

**INTERNSHIP REPORT ON**  
**SMART POS AND SMART SELF-CHECKOUT IOS APP**

**(Feb 2022 - June 2022)**

Internship report submitted in partial fulfillment of the requirement for the degree of  
Bachelor of Technology in

**Computer Science and Engineering**



**BY**

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## **DECLARATION**

I hereby declare that this submission is my own work carried out at Zopsmart Technologies Pvt Ltd, Bangalore from February 2022 to June 2022 and that, to the best of my knowledge and belief, it contains no material previously published or written by another person nor material which has been accepted for the award of any other degree or diploma from a university or other institute of higher learning, except where due acknowledgment has been made in the text.

### **SUBMITTED BY:**

Varun Singh

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Computer Science & Engineering and Information Technology Department.

Jaypee University of Information Technology, Wagnaghat, Solan

**CERTIFICATE**

This is to certify that the work which is being presented in the project report titled “**Smart POS and Smart Self Checkout iOS Apps**” in the fulfillment of the requirements for the award of the degree of B.Tech in Computer Science And Engineering and submitted to the Department of Computer Science And Engineering, Jaypee University of Information Technology, Waknaghat, Solan is an authentic record of work carried out by **Varun Singh (181353)** under the supervision of **Mr. Narendran Anil (Engineering Manager)** and **Mr. Pratyush Kumar (iOS Team Lead)**, Zopsmart Technologies, Bangalore, India.

**VARUN SINGH 181353**

**The above statement made is correct to the best of my knowledge.**



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## ACKNOWLEDGEMENT

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It is indeed with a great sense of pleasure and immense sense of gratitude that I acknowledge the help of these individuals.

I am highly indebted to Mr. Pankaj Kumar, Training & Placement Coordinator of our college for the facilities provided to accomplish this internship. I would also like to thank the Head of our Department Dr.Vivek Kumar Sehgal and the faculty for teaching us the skills required for this internship. And special thanks to my mentor in the college Dr. Ruchi Verma who supported me throughout the whole and guided me to achieve the best.

Finally, I must acknowledge the constant support and patients of my parents.

**Varun Singh (181353)**

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Jaypee University of Information Technology, Wagnaghat, Solan

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# CHAPTER 01

## INTRODUCTION

### 1.1 Introduction

An internship is a professional teaching moment that provides students with real-world experience in their field of study or career objectives. An internship allows students to gain new skills while also exploring and advancing their professions. This paper describes my current internship with ZopSmart Technologies in Bangalore. This internship report describes the actions that assisted me in meeting a number of my stated goals. For my internship as a full-stack iOS developer, I was assigned the profile of Software Engineer. During the initial months of the internship, we were requested to learn about the Swift language, which was followed by autonomous live assessment tasks provided by the mentor. Following the completion of this learning procedure. After the completion of this learning process, I was assigned the live project of the company name “**SMART SELF CHECKOUT**” post-completion I was assigned “**SMART POS**”. I was asked to build the smart pos for iOS devices from scratch while I implemented full smart self-checkout functionality in an iOS app.

### 1.2 Job Description

Software engineering is the application of engineering ideas to the conception, implementation, and technical administration of the software. Software engineering was created to solve the issues associated with low-quality software efforts. When software surpasses deadlines, budgets, and quality expectations, problems develop. It ensures that the software is created consistently, correctly, on schedule, at a reasonable cost, and in accordance with the specifications. Software engineering has become critical in order to keep up with the quickly changing demands of users and the context in which the program is supposed to operate.

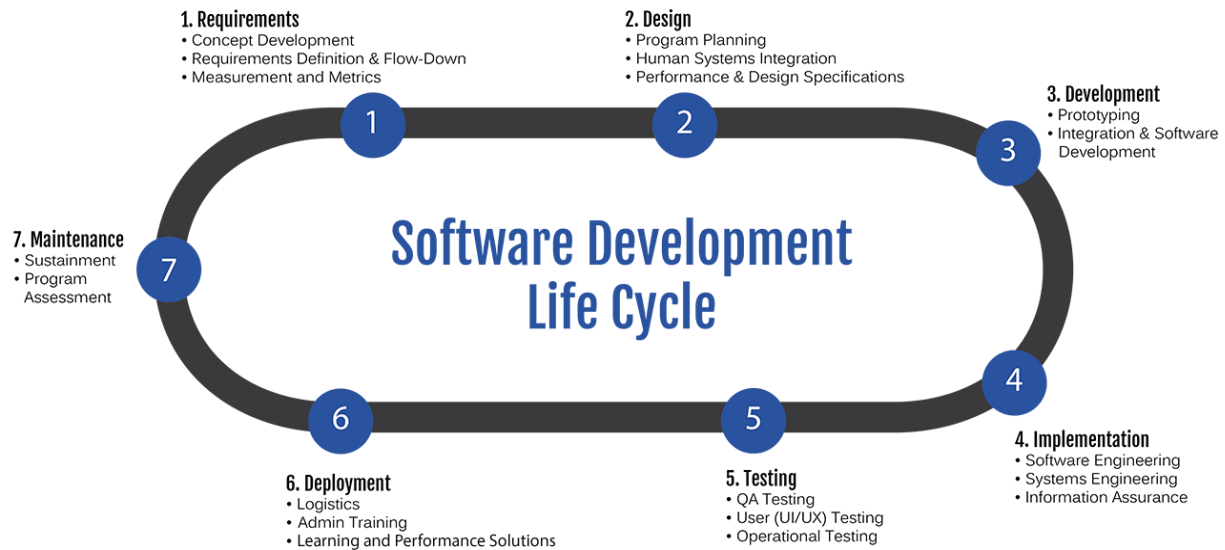


Fig 1: Software development cycle

The Software Engineer Trainee is in charge of assisting with software design and development. They collaborate with other team members to provide safe and trustworthy software solutions. This position's tasks and responsibilities are Application development (code, programming), Code debugging and testing New software applications, diagnosing, and resolving a wide range of technical obstacles collaborating with top executives identifying concerns, and providing solutions

### 1.3 iOS Development

The process of creating mobile applications for Apple devices such as the iPhone, iPad, and iPod Touch is known as iOS application development. The software is created in Swift or Objective-C and then published on the App Store for people to download. Every developer needs a Mac computer, which is typically more expensive than Windows-based computers. Furthermore, after your software is finished, it must go through a rigorous quality assessment procedure before it can be published through the App Store.



