B.Sc. Engg. Project

PACIFIC WORLD

A Project on Point of Sale

by

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Abstract

Compliance associates provide support service to the BIC (Branch In-Charge) in all branches. The main activity is to identify non-compliance occurring in branches. Notify the BIC for the better operation of the branches.

Contents

Chapter 1

Introduction

1.1 System Description

The POS stands for point of sale which is a process where a transaction is made when customers select some product and finalize it after checking out from the main window. It is very useful for keeping the track record of inventory and the number of sales made per day. There are many benefits of using this method including better user experience, retention of customers, price customization of every product, and keeping the track record of the previous purchase history of the customers. This process refrains you from using old traditional methods of carrying out sale process in which cash registers were used.

Figure 1.1: POS system in a shop

1.2 Objectives

- point-of-sale (POS) system provides businesses with the ability to computerize
- **s**ystematize and correlate retail information
- cash registers, including complex register systems
- limited information collection capacity
- systems can gather, store and return detailed reports on inventory trends and customer information

1.3 Audience

- Accountant
- Administrator
- Cashier
- Manager
- Super Admin

1.4 Motivation

- **P**erceived Organizational Support (POS) demonstrates the extent to which employees believe that their organization values their contributions.
- **P**erceived Organizational Support also shows how the organization cares about the well-being of its employees
- **H**ow it can possibly meet their socio-emotional needs.
- **P**erceived Organizational Support arose from the organizational support theory developed by Robert Eisenberger, an American professor of psychology and management and Linda Rhoades Shanock, an American organizational psychologist, among others.

- **I**n general, Perceived Organizational Support contributes to a positive reciprocity dynamic with personnel; as soon as the employee has a good perception of the organization, their efforts and work will improve.
- **T**his has to do with the fact that employees generally perform better after receiving rewards, regardless of whether these are intrinsic or extrinsic incentives.
- **O**ne is the result of the other; as such, this brings about a successive (reciprocal) dynamic

1.5 Scope of the system

- **I**nvoicing: Selling, Buying, Renting and Repairing
- **I**nventory Management
- **C**ustomer Orders and Suppliers Orders Management
- **I**ntegrated Supplier Purchasing
- **C**onsistent and Customizable Reports
- **M**ulti-Store Management

1.6 System Development Life Cycle(SDLC)

1.6.1 What is SDLC?

The System Development Life Cycle (SDLC) is a structured process that enables the production of high-quality, low-cost software, in the shortest possible production time. The goal of the SDLC is to produce superior software that meets and exceeds all customer expectations and demands.SDLC works by lowering the cost of software development while simultaneously improving quality and shortening production time. SDLC achieves these apparently divergent goals by following a plan that removes the typical pitfalls of software development projects. That plan starts by evaluating existing systems for deficiencies.

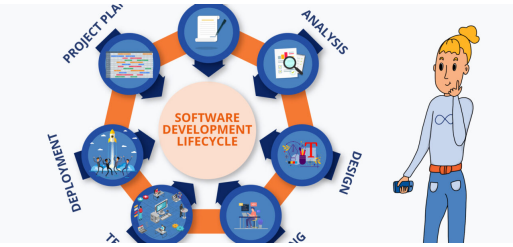

Figure 1.2: The Seven Phases of the SDLC

1.6.2 Identifying Our Problem, Opportunities And Objectives

Problems :

- **H**acker detection is a crucial component of keeping your POS system and customers' credit card information secure.
- **O**ne of the main benefits of switching to a digital POS system is the breadth of reporting analytics at your fingertips.
- **A**nother reason to upgrade to a new POS system is for optimal tracking and reporting on sales and promotions.
- **L**ike any new system you incorporate into your business, there are going to be employees who struggle to use it optimally, or even at all.
- **B**uying a tablet and enabling it with an off-the-shelf POS system is certainly one way to upgrade your business.
- **A** solid WiFi network is an essential part of your business plan.

Opportunities :

- **B**etter Inventory Management.
- **S**imple Invoicing.
- **Q**uick Payments.
- **B**etter Customer Management.
- **B**etter Customer Orders.

- **B**etter Purchasing / Supplier Order Management.
- **B**etter Customer Experience.
- **B**etter Customer Satisfaction Loyalty.

Objectives :

- **I**nventory Management.
- **C**ustomer Data.
- **A**ccounting Automation.
- **O**verall Objectives.

1.6.3 Determining Human Information Requirements

The next phase the analyst enters is that of determining the human needs of the users involved, using a variety of tools to understand how users interact in the work context with their current information systems. The analyst will use interactive methods such as interviewing, sampling and investigating hard data, and questionnaires, along with unobtrusive methods, such as observing decision makers' behavior and their office environments, and all-encompassing methods, such as prototyping

1.6.4 Analysing System Needs

- **I**nventory
- **T**op seller products
- **S**ales trend
- **R**eturns, Exchanges, Refunds
- **C**ustomer Insights
- **S**taff performance

- **W**hat to buy
- **H**ow to buy

1.6.5 Designing The Recommended System

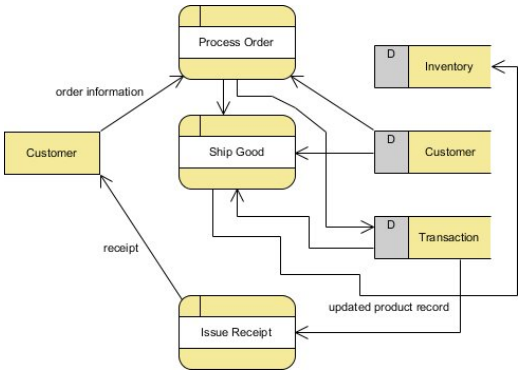

Figure 1.3: Data Flow Diagram (DFD)

