## GraphQL

GraphQL is described as a “a query language for APIs and a runtime for fulfilling those queries with your existing data. GraphQL provides a complete and understandable description of the data in your API, gives clients the power to ask for exactly what they need and nothing more, makes it easier to evolve APIs over time, and enables powerful developer tools.” Graphql (2019)

## Restful API

A RESTful API as described by Rouse is an” application program interface (API) that uses HTTP requests to GET, PUT, POST and DELETE data. It is based on representational state transfer (REST) technology, an architectural style and approach to communications often used in web services development.

A RESTful API breaks down a transaction to create a series of small modules. Each module addresses a particular underlying part of the transaction. This modularity provides developers with a lot of flexibility, but it can be challenging for developers to design from scratch. “(Rouse,2019).

## Database Management System

## Amazon DynamoDB

DynamoDb is a fast and flexible NoSQL database service for any scale.

Amazon DynamoDB “is a key-value and document database that delivers single-digit millisecond performance at any scale. It's a fully managed, multi-region, multi-master, durable database with built-in security, backup and restore, and in-memory caching for internet-scale applications. DynamoDB can handle more than 10 trillion requests per day and can support peaks of more than 20 million requests per second.”

### Oracle Database

Oracle database (Oracle DB) is a relational database management system (RDBMS) from the Oracle Corporation. Techopedia explains that “Oracle DB is one of the most trusted and widely-used relational database engines.

The system is built around a relational database framework in which data objects may be directly accessed by users (or an application front end) through structured query language (SQL). Oracle is a fully scalable relational database architecture and is often used by global enterprises, which manage and process data across wide and local area networks. The Oracle database has its own network component to allow communications across networks.” Technopedia (2019).

## Progress Report

### Shelf Mangement

The Shelf Management is designed for the shelve packers, who primarily are responsible for making sure new goods replace purchased ones and that they are in the correct place. Their job includes, mapping out where each item is located in the store.

#### Program

The shelf management system is about 40% done as most of the pages duplicate themselves and serve roughly the same functionality.

* Dashboard

The Dashboard which is not complete, navigates through the shelf fragment and is in actuality supposed to have 3 Buttons: Shelf Management, In-Stock Management and Out-Of-Stock Management.

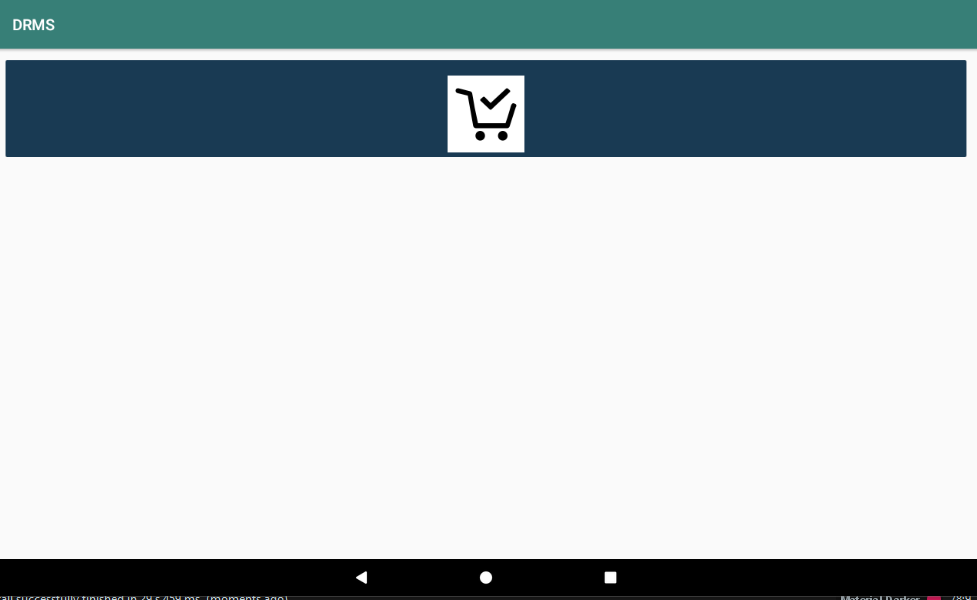


Figure 2:Current Shelf Dashboard

* In-Stock Management Activity

Clicking the In-Stock button navigates to the Activity which now displays the different Aisles/Categories of products that a packer can click on/ search for a product and view all the products that are currently still in Stock.