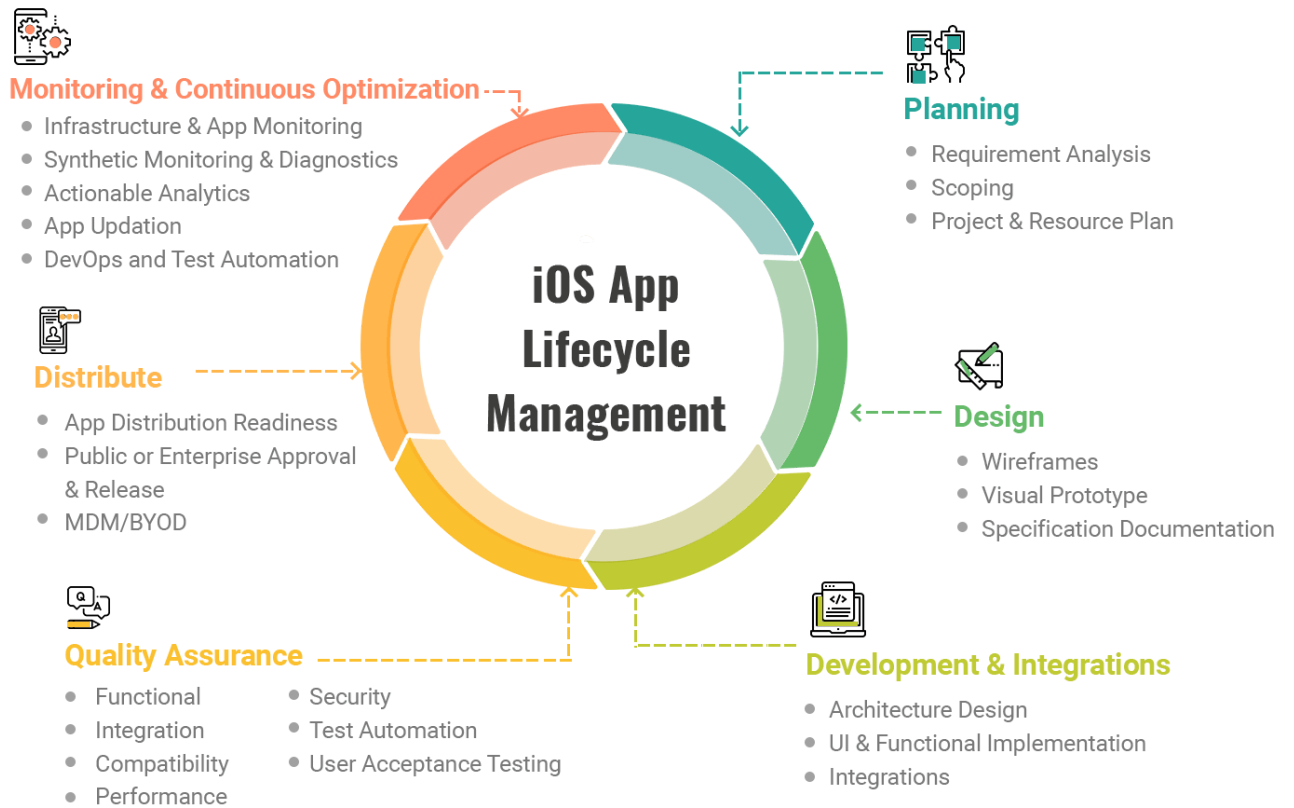


Fig 2: iOS development cycle

## 1.4 iOS Developer Requirements

- A Mac machine running the most recent version of macOS.
- Xcode, the integrated development environment (IDE) for macOS, is available for free through the Mac App Store.
- An active Apple Developer account costs \$99 per year.

These three requirements complement one another: Only active Apple Developer Program members can submit an app to the Apple App Store. Apps signed and published by Xcode are the only ones that may be submitted to the App Store. Xcode is only available on macOS, which is only available on Apple systems.

## 1.5 iOS Programming Languages

For iOS app creation, there are presently two programming languages available.

**Objective-C:** First introduced in the early 1980s, Objective-C served as the principal programming language for all Apple devices for decades. Objective-C is an object-oriented programming language derived from the C language that focuses on sending messages to multiple processes (as opposed to invoking a process in traditional C programming). Many developers prefer to keep their traditional Objective-C programs rather than integrate them into the Swift framework, which was launched in 2014.

**Swift:** Swift is the new "official" programming language of iOS. While Swift and Objective-C have many similarities, Swift is meant to employ a simpler syntax and is more focused on security than its predecessor. You can simply merge legacy code into current programs since it shares a run time with Objective-C. Swift is simple to learn, especially for those who are new to programming. Swift is quicker, more secure, and easier to use than Objective-C, so unless you have a compelling reason to continue with Objective-C, you should intend to use it to create your iOS app.

## 1.6 Objectives

The goal of the internship is to learn more about programming languages like as Swift and libraries such as UIKit and SwiftUI. Following the training, I was assigned to work on a live project for the firm. This internship gives freshmen experience in order for them to understand more about the industry. The goal was to learn enough so that we could work easily on the project that had been allocated to us.

## CHAPTER 02

### COMPANY DESCRIPTION

#### 2.1 Zopsmart Technologies

They are a cutting-edge retail technology firm that gives you all of the tools you need to start your own e-commerce business. They have a suite of solutions that will swiftly and simply enable you to reach your goals, whether you are a traditional retailer looking to expand your omnichannel business or an online-only shop looking to build your e-commerce business.



Fig 3: ZopSmart Logo

##### 2.1.1 Zopsmart Solutions

- **e-Commerce:** Provide your consumers with a first-rate buying experience
  - Quickly locate goods with intuitive search. Product listing that is personalized for convenience of ordering. Self-service rescheduling and returns for a seamless order experience.
- **m-Commerce:** Give your consumers a fantastic purchasing experience on mobile devices.
  - A website that is responsive and adjusts to all screen sizes. For a world-class experience, use native Android and iOS mobile applications. Cart persists across devices for convenience.

- **e-Wallet:** Use an integrated wallet to increase consumer loyalty - An integrated wallet allows for quick and easy checkout. Refunds and wallet cashback to promote repeat purchases Wallet-credit as gift cards for low-cost client acquisition
- **Order Management:** Manage your orders quickly and simply - All of your orders will be shown in a single interface, together with their data such as client name, amount, and order status. Order statuses change as each process step is completed. Option to add or remove items from the order.
- **Operations:** Give your clients exceptional service at the lowest possible cost by using the Store-manager mobile app to manage everyday chores. Inventory checker mobile app to ensure catalog correctness. Picker is a smartphone software that allows for error-free and efficient choosing and packaging. Dispatch module for the most efficient delivery route. Delivery smartphone app for consistent order delivery, risk-free payment collecting, and precisely choosing returns.
- **Monitoring and Analytics:** Manage your business with minimum oversight - Real-time tracking to monitor every area of your operation. Deviation notifications in the operations process to prompt urgent actions Intelligent analytics helps spot patterns and enhance processes. Detailed logs for each activity to help you track down any issues.

### 2.1.1 Zosmart Omni-channel solutions

- **Smart POS:** Provide your consumers with a genuinely omnichannel purchasing experience - One customer accounts for all channels (Walk-in, Online, Kiosk, and Tele). Allows for purchases and returns from any channel. A loyalty program that is shared across all channels. It also works offline.

