Donut on Demand

Scientific Report

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Introduction

Doughnuts (or Donuts) are made from fried dough confectionery, and have its origin in “Olykoek”, a Dutch cake made of sweetened dough. The word itself means oil cakes, which are usually consumed as dessert. Made in homes or purchased in outlets, they are very popular among kids and young people in general. Donuts can be eaten anytime, anyplace and with about anything, from sweet, chocolate flavored snack donut to paired to the bun on a chicken sandwich. Additionally, they can be complemented with a wide range of topics, including chocolate, cereal to pork. According to the report on the Global Doughnuts Market [1], the global market of doughnuts reached USD 40 billion in 2016, with Asia Pacific reaching USD 8 billion, putting Asia Pacific as the second largest region after North America. One of the main factors of growth is the increase in disposable income in households, increase in habit in munching, changing lifestyle in urban cities, while restricting factors include a healthy lifestyle. Doughnuts vendors can increase the number of visits at their outlets by offering a larger number of selections, such as flavour, topping, type and more.

While doughnut comes in all forms and flavours and some types can be bought almost anywhere and anytime, we can’t always get the flavour we want once we get in store because they often run out of stock. Additionally, there is no centralized place to browse a larger selection or for local store owners to offer handmade products and get themselves known.

As donut lovers, our company Donuts TC™ aims to make the order and pick up of donuts easier while offering customers a centralized place to explore different options to suit different tastes and occasions. We want to set up an innovative service for our customers, at the crossroads of the eShop and the drive-in. This service, called "Donuts on Demand" (DoD), will allow customers to make their selection from our range of donuts, place their order and specify the date and time they will pick them up.Ordering on Donuts on Demand ensures that you always get your favorite cookie recipe, right out of the oven, on time. No more queues in the store, no more unpleasant surprises such as chocolate being out of stock. Donuts always fresh, available in less than two hours and recovered while still hot for even more gourmet family moments

Related Work

In Thailand, one of the closest examples we want to achieve in a different industry is the industry of cakes and cupcakes. For example, GoTasty offers a selection of custom made cupcakes to suit various occasions such as birthdays. Hobby Cake offers a high customization of birthday cakes and can be ordered online for delivery or pickup. The process is as simple as describing the cake with words on LINE chat, sending a reference picture or even just a drawing.

One of the most well-known donut sellers in Thailand and internationally is Krispy Kreme, who offers a good selection of doughnuts online. However, the number of options are standardized, limited and not handmade.

One of the closest examples of “Donut on Demand” is US-based Duck Donuts, a specialised made-to-order donut company who offers a large selection of existing recipes as well as an option to make our own donuts by choosing our dough, coating, topping, drizzle and more. The donuts ordered can be delivered or picked up at a store.

Our work will implement a similar functionality for our customers to browse a large selection of doughnuts not only from one manufacturer or seller but from many, from local handmade stores to larger chains. Our application will focus on customers in Thailand but can be adapted for other parts of Asia Pacific in the future.

Design

Our system will implement one of the most predominant software architectures in client-server, a three-tier architecture [2]. This will device our software into three logical tiers:

The presentation tier or user interface

This will be our top-level tier, our user interface and what our stakeholders will see. The main purpose of this tier is to display information and allows the user to interact indirectly with the application logic tier below. Our top level tier will run in a web browser and will be fully responsive to the user's device. It will use HTML but with a Java templating engine, CSS and some Javascript.
For example, this layer will:

- Display a list of products to customers
- Display a dashboard for managers and supervisors

The application tier

Also called the controller, our application tier provides business logic and data access. It is the heart of our application where the information collected from the presentation tier is processed against the data tier using business logic.
For example, when a customer visits the website homepage, the application layer retrieves a relevant list of products from the data tier and transmits the data to the presentation layer which presents the information in a readable format.
Our application tier will be fully developed in Java with the Spring Boot Framework.
This will include controllers, services, models, JPA and Data Access Object.

The data tier

The database tier or backend is where all the information entered by stakeholders, customers or managers is stored is a permanent way. It is important to note that for security reasons as well as best practices, the presentation and data tier will not be able to communicate directly with each other.

We will use a Relational Database Management system PostgreSQL as it will fit the database structure of a typical online store.

References

[1] Goldstein Market Intelligence, 2020, Global Doughnuts Market Report 2030, *On the basis of products, On the basis of types, By Region With COVID-19 impact | Forecast Period 2017-2030*.
[2] IBM Cloud Education, 2020, Three-Tier Architecture, https://www.ibm.com/cloud/learn/three-tier-architecture