Bilkent University

Department of Computer Science

Senior Design Project

Project Name: PriceWise
Project Specifications Report

Group: T2323

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1. Introduction

1.1 Description

In Turkey, online shopping has become a tremendous part of daily life. People prefer to look for routine grocery products from their device screens rather than store shelves. However, online shopping has also clarified that distinct convenience stores sell identical items (same product and brand) at varying prices on their websites. A chocolate bar from a particular brand may cost 50 TL in Store A. On the other hand, Store B may sell the same chocolate bar for 30 TL [1]. Searching for the best price for one product may not be compelling, but it is an uphill battle to do the same for all the items on a shopping list. It is where PriceWise comes to the rescue. PriceWise is a mobile app that assists people in shopping. It collects the latest data from various stores and shows all the different prices of the same product. Thanks to this, people will easily compare and find the cheapest price. However, what sets PriceWise apart from other apps is its ability to optimize and manage users' shopping lists. People will enter the products in their lists, and the app will compute the total list prices from different stores. While doing this, it will also consider other factors, such as courier fees, store discounts, and user preferences. Then, PriceWise will display the cheapest shopping list price to the user. Our goal with this application is to improve people's shopping experiences and enable them to save money without reducing their quality of life.

1.2 High Level System Architecture & Components of Proposed Solution

The PriceWise system can be structured as a mobile application with a back-end server and a database system to store necessary information about products and users.

1.2.1 Mobile Application (Front-end)

- The mobile app will have an user-friendly interface that users can choose their shopping list and compare prices.
- Users can create, edit and delete shopping lists. Also, users can add new products to the lists.
- The application will fetch data of products from different stores to compare prices for the same product and display the results to the users.
- The application will have a feature to optimize a shopping list, considering factors like users’ preferences and store discounts.

1.2.2 Back-end Server

- The server gets the price of products from various stores, which can be done through parsing.

- The application is responsible for managing user accounts, ensuring authentication. The app will store user preferences, including stores and a record of past shopping lists.
- There will be list optimization algorithms to optimize shopping lists based on prices, discounts and user preferences.

1.2.3 Database

- Products and prices will be stored and this data should be regularly updated to provide more accurate results.
- User information, preferences and past shopping lists are needed.

1.2.4 External APIs

- In order to provide information about the location of stores, the application should integrate with API.

1.2.5 Third-Party Services

- Integration with different notification servers to give information to users about the promotions.

1.3 Constraints

1.3.1 Implementation Constraints

- Github platform and Git will be used to ensure communication of code.
- Flutter will be used for developing UI.
- Python will be mainly preferred due to wide range libraries on machine learning and parsing. The following libraries of Python considered to use: Django, Flask, FastAPI

1.3.2 Economical Constraints

- Publishing the app on Google Play Store (Android) will cost 25 dollars for only one time.
- Publishing the app on the App Store (iOS) will cost 99 dollars annually.

1.3.3 Ethical Constraints

- The products that users add to the cart or purchase will not be visible to either the application admins or other users.
- There will be functions that users can share publicly, such as product recommendations and comments. Such situations will be done strictly and only with user permission.

1.4 Professional and Ethical Issues

1.4.1 Professional Issues

- Ensuring the accuracy of data that is collected from different stores to maintain the trust of users.
- Regularly updating data of products and reflecting real-time to users.
- Showing how the app determines the cheapest shopping list and what factors are considered.

1.4.2 Ethical Issues

- All stores and brands of product should be treated equally to users.
- Ensuring that the app does not deceive users while displaying prices and discounts.
- Explaining how the optimization works and how user preferences are considered.

2. Requirements

2.1 Functional Requirements

2.1.1 Sign Up & Log In

The application should

- Allow users to register manually or using Open Authentication.
- Request permission for the location services.

2.1.2 Item Price Comparison

The application should

- Allow users to select an item.
- Show the price of selected item from various stores / websites.
- Find the best price for the selected item.

2.1.3 Shopping List Price Comparison

The application should

- Allow users to select multiple items.
- Add selected items to the shopping list.
- Show the price of the created shopping list from various stores / websites.
- Find the best price for the created shopping.

2.1.4 Alternative Item Suggestion

The application should

- Suggest users an alternative product from different brands in the category of the product they choose.
- Show the price of suggested alternative item from various stores/websites.

2.1.5 Alternative / Split Shopping List Suggestion

The application should

- Suggest users split shopping lists if it is more affordable to buy some of the items from one store and buy the rest of the list from another as an alternative to shopping from only a single store.

2.1.6 Suggestion of Sale Offers

The application should

- Notify the users about the stores' special offers such as if they buy a particular item from that store, the second one will have a 50% discount.
- Modify the list automatically if the users click to apply the notifications of offers.

2.1.7 Closest Store Suggestion

The application should

- Find the closest shops to the users' locations.
- Show an approximate shopping list price for that store (it may be a little bit different from the prices online).
- Indicate if it costs less to go and buy from the closest store compared to online shopping (this feature would be useful, especially in situations where the courier fee is too much and the user is already very close to a store).

2.1.8 Learning Users Preferences

The application should

- Obtain data from the users by following their item selections by using appropriate machine learning algorithms (if the users permit data collection).
- Use the obtained data to generate more suitable and advanced item/special offer/shopping list suggestions to the users

2.2 Non-functional Requirements

2.2.1. Usability

- The application should have an user friendly and intuitive interface to provide a positive user experience.
- The layout should be similar to other competitors as this will ease the transition process of the users to our application.

2.2.2. Reliability

- The application should be accurate and up to date since the prices of many products in Turkey change frequently. It should inform the users about incoming sales for the products.

2.2.3. Performance

- The application should have minimal response times to ensure a positive user experience.
- The application should be able to handle high request traffic during special days such as holidays and Black Friday.

2.2.4. Supportability

- The application should be supported on different Android and IOS versions.

2.2.5. Scalability

- The application should be designed to handle an increasing number of users and data as the time goes on.

3. Feasibility Discussions

3.1. Market & Competitive Analysis

3.1.1. Epey.com

Epey.com is a website where you can compare different prices of the same product which is similar to what PriceWise promises [1]. However, Epey.com sells only technological devices, cooking utensils and other types of long lasting products such as shampoo, toothpaste and olive oil. There aren't any basic grocery products like chocolate, milk or soda. It also does not have any function that allows the user to create shopping lists.

3.1.2. Cimri.com

Cimri.com also compares different prices of the same product [3]. Additionally, it has a subsection called “cimri markette” where it shows grocery products and allows users to create shopping lists just like PriceWise aims. However, when a product does not exist in a store, it does not recommend an alternative product or split the list. The website forces the user to shop from only one store. Because of these, Cimri.com can not provide the most budget-friendly solution that PriceWise will offer.

3.2. Academic Analysis

Consumers are increasingly turning to Internet price comparison sites to learn about the marketplace. Pricing derived from a price comparison site's search can serve as contextual reference pricing, influencing the attractiveness of prices found later when people purchase offline at local stores [4]. This trend highlights the importance of price comparison applications and sites, as they not only empower consumers with valuable market information, leading to more informed purchasing decisions, but also play a crucial role in shaping pricing strategies and competitive dynamics within various industries.

Glossary & References

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