- **Smart Self-checkout:** Queue-busting mobile app for your store - Scans product barcodes to add things to the basket. Uses the search box to add things to the basket. All contemporary online payment options are accessible. Allows for a rapid security check and exit from the business.
- **Smart Product-locator:** Product locator through the mobile app for your store's consumers - Uses WiFi or infrared beacons to determine the location of the consumer. Provides the exact path to the product. Notifies store employees to assist the customer. Notifies store personnel if an item is not located. Allows the consumer to self-checkout.

## 2.2 Zopsmart Major Clients

### 2.2.1 Kroger

The Kroger Firm, or simply Kroger, is an American retail company that runs supermarkets and multi-department shops throughout the United States (either directly or through subsidiaries). Kroger is the largest grocery chain in the United States by revenue, the third-largest general retailer after Walmart and Amazon, and the seventh-largest American-owned private employer in the United States. Kroger is placed #17 on the Fortune 500 list of the top firms in the United States by total revenue. It all began in 1883, and over 140 years later, the Kroger Company is still picky about how they serve their customers and communities, how they innovate, and who they recruit. They satisfy their customers' evolving demands by making fresh food available to all as America's largest grocer, with roughly 2,800 locations in 35 states operating under 28 distinct brands. Their present procedures are based on Barney Kroger's early attempts to serve consumers via product freshness, cheap pricing, and innovative basics, which continue to be at the core of Kroger's purpose today.



Fig 4: Kroger Logo

### 2.2.2 McAfee

McAfee is a multinational computer security software firm based in San Jose, California. McAfee primarily creates digital-security technologies for desktop computers and server devices, as well as mobile devices. McAfee's brands, products, and sub-products include the following: Currently available items

- McAfee Total Security
- LiveSafe by McAfee
- VPN McAfee Safe Connect
- McAfee Mobile Security for Android, iOS, and many others



Fig 5: McAfee Logo

## CHAPTER 03

### TOOLS AND TECHNOLOGIES USED

#### 3.1 Swift:

Swift is a general-purpose programming language that was designed with a contemporary approach to safety, performance, and software design principles in mind.

The Swift project's purpose is to provide the best available language for a wide range of applications, including system programming, mobile and desktop apps, and cloud services. Most significantly, Swift is intended to make it easier for developers to write and maintain proper applications. To accomplish this, we believe that the most apparent approach to creating Swift code should also be:

**Safe.** The most obvious technique of writing code should also be safe. Undefined behavior is the enemy of safety, and developer errors should be identified before the software is released to the public. Swift may appear severe at times when choosing safety, but we think that clarity saves time in the long run.

**Fast.** Swift is designed to be a successor for C-based languages like C, C++, and Objective-C. As a result, Swift's performance for most jobs must be equivalent to those languages. Performance must also be predictable and steady, rather than merely quick in spurts that require cleanup afterward. There are many languages with innovative properties, but being quick is uncommon.

**Expressive.** Swift leverages decades of advances in computer science to provide syntax that is easy to use and has current capabilities that developers demand. Swift, on the other hand, is never satisfied. We will continue to follow language improvements and embrace what works, developing to make Swift even better.



Fig 6: swift Logo

Swift has characteristics that make code easier to understand and write while yet providing the developer with the control required in a genuine systems programming language. Swift includes inferred types, which make code clearer and less prone to error, and modules, which eliminate headers and give namespaces. Memory is handled automatically, and semi-colons are not required.

Swift's features are intended to work together to produce a language that is both strong and enjoyable to use. Swift has the following extra features:

- Closures and function pointers have been combined.
- Multiple return values and tuples
- Generics
- Iteration across a range of collections that is quick and succinct
- Methods, extensions, and protocols are supported by structures.
- Patterns of functional programs, such as a map and filter
- Built-in error handling power

### 3.2 UIKit

When designing iOS applications, you'll most likely utilize the UIKit framework. It defines the fundamental elements of an iOS application, like labels and buttons, as well as table views and navigation controllers. Let's understand UIKit by showing sample file creation.



