DEPARTMENT OF INFORMATION SYSTEMS

SYSTEMS DESIGN & DEVELOPMENT

SYSTEMS SPECIFICATION FOR POPPEL ORDER PROCESSING

TEAM MEMBERS

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- We have not allowed, and will not allow, anyone to copy our work with the intention of passing it off as their own work.

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1. INTRODUCTION

1.1. OVERVIEW OF SPECIFICATION

This document involves all the components and the structural design that is required with the goal for us to implement Poppel's Order Processing system. We have been following the Software Design Life Cycle since it creates structure and permits us to zero in on each task while creating and designing a high-quality system. We have completed the requirements analysis phase as of now, what follows next is the design phase and in this phase our point is to design a high-level design of the system to have the option to catch and convey each requirement. We will do this with the assistance of a progression of diagrams that will delineate and address the functionality of the system. These diagrams will likewise assist us with seeing how the design classes interface with each other and how their behaviour influences the system. After we successfully complete the Requirements Analysis and Design phase what follows next is the Implementation phase. In this phase we will build up the system on C# as indicated by the requirements and the design phase, discussed in past phases. We will at that point test the system utilizing a progression of test cases to ensure that it functions as indicated.

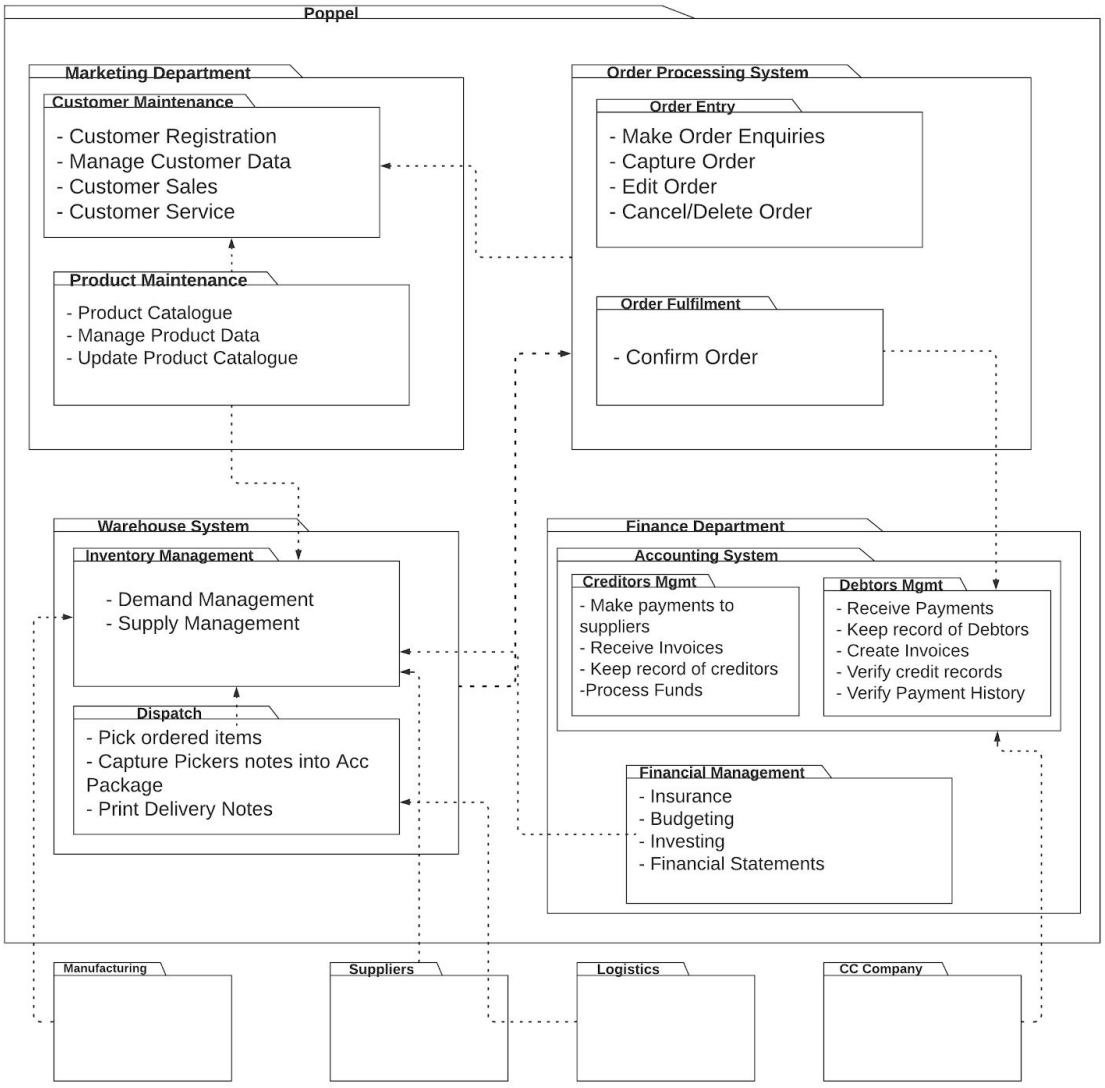
1.2. CONTEXT & SCOPE OF SYSTEM SPECIFICATION

This project was introduced to us at the beginning of the year and we invested a lot of time sorting out the myriad of issues the individuals at Poppel are confronting with respect to their current order processing system, as part of the Analysis phase of the Software Design Life Cycle. Also, what we discovered above all else was that the system was obsolete and very complex. It wasn't a productive and practical system in light of how manual-based and labour intensive the system was. This has affected the day to day tasks at Poppel and accordingly they have neglected to perform at their optimum and to attract customers. They have additionally missed out on awesome opportunities that would further grow their organization. To remedy this predicament, our fundamental goal is to streamline the processes and to improve the system overall. Our proposed system for Poppel will guarantee that pointless functions that make the system cumbersome and complex are eliminated for instance their current order processing sheet of paper which yields a great deal of mistakes and errors.

Our main objective is to design and execute an integrated electronic or computerized ordering system that streamlines the processes rather than a fully manual based one. This will help all parties involved in the ordering process to perform all tasks on a single user system ensuring data integrity. This has numerous advantages to it including and not restricted to entering invoice data in a more reliable manner which diminishes the possibility of errors, it’s not tedious or time consuming and it will altogether lessen the amount of time used to process invoices making it less labour intensive giving the marketing clerk additional time to focus on other value-added tasks of the organization.

We decided to include a package diagram that will show how the subsystems at Poppel interact with each other. The package diagram illustrated below will include the high-level scope of the Poppel organization including the order processing system that we are in the process of designing.

PACKAGE DIAGRAM OF POPPEL ORDER SYSTEM.



1.3. DESIGN ASSUMPTIONS & CONSTRAINTS

Below are the assumptions/constraints of a general order processing system according to the capture an order use case.

- Marketing clerk is logged into the system
- The clerk's username and password combination are made up of a mixture of characters
- Orders are captured through a telephonic dialogue between the marketing clerk and the customer

- The order processing system is a single user system that allows operation by only one marketing clerk at a time
- Orders cannot be confirmed if the customers credit limit has exceeded the limit
- The marketing clerk verifies the order and credit card number and credit status with the customer before ending the call

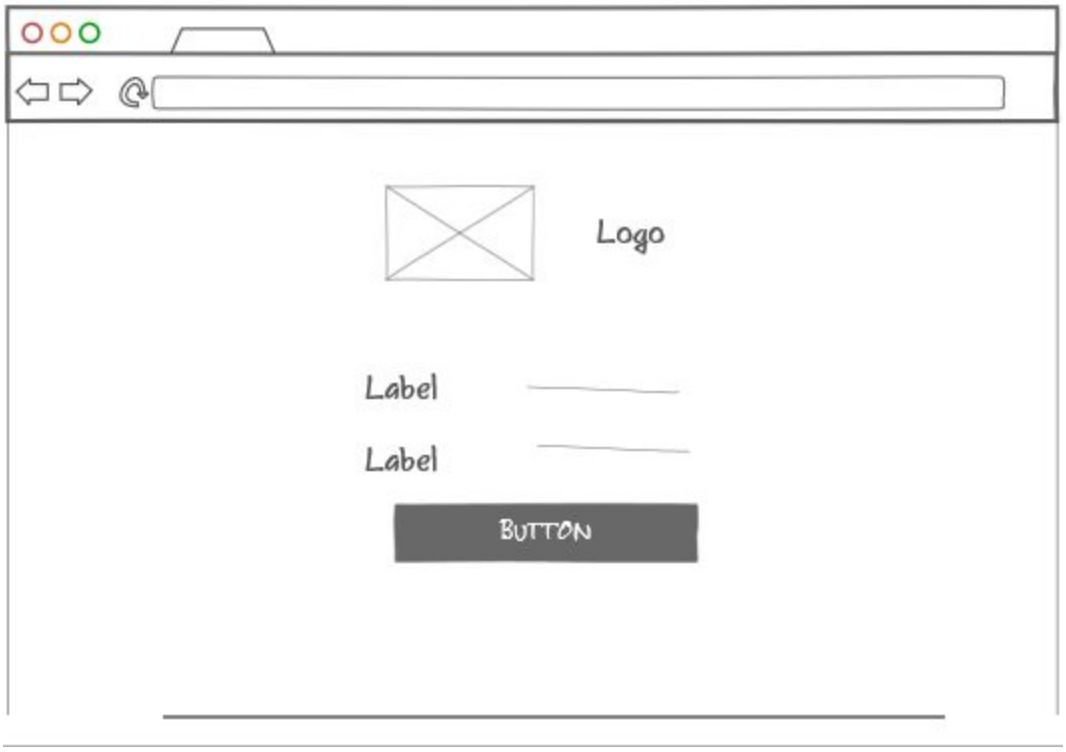
2. User Interface & Dialogue Design

This section of the specification will model a depiction of what the dialog between the user and the system will look like using wireframes for each screen. And will also give a brief description of what is happening on the screen.

2.1. Wireframe Diagram or Windows Navigation Document

This is just a basic and rough idea of how the screens will look like, later on in the specification realistic mock-ups of the system will be presented.