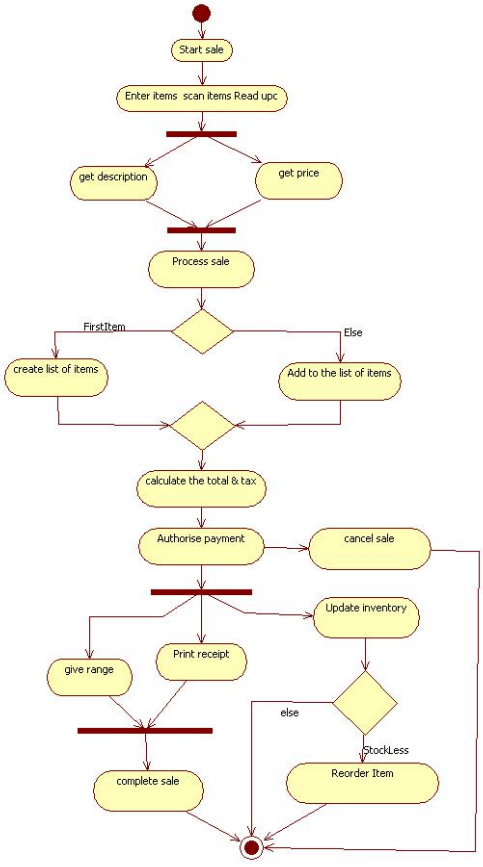

Figure 1.4: Activity Diagram

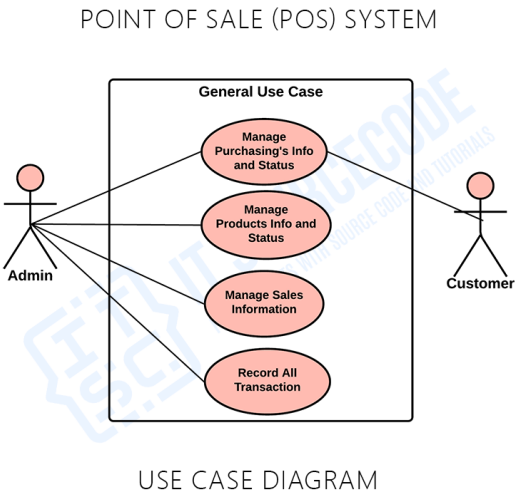

Figure 1.5: Use Case Diagram

1.6.6 Developing Language And Documenting Software

- **F**ront end : HTML5, CSS3, JavaScript ES6, Bootstrap5, React.
- **B**ack end : Node.js, MySQL
- **D**ocumentation: Latex

1.6.7 Testing And Maintaining System

Unit Testing :

- **L**ogin/Logout Authentication
- **A**dmin Authorization
- **U**ser Authorization

Performance Testing

- **R**un time Check
- **O**ptimization
- **S**peed Testing

- **U**ser Limitation
- **O**verall Testing

1.6.8 Implementing And Evaluating System

■ Implementing

- **E**ngage Staff From the Start of the Selection Process.
- **E**nsure Your System Has Five Key Capabilities
- **T**rain, Train, Train
- **E**stablish Guidelines for Mobile POS Usage
- **S**et Up Security Measures From the Beginning

■ Evaluating

- **E**fficient Pricing/Tagging Application
- **S**ecure, Flexible, and Fast Checkout
- **S**ales Reporting and Data Analytics
- **I**nventory Management
- **C**ustomer Management

Chapter 2

Methodology

2.1 Feasibility Analysis

Feasibility Study can be considered as preliminary investigation that helps the management to take decision about whether study of system should be feasible for development or not.It identifies the possibility of improving an existing system, developing a new system, and produce refined estimates for further development of system. It is used to obtain the outline of the problem and decide whether feasible or appropriate solution exists or not. The main objective of a feasibility study is to acquire problem scope instead of solving the problem. The output of a feasibility study is a formal system proposal act as decision document which includes the complete nature and scope of the proposed system.

2.1.1 Technical Feasibility

- It investigates the technical feasibility of each implementation alternative.
- It analyzes and determines whether the solution can be supported by existing technology or not.
- The analyst determines whether current technical resources be upgraded or added it that fulfill the new requirements.
- It ensures that the candidate system provides appropriate responses to what extent it can support the technical enhancement.

2.1.2 Operational Feasibility

Operational feasibility is dependent on human resources available for the project and involves projecting whether the system will be used if it is developed and implemented. Operational feasibility is a measure of how well a proposed system solves the problems, and takes advantage of the opportunities identified during scope definition and how it satisfies the requirements identified in the requirements analysis phase of system development. Operational feasibility reviews the willingness of the organization to support the proposed system. This is probably the most difficult of the feasibility's to gauge. In order to determine this feasibility, it is important to understand the management commitment to the proposed project. If the request was initiated by management, it is likely that there is management support and the system will be accepted and used. However, it is also important that the employee base will be accepting of the change. The essential questions that help in testing the operational feasibility of a system include the following:

- Does current mode of operation provide adequate throughput and response time?
- Does current mode provide end users and managers with timely, pertinent, accurate and useful formatted information?
- Does current mode of operation provide cost-effective information services to the business?
- Could there be a reduction in cost and or an increase in benefits?
- Does current mode of operation offer effective controls to protect against fraud and to guarantee accuracy and security of data and information?
- Does current mode of operation make maximum use of available resources, including people, time, and flow of forms?
- Does current mode of operation provide reliable services
- Are the services flexible and expandable?
- Are the current work practices and procedures adequate to support the new system?

- If the system is developed, will it be used?
- Manpower problems
- Labour objections
- Manager resistance
- Organizational conflicts and policies
- Social acceptability
- Government regulations
- Does management support the project?
- Are the users not happy with current business practices?
- Will it reduce the time (operation) considerably?
- Have the users been involved in the planning and development of the project?
- Will the proposed system really benefit the organization?
- Does the overall response increase?
- Will accessibility of information be lost?
- Will the system affect the customers in considerable way?
- Legal aspects

2.1.3 Economical Feasibility

- Costs for technology

  To produce an e-commerce website requires a high speed connection to the Internet, a web server, and software. Other costs that are relevant is the cost of the payment system, whether it is taking online payment directly from the Society's web site or an alternative third-party like Pay pal or more expensively using an online bank.