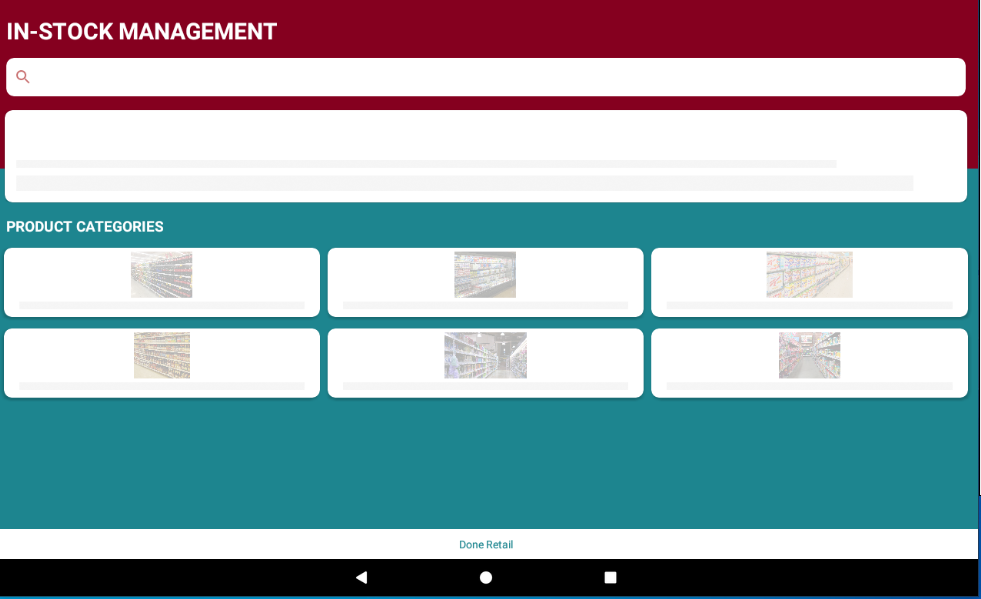


Figure 3: In-Stock Management

* Shelf Management Activity

Clicking the Shelf button navigates to the activity which displays the different Aisles/Categories of products that a packer can click on/search for a product and view all the products that are currently still on shelf and ready to be purchased. Packer can also view the products that might need to be restocked on shelves.

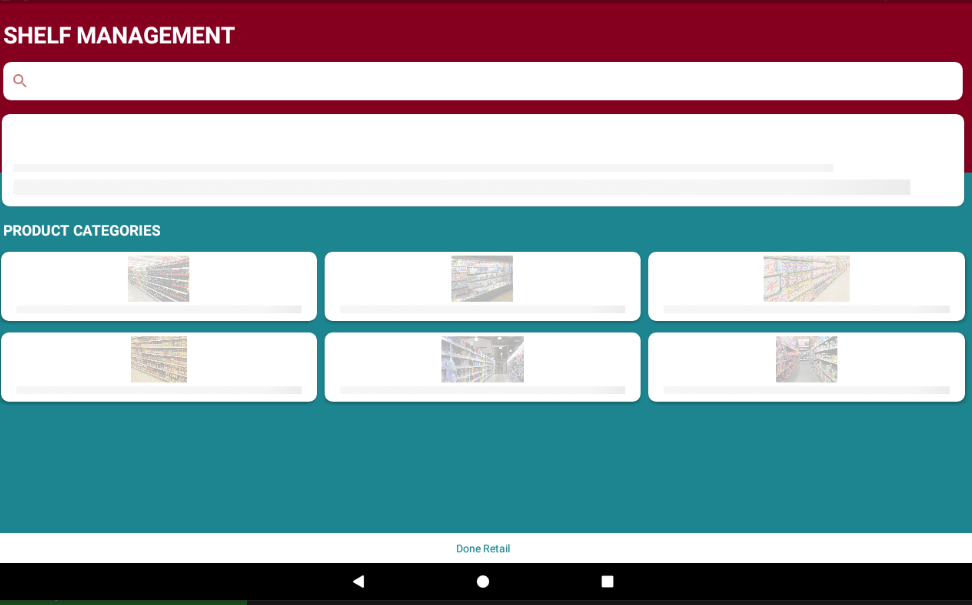


Figure 4: On Shelf Management

* Out – Of –Stock Management

Clicking the Out-Of-Stock button navigates to the page which displays the different aisles/categories of products that a packer can click on/search for a product and view all the products that are currently still out of stock, due to being purchased, or having an error. Possible errors include, the product expiring or damaged.