1. **Login Form**

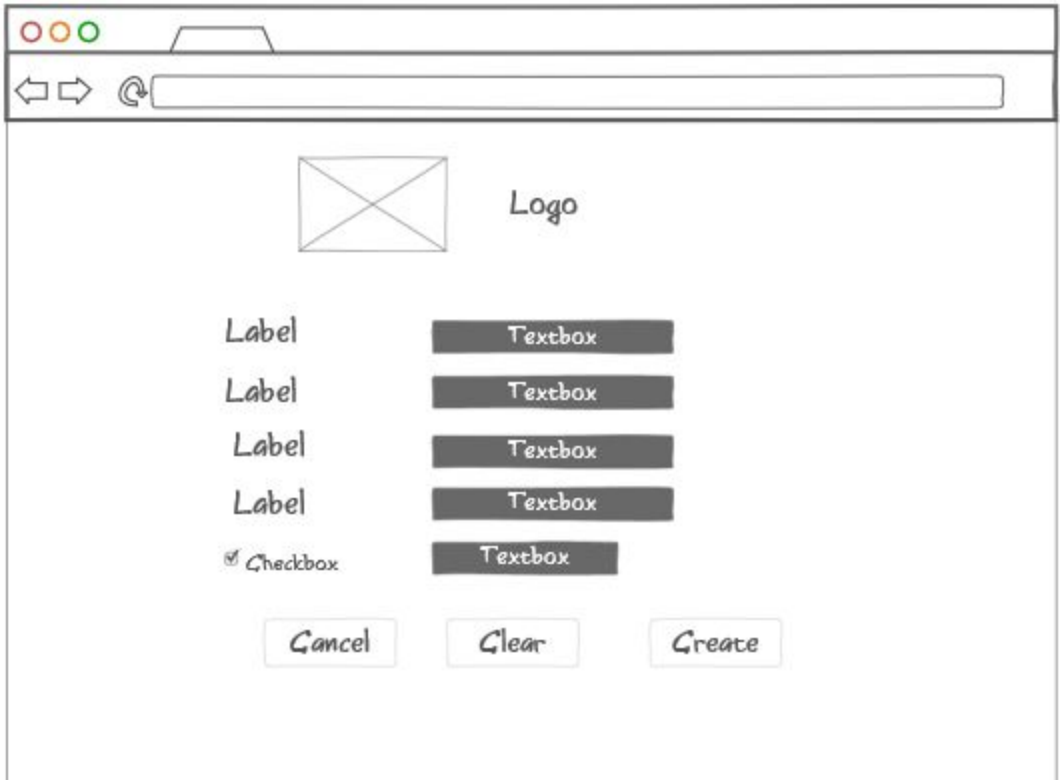


This is the login form. And this is the beginning of the ordering process between the marketing clerk and the customer. The user which is the marketing clerk of Poppel will gain authorization to the system by inputting their details such as username and the password to gain access to the system. The system will check the clerks details ensuring that they are correct and that they are in the correct format and if not a pop up message will be shown to the user alerting them that their details are invalid.

2. **Home - Main Form**

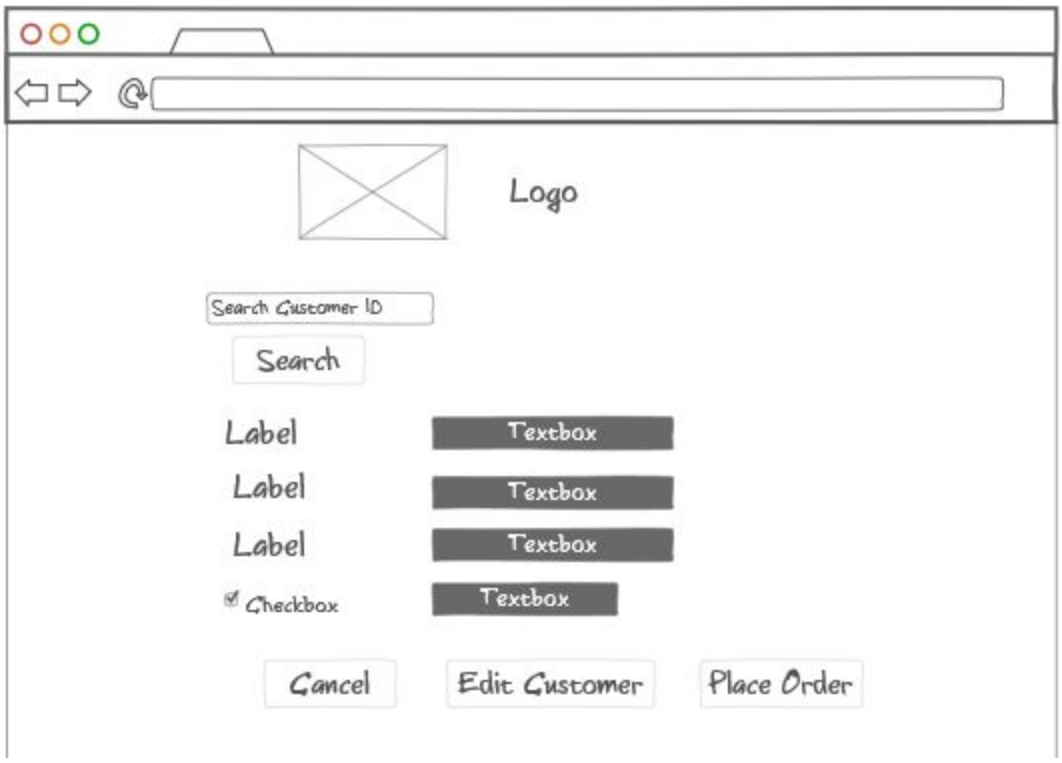
Once the user has gained access to the system, the next screen that they will be greeted by is the main form of the system. This screen gives the user the freedom to engage with the system in a variety of ways. The user has the option to create or add the customer to the system, they can also manage the customers in the system, they can also generate reports such as the expired products and the picking list reports.

3. **Create a Customer**



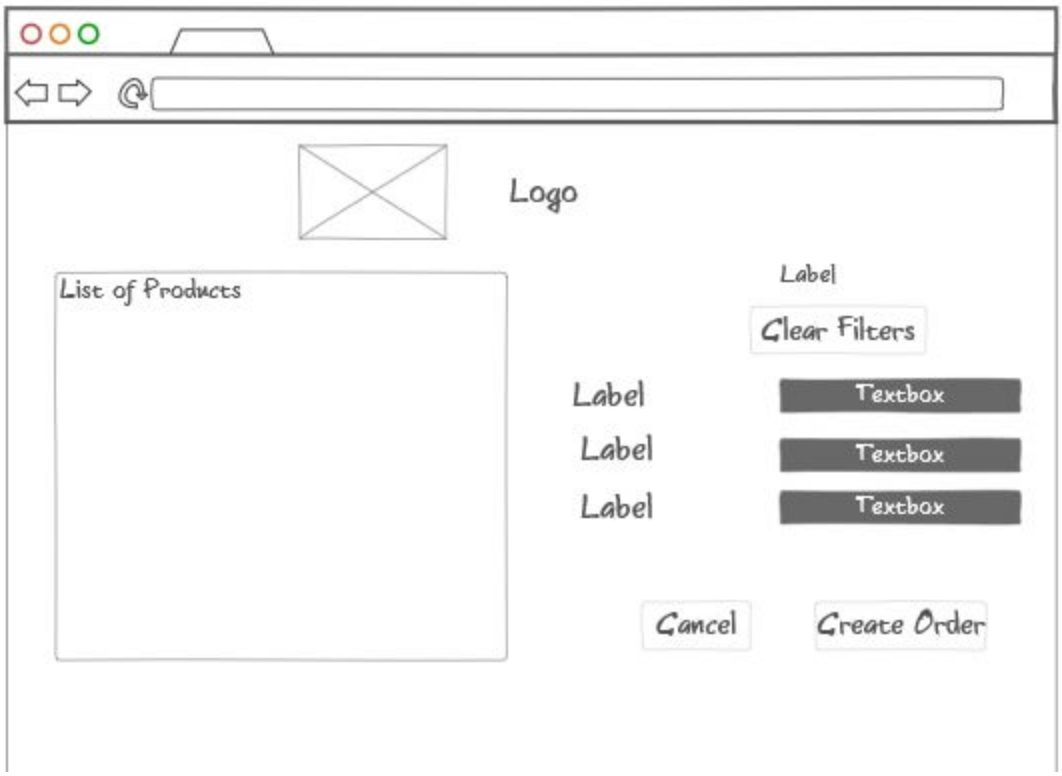
During the telephonic dialogue between the user and the customer. The user will receive information about their personal, credit and address details. Upon receiving that information the user will input the relevant information to the textboxes on the screen. Once the user has completed the capturing of the customer's details they have the option of creating the customer and saving their details to the system. They can also clear all fields if somehow there was a mistake and they can also cancel if the customer withdraws from the customer registration process. The customers can only be captured on the system if they are correct and are in the correct format. If that isn't the case the system will alert the user if a particular field has incorrect information or is in an incorrect format. After the system captures the customer details, the system will generate a customer id for the newly created customer.

4. **Manage Customer**



This part of the system the user will manage the customers details in a variety of ways. Firstly they will search the customer they created by searching them using the customers id. They will then have the option of editing and deleting the customer from the system. The user will also have the capability of placing the order for the customer. They can also cancel the process from progressing using the cancel button.

