most relevant recipes. Each pantry item that is ingredient of the user has a specific id which is already assigned for list of frequently used ingredients displayed to the user on the website in pantry. This set of frequently used ingredients is constant and displayed to the user for head start and get familiar with the system. User just have to check the check boxes to add that item to list of available items in user's pantry. The list is saved and can be used later when user sign in back to the system at later stage. User also has the facility to add his specific ingredient which is not present in the frequently used ingredient list. This added ingredient gets specific run time id when user add to the pantry and get saved to database to the list of user's pantry items. Each user has different list of ingredients and this list is saved in Postgres database. Id string of pantry items is saved and matched with the id string of each recipe which is already calculated and stored in database. This technique uses hamming distance to find most relevance recipe to suggest to the user. Least hamming distance is the best matched recipe and returned to the user. Food recipes information is displayed on recipe page along with the list of ingredients. Along with this user can do general search which provides them with new recipes which they might want to try in future.

5.SYSTEM FEATURES

5.1 Register or Log on

A customer may decide to create an account. This is beneficial to the customer because it allows user to save or bookmark recipes they have found as well as save ingredients that they have inputted to their pantry to use for next time. Users who doesn't have an account could be able to search for recipe which can be said as a general search for finding recipes of one's interest.

5.2 Add ingredients to your pantry

A customer can add ingredients to their pantry by clicking on checkboxes or typing in specific ingredient. The pantry slide open like a drawer when the customer wants to use it. The pantry stores the ingredients so the end user knows what they has already as well as ingredients they do not have.

5.3 Search for a recipe

The customer can type their query directly into the text box to search for a recipe they want to make. For example,

"pasta dinner with tomatoes". The system fetch recipes that match the description and pop up a recipe towards the left of the website displaying the recipe title, an image, ingredients required, and steps needed to make the recipe.

5.4 Save or bookmark recipes

Customers who are registered are be able to save recipes to view them later. A customer with an account is also be able to save the ingredients that they inputted to the pantry to use for future searches and recipes.

5.5 Leave a rating or feedback response

Customers who have an account is able to leave a star rating for recipes that they have tried and also leave specific feedback or suggestions so that other users can see.
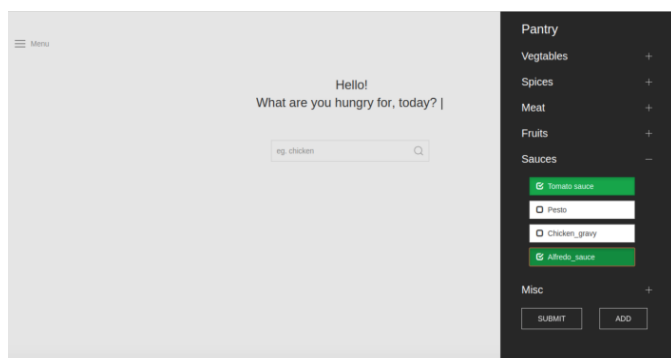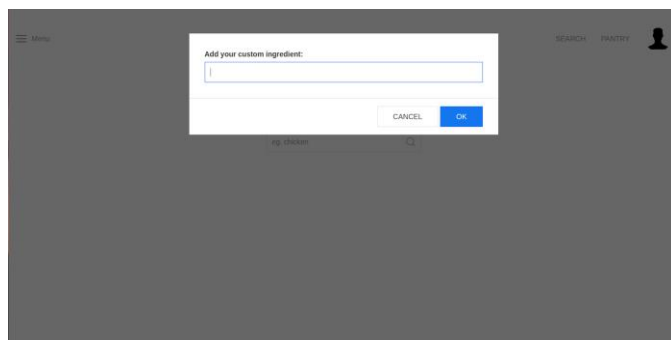
6. CONCLUSION

Personalized food recipe recommendation and search is web based system which help users in decision making while searching for most relevant recipe using ingredients they already have. This website facilitate users to search for random recipes just to explore during free time or as per their interest. This system provides users the best experience and saves time and hassle to search for recipes of their interest. Ultimately, this brings users personalized experience and is useful to all.

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