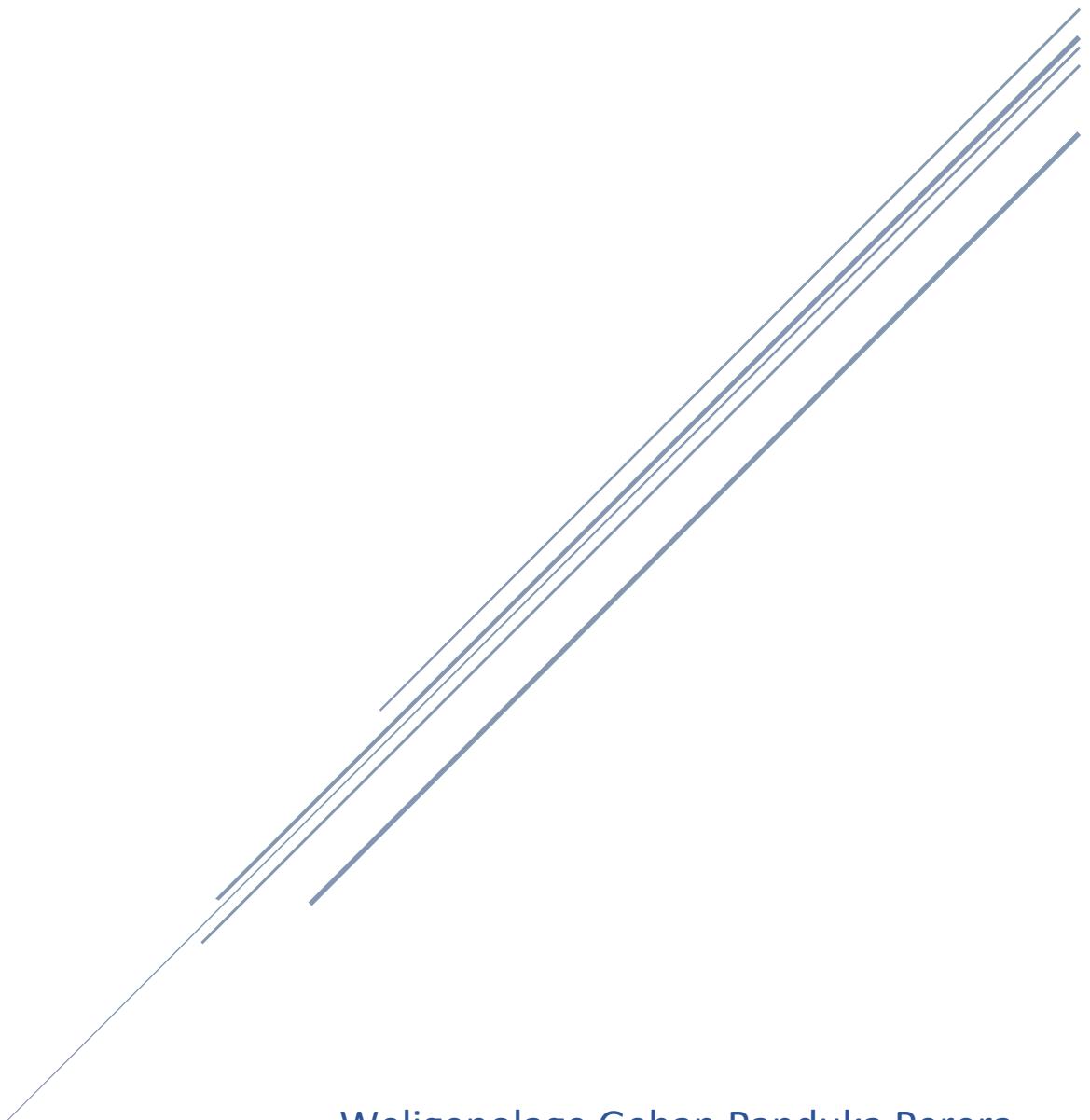


RESTAURANT DELIVERY MANAGEMENT APPLICATION

For Pinto Delivery Solutions Ltd.



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ABSTRACT

These days, organizations increasingly must depend on IT solutions in order to optimize their business processes and stay abreast with the competition. Organizations in most industries around the world are looking to cut costs and increase efficiencies by automating most of their activities through IT systems. And if they are able to build or select the most appropriate solutions that cater to their exact requirements, companies can even gain significant competitive advantage over their competitors. In particular, many businesses are looking for ways to reach customers more efficiently using modern IT solutions.