**Step 1:** go to file Create New Project, and select Single View Application.

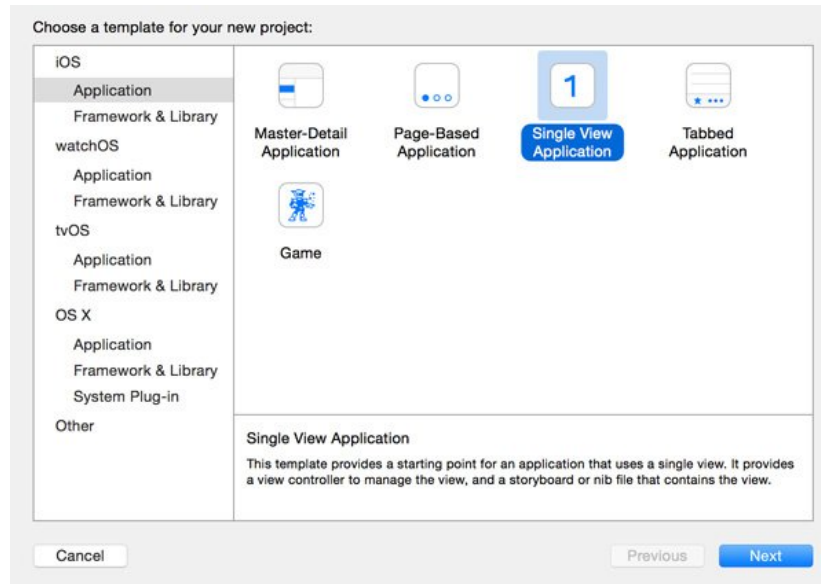


Fig 6: New Project Template Screen

**Step 2:** After Selecting Single View application select the targets for the project.

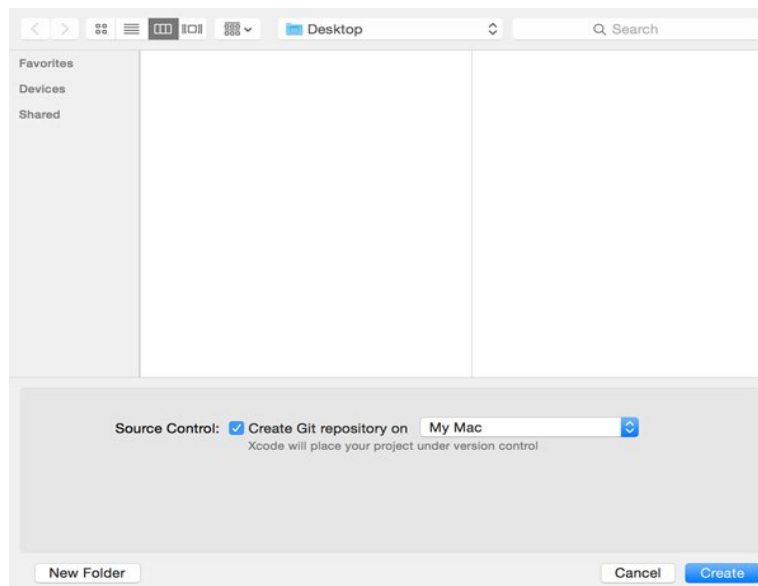


Fig 7: New Project Targets Screen

**Step 3:** Now we can see the application view created, where we change targets, build settings etc.

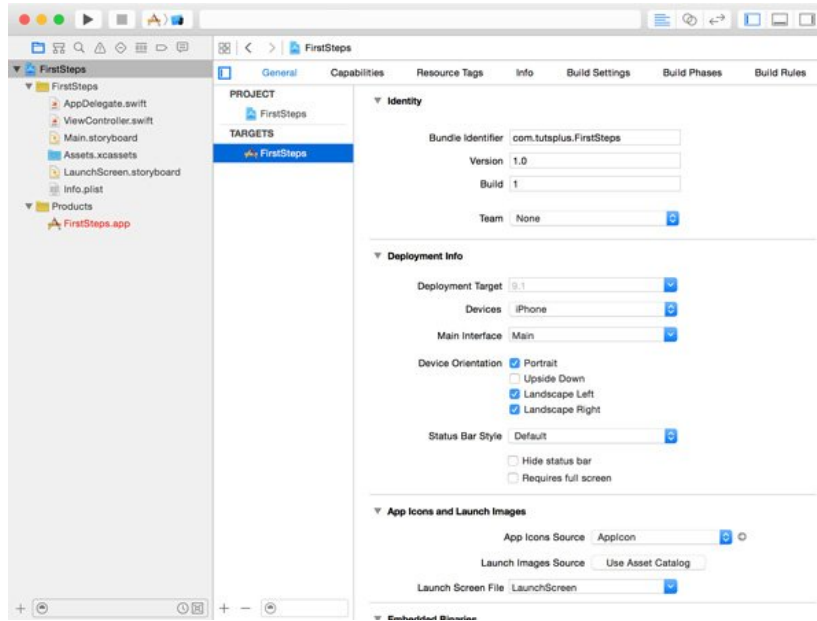


Fig 8: New Xcode Project View

**Step 4:** Here we create the folders and files containing View, Models, ViewModels and ViewControllers.

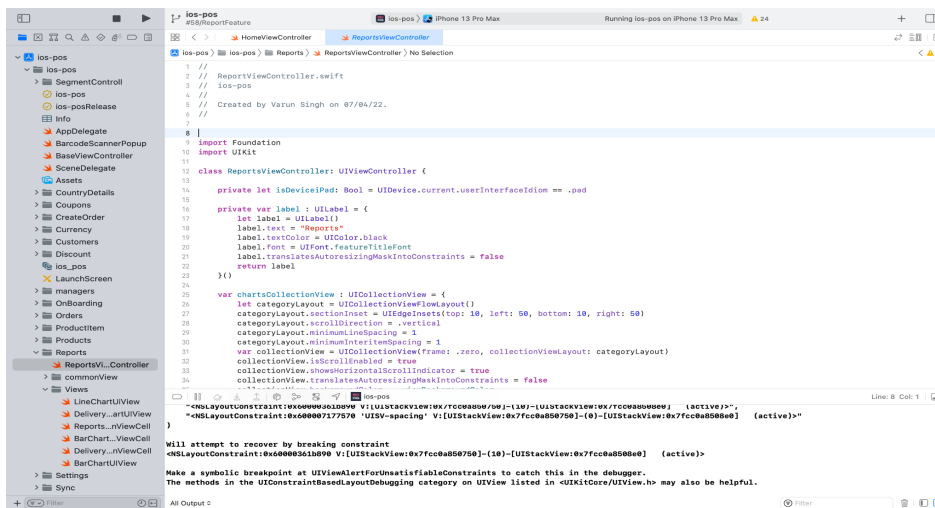


Fig 8: Xcode project of SmartPOS with multiple views and controllers

**Step 5:** Here we can see the StoryBoard LaunchScreen

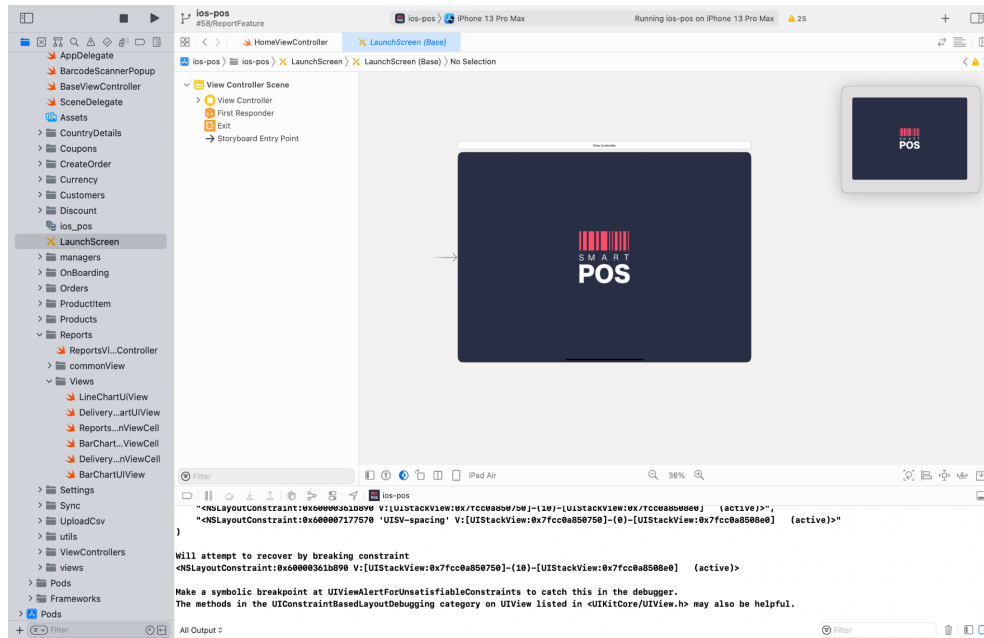


Fig 9: Xcode project of SmartPOS with StoryBoard Launch Screen.

### 3.3 Github

GitHub allows software developers and engineers to build public-facing cloud repositories for free. Downloading a GitHub repository to your device allows you to add and modify files locally before "pushing" your changes back to the repository, where they will be visible to the public.

#### 3.3.1 Repository

A repository is a part where all of the project's files are stored. Each project has its own repository, which may be accessed through a different URL.

