Discount Detective Plan

Bringing small supermarkets and customers together

Introduction

In an increasingly digital society, we need a way to connect customers with small businesses. An important type of small business is small food retailers. For instance, local butchers, fresh produce stores, and Asian supermarkets. Our Software Engineering team aims to connect customers with these small stores by building a produce comparison app. The app will be specifically catered to supplying data from smaller, local businesses, displaying them as a viable option next to big franchises and thus diversifying New Zealand's online produce comparison scene.

Project Description

We have one semester to complete Discount Detective. As such, we will adhere to strict deadlines for our key deliverables. This includes the project plan and pre-release versions which will culminate in the delivery of the final version of the app.

Discount Detective will be an Android app programmed in Kotlin using Android Studio. We will share the project between programmers using the Git version control software, via GitHub. Discount Detective will compare the price of produce from a diverse range of brick and mortar stores within Dunedin. Among others, these will include New World, FreshChoice, Four Square, Veggie Boys, Deep Creek Deli, Origin Food, Couplands, Taste Nature, and Spelt Bakery. We will be using Google Firebase in order to provide any authentication necessary (e.g. for verified retailers to upload their prices) and to provide the services to sync prices and products between all devices.

It is important to note that the smaller, local businesses may have more expensive goods. As we are producing a price comparison app, our users may favour the businesses that have the lowest prices. While we do want to match users with their desired prices, we also want local businesses with potentially higher prices to compete with larger businesses. Thus, we plan to add additional features, such as locating the small businesses at the top when users search for items to even the field for smaller businesses.

Team Members

Our team takes a talent-oriented approach which was the basis for forming the group, where we delegate tasks according to our strengths and make decisions together. Our team members are Shea Smith, John Marshall, Petra Fisher and William Hadden.

Shea has had significant experience developing Android apps in both Kotlin and Java, both personally and professionally, and is familiar with the latest techniques and best practices for Android, along with experience building REST APIs in C#, and web frontends in Angular and Typescript. Additionally, he also works part-time at a bespoke software development company, and so is familiar with CI/CD processes, Agile development methodology, and writing both technical documentation, but also documentation for end users and clients. Because of this, he will be primarily focused on the programming side of the app, particularly on the overall structures of the app.

John has experience in game development mainly in Lua and C#. John works often with the user side of development and has strengths in planning and programming but also with disconnecting himself from the development process to be able to view the app from the perspective of the user. From his work in game development John has experience in managing and working with groups that contain a range of perspectives and work styles. John makes a good addition to the team as he will be able to accommodate the different work approaches and help to bridge the gaps within the group to ensure the team is not just productive but positive.

William has worked professionally in technology consulting across a range of areas including developing computational models and other professional programming experiences in a variety of languages. He currently works part time for an AI company developing tools to analyse the sentiment of written text. William believes that his experience in consulting and programming means that he is skilled at bringing together the needs of various stakeholders to give a cohesive final product. Having had experience developing products in teams he looks forward to working closely with the other members on the project.

Petra has worked freelance as a Graphic Designer. She has programmed HTML and CSS, Java, Python, C and C++. As a Residential Assistant at a University College, Petra brings to the group strong team working skills and also the ability to evaluate the app from a significantly different perspective from the rest of the group. Her strong time management and problem solving skills will also prove invaluable in the process of creating this app.

Market Research

We conducted market research, and sought to answer the following questions:

- What is our target market?
- What already exists that is similar to our app?
- How will we differentiate ourselves?
- What demand is there for such an app?

Our target market for users is anyone in Dunedin who wants to compare prices across a large range of supermarkets. These people could include both University students and workers. Our target market also includes small businesses that want to promote themselves to potential customers who do not have access to the large platforms enjoyed by supermarkets.

Grocer is currently the only one produce comparison app on the Google Play Store for New Zealand. This app was released to the app store earlier this year (2022). The Grocer App supports six different stores. Countdown, Fresh Choice, New World, PAK'nSAVE, SuperValue and The Warehouse. The app allows shoppers to compare the price of groceries across these six supermarkets, in order to find the cheapest options.