Pinto Delivery Solutions Ltd. offers pick up & home delivery services to its customers from several restaurants in the city of Colombo. They were looking to gradually expand their operations and as such, they realized the necessity of providing an online ordering option to its customers. The management expects that such a solution should not only help them broaden their customer base, but also produce a faster & more efficient communication flow between their staff, customers and the vendors (restaurants).

This professional project is an attempt to develop a fully functional Restaurant Delivery Management Application (referred to herein as “Online Ordering Solution”) to facilitate these primary requirements. The finished system has the following capabilities:

- Ability for customers to browse updated menu information (for each participating vendor/restaurant) & place orders online.
- Accommodation of 3 different user types (staff, vendors & customers), each with the required level of functionality.
- Ability for vendors to view & accept/reject any pending orders.
- Online communication capability between vendors & admins/staff once an order is placed.
- Vendors (i.e. restaurant managers) can keep their profiles & product lists updated.
- Ability for staff to edit order details at any time.
- Ability to enter & track offline orders (phone orders) in addition to online orders.

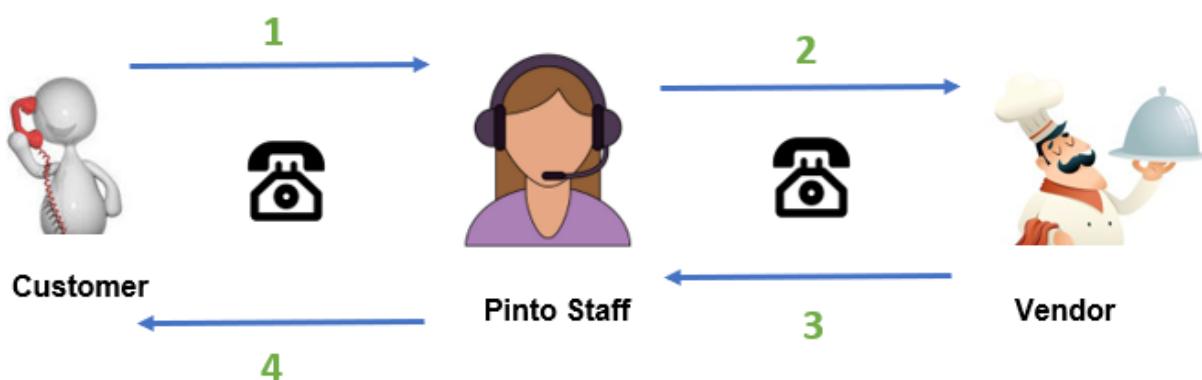
In addition to facilitating online ordering, the system has been developed to automate the exchange of information between all 3 parties. Assuming that vendors become willing, proactive users of the system, then only the final confirmation phone call (to the customer) will be required. I developed this Online Ordering Application using open source technologies like PHP & MySQL, and since it is a web application, no special software or hardware was required by the company. Only a web server was needed to host it.

1. INTRODUCTION

1.1 Organization Background

Pinto Delivery Solutions Ltd. began its operations last year. It offers pick up & home delivery services to its customers from several restaurants in the city of Colombo. It currently has only 4 full time call center staff in addition to 3 drivers. The management has decided to invest in expanding the size of the company early this year. They plan on doubling the number of staff members & drivers by April. They have also understood the need to offer an online ordering facility in order to increase their customer base.

1.2 Current System



Currently, all ordering is done over the phone. Customer will initiate the process by calling the Pinto hotline. In the absence of a single, comprehensive source of information listing all deliverable food items, most customers tend to need more information before they can decide on the exact items that they want to order. In these situations, once the customer initially expresses interest in a certain restaurant or a type of dish, the Pinto staff member will usually give a briefing of related food options from the list of partner restaurants. The staff member will generally rely on either the brochures of the partner restaurants or their websites (if available) to provide this information. The customer will decide & place her order at the end this typically lengthy phone conversation. The call center agent will then record this order in a shared Excel sheet (on Google Drive) & within a few minutes, he or a colleague will contact the relevant restaurant to place the customer's order. During this phone call (to the vendor/restaurant), the customer service agent may sometimes learn that either the item is unavailable or that its price has changed. The vendor