#### 3.3.2 Forking a Repository

When you fork an existing project, you are creating a new one. This is a fantastic tool for encouraging the development of new apps and projects. If you find a project on GitHub

that you'd want to contribute to, fork it, make your modifications, and then republish it as a new repo. If the repository from which you forked to create your new project is changed, you may quickly apply changes to your existing fork.

### **3.3.3 Committing the changes**

Once you've staged the files you wish to add, you're ready to commit. Whether you commit using GitHub Desktop or the command line, the commit message is critical. Use short commit messages that summarize your change. Because commit messages will guide you through your repository's history, they should be informative. In command-line commits, the following message format can be used:

### **3.3.4 Pull Requests**

You've forked a repository, made a wonderful modification to the project, and want the original devs to notice it—and maybe incorporate it into the original project/repository. Create a pull request to do this. The original repository's authors can review your work and decide whether or not to include it in the official project. When you submit a pull request, GitHub provides an efficient communication channel between you and the primary project's maintainer.

## **3.4 Charles**

Charles is a debugging proxy tool, Charles for iOS allows you to collect and analyze network requests and answers on your iOS device. You can inspect metadata, headers, and bodies in the app, allowing you to diagnose your app's networking difficulties without the need for a computer.

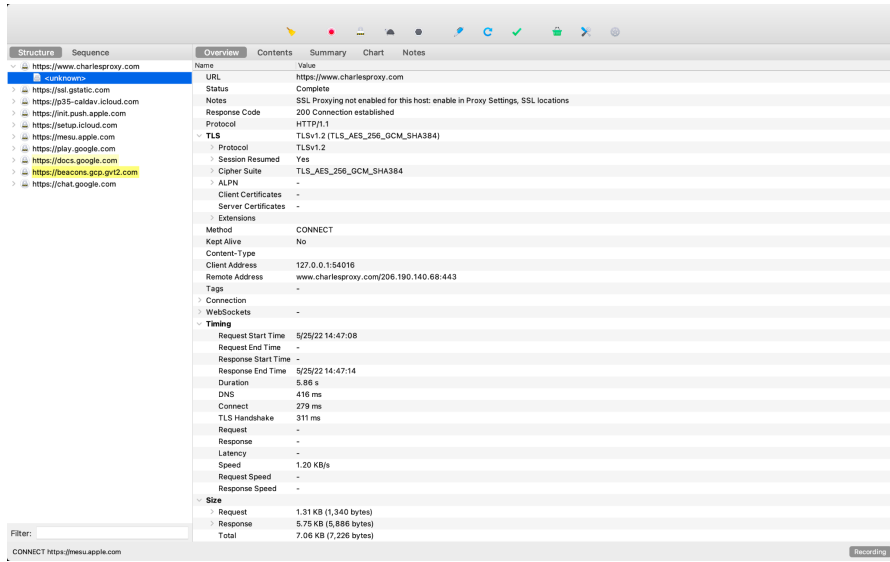


Fig 10: charles screen showing API calls

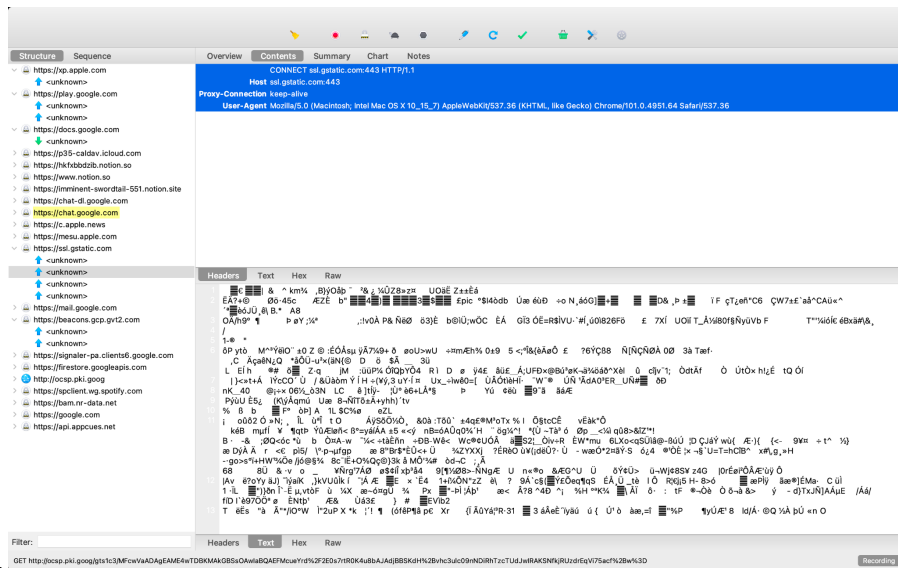


Fig 11: charles showing API Summary

## CHAPTER 04

### **LIVE PROJECT**

#### **4.1 Smart Self Checkout**

Smart Self Checkout is a very new and user friendly functionality that has been implemented in our product named Zopping. Queue-busting mobile app for your store - Scans product barcodes to add things to the basket. Uses the search box to add things to the basket. All contemporary online payment options are accessible. Allows for a rapid security check and exit from the business.

**PS:** Screenshots not shared because of confidentiality of feature, as the product is under progress.

#### **4.2 Smart POS (Point of Sale)**

Provide your consumers with a genuinely omnichannel purchasing experience - One customer accounts for all channels (Walk-in, Online, Kiosk, and Tele). Allows for purchases and returns from any channel. A loyalty program that is shared across all channels. It also works offline.

Smart Pos built mainly focuses on helping small to mid-level shops/supermarkets to get an automated tool for maintaining their inventory and seamless bill payment for customers. Currently it has major functionalities like Create Order, Add Products to inventory, Coupons, Weekly sales report, customer and order details.

It has functionality like printing the invoice where users can customize the header and footer. Currently this app has been deployed as a free app on App Store and Play Store. But to sync the shop data and permanently save on database users need to open an online shop account on our zopping platform.

## 4.2.1 Functionalities

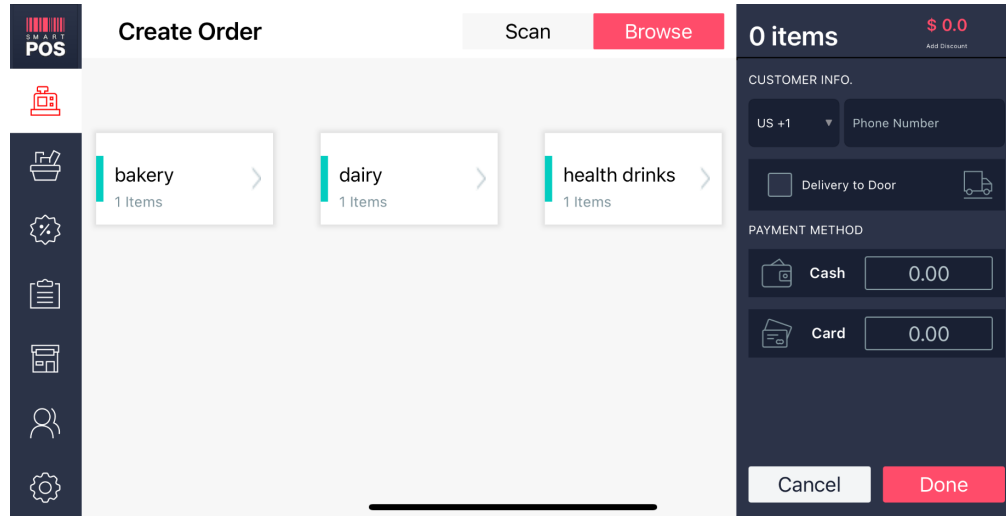


Fig 12: Create Order Screen showing all the available categories

Fig.12, is a create order screen in which we can see multiple categories of products available in the catalog. From this screen we can navigate to products of different categories so that we can add them to cart as shown in fig(2).