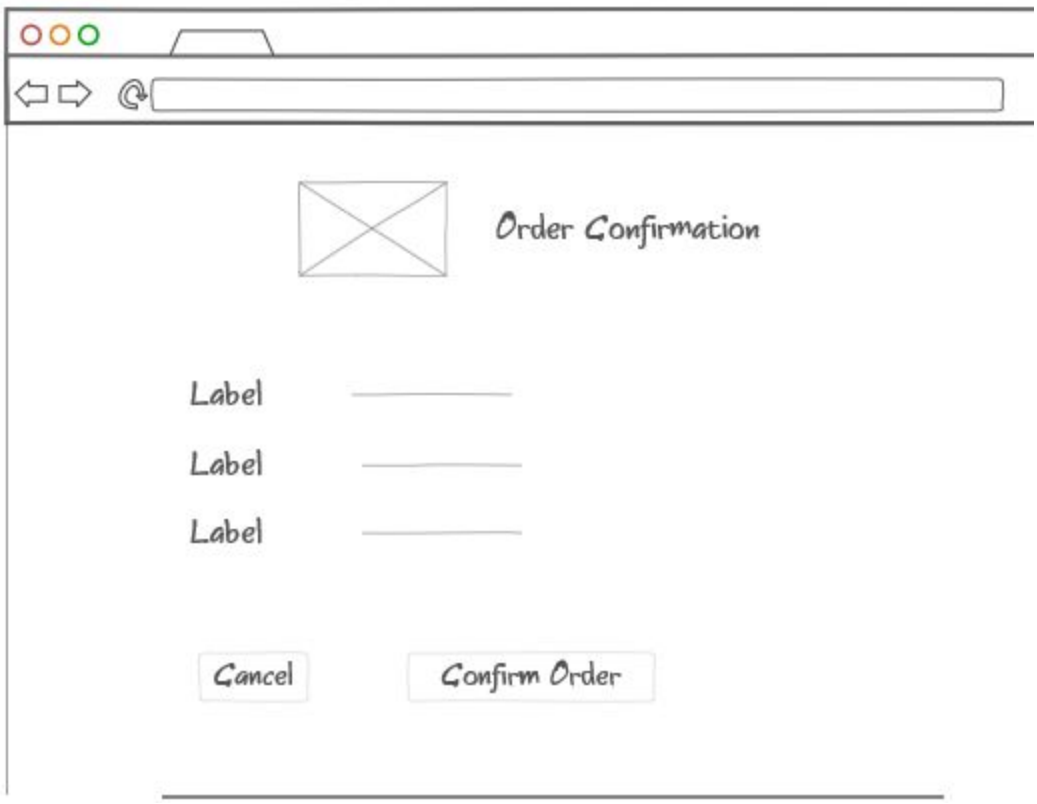
5. **Create Order**



In this screen, the user will have a selection of products to choose from, the customer wishes to order. The products are accompanied with their description, name, price, quantity and stock status of the product. The user can also filter out which products they want to select and which product category. This makes the process of looking for a product a lot quicker and easier. After the products have been selected by the user they will be stored in a shopping cart where the user can select the quantity of the product, the total cost of the order will also be displayed.

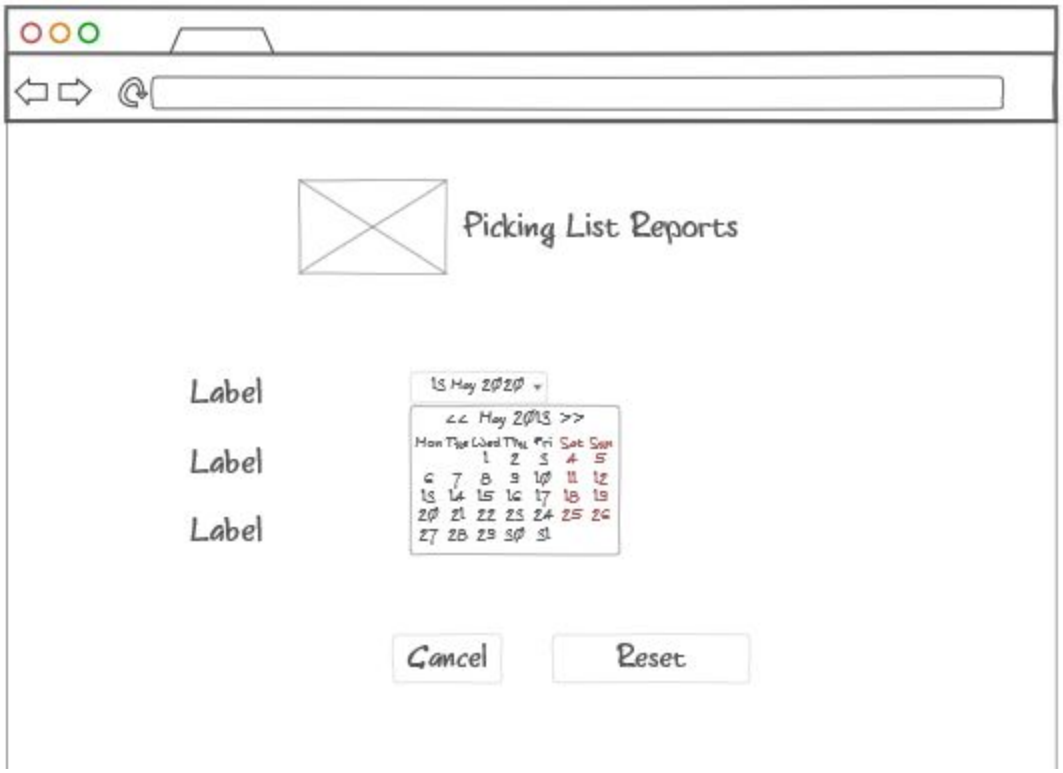
If the product the customer wants is not in stock, the user won't be able to add it to the shopping cart and the user will have to let the customer know. The user can also remove a product from the shopping cart that hasn't been invoiced as yet and if all is well the user can then proceed to create the customers order.

6. Order Confirmation/Summary



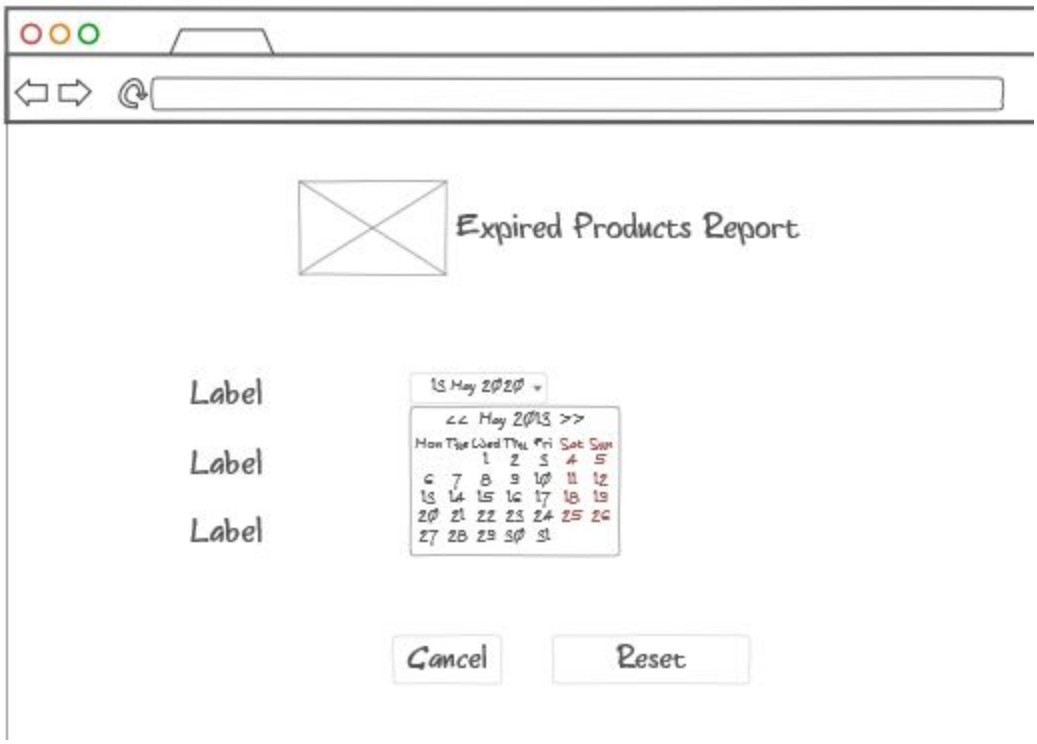
This is the order confirmation screen. And it displays the customers details, delivery and credit details that were captured in the earlier screens. And this screen also displays the order details of the customer. The user will then confirm with the customer if these details are correct and if they are the user will then click the confirm order button to confirm the details of the customer.

7. **Picking List**



This screen generates a report and displays all the products that the customer wants to order and all the products that the user selected and added on the shopping cart. It also displays the date in which the order was created. This date can also be resetted and the user can always the process as well using the appropriate button.

8. **Expired Products**



In this screen the user can select the dates of an expired product and all the products which expire on that particular date will be generated on a report. For whichever reason the user can reset the dates and choose other dates or cancel using the appropriate buttons on the screen.

- Screen Standards

1. The headings for all the screens are standardised to use the font Microsoft Ya Hei. In the shade black and turquoise blue for some screens. The size of the font for headings is 24pt and is bold and also underlined.

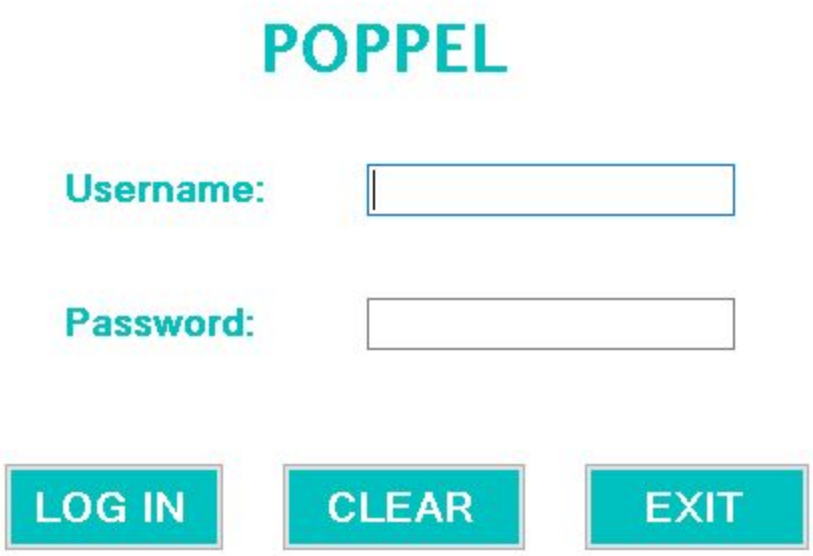
2. The buttons have a white back colour and a turquoise blue fore color. And these colours also form part of the system and you see them whilst using the system. The most prominent colours on the system are turquoise blue, whitye, black and grey.

