Project Requirement

Beat Me

CS 157A - TEAM 1
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CS 157A - [Section 01]

1. Project Overview

1.1. Background

- The number of e-commerce shoppers is growing every year. Often, they have a difficult time to find the best price for what they are looking for. For example, on Amazon Prime Day, because lots of products are on sale at the same time, the shopper may have a hard time to figure out which products provide the best price. Also, the cost of the product is continually changing, and the list of the item looks very similar.

1.2 Customer or Market Needs

- According to *Figure 1.* by Statista, the number of e-commerce shoppers in the United States is growing. Therefore, the online deal tracker would help them to find the best price for the product. Currently, there is a website called *CamelCamelCamel,* which allows the online shopper to keep track of the item price, yet it is only for Amazon. *Beat Me* keeps track of the item price over verified online retailers so that the shopper is more likely to find the best price for the specific item.

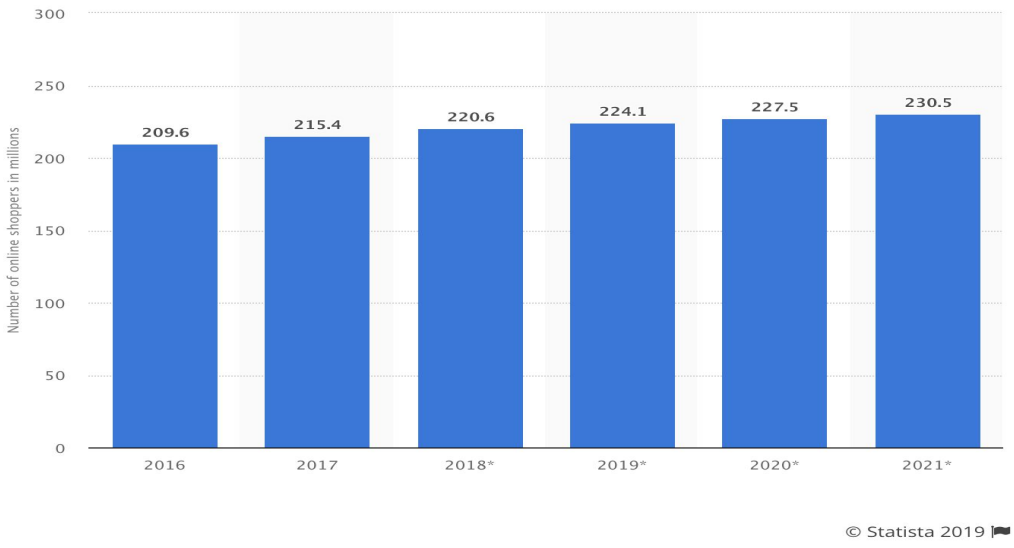


Figure 1. Number of digital shoppers in the United States from 2016 to 2021 (in millions)

1.3 Stakeholder Profile

1.3.1 Clients

- Anyone can use *Beat Me* to find the best price on the online retailer's website. *Beat Me* will guarantee the user's convenience because *Beat Me* will notify the user when the price cheaper than usual so that the user does not need to keep checking the price of the product.

1.3.2 Investors

- The small online retailer could have more benefits than big online retailers such as Amazon or eBay because Beat Me will provide advertising effects.

2. System Environment

2.1 A Structure Diagram of The System

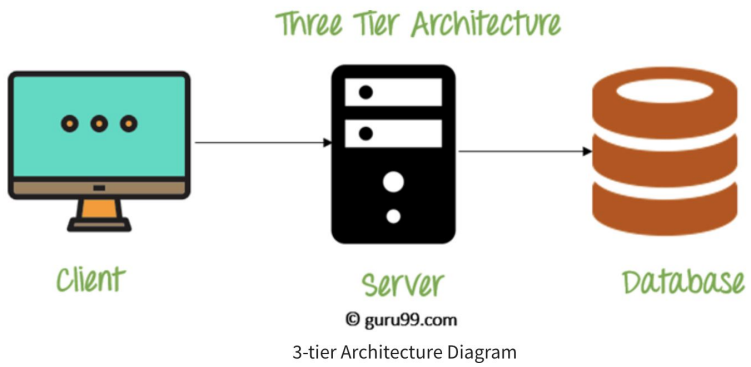


Figure 2. 3-Tier Architecture

2.2 System Requirement

- Front-end(Client): React JS, HTML, CSS, Javascript
- Back-end: Flask, Python
- Server: Apache
- Database (RDBMS - Database): MySQL 8.0
- Software: Git, Github, Taiga, Google Drive.