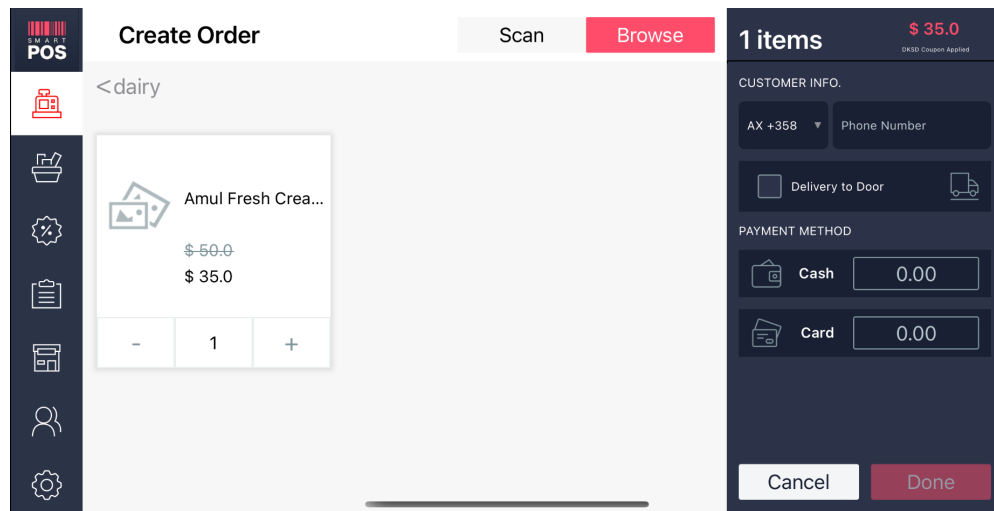


Fig 13: Create Order Screen showing all the available products inside a particular category

In Fig.13, is screen to show the list of all items present inside the specific category, from this screen we can see each item's description as well as we can add items to cart.

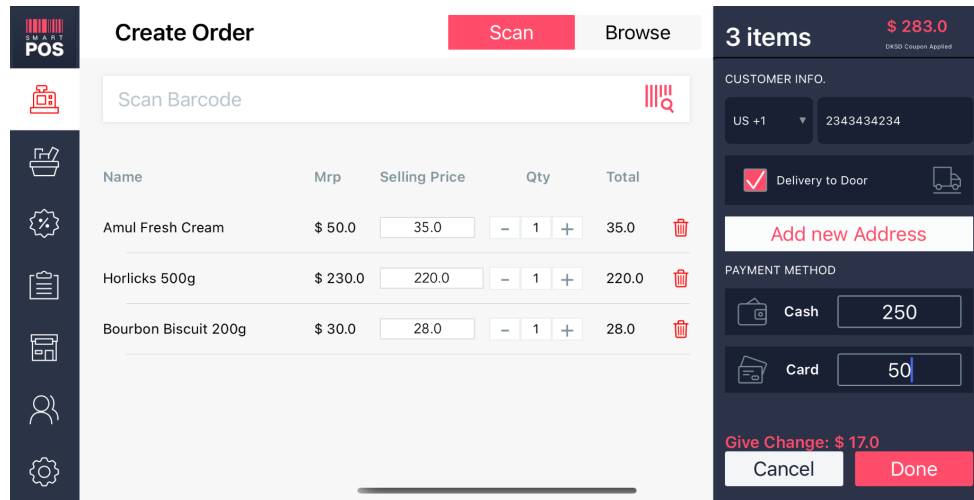


Fig 14: Create Order Screen Item List view

In Fig.14, is the screen where we can see there is a list of all Items which are added to the cart. From this screen we have one more major functionality that we can add products directly to the cart by scanning the product barcode or writing the barcode in the search box.

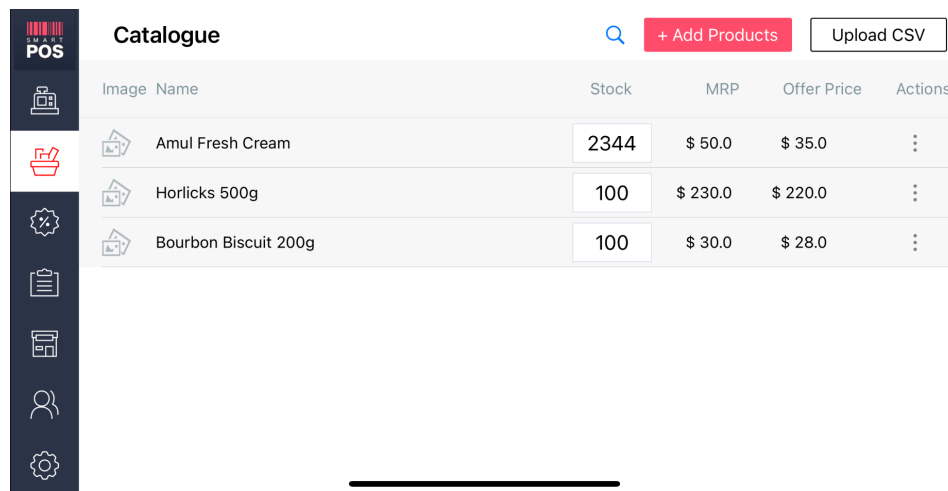


Fig 15: Catalog Screen



Fig.15 shows catalog screen we can see the list of all items present inside the catalog, from where we have lots of functionalities to see like Add Product, Upload CSV and Stock.