3. The buttons are also placed at the bottom of each screen and in most cases lead to other screens upon clicking them.

2.2. Detailed Screen Layout

In this section we will depict the realistic mock-ups of our system modelling the dialogue between the user and the customer.

1. **Login Form**

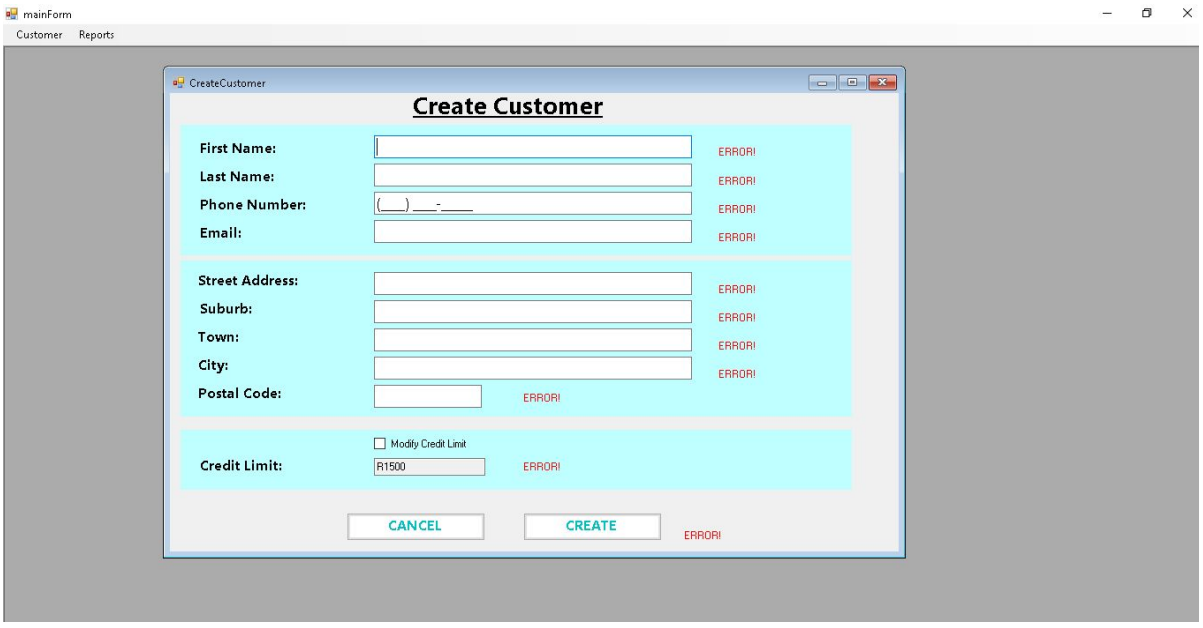


The login form allows the user to enter their details so they can proceed to the main form. The details have to be valid and if they are not the system will alert the customer that the entered details are incorrect with a pop-up message.

2. **MainForm**

This is the main form. This is where the user can interact with the various screens on the menu strip. Here, the user can access the create a customer, manage customer and also generate the picking list and expired products reports.

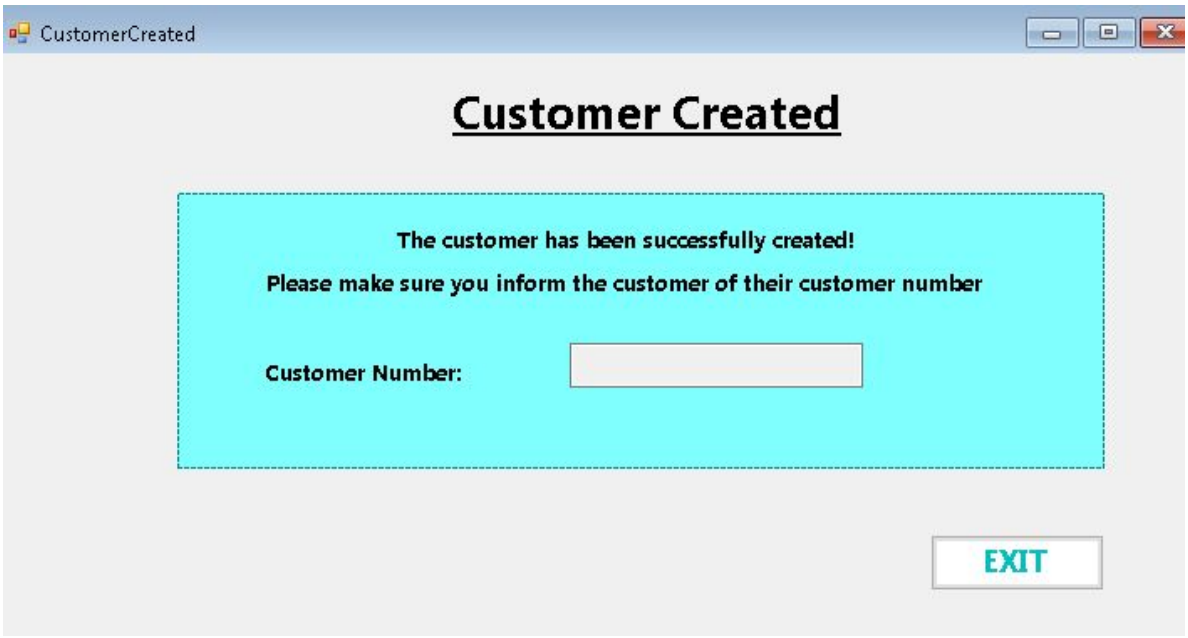
3. Create a Customer



This part of the system is where the user can enter the customer details such as personal, address and credit details. The user enters the customers details to register them on the system and to capture these details. If the fields are blank or have an incorrect format an error will be

picked up and this will hinder the user from capturing the customers details. The user can also cancel the customer registration process using the “cancel” button should the customer want to.

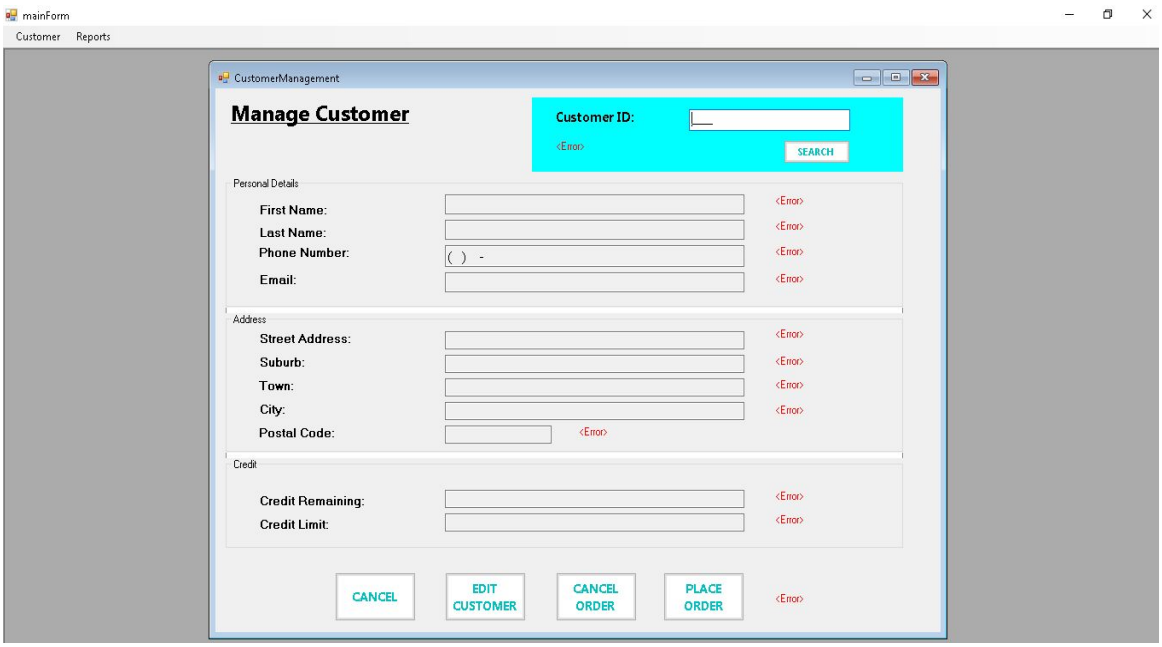
4. **Customer Created Form**



After the customers details have been entered, the user creates the customer provided their details are valid. After the user creates the customer by clicking the create customer button on the previous screen, this screen comes up next.

This screen displays the customer id generated by the system, notice that the text box is read-only because we don’t want the user to manipulate the customer id as this is a specific unifier to that customer. The screen also has an exit button at the bottom right corner.