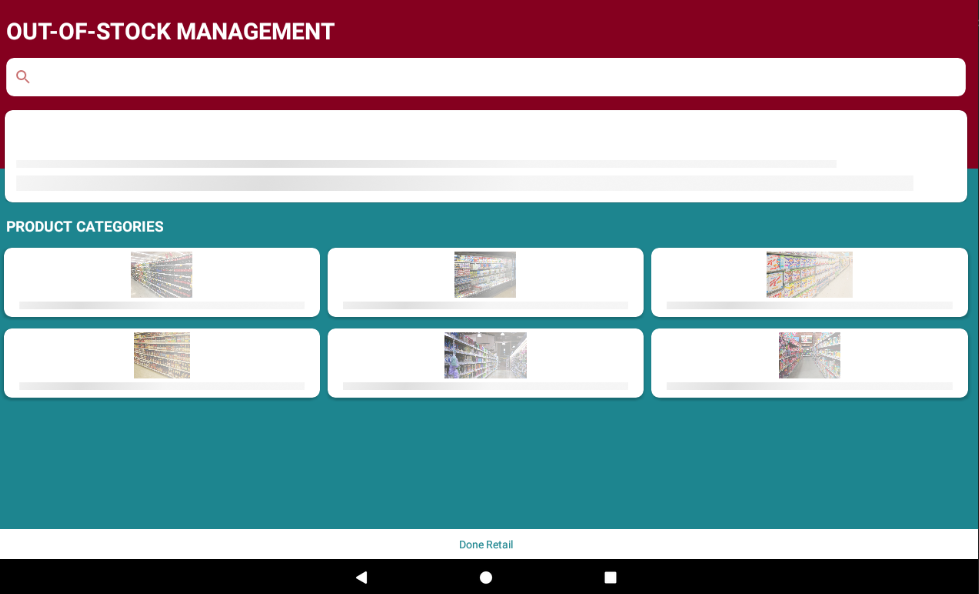


Figure 5: Out-Of-Stock Management

#### Source Code

The 3 above activities developed using a shimmer. “Shimmer is an Android library that provides an easy way to add a shimmer effect to any view in your Android app. It is useful as an unobtrusive loading indicator that was originally developed for Facebook Home.” (Rouse, 2019).

This was used as it has a nice, animated view to help enhance the appearance of the different categories /aisle and is a good UI especially since it designed for packers that are working long hours and expect easy to use technology. Most of this code is mainly from Haerul Muttaqin’s youtube channel.

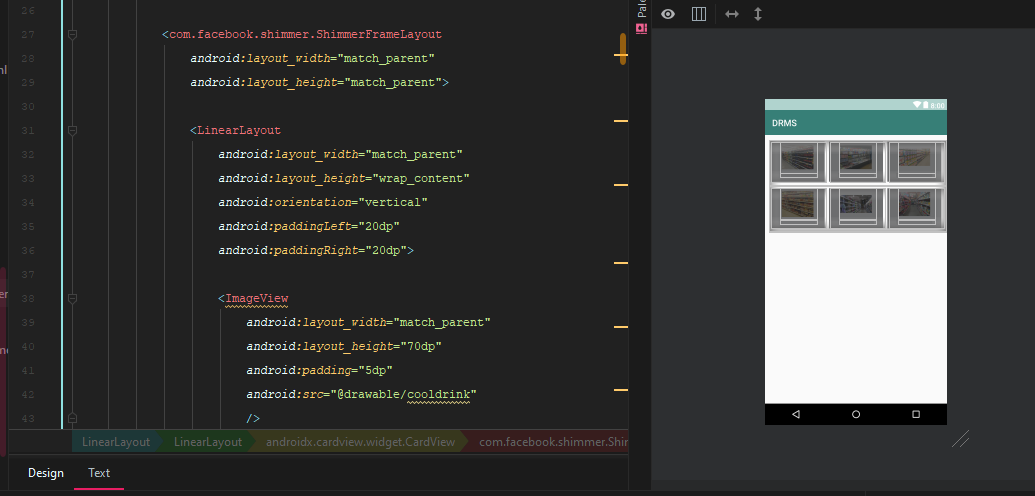


Figure 6: Source Code

#### Problems Encountered

During the design of the Shelf management, there were quite a few problems that were experienced:

1. Deciding on a layout that was fitting for people who work long hours and expect a simple application that will make their work quicker was a challenge that was at the end of phase 1 solved.
2. One the biggest problems that the team is facing is lack of resources, everything we do is at Lab 212 and that has restricted us in so many ways as we don’t always have access to the Lab.
3. Understanding how to use basic Android studio functions and being able to apply them on the application, and this limited the addition of functionality as most of the time was spent on trying to learn the technology.
4. The effects used on the shelf division are that of a higher API than that of the tablet that is which is where the application will be deployed on, this issue is not yet resolved.
5. A lot of merge conflicts especially from the shelf management side, but the conflicts were resolved.

# Bibliography

*Amazon Web Services, Inc* . 2019. Amazon DynamoDB – Overview. <https://aws.amazon.com/dynamodb>. Accessed 25 Sept. 2019.

Anon. Firebase.2019. <https://www.programmableweb.com/api/firebase> . Accessed 27 Sept. 2019.

Bush, T. 2019. What Is The Difference Between Web Services and APIs? <https://nordicapis.com/what-is-the-difference-between-web-services-and-apis/> Accessed 27 Sept. 2019.

Computer Hope. 2016. Trello. <https://www.computerhope.com/jargon/t/trello.html> Accessed 28 September 2019.

Finance Online. 2017. Bitrix24 Review. <https://reviews.financesonline.com/p/bitrix24/#what-is>. Accessed 28 September 2019.

*Firebase.2019.* Firebase Realtime Database. Store and Sync Data in Real Time. <https://firebase.google.com/products/realtime-database> .Accessed 28 Sept. 2019.

*Graphql.Org*. 2012. GraphQL: A Query Language for APIs., <https://graphql.org/> .Accessed 1 July 2019.

Khanyile TS, et al. 2019. Software Proposal and Execution Plan.

Muttaqin. H. 2019. FOOD HOMEPAGE — #1 Android Food App (Meal Recipes) YouTube. <https://www.youtube.com/watch?v=njTHtyzaBug> Accessed 25 Sept. 2019.

MariaDB.Org. 2015. About MariaDB - MariaDB.Org. <https://mariadb.org/about/>.

Accessed 27 Sept. 2019.

Microsoft Azure. 2019. SQL Database – Cloud Database as a Service.<https://.azure.microsoft.com/en-us/services/sql-database/> . Accessed 28 Sept. 2019.

Osbourn T. 2016. GitKraken Review. <https://tosbourn.com/gitkraken-review/>. Accessed 28 September 2019.

Patro N.C. 2018. Native App vs Hybrid App. [https://codeburst.io/native-app-or-hybrid-app-ca08e460df9. Accessed 29 September 2019](https://codeburst.io/native-app-or-hybrid-app-ca08e460df9.%20Accessed%2029%20September%202019).

Rouse. M. 2018. Amazon API Gateway. <https://searchaws.techtarget.com/definition/Amazon-API-Gateway>. Accessed 29 September 2019.

Rouse. M, 2018. Android Studio. <https://searchmobilecomputing.techtarget.com/definition/Android-Studio>. [Accessed 29 September 2019].

Rouse. M. 2018. GitHub. <https://searchitoperations.techtarget.com/definition/GitHub>. Accessed 29 September 2019.

Rouse. M. 2018. Slack Software. [https://searchcontentmanagement.techtarget.com/definition/Slack-software. Accessed 29 September 2019](https://searchcontentmanagement.techtarget.com/definition/Slack-software.%20Accessed%2029%20September%202019).

SearchAppArchitecture. 2019. What Is RESTful API. <https://searchapparchitecture.techtarget.com/definition/RESTful-API> .Accessed 1 Oct. 2019.

Technopedia Organisation. 2016. Collaborative Software. [https://www.techopedia.com/definition/6542/collaboration-software. Accessed 30 September 2019](https://www.techopedia.com/definition/6542/collaboration-software.%20Accessed%2030%20September%202019).

Technopedia Organisation. 2019. Oracle Database. <https://www.techopedia.com/definition/8711/oracle-database>. [Accessed 27 October 2019].