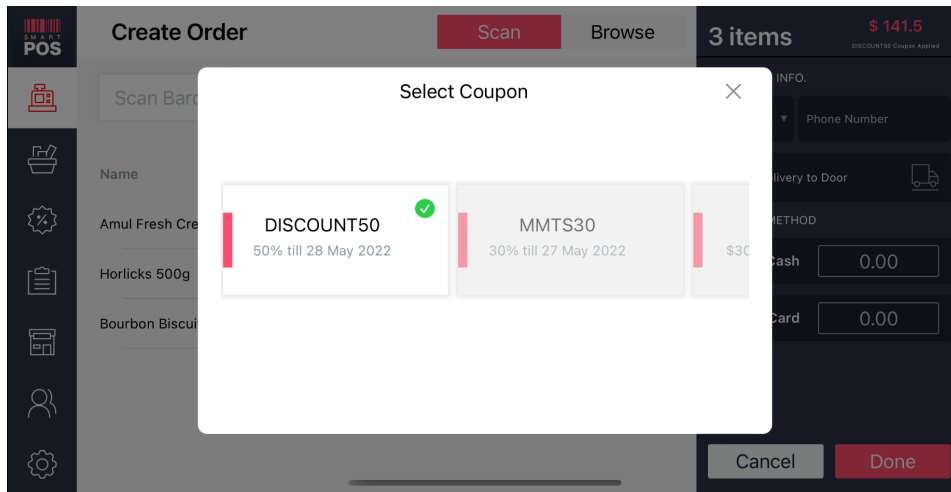


Fig 16: Coupons popup view Controller

In this Screen (fig.16) we can see the list of all coupons with their proper description like validity and percent, the coupons available gets visible and user interaction is enabled only when it is enabled from coupons main screen.

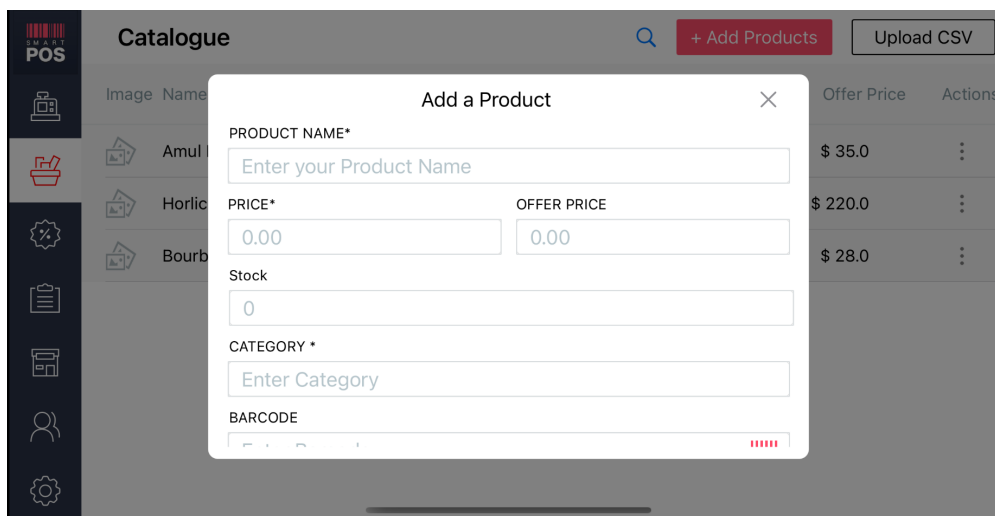


Fig 17: Add Product popup view Controller

In this Screen (fig 17) we can see the popup to add the product to the catalog.

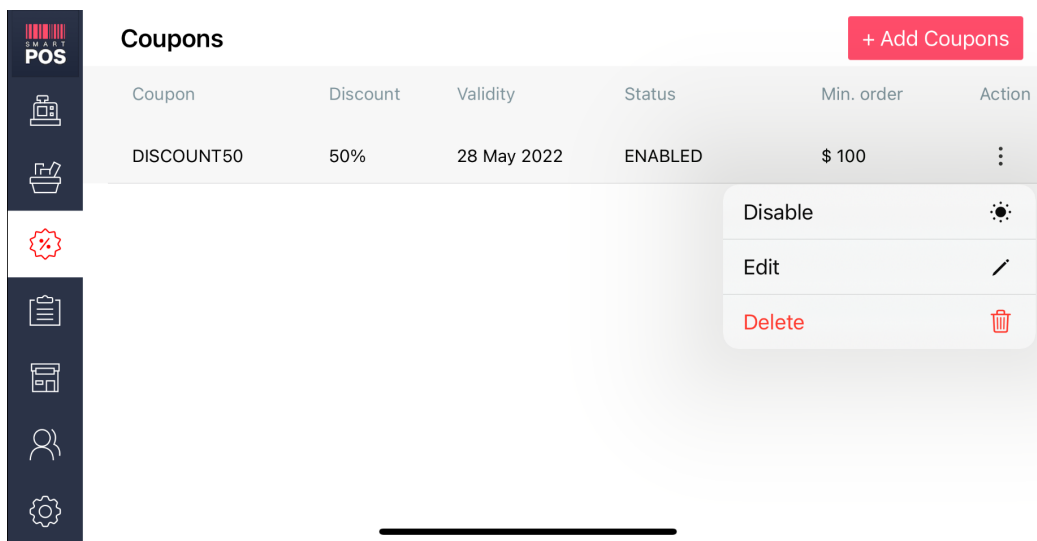


Fig 18: Coupons View Controller.

In this Screen (fig.18) we can see the coupons View Controller. Where there is a list of all the coupons available and we can handle the edit, delete and disable functionalities. And also we have added coupons functionality.

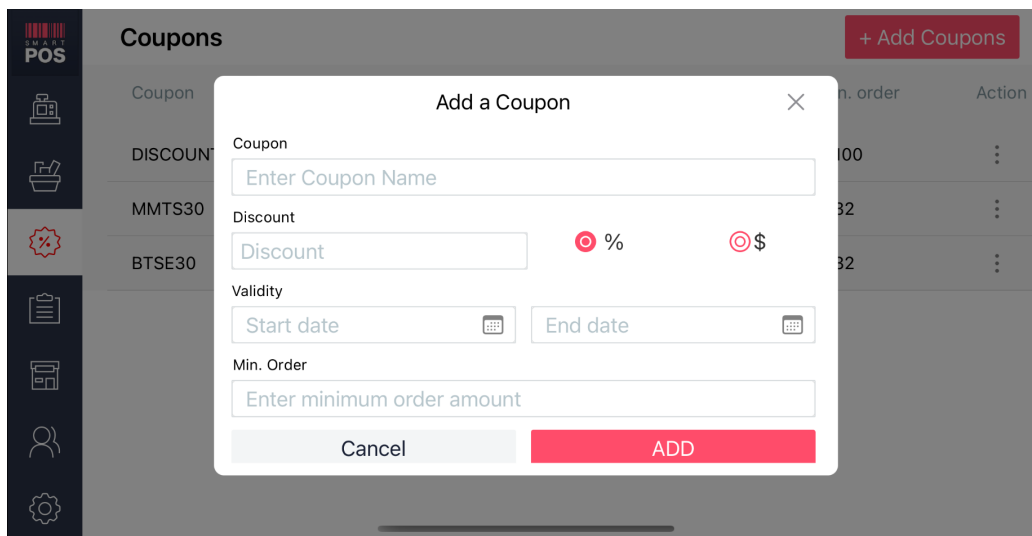


Fig 19: Add Coupons popupView.