- Costs for technological development

  This will involve a number of programmers who are able to interpret your functional requirements and program/create your website.

- Costs for the consultancy support (design and implementation)

  You would require the services of specialists in e-business design and implementation to guide you through this process.

- Costs for the organisation for piloting training

  During the technological development of a website it is always a good idea to allow admin staff who will be using the system on a daily basis to pilot the system to as a training initiative.

- Running costs

  These are an upkeep of the web server and maintenance costs.

- Running costs for change process

  This is the cost of factoring in for your employees to train and adapting to the newly introduced technology, mainly the strategies used to make the change as smooth as possible.

  Additionally being on the Internet would result in the your company having to become familiar to respond to emails, queries, and complaints that require instant or quick responses as opposed to replying to a Customer/Client via a letter. To be successful online, your company would have to address this issue of Change Management in that it would have to incorporate into its business, processes in order to guide the company to successfully maximise its effectiveness on the Internet.

2.2 Context Level Diagram

2.2.1 What is Context Level Diagram?

Context diagrams show the interactions between a system and other actors (external factors) with which the system is designed to interface. System context diagrams can be helpful in understanding the context which the system will be part of.Context diagrams are high-level diagrams, meaning they don't go into the detailed ins and outs of the system. Instead, they map out an entire system in a way that's simple, clear, and easy to understand. For example, arrows are used to represent the flow of data between the system and each external element.

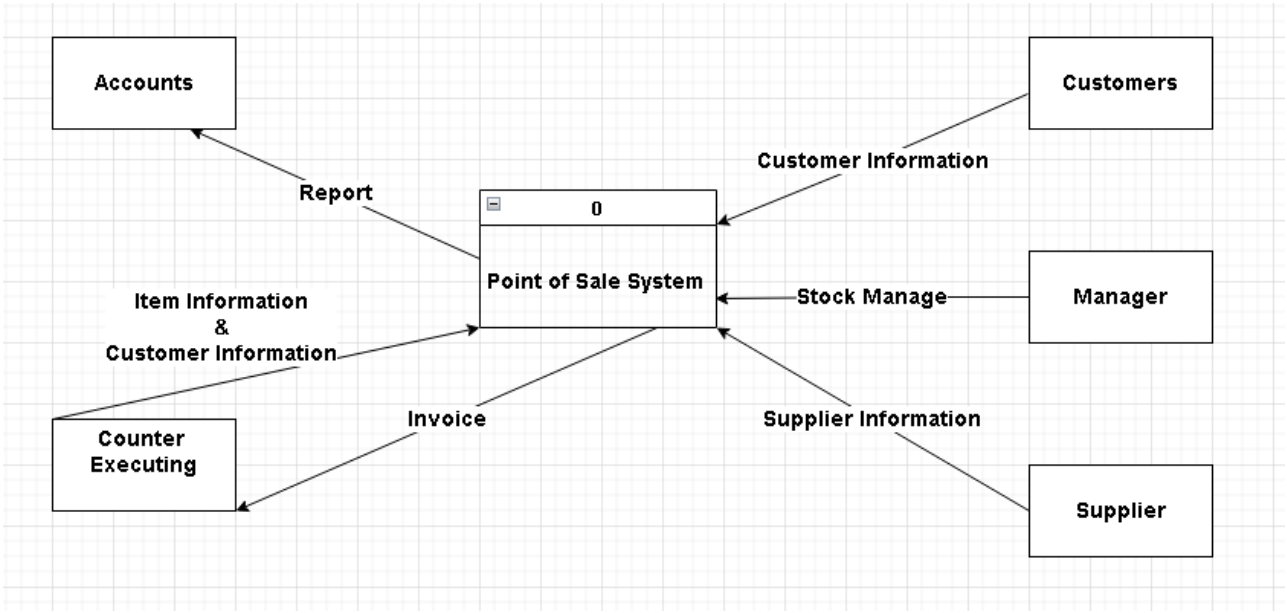

Figure 2.1: Context Level Diagram

2.3 Use Case Diagram

2.3.1 What is Use Case Diagram?

Use-case diagrams describe the high-level functions and scope of a system. These diagrams also identify the interactions between the system and its actors. The use cases and actors in use-case diagrams describe what the system does and how the actors use it, but not how the system operates internally. First, you need to organize your four key elements — system, actors, use cases and relationships. Then, arrange them visually in a way that makes sense and will allow you to see immediately the connections between them.

2.3.2 How to Draw a Use Case Diagram?

A Use Case model can be developed by following the steps below.

- Identify the Actors (role of users) of the system.
- For each category of users, identify all roles played by the users relevant to the system.
- Identify what are the users required the system to be performed to achieve these goals.
- Create use cases for every goal.
- Structure the use cases.
- Prioritize, review, estimate and validate the users.

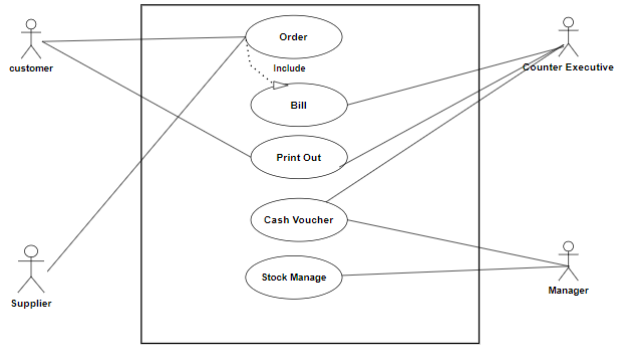

Figure 2.2: Use Case Diagram

2.4 Sequence diagram

2.4.1 What is a sequence diagram?

A sequence diagram is a Unified Modeling Language (UML) diagram that illustrates the sequence of messages between objects in an interaction. A sequence diagram consists of a group of objects that are represented by lifelines, and the messages that they exchange over time during the interaction. The sequence diagram is a good diagram to use to document a system's requirements and to flush out a system's design. The reason the sequence diagram is so useful is because it shows the interaction logic between the objects in the system in the time order that the interactions take place.