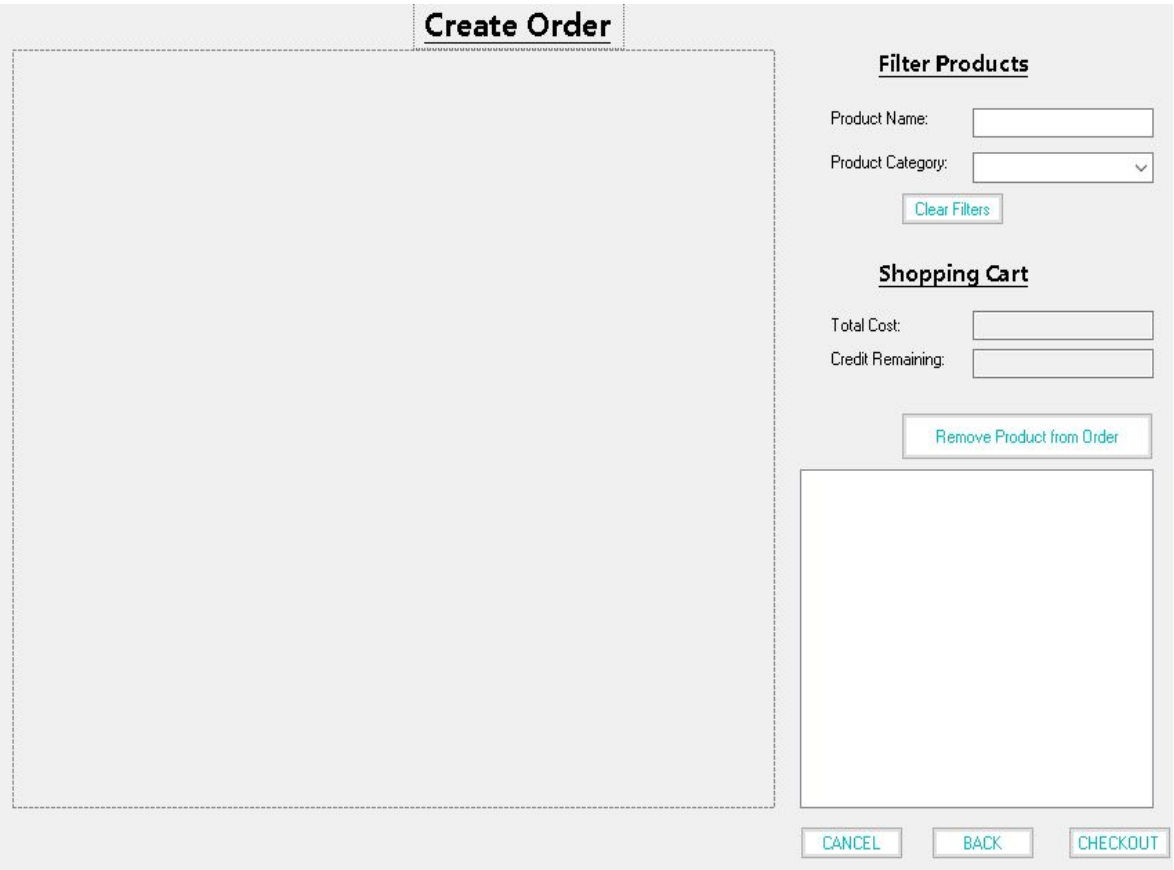
5. **Manage Customer**



This is the customer management screen. This is where the user enters the customer id and searches the customer on the search textbox. If the customer id is saved on the system the customer details linked to that customer id will be displayed on the read-only textboxes on the screen.

If the user needs to edit the customer they can do so by clicking the “edit customer” button. This will allow them to either edit the fields of the customer or remove the customer completely from the system. If all is well the user will then place the order, or cancel the order altogether.

6. Create Order

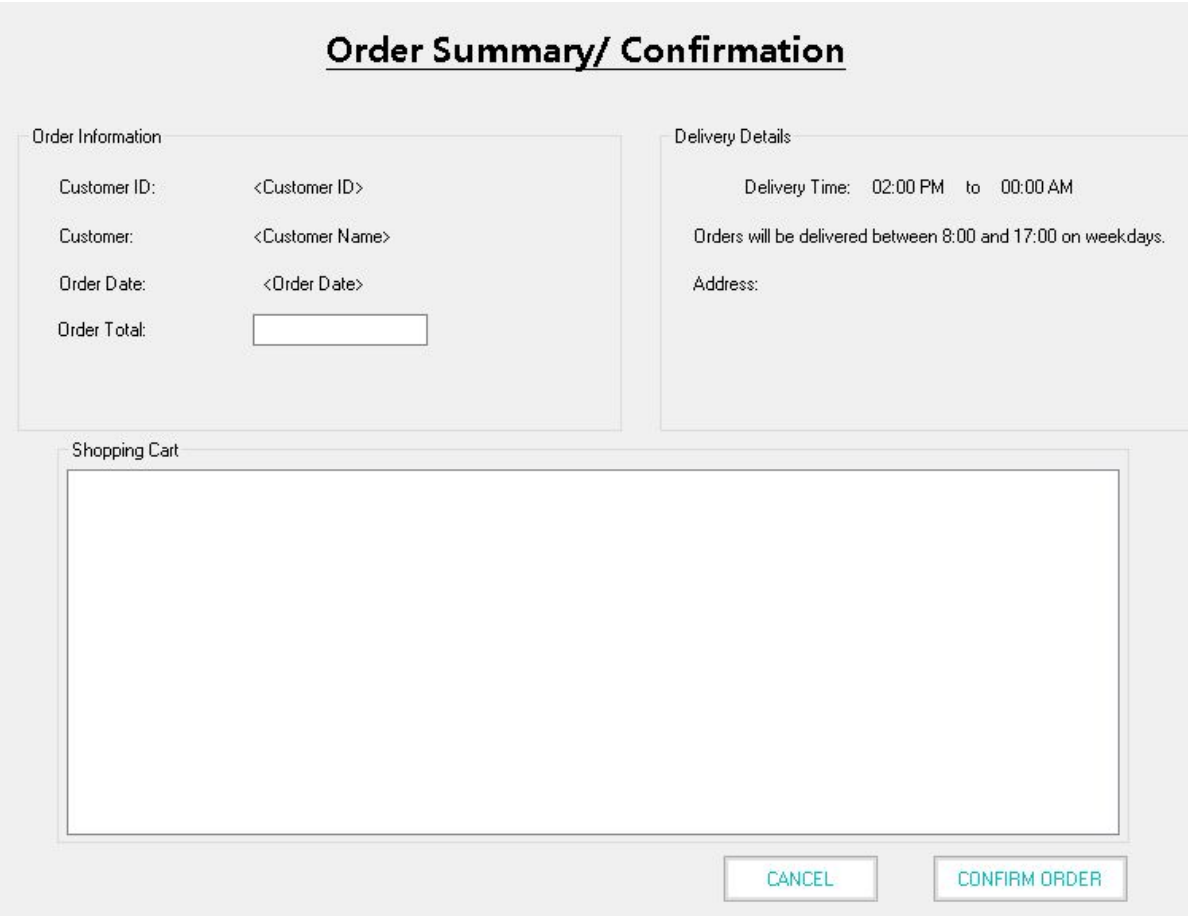


After the user clicks on the “place order” button from the previous screen the create order screen comes next. This is where the user selects the products the customer wishes to have on their order from the list view. The products are accompanied by their name, description and price.

The user can also search the product name and the product category in a drop-down combo box. This allows the user to find a specific product faster and this speeds up the ordering process. The user will then add the products to the shopping cart and in here the user can click on the product and then click on the button above the shopping cart titled “remove product from order’. If all is well, the user can then click the “checkout” button or if the customer wants to add more products the user can. If the user wants to go back to the previous slide or cancel the ordering process they can click the appropriate buttons to do so.

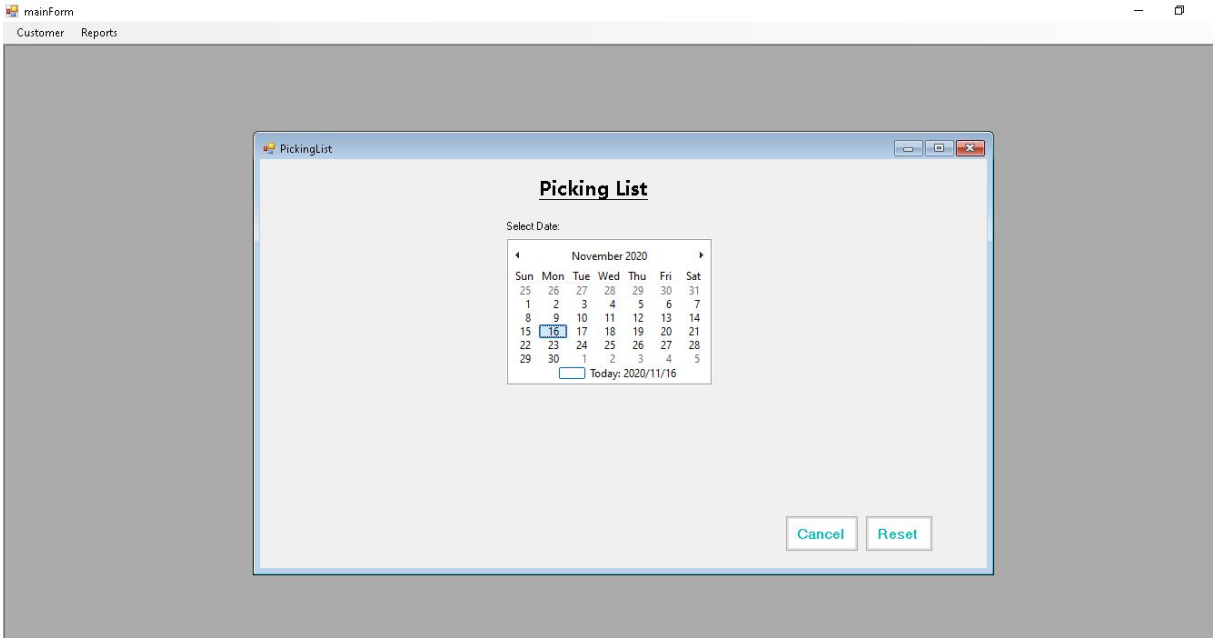
When the user clicks on these buttons, especially the “cancel”, “back”, “exit” buttons, a message box pops up confirming whether or not they are sure they want to go ahead and cancel or exit that particular screen.