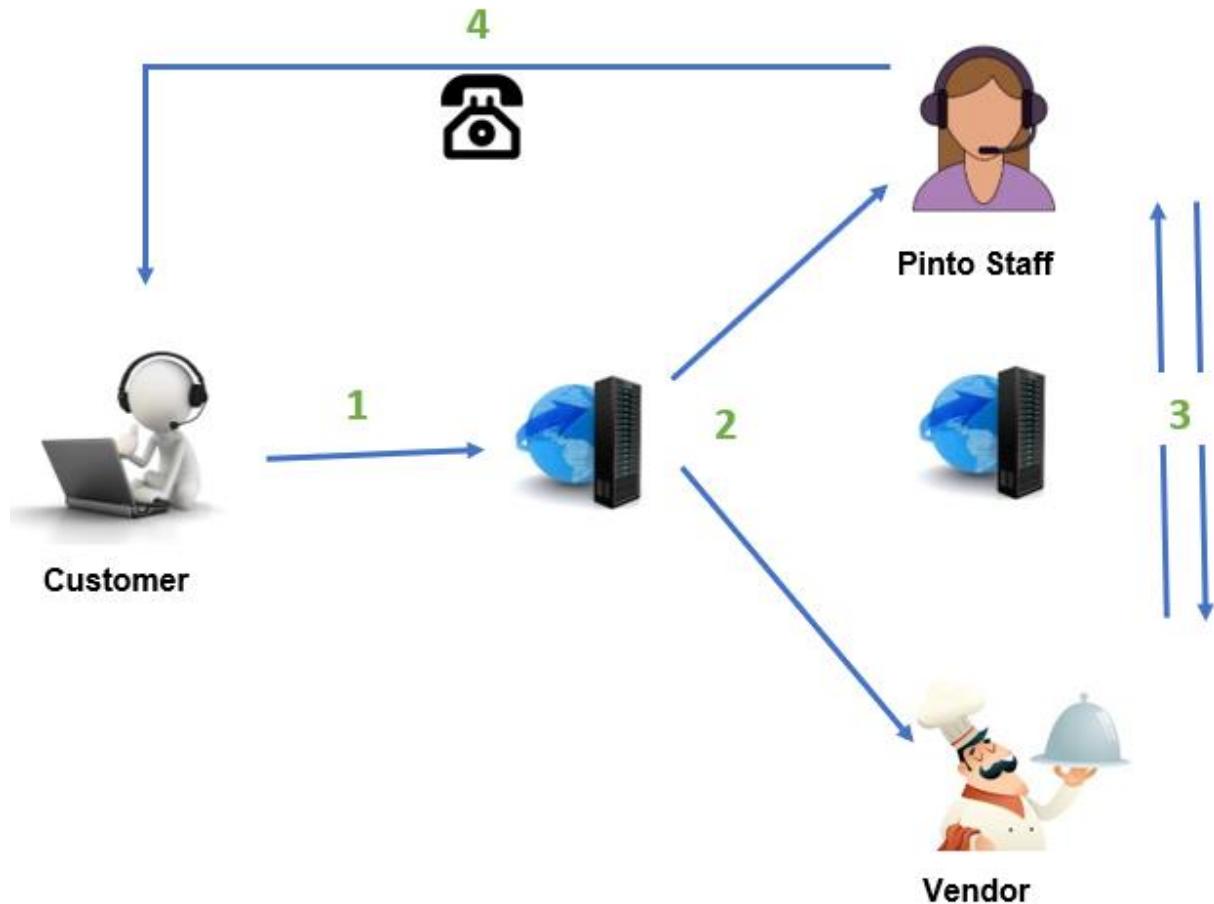
might also warn of a longer wait time to prepare the dish. In these situations, the Pinto service agent will have to call back the customer to communicate this new development. The customer can then either cancel the order or revise it during this conversation. If the order is revised, the process will start all over again.

On the other hand, if the originally requested item was available, the customer service agent will place the order with the restaurant on behalf of the customer. He will then call back the customer to confirm the order and to discuss the mode of payment. Once the order is confirmed, a driver (who may already be on the road) will be dispatched to collect the items from the restaurant(s) & to deliver to the customer's address.