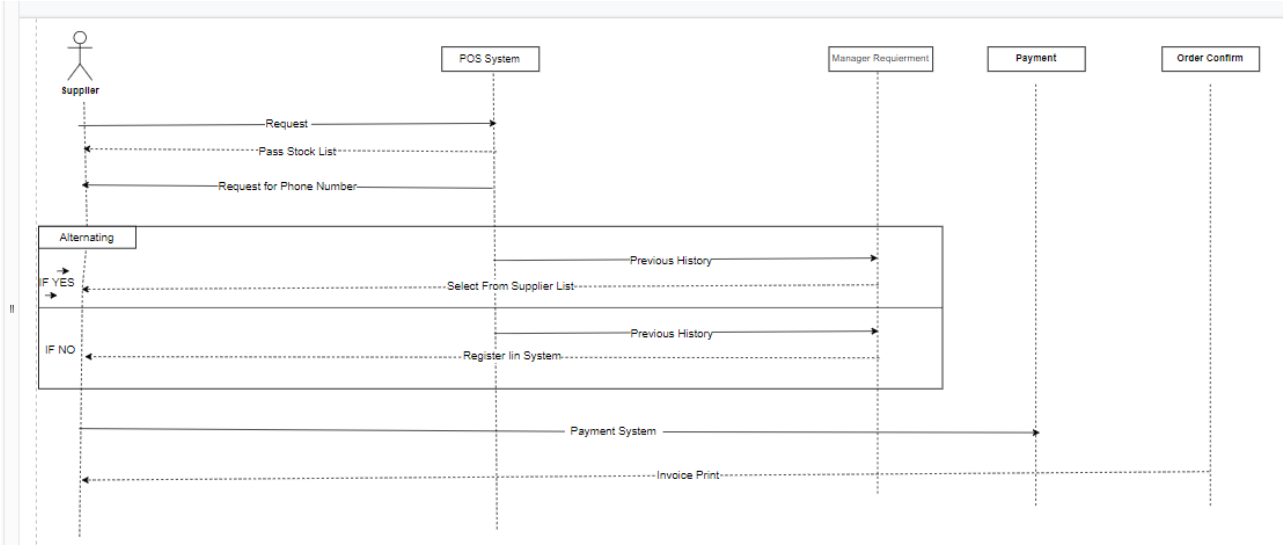

Figure 2.3: Sequence Diagram 1

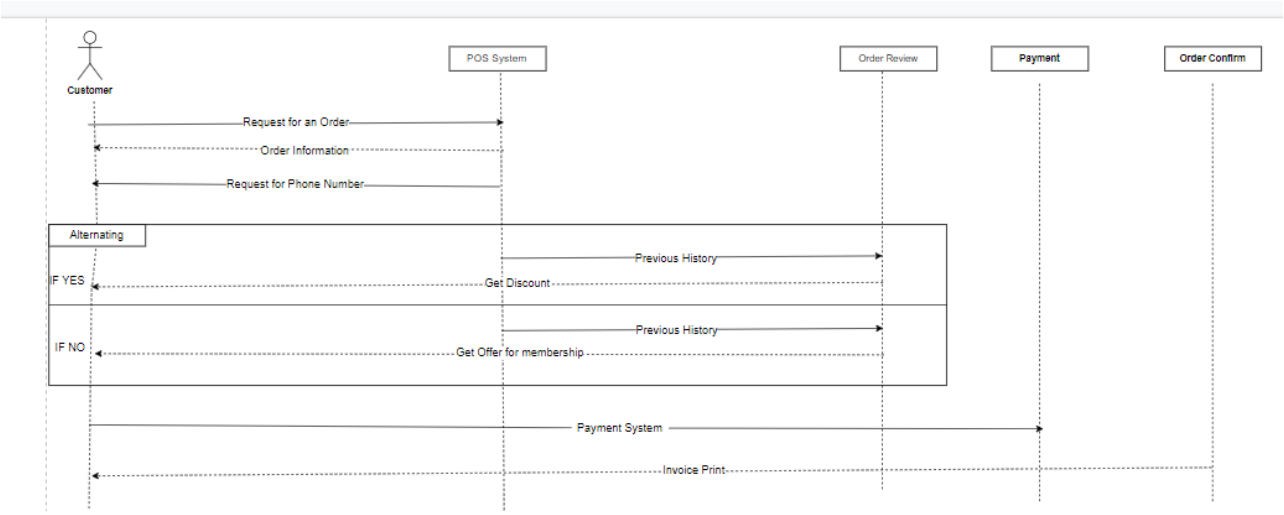

Figure 2.4: Sequence Diagram 2

Chapter 3

Implementation

3.1 Software Tools

3.1.1 Oracle APEX

Oracle APEX (also known as APEX or Oracle Application Express) is an enterprise low-code development platform from Oracle Corporation that is used to develop and deploy web applications on Oracle databases.

Figure 3.1: Oracle APEX

3.1.2 Oracle SQL Workshop

SQL Workshop allows you to create, view, and maintain your database objects. All you need is your web browser.

3.2 System Images

3.2.1 Login Page

In our login page we need username and password to sign in this system.Only admin can access this page.