7. Order Confirmation



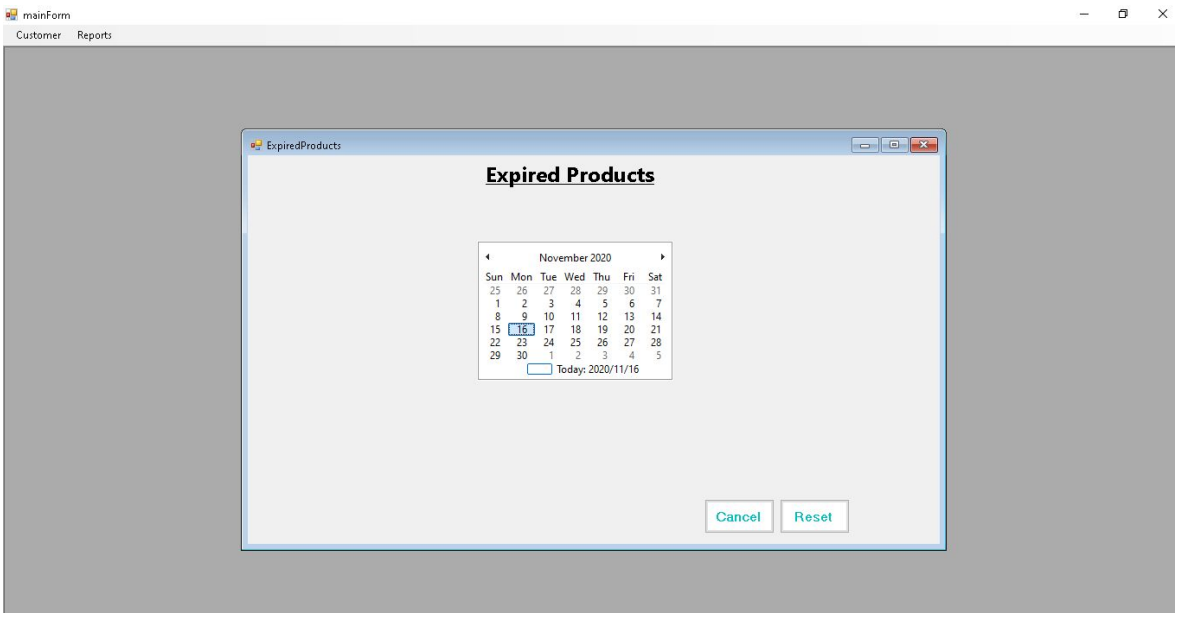
This screen displays all of the customers details upon completing the order process. It displays the order information, the delivery details, the customer's delivery address, the shopping cart and the buttons where the user can either cancel or confirm the order details on the screen.

8. Picking List



This screen displays the picking list. The user will click on the day the order was created and a list view with the products to be picked will display the products.

9. Expired Products

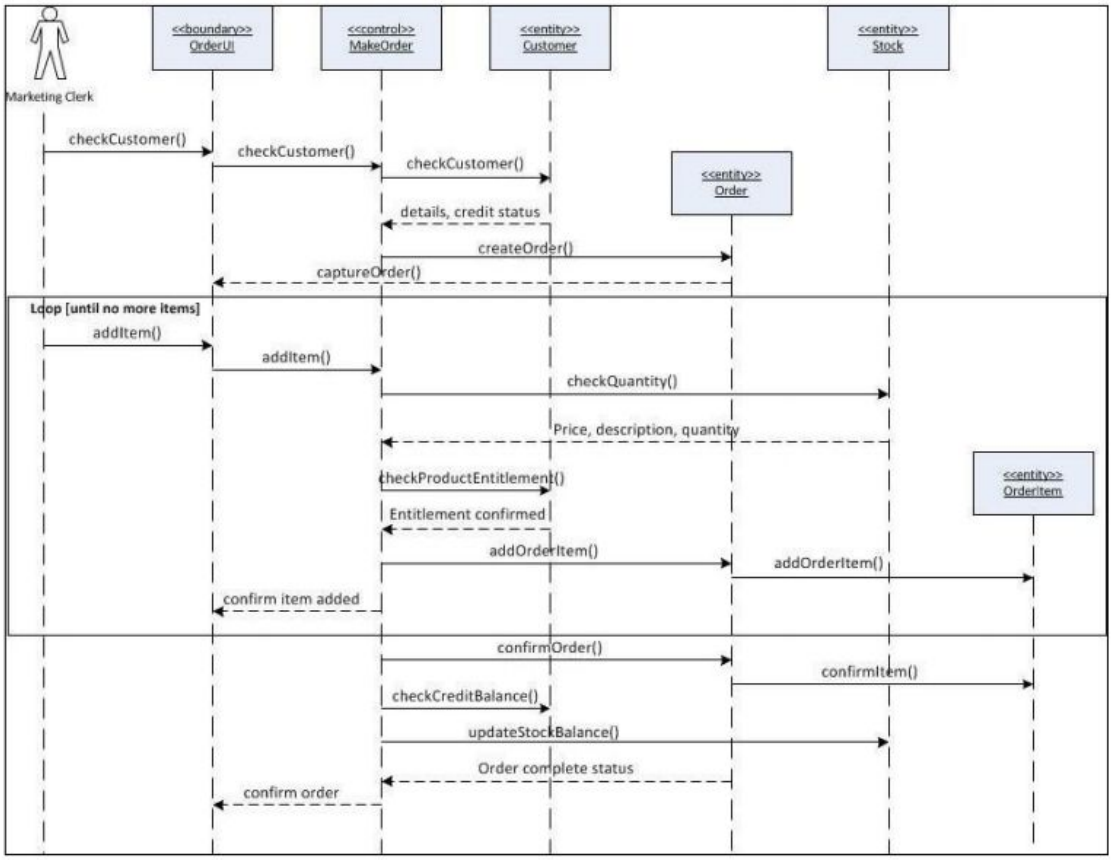


The user in this screen will select the date of products on the calendar that have expired on the system. The response to that will be a listview with products that have expired and their expiration date.

3. POPPEL SEQUENCE DIAGRAMS

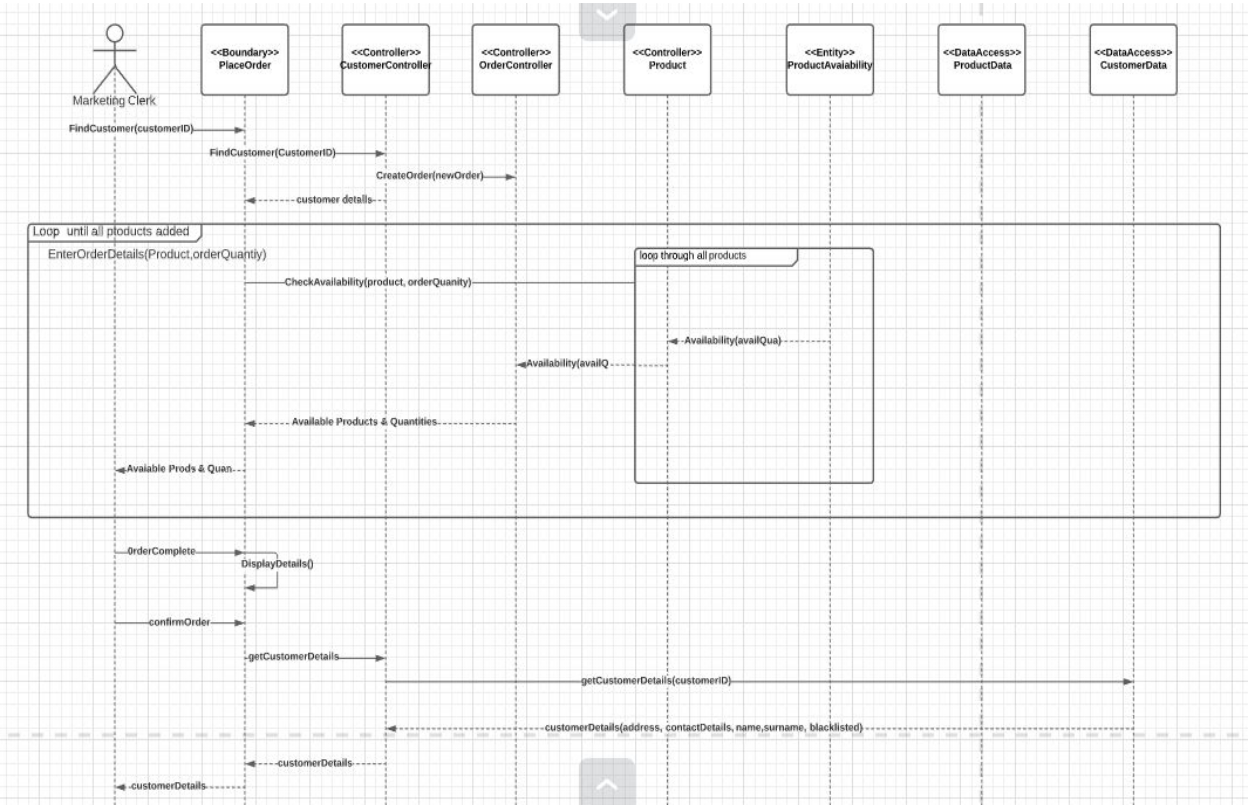
3.1. POPPEL ORDER SYSTEM DETAILED SEQUENCE DIAGRAM

Detailed sequence diagrams are interaction based diagrams which detail how the operations of a system are carried out. Sequence diagrams are time focused, they reflect this by showing the order of interactions visually through using the vertical axis of the diagram to represent what messages are sent and when. This sequence diagram depicts the capturing of the customer details and creating an order.