3. Functional requirement

3.1 Performance

- To using a Smartphone or PC, the client can access the *Beat Me* website and perform price tracking on certain products.

3.2 Functionality/Features

- Supports popular retail sites such as Amazon, Bestbuy, Walmart, etc by using their provided API or web crawling.
- Allow users to track the price of a specific product on a supported retailer site.
- Notifies users through email when the price of a product drops below the user's desired price.

Specific Functions:

User registration

- The user shall be able to register an account with a username, email, and password
- The system will validate the user's input and check for conflicts in the database before adding the user

User login

- The user shall be able to log in to his/her account with the correct username/email and password combination
- The system will confirm the user's credential stored in the database before granting access to the user's product tracking page

Update user information

- The user shall be able to update their email for receiving notification
- The system will update the email address of the user in the database

Update login password

- The user shall be able to update their login password by providing their current password

Adding product for tracking

- The user shall be able to paste the link of the product page (e.g., Amazon) and set the desired price that they are willing to pay.
- The system will add the product link to the database as well as any related items.

Updating the desired price of the currently tracked product

- The user shall be able to update the wanted price of particular merchandise.
- The system updates the latest desired price of the product associated with the user in the database.

Removing a product for tracking

- The user shall be able to remove a tracking product on their list.
- The system removes the association between the user and the product, but will not remove the product from the database.

Browsing tracked products

- The user should be able to browser all the products they've tracked, displaying their current price and the desired price, as well as links to the actual product.
- The system will fetch all the product information that the user is tracking from the database and display it for the user.

Order products

- The user shall be able to order the products by name, current price, or price difference.
- The system will sort the user-specified criteria and display it for the user.

Announcement

- The admin user can post important announcements with messages and time.
- The user will see the announcement on the main page.

TokenBlacklist

- The system store the user token to handle the login system.
- When the user logout, the token will expire and store it into the TokenBlakclist database table.

Administration

- The admin user can register with id and password
- The admin account has more accessibility to the website than the normal user.

Comment

- Each user can leave comments on product’s description pages.
- Once the user leaves the comment, any users can see the comment.

4. Non-Functional issues

4.1 Security

- The user account will be password protected.
- The user's login information will be stored as hashed and salted in the database. This prevents the user's credentials from being used in case the database is breached.
- *Beat Me* website will implement with the SQL injection prevention method.