Figure 3.2: Login Page

USERS

Table | Data | Indexes | Model | Constraints | Grants | Statistics | UI Defaults | Triggers | Dependencies | SQL | REST | Sample Queries

Add Column | Modify Column | Rename Column | Drop Column | Rename | Copy | Drop | Truncate | Create Lookup Table | Create App

Column Name	Data Type	Nullable	Default	Primary Key
USER_ID	NUMBER	No	-	1
USER_NAME	VARCHAR2(255)	No	-	-
PASSWORD	VARCHAR2(255)	No	-	-

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Figure 3.3: Database of Login Page

3.2.2 Home Page

This is our home page. There are four items. These item are home,sale,item,administration.

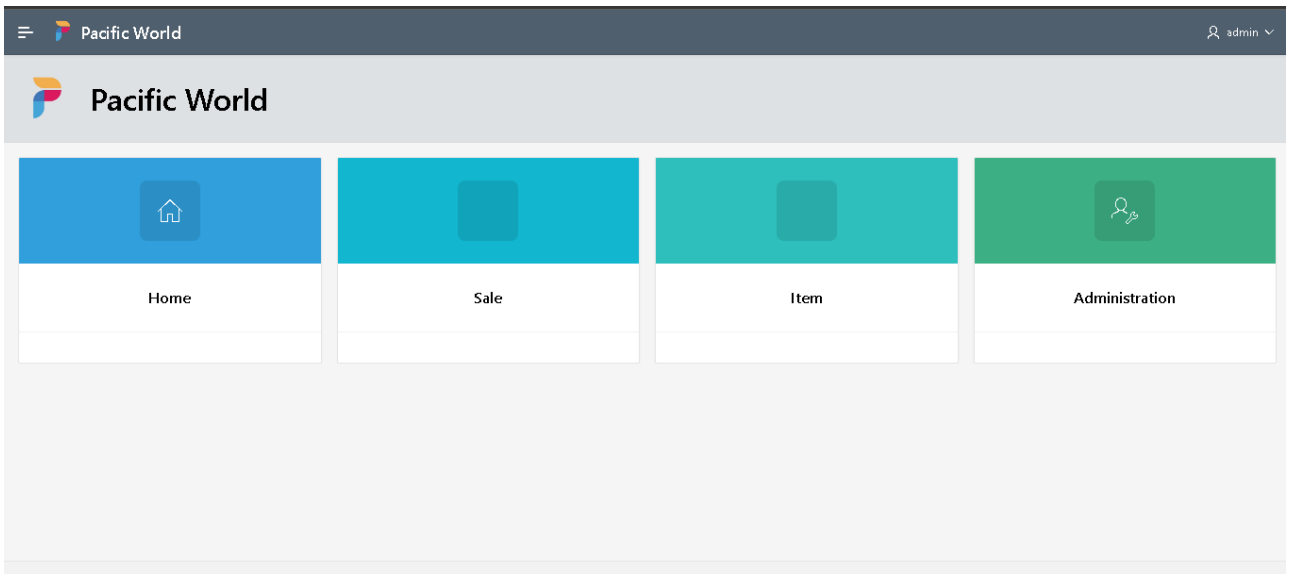

Figure 3.4: Home Page

3.2.3 Item Page

Item page will add new product. We can see our product name and product details.

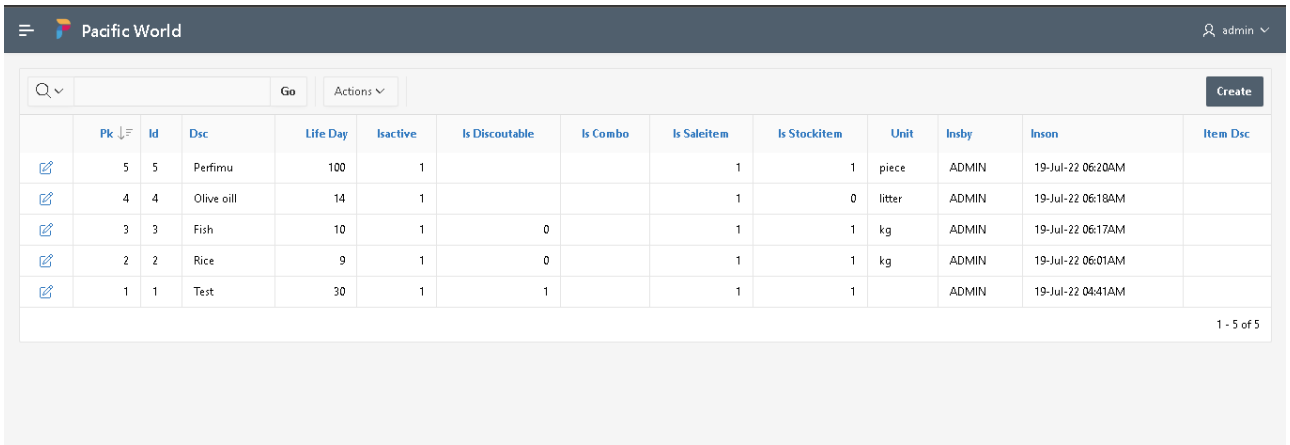

Figure 3.5: Item Page

A$ITEM_INFO

ITEMTYPE_FK	NUMBER(5,0)	Yes	-	-
LIFE_DAY	NUMBER(3,0)	Yes	-	-
ISACTIVE	NUMBER(1,0)	No	1	-
APPUSER	VARCHAR2(40)	Yes	-	-
INSBY	VARCHAR2(40)	Yes	-	-
INSON	VARCHAR2(40)	Yes	-	-
UPDBY	VARCHAR2(40)	Yes	-	-
UPDON	VARCHAR2(40)	Yes	-	-
IS_DISCOUTABLE	NUMBER(1,0)	Yes	-	-
IS_COMBO	NUMBER(1,0)	Yes	-	-
IS_SALEITEM	NUMBER(1,0)	No	'0'	-
IS_STOCKITEM	NUMBER(1,0)	No	'0'	-
IS_FORMULATIONITEM	NUMBER(1,0)	Yes	1	-
UNIT	VARCHAR2(20)	Yes	-	-
IS_ENTRY_COUNTER	NUMBER(1,0)	Yes	-	-
IS_FOOD_COUNTER	NUMBER(1,0)	Yes	-	-
ITEM_DSC	VARCHAR2(255)	Yes	-	-
IS_HOLIDAY	NUMBER(1,0)	Yes	2	-