In this Screen (fig.19) we can see the coupons popup view. Here we have different fields to add coupons.

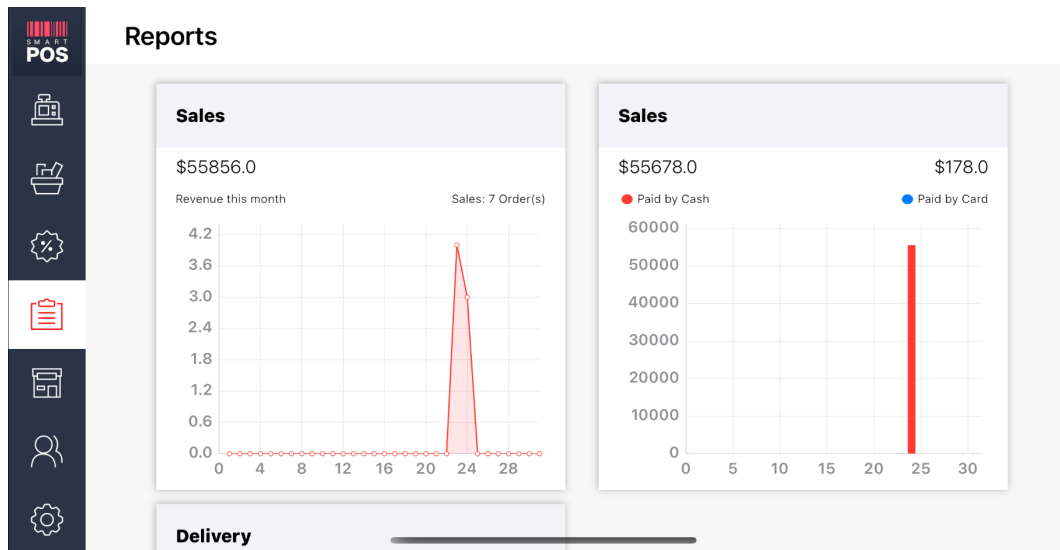


Fig 20: Reports View Controller.

In this Screen (fig.20) we can see the reports of daily sales, revenue generated, and mode of delivery.

The screenshot displays the 'Orders' section of a POS application. It features a sidebar with navigation icons and a table listing individual orders. Below the order list, there is a detailed view of the products included in an order, including their quantities, MRPs, selling prices, and total amounts.

Order ID	Status	Date	Mode	Total Amount
5	N/A	05-24-2022	Pick up	\$ 43.0
6	N/A	05-24-2022	Pick up	\$ 43.0
7	N/A	05-24-2022	Pick up	\$ 55555.0
8	N/A	05-25-2022	Pick up	\$ 141.5

Product Name	Quantity	Mrp	Selling Price	Total Amount
Amul Fresh Cream	1	\$ 50.0	\$ 35.0	\$ 35.0
Horlicks 500g	1	\$ 230.0	\$ 220.0	\$ 220.0
Bourbon Biscuit 200g	1	\$ 30.0	\$ 28.0	\$ 28.0

Fig 21: Orders View Controller.

In this Screen (fig.21) we can see the list of all orders placed with all the required details.

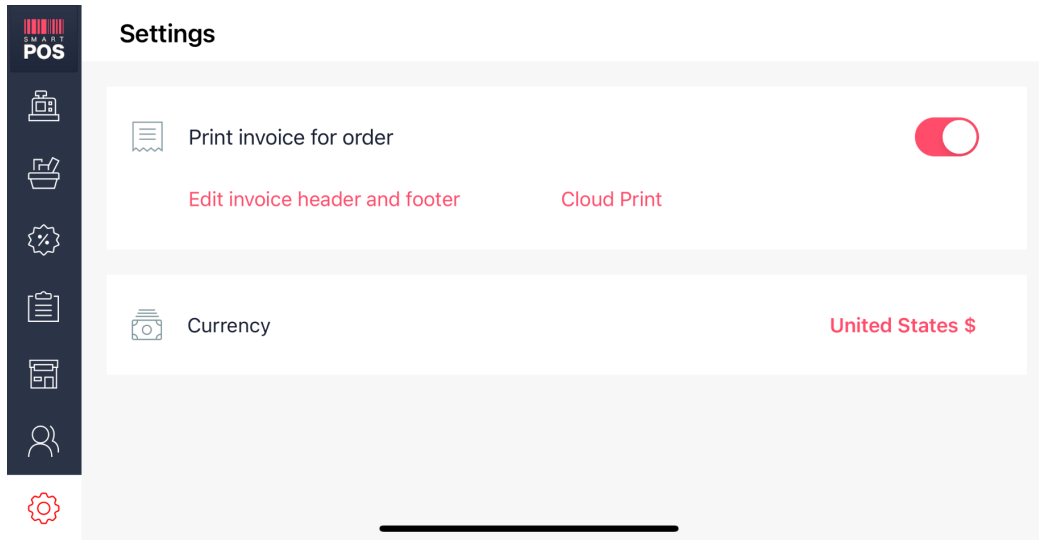


Fig 22: Settings View Controller.

In this Screen (fig.22) we can change the currency and also can customize the print functionality of invoice like header and footer.

## **CHAPTER 05**

### **CONCLUSION**

#### **5.1 Conclusion**

Finally, this internship has been a fantastic and gratifying experience. I can honestly state that my time with Zopsmart Technologies was quite useful to me. Needless to say, the technical aspects of my work aren't ideal and might be improved with more time. As someone with little prior expertise with iOS programming, I believe the time I spent learning and comprehending was well spent, as it aided in the creation of a completely functional app service. Time management and self-motivation are two of the most important principles I've learnt.

#### **5.1 Future Work**

As a result, any features and technologies I develop in the future will have a huge impact on small businesses by technologically elevating them and supporting them in easily constructing smart stores through touch. As a consequence, further work will be done in the future to create a better self-checkout experience for consumers, as well as a more accurate and up-to-date point of sale application.

#### **5.2 Mentor's Review**

He performed admirably during training; he is a quick learner who takes less time to comprehend concepts. At the same time, he has exceptional problem-solving skills, making him an invaluable asset to our organization.

**Jeni Kanth**  
**Senior Software Engineer,**

## References

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1. About Zopsmart Technologies from ZopSmart.com <https://zopsmart.com/>
2. Smart POS | App Store <https://apps.apple.com/in/app/smart-store-pos/id1622027004>
3. Swift Official Documentation <https://www.swift.org/>
4. McAfee official website <https://www.mcafee.com/>
5. Kroger website <https://www.kroger.com/>

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