Access Control

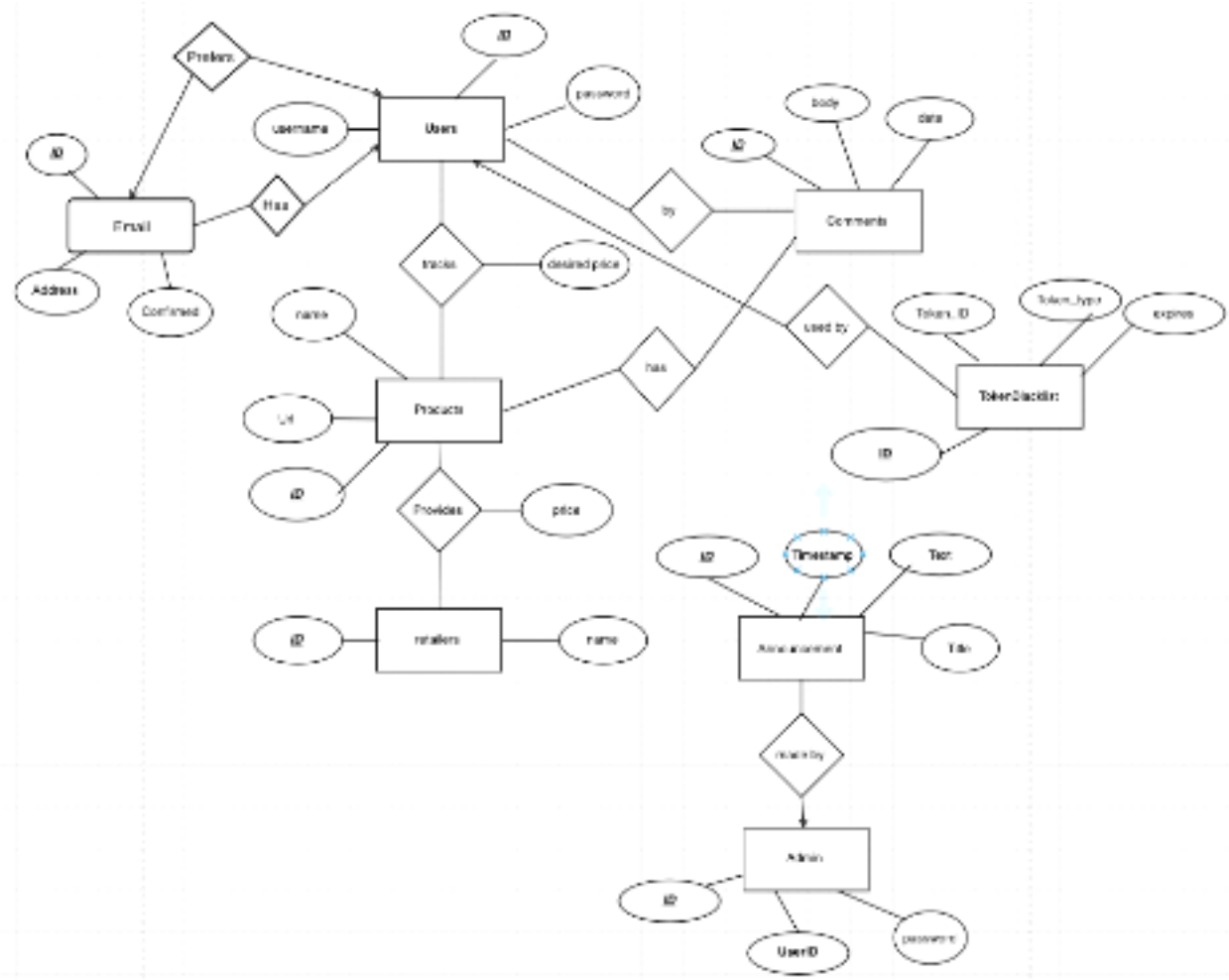
- A user will only be able to see and update his/or her product tracking list associated with their account.

Graphical User Interface (GUI)

- Our GUI will aim to maximize the ease of use for the user. The user will be able to see the list of products they are tracking. It describes as columns of name, current price, desired price, and the price difference of the present and wanted price.
- The user can sort the list based on each of the columns in ascending or descending order. We will also have a field at the top of the page to enter/paste in a new product link, which will then prompt the user to enter the desired price for the product. We will have a few pre-calculated values based on the current product price allowing

ease of setting the desired price, for example, 10%, 20%, 50% off the current price.

5. E/R Diagram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5.1 Database Schema

- User(id, username, password, primary_email_id)
- email(id, address, user_id)
- tracks(user_id, product_id, desired price)
- product(id, name, price, website)
- comment(id, date, body)
- by(user.id, review.id)
- product_review(product.id, reviews.id)
- retailer(id, price, name)
- Announcement(id, time, title, text)
- tokenBlacklist(id, tokenId, Token_type, expires)
- admin(adminLogin, password)

5.2 Database Description

- ***User***: User table has a relationship with email table such as users has multiple emails and users can choose their preferred email
- **Product**: The product table has two relationships with user table and retailers. Users can choose their interested product and can compare product prices from retailers and the user's desired price.
- **Comment:** comment table has two relationships with user table and product table. Each product has comments and it can identify with product id and comments id. Also, users can leave comments on each product and identify with user id, comment id.
- **TokenBlackList:** TokenBlackList table store token identification, type, and expires and it identified with id. Also, user table and TokenBlackList table have a relationship. Each token assigned to a specific user.

- **Announcement:** This table stores title, body text, and the current time. It identified with id. Announcement table has a relationship with admin table. The registered admin user can make announcements.

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Number of digital shoppers in the U.S. 2021. Retrieved from https://www.statista.com/statistics/183755/number-of-us-internet-shoppers-since-2009/