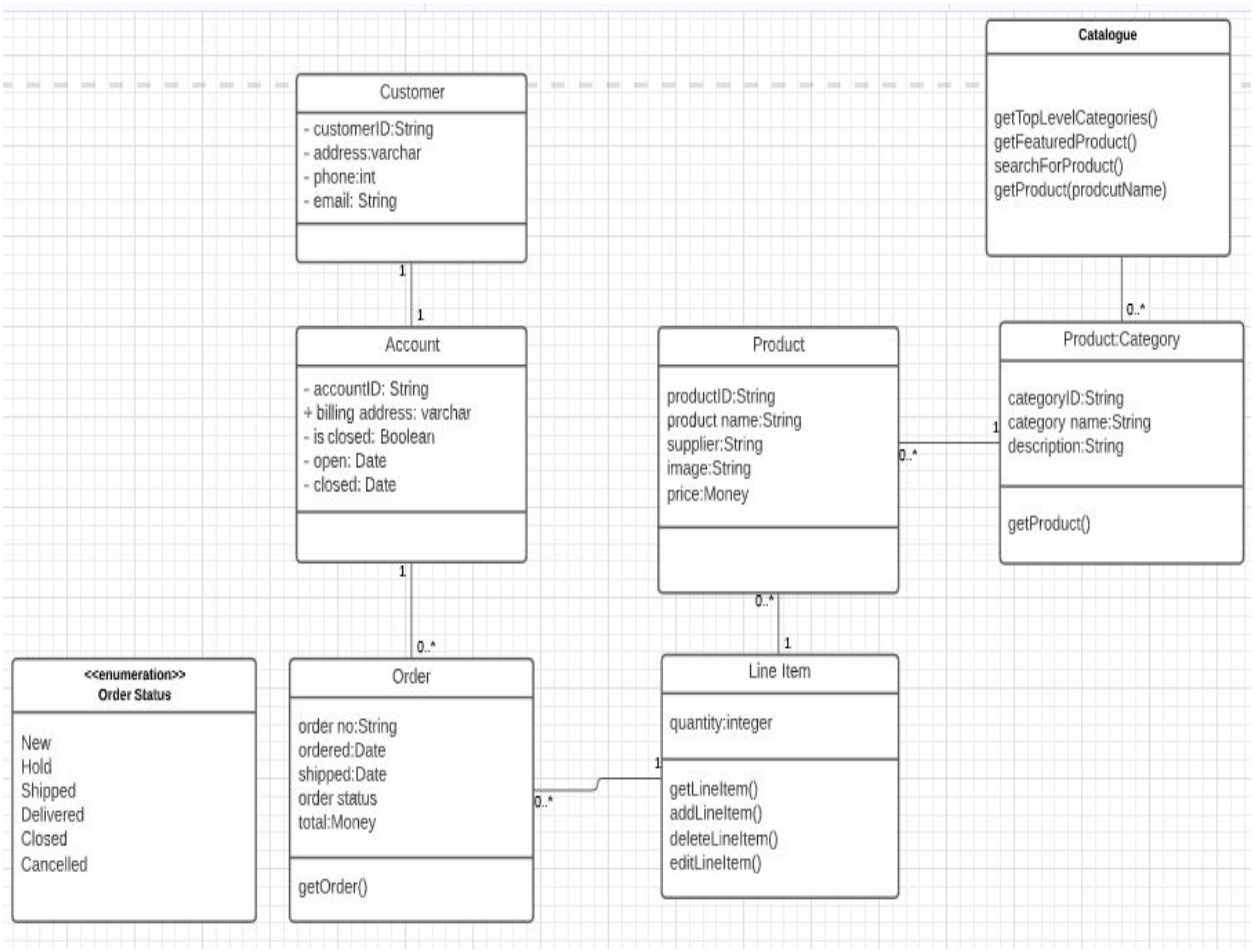
3.2. Poppel Order System Design Sequence Diagram

A design sequence diagram is used for modeling the interaction between the different objects of a single use case. It illustrates how the different parts of the system communicate with one another to carry out a specific task and the order in which that particular task is carried out. This particular design sequence diagram captures the ordering process of the Poppel case study, with respect to the given use case scenario.



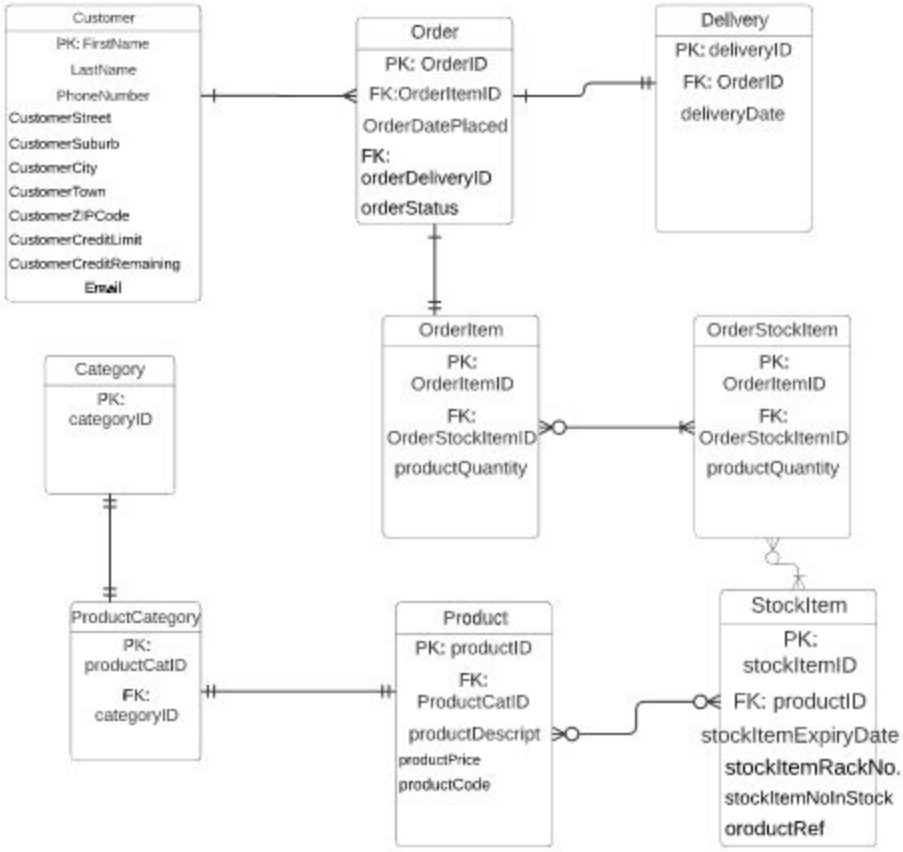
4. Poppel Order System Design Class Diagram

The class diagram below describes the structure of the Poppel order processing system by displaying the system's classes, their respective attributes, methods and the relationship among these objects.



5. Entity Relationship Diagram

The entity relational diagram is a very important diagram because it depicts the interaction between classes, and how these classes communicate using primary and foreign keys. With an erd diagram you can also tell the relationship between two classes through the use of cardinalities especially in this context and also through multiplicities.



6. Report Design

Our proposed system will generate two reports, one of them being a picking list which has the finalized order of all the items which were included in a customer's order. The second report which will be generated by the Poppel order system will be the expired products list.

6.1. Picking List

After every confirmed customer order, the system will generate a finalized version of all the ordered items, in an alphabetical order. This particular report will consist of all the vital amounts related to a customer's order, included in these are the IDs of all the selected products, the quantity of each product and the cost related to each product.

This report is vital because customers are able to rectify their ordering mistakes, if any, before confirming an order.

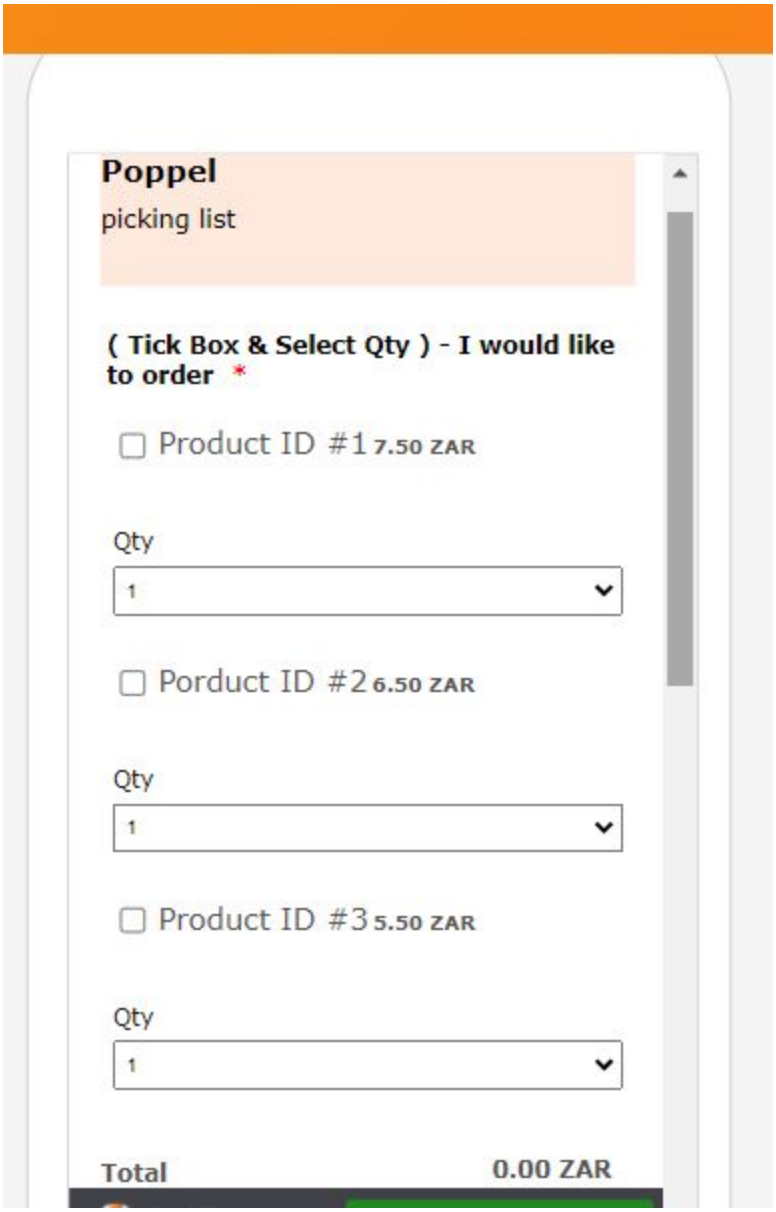
This is generated when a customer has confirmed their order and they want some proof of confirmation. This document acts as receipt of some sort.

The system automatically reflects this report when the user is done picking their list of products, however, the customer still has an option to not view this.

6.1.1. ***Detailed Output Requirements***

- Output type & ID: Summary Report
- Report objectives: Summarise customer's final order with each completed order
- Audience: Customer/Marketing Clerk
- Content: quantity, productID, total cost
- Layout: Columned table, landscape view
- Selection: ProductID, ProductDescription, ProductPrice, ProductQuantity
- Sequence: Ascending Chronological Order: item picked first to item picked last
- Comparison: invoiced products
- Grouping: grouped by customer order
- Media to be used: Electronic
- Frequency: Upon request, with every confirmed order
- Distribution: automatically displayed with every order confirmation, upon request by user
- Privacy, Security & Integrity Requirements: viewable only by customer and marketing clerk

6.1.2. *Report Layout: Picking List*



6.2. Expired Products List

6.2.1. The user is able to select a particular day of the year and the system will generate a list of products that expire on that specific date that the user has indicated.

This particular feedback serves to make the user aware of certain products which have passed their desirable state.

The marketing clerk is able to use this information to identify all the products on the ordering system which ought to be removed and replaced with the appropriate ones.