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Figure 3.6: Item Information Database Table

3.2.4 Item Form

Here we can add our item name, expiration date, stock, unit

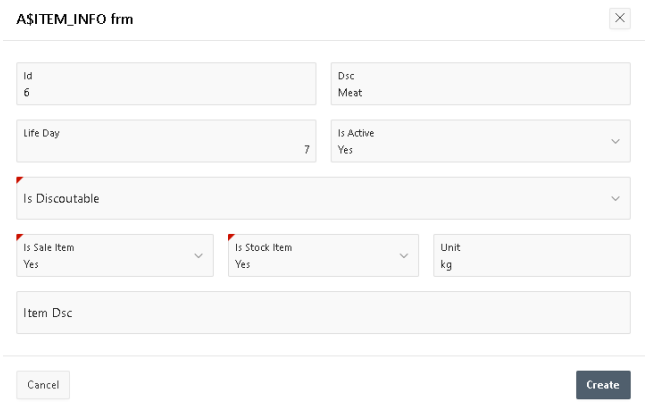
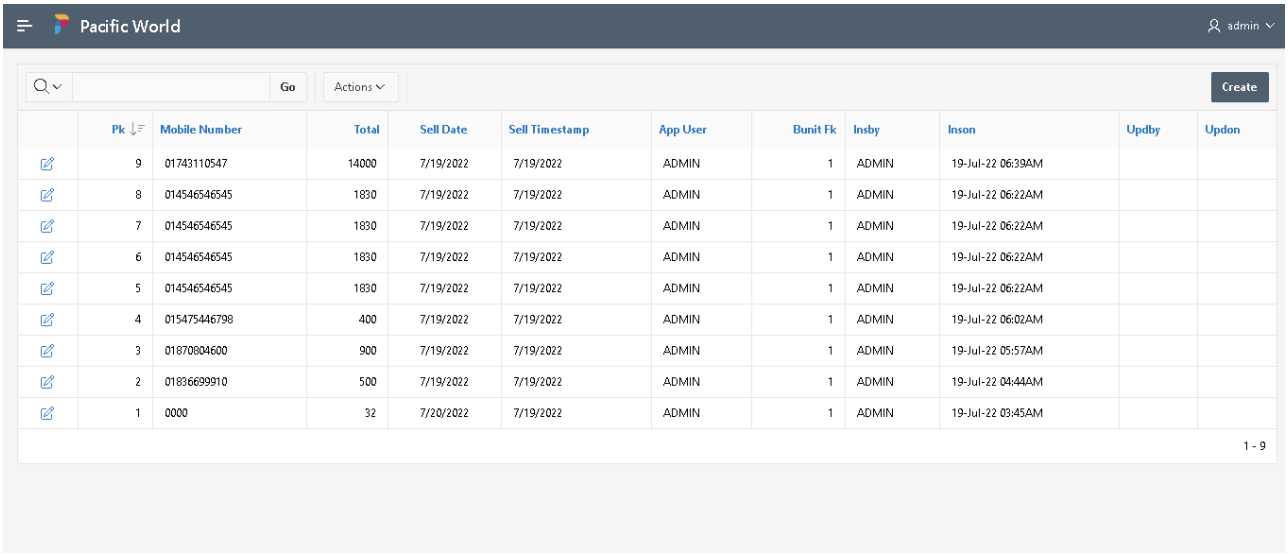


Figure 3.7: Item Form

3.2.5 Sale Page

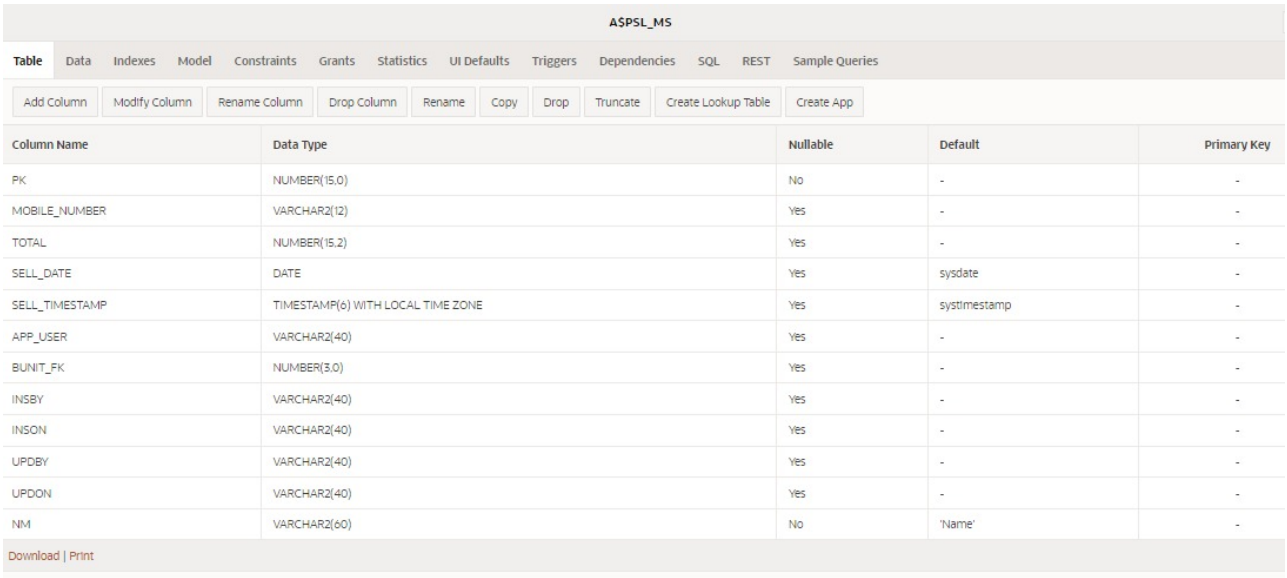
Here we can see our all sale details with customer phone number