There are no other supermarket comparison apps for New Zealand on the app store. However, similar apps for the United Kingdom and the United States exist. These include Superizon (UK) and WiseList (US). There exist price comparison apps for other goods in New Zealand. For instance, Gaspy, a fuel price comparison app and PriceSpy for comparing technology and household items as shown in Figure 1.

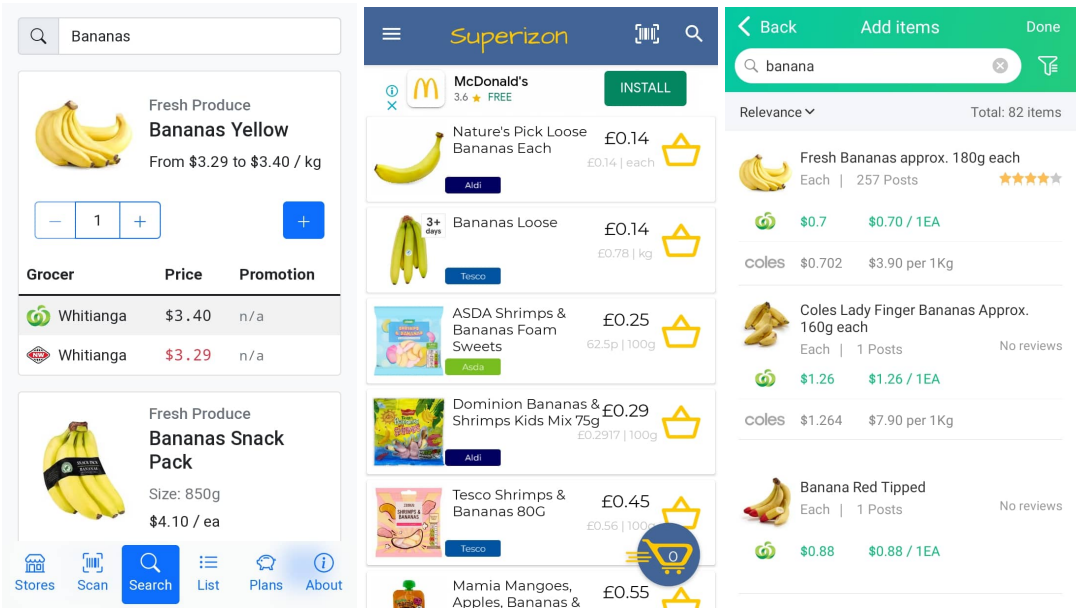

Figure 1: Screenshots of apps from left to right: Grocer, Superizon, and WiseList.

Noticeably, none of these apps cater for small, local retailers. Consequently, there is a gap in the market which our app aims to fill.

The demand for such a product is evident from our research. People naturally want the lowest prices. Most people also want to see their smaller local businesses supported. Both as a neighbourly and environmentally friendly gesture and because it is in their interest long term that the market is not monopolised by only a few larger businesses. Additionally, the fact that similar apps exist and are widely used points to our target market being interested in our product. We've seen the success of many "shop local" campaigns over the past few years, which indicates that consumers are willing to shop at local stores, but may not be aware of the range of products available at them. Furthemore , the New Zealand Commerce Commission believes that supermarket price comparison apps would be beneficial to New Zealanders as stated in their latest 2022 report that "price comparison websites can promote competition by making it easier for consumers to make well-informed decisions when choosing between goods and services".

Features

The app will include a variety of features (Table 1).

Feature Name	Required	Description
Display Products	✓	Show different categories to cater towards what people are looking for, whether it be lowest prices, similar products from local businesses, and their favourites.
Automated Web Scraping	✓	Automatically get product information for certain supermarkets to be displayed.
Shopping Lists	✓	Ability to select products and put them into an easy to use, mutable list of products; displaying a price at the end and where each product can be found.
Categories	✓	Different sections within the app based on what the user is looking for. These include lowest prices, similar products from smaller supermarkets and favourites.
Manual Input	×	Ability for users to add their own products. This is especially important for smaller businesses whose websites are not scraped (e.g. farmer's market stalls).
Barcode Scanning	×	The ability for users to be able to scan the barcodes of products in their pantry and then automatically find the matching product for that barcode.
Map Locations	×	Ability to show where the business/retailer is located on a map such as Google maps.

