



Initial Plan

Enhancing the shopping experience in grocery stores of customers with dietary restrictions through technology

CM3203 - Individual Project
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Project Description

According to a study conducted by The Harris Poll, an American market research and analytics company, over 60% of people in the USA say they monitor their consumption of at least one nutritional component ("Majority of US Households Have Someone With Diet Restrictions"). For example, up to 15% of northern Europeans, 80% of Blacks and Latinos and up to 100% of American Indians and Asians suffer from the inability to digest lactose (Swagerty et al. 2002). Food restrictions can be caused by an individual's ethical beliefs (veganism, vegetarianism), health problems (Diabetes, gluten intolerance) or religious practices (Majority of Hindus tend to be lacto-vegetarian). Individuals with dietary restrictions may experience stress and anxiety due to their diet requirements, however restricting certain foods has proven to lead to a longer life expectancy (Testa et al. 2014). While efforts are being made to inform people what ingredients the products they consume on a daily basis contain, it is still widely known that analyzing every single food label in the grocery store is a tedious and exhausting process. Individuals with dietary restrictions mention that the terminology used in food labels is hard to interpret and that there is a lack of information about whether there are any allergens in food products (ACNielsen, 2005).

The idea for this project is to create a smartphone application that is able to scan the packaging of a product in a grocery store and provide information on whether it suits their diet based on the dietary information a user has entered into the application. The application aims to help the problem of improper food labelling that may sometimes confuse grocery shoppers into buying products that might be against their religious (Example: Muslims do not eat ingredients derived from pigs) or ethical beliefs (vegans do not eat animal based ingredients), as well as harmful to their health (allergies, such as crustaceans). See this short video for [reference](#).

The main difference between this application and similar ones such as Yuka (<https://yuka.io>) or Think Dirty (<https://thinkdirtyapp.com/>), is that the user will be able to enter their own dietary restrictions as well as the restrictions of their family members. Currently available applications mainly focus on a single market (vegans, vegetarians, muslims, etc.) and do not provide the opportunity to enter more requirements if the user has any.

Project Aims and Objectives

The primary aim of the project is to research what struggles people with dietary restrictions face while shopping in grocery stores and to build a mobile application to help them overcome their everyday challenges.

Objectives

- Research and learn what main problems people often face regarding their dietary restrictions

- Realise how we can help people overcome their struggles while shopping in grocery stores using technology
- Design the required technology based on the information collected during the user research stage
- Learn how to effectively use technologies like Angular and Firebase while building mobile applications
- Build the designed technology according to good coding practises
- Test the built solution to make sure that our technology is error-free using a sample data set.
- Compare our built application to similar products on the market and discuss what value our project brings.

Primary user requirements

- User will be able to input their dietary restrictions into the database of the application
- User will be able to search for grocery products and the application will display what ingredients they contain
- User will be able to set up and log in to their own user profile
- User will be able to scan a product label using the smartphone camera and the application will be able to recognize what the product is
- The application will be available on the Android platform.

Additional requirements

- The application will be available on the iOS platform.
- The application will have accessibility features such as text-to-speech, image alt text and large text.
- User will be able to save their favourite products in a separate list
- User will be able to add the dietary restrictions of their family members or friends