	Pk	Mobile Number	Total	Sell Date	Sell Timestamp	App User	Bunit Fk	Insby	Inson	Updby	Updon
	9	01743110547	14000	7/19/2022	7/19/2022	ADMIN	1	ADMIN	19-Jul-22 06:39AM		
	8	014546546545	1830	7/19/2022	7/19/2022	ADMIN	1	ADMIN	19-Jul-22 06:22AM		
	7	014546546545	1830	7/19/2022	7/19/2022	ADMIN	1	ADMIN	19-Jul-22 06:22AM		
	6	014546546545	1830	7/19/2022	7/19/2022	ADMIN	1	ADMIN	19-Jul-22 06:22AM		
	5	014546546545	1830	7/19/2022	7/19/2022	ADMIN	1	ADMIN	19-Jul-22 06:22AM		
	4	015475446798	400	7/19/2022	7/19/2022	ADMIN	1	ADMIN	19-Jul-22 06:02AM		
	3	01870804600	900	7/19/2022	7/19/2022	ADMIN	1	ADMIN	19-Jul-22 05:57AM		
	2	01836699910	500	7/19/2022	7/19/2022	ADMIN	1	ADMIN	19-Jul-22 04:44AM		
	1	0000	32	7/20/2022	7/19/2022	ADMIN	1	ADMIN	19-Jul-22 03:45AM		

1 - 9

Figure 3.8: Sale Page



Column Name	Data Type	Nullable	Default	Primary Key
PK	NUMBER(15,0)	No	-	-
MOBILE_NUMBER	VARCHAR2(12)	Yes	-	-
TOTAL	NUMBER(15,2)	Yes	-	-
SELL_DATE	DATE	Yes	sysdate	-
SELL_TIMESTAMP	TIMESTAMP(6) WITH LOCAL TIME ZONE	Yes	systimestamp	-
APP_USER	VARCHAR2(40)	Yes	-	-
BUNIT_FK	NUMBER(3,0)	Yes	-	-
INSBY	VARCHAR2(40)	Yes	-	-
INSON	VARCHAR2(40)	Yes	-	-
UPDBY	VARCHAR2(40)	Yes	-	-
UPDON	VARCHAR2(40)	Yes	-	-
NM	VARCHAR2(60)	No	'Name'	-

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Figure 3.9: Sale form database Table

3.2.6 Sale Form

Here we can add customer phone number, chosen products of customer, qty, and total amount.