Favourites	×	The ability to favourite items or products so that users can then find them later with ease (these would be displayed in a separate section).

Table 1: Proposed features for Discount Detective.

We hope to get all the features listed by the full release of our app. However, we do also recognize in our risk analysis below that we may not be able to fulfil all of these. Therefore, we have decided on features that are required for the app in its base form and then add the other non-essential features if time permits.

Risk Analysis

Our project contains many risks both technical and also within the team which must be met with adequate solutions to ensure that we can reach our deadlines and create the app we have planned (Table 2).

Possible Risks	Solutions
• Features being hard to create. • Spending too much time on one feature due to its complexity.	We will have regular team meetings which discuss where we are at and if we are on schedule.
• Overload of features for the user • Too many features make the app too confusing to use and negates its original purpose.	We will be careful to only include the necessary features and will use comprehensive user testing of our beta model to pinpoint weak or confusing aspects of the GUI.
• Team members becoming sick, injured or otherwise unable to work on the project.	We will introduce redundancy into our schedule. At least two people will have the knowledge and ability to complete a task at all times.
• Original app purpose not fulfilled. • Failing at providing smaller businesses with a better shot at competing with larger supermarkets.	We must keep the original purpose of our app in mind whenever we are making decisions for the app. Otherwise, we could end up with another price comparison app that actually favours large supermarkets, which is not our aim.
• Supermarkets unhappy with us data scraping their websites.	We will be careful to abide by New Zealand Copyright laws.
• Issues and errors in our code.	We will use coding best practice, test frequently and solve errors when we find them.
• Team members not understanding other team members' code.	All team members will strive to write clear, well commented code.
• Prioritisation of “cool features” over	We will create and follow a plan that prioritises

core app functionality.	core features first, while leaving extra “cool” features last.
• Data from different supermarkets not matching correctly or becoming out of date.	Where possible, we will match using barcodes and will design flexible matching rules that try to match products from different stores as accurately as possible, while avoiding false matches.

Table 2: Possible risks and their respective solutions for the development process.

Ethical and Legal Issues

It is important to our team that we consider potential ethical challenges.

We will be creating a people-focused app. To be successful, the app must help small businesses as well as our target users. Therefore, we would like to consult the small businesses in question to make sure that our product aligns with their company values and is benefiting them.

As with many apps, one of our main ethical issues is centred around security. We must make sure that user data is stored securely and without risk. Our app procedures must align with the New Zealand Privacy Act 2020. In particular:

- We must only collect and hold personal information which is needed for our app to function well. As we are not an app based on personal information, this will be limited to authentication features only and we will not be collecting any particularly sensitive information.
- The user must know that this information is being collected and held. We will use the data safety section of the Google Play Store for this purpose. This gives an overview to the user about what data an app collects before they download the app, along with any applicable descriptions when asking for the information within the app.
- The information will only be used for the purposes of price comparison in Discount Detective.

The app must also abide by the New Zealand Copyright Act 1994. We have investigated the legality of the web scraping we intend to do. The raw text that we are scraping is permitted as it constitutes facts, and is therefore not able to be copyrighted. The images are also permitted under the fair dealing, as the usage of the images in our app falls under the exceptions for criticism and review as we are reviewing the different prices of those products. We will avoid using shop logos, as they could be an infringement of copyright laws, as we are not reviewing or criticising the logos.

Project Schedule

Creating our app has a strict schedule. We have hard deadlines for finishing deliverables and must finish the app by 7th of October. We have created the following Gantt Chart to visually plan out our schedule. We have assigned tasks to group members but these are subject to change based on their difficulty and any other events that may arise (Figure 2).