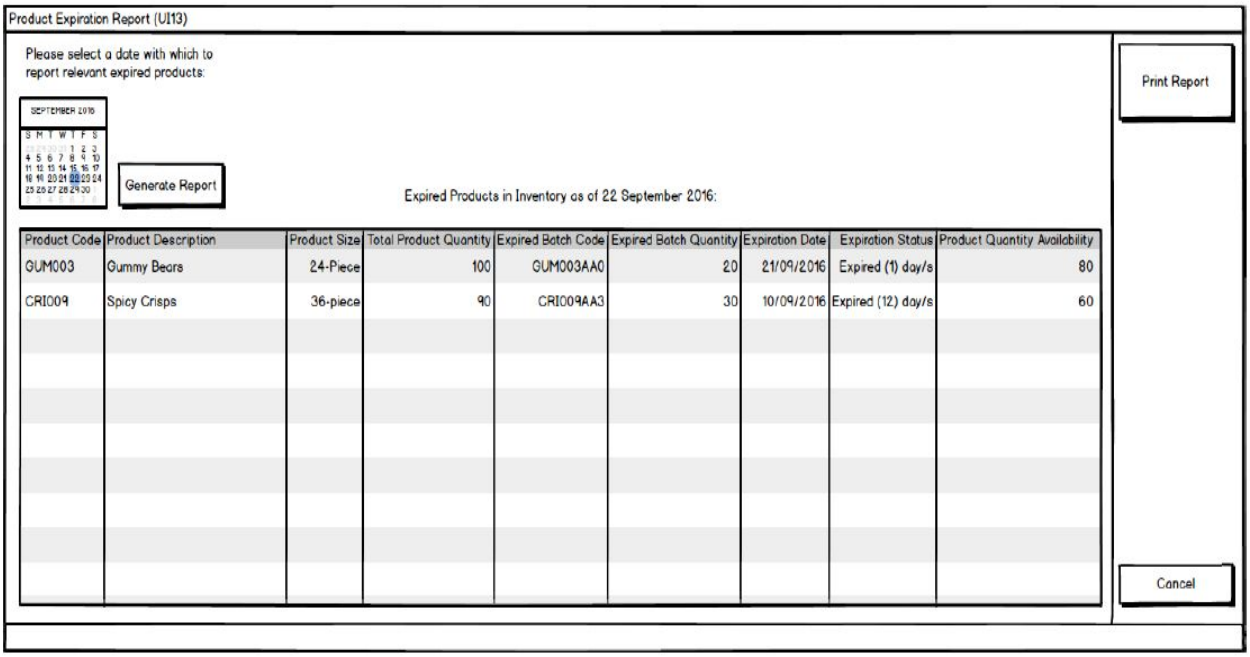
This will be appropriate in scenarios like stock-taking, where the company is identifying every item on hand, counting it and summarizing the quantities by order of item. The process is made easy since the user of the system will be able to identify those products that need to be excluded from the inventory.

The report can be generated usually during stock-taking and when the user is creating a new order.

6.2.2. Detailed Output Requirements.

- Output type & ID: Expiration report for current (or indicated) date
- Report objectives: A detailed report identifying which stock has expired by/is expiring on the date the report is generated.
- Audience: Marketing department, stock control and operation director
- Content: ProductID, Product Description, Product Quantity, Total Products, Expiration Status
- Layout: A columned table, landscape view
- Selection: ProductID, ProductName, ExpirationDate, StockQuantity, BatchCode
- Sequence: Descending Chronological Order: recent expiration date to the oldest
- Comparison: ExpirationDate <= TODAY (or indicated day)
- Grouping: grouped by batch code
- Media to be used: Electronic
- Frequency: daily, else when requested by user
- Distribution: emailed daily or upon request to the relevant parties
- Privacy, Security & Integrity Requirements: viewable only by user with password access

6.2.3



7. INPUT-OUTPUT STANDARDS & CONTROLS

This section highlights the different types of integrity controls implemented in our proposed Poppel order processing system. These were used in this system to help in rejecting invalid data inputs, prevent data outputs which are unauthorized and protect the system and its data from data leaks and/or tampering.

7.1. INPUT INTEGRITY CONTROLS

Input integrity controls are controls which will prevent the use of incorrect or erroneous data from being entered into the system.

The input integrity control which was implemented by our system is checking the customer's number when the marketing clerk enters it into the system, to ensure that the

customer exists in the system, if not, a new customer number is generated and supplied to the user. And also in our system we used a masked text box for the user to enter a phone number and a specified format for that text box is set and the should be a form of an input control.

7.2. Output Integrity Controls

Output integrity controls are focused on ensuring that the output generated by the system is accurate and complete.

The output integrity control that was adopted by our system is the process of checking each customer's credit limit before confirming their order. Another form of output control comes into play with reports, the reports either display products that have been ordered and need to be picked or it displays expired products using the expiration dates selected by the user on the system.

8. Implementation Plan

The implementation plan is to track the time we completed each implementation stage of the project. We scheduled the plan from the design phase to the implementation phase of the software design life cycle and overall this was implemented in approximately 4 weeks.

Implementation Stage	Task	Duration	Start Date	End Date
Class Implementation	Coming and decking on the entity classes that have to go on the domain layer	2 days	6/11/2020	7/11/2020
Database Manipulation	Creating a database per entity class,	3 days	7/11/2020	9/11/2020

	creating controllers, Creating the database layer and adding information to allow data manipulation			
UI Design	**Creating the windows forms and adding labels, text boxes etc to the presentation layer**	**2 days**	**9/11/2020**	**10/11/2020**
Programming System	**Create a customer, Create a customer order, Reserve inventory items, Cancel an item, generate a picking list and expired products reports**	**5 days**	**10/11/2020**	**14/11/2020**

9. TEST PLAN

9.1. TEST ENVIRONMENT

A typical test environment involves hardware, operating system and user settings, it allows the marketing clerk (user) to access software and data stored locally on the host or in a central data centre or the cloud. A system may require parts to be hosted on one or more servers such that application servers will host one or more applications and

database servers will host one or more databases. A network that contains the infrastructure needed to make servers communicate with each other, clients/hosts and other networks. Physical or virtual storage, either of which may be provided from a network disk or dedicated for the system. Part of the storage should be set aside for backups, when required, of course. The infrastructure will only be available to those involved in the project.

9.2. TEST ITEMS

1. Create a customer
2. Create a customer order for at least 3 products
3. Check if customer is black-listed
4. check inventory availability
5. reserve inventory (items)
6. remove/cancel an item that hasn't been invoiced
7. create report to identify all the expired products
8. Generate a picking list to initiate delivery

9.3. TEST APPROACHES

- **Functional Testing** is a type of testing which verifies that each function of the software application operations meet requirement specification. This testing mainly involves black box testing and it is not concerned about the source code of the application. All the functionalities of the system are tested by providing appropriate input, verifying the output and comparing the actual results with the expected results.

- **Performance Testing** is a type of software testing to ensure software applications will perform well under their expected workload. The goal of Performance Testing is not to find bugs but to eliminate performance bottlenecks. For instance, Check the maximum number of users that the application can handle before it crashes or check CPU and memory usage of the application and the database server under peak load conditions

• **Security Testing** is a type of Software testing that ensures software systems and applications are free from any vulnerabilities, threats, risks that may cause a big loss. The security test will be done both manual and automation. For example, A password should be in encrypted format, the system should not allow invalid users.

• **Integration Testing** is done to test the components when integrated to verify that they work as expected i.e. to testing the modules which are working fine individually does not have issues when integrated. For example, if the hotel program can integrate with the hotel database system.

• **Acceptance Testing** is the process of verifying that a created hotel software works for 'the user'.Acceptance tests also ensures that no requirement has been left out while creating the software and that everything is as it should be to satisfy the user

9.4. PROBLEM TRACKING (TEST CASES)

Below are the test cases and they are used to track a problem in the system. If a test case doesn't meet the required functionality then that means that test case is a fail. If a test case does meet the required functionality then that mean the test case is a pass.

Test Case	STeps	User Action	Results	Pass/Fail
Login	1	Login with invalid credentials	System sends a message that invalid credentials have been entered	
	2	Login with Correct credentials Username:	System opens the mainform upon correct credentials entered on	

		Staff Password: **Poppel01**	the login form.	
Create Customer	1	Fields filled out incorrect format e.g. first name has numerical characters.	System must inform the user that the entry is invalid.	
	2	Fields left blank, Credit Limit not set	System must inform the user that the fields are blank, System should inform user that a credit limit has not been set	
Create an Order	1	Products not selected by user	System must inform the user that the products have not been selected.	
	2	Total exceeds credit limit	System must inform user the total cost exceeds the credit limit	
Generate a picking list	1 & 2	Date selection = no Date selected	System must inform user that a date needs to be selected in	

			order for a report to be generated if date is selected system generate a picking list report	
Generate an expired products report	1 & 2	Date selection = no	system should alert the user that a date needs to be selected for a report to be generated. if date is selected, the system should generate a report for expired products using the expiration dates entered by the user	

9.5. **TEST SCHEDULE**

Poppel Ordering System	Duration	Start Date	End Date

Create Customer Order System	18	01/10/2020	18/10/2020
Unit Testing	5	01/10/2020	5/10/2020
Integration Testing	3	06/10/2020	08/10/2020
Beta Testing	10	09/10/2020	18/10/2020
Inventory Availability System	15	19/10/2020	20/10/2020
Unit Testing	6	19/10/2020	24/10/2020
Integration Testing	4	25/10/2020	28/10/2020
Functional Testing	5	29/10/2020	30/10/2020
Create a Customer System	13	05/11/2020	17/11/2020
Unit Testing	5	05/11/2020	09/11/2020
Integration Testing	3	06/11/2020	12/11/2020
Beta Testing	5	06/11/2020	17/11/2020
Reports & Queries	10	07/11/2020	08/11/2020
Unit Testing	5	08/11/2020	09/11/2020
Integration Testing	5	10/11/2020	10/11/2020
System Testing	16	11/11/2020	12/11/2020
Beta Testing	10	13/11/2020	14/11/2020
User Acceptance Testing	6	14/11/2020	16/11/2020