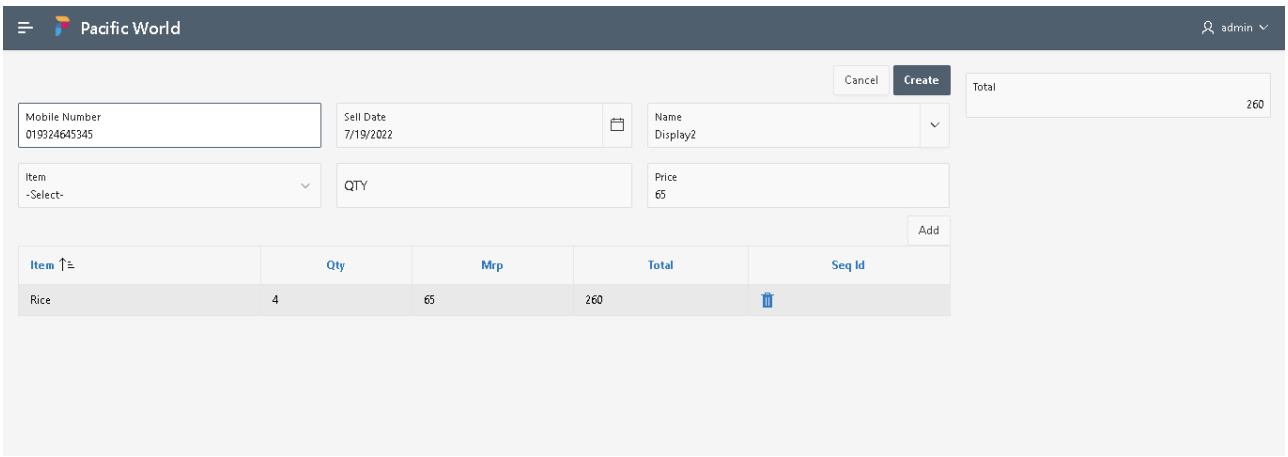


Figure 3.10: Sale Form

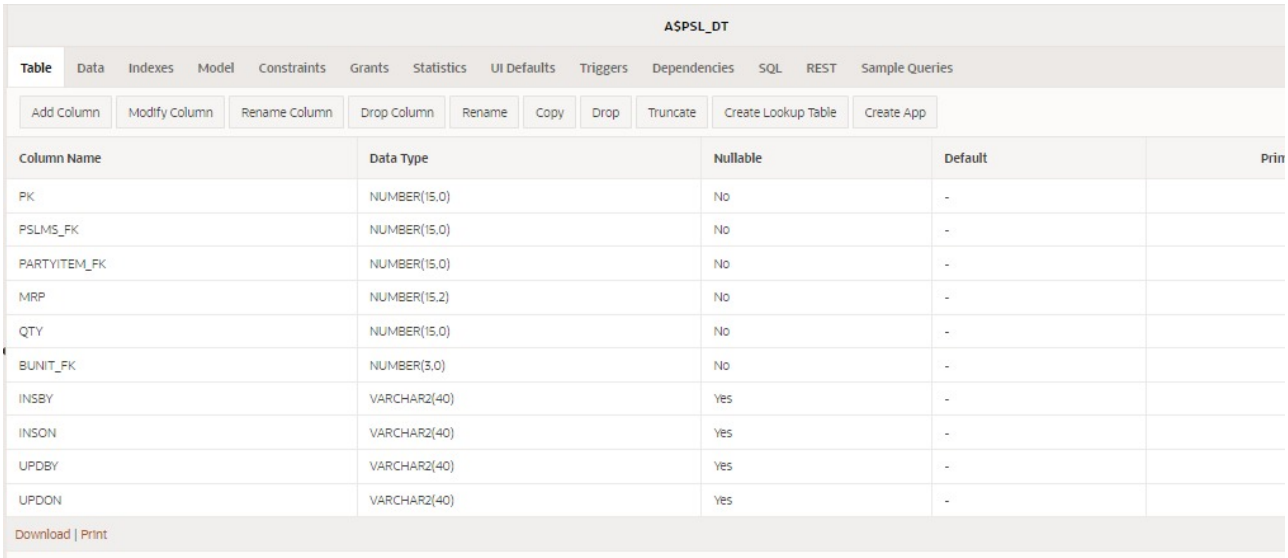
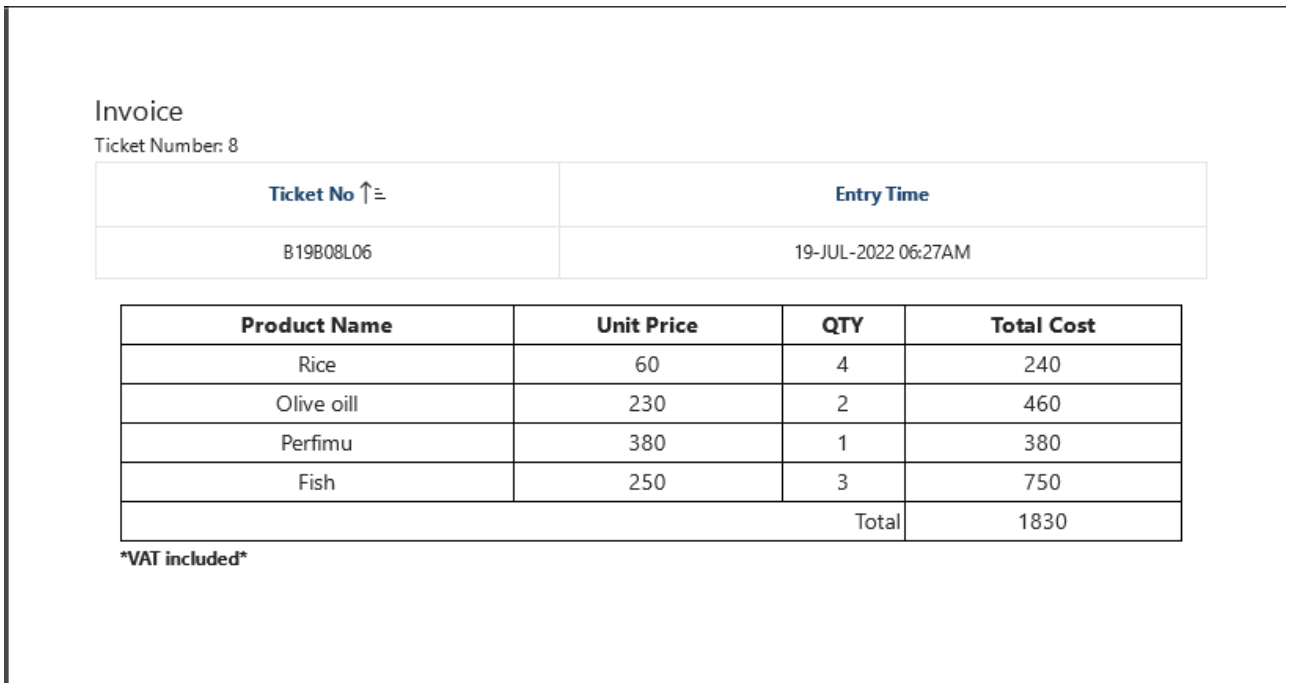


Figure 3.11: Sale form database Table

3.2.7 Invoice

Invoice printout out for customer. It will be given by cashier to customer



Invoice

Ticket Number: 8

Ticket No	Entry Time
B19B08L06	19-JUL-2022 06:27AM

Product Name	Unit Price	QTY	Total Cost
Rice	60	4	240
Olive oill	230	2	460
Perfimu	380	1	380
Fish	250	3	750
		Total	1830

VAT included

Figure 3.12: Invoice

Chapter 4

Conclusion

4.1 Advantage of our System

A point of sale (POS) system is used by businesses to deal with sales transactions.

- Better customer service :Giving our customers a great experience leads to greater customer satisfaction, which keeps them coming back. Choosing a great POS system helps to move along a sales transaction faster and more efficiently
- Easier Team Management :Our systems allow you to track employee-related data, such as sales per employee and number of hours worked. This gives you a greater view of your business's team and helps you plan more efficiently.
- Saved time :By using our system helps to save time, as this systems are packed with features that reduce the amount of time you need to spend on admin or mundane tasks.
- Increase sales :As well as improving customer and employee experience, our system can help increase your sales.
- Quick Payments :Our point of sale helps make payments faster. The employee selects the products the consumer wants to buy and the system automatically calculates the price. The invoice can be sent by email or printed directly on the spot with a receipt printer.

4.2 Limitation

- When our products spoiled that can not be updated in our system.
- We can not provide any free products or discount for admin relatives.
- In this system we can not provide home delivery system.
- There are no late payment option.

4.3 Future Work

- In future we implement payment gateway method.
- We add home delivery system in future.
- When our products are spoiled in future we update this information.