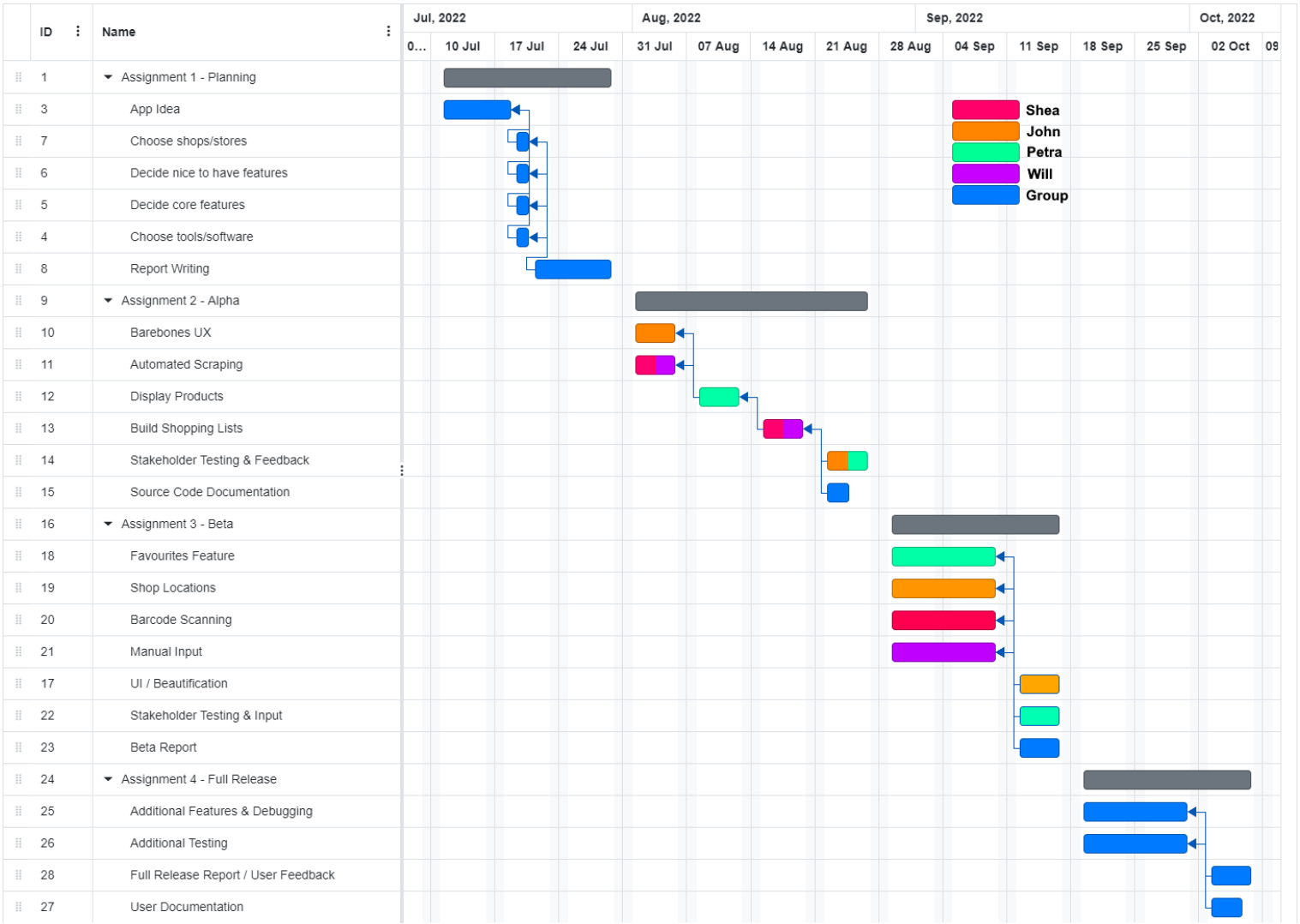

Figure 2: Gantt Chart showing the planned timeline and assigned tasks for the project.

Conclusion

Discount Detective will fill a hole in the current market by connecting customers with a diverse range of grocery stores. Our software engineering team has planned the app in detail. We have carried out market research and found evidence that our target market is interested in the app and that it is unique. Our team has analysed known project risks, considered ethical and legal requirements, and produced a visual schedule of what we aim to achieve and when. This project plan will act as a useful guide as our team works towards a fully-functional and appealing app, which will achieve our goal of diversifying where people shop by bringing smaller businesses to the forefront.

References

- Commerce Commission (2022). Market study into retail grocery section. 8 March 2022. https://comcom.govt.nz/__data/assets/pdf_file/0024/278403/Market-Study-into-the-retail-grocery-sector-Final-report-8-March-2022.pdf.