Work Plan

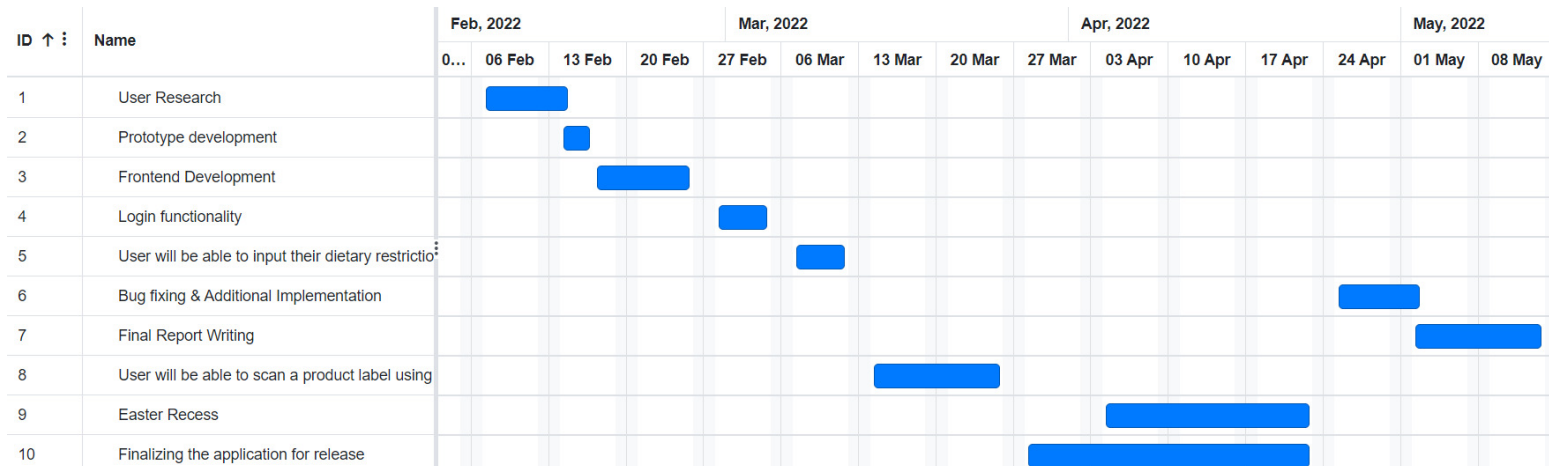
My plan is to complete this project using the agile software development methodology, precisely the Kanban framework due to its simplicity, focus on writing quality code rather than documentation (What is Kanban Methodology | Introduction to Kanban Framework, 2022) and the fact that I am familiar with it. Throughout the development I will be using Trello's Kanban board which I will use to store task tickets in the board's backlog, make notes on the changes I have done while developing the application to avoid any confusion and track progress.

For this project I will be using the Angular framework for all of the front-end work and Google's Firebase service for the back-end (Database support, storage, hosting, notifications). Both Firebase and Angular have huge user communities on the web that will make it easier to find help with any problems I might encounter, which will

help me to save time to focus on business logic of the project. I will be developing on a Windows OS and I will be using the IntelliJ integrated development environment.

I have decided to use a Gantt Chart to plan the timeline of the project as well as to assess how much time I should be spending on each of the development stages.

Gantt Chart (Timeline)



User Research

7th - 14th Feb.

During the second week of the semester I will spend time working on getting to know the issues users with dietary restrictions face while shopping in grocery stores and what could help them. I will do literature research to determine what are the common problems with product labelling around the world and the technologies that could help solve them.

Prototype Development

14th - 16th Feb.

Three days will be spent developing prototypes based on the research I will have done in the previous stage. I will be using a UX & UI development tool - Figma to design my prototypes, sketches and wireframing. I decided to spend the least time on prototype development because I feel comfortable designing products and I believe it will not take me much time to find the perfect design.

Frontend Development

17th - 25th Feb.

A week will be spent designing the frontend of the application based on the prototypes I will have designed in the previous stage.

Login Functionality

28th Feb - 04th Mar.

A week will be spent developing the login functionality of the application using Google's Firebase. I developed a similar functionality for a university project last year so it should not take me a lot of time to recreate.

Feature to let the users input their own dietary restrictions

07th - 11th Mar.

A week will be spent developing a feature that will let the users input their own dietary restrictions into their user database. I will use Angular and Firebase to create necessary databases and other backend needs. These restrictions will be used in later stages.

Feature where the user will be able to scan a product label

14th - 25th Mar.

Two weeks of the project will be used to develop a feature that will provide the user with an ability to scan any grocery product in the store using a smartphone camera and view the ingredients list in the phone screen. This will also provide the user with information on whether any of the ingredients are potentially harmful to them. I decided to focus on this feature for two weeks as I have done nothing similar to it before and I think I will find it quite challenging.

Finalising the product for release

28th Mar. - 22th Apr.

Four weeks will be spent preparing the product for the release. During these weeks I will develop accessibility features and make sure that the app is optimised for best performance as well as research what improvements can be done. A settings page will be created where the user will be able to customise the application to their likings. The deliverable of these weeks is to have a really good, working minimal viable product.

Bug fixing & Spare time

25th Apr. - 02nd May.

Two weeks will be spent fixing any bugs and implementing any additional features I can manage to develop in time.

Final Report

02nd May. - 13th May.

During the last two weeks of the project I will focus on completing writing and editing the final report.

Final Deliverables

The final deliverables will include a functional mobile application with all of the primary objectives and a final report, which discusses its development and the insights collected from the participants during the user research process.

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