1.3 Weaknesses Identified

- Because customers are not updated on the complete, accurate list of food choices available for delivery, the initial phone call to place an order is usually very long. This results in long wait times for other customers whose calls are on hold.
- A call center agent (Pinto staff member) may need to call the same vendor multiple times over a single order if the originally requested item is unavailable or if its price has recently changed. In such a situation, the customer will need to be informed & then the order will likely get revised. These scenarios continue to add to the long wait times experienced by other customers who do not have an alternative option such as placing their orders online.
- There are a few other delivery services already offering online ordering capability. Therefore, Pinto is unable to attract many potential customers who prefer to order online.
- Because orders are recorded & updated on a shared excel file by different staff members, there are sometimes inconsistencies with regard to how orders are entered & updated. This has resulted in either the same action being repeated or an order getting ignored due to miscommunication.
- Due to the absence of a standardized way of recording & updating historical order information, management does not have a reliable way of identifying ordering trends or the performance of vendors & their products.

1.4 Proposed System



In addition to facilitating online orders, the proposed “Online Ordering System” will streamline order tracking & updating activities while significantly improving the communication flow between all 3 parties involved. The system will run online with a database that uses php mysql.

1.4.1 Objectives

- Allow customers easy access to updated menu information for each participating restaurant.
- Online ordering capability
- Ability to enter & track offline orders in addition to online orders. For this, Pinto’s staff should have the option of creating a brand new order in the system (in order to represent an order placed via phone call).

- Reduce the average time spent on phone calls per order.
- Allow vendors to view & accept/reject any pending orders. This includes offline orders (entered by staff) as well as online orders.
- Once an order is placed in the system (either by a customer or by a staff user), it should help optimize communications between vendors & staff regarding availability, order modifications etc.
- Enable vendors (i.e. restaurant managers) to keep their profiles updated. This includes offered menu items, operating hours etc.
- Ability for staff (at Pinto) to edit order details at any time.
- Report generation

2. REQUIREMENTS ANALYSIS & SPECIFICATION

2.1 Introduction

In software engineering, requirements analysis encompasses those tasks that go into determining the needs or conditions to meet for a new or altered product or project, taking account of the possibly conflicting requirements of the various stakeholders, analyzing, documenting, validating and managing software or system requirements. In particular, requirements engineering comprises four specific processes:

- Requirements Elicitation
- Requirements Analysis
- Requirements Specification
- Requirements Validation

From an early stage, it had become very clear to the management that an online ordering capability would be essential if they are to achieve any growth in the industry. It was also quite obvious that such an online ordering application should also allow authorized users to continually update the list of offered products and their details. However, a careful & thorough analysis of Pinto's business processes was necessary to identify most other system requirements since they were not as obvious from a high-level view point.

It was important to first understand all the shortcomings of the current (offline) ordering system at the company. Many discussions were held with various stakeholders to identify the existing business processes & how the proposed system would benefit or improve those processes.

2.2 Requirements Elicitation

Requirements elicitation is the process through which the customers, buyers, or users of a software system discover, reveal, articulate, and understand their requirements. It is one of the most critical steps in a software engineering project. Inaccurate or incomplete requirements are the most common causes of poorly developed systems. Therefore, a sound, systematic process should be adopted when gathering requirements.

A wide range of requirements elicitation techniques exist for requirements development. It is essential to select the most effective of these techniques based on the specific situation and the client organization. Using multiple techniques to elicit requirements information can be very

powerful and produce higher quality results. Requirements elicitation techniques are grouped into the following categories:

- Interviews
- Observation
- Questionnaires
- Focus groups
- Domain Analysis

Interviews are the commonly used and most popular method for requirements elicitation. In this method the analyst and the engineers discuss with the different types of stake holders to understand the requirements of the system and the objective they have for the system. I interviewed various different stakeholders in order to form a complete picture of the system's required functionality. In addition to the managers & staff at Pinto, I also conducted phone interviews with several participating vendors & customers.

Additionally, I made a number of visits to the call center in order to observe their current process and identify any weaknesses. Through observation, I was able to gather more requirements for the proposed system. Detailed tasks are difficult to clearly describe in spoken words. Observation allows us to follow the users as they interact with customers, systems and processes.

Questionnaires reach a large number of people, not only in less time but also in a lesser cost. The result from the questionnaires mainly depends on the two factors: the effectiveness & design of the questions and the honesty of the respondents. A well structured questionnaire influences people to answer honestly, thus making it possible to gather reliable results from a large group of people. I did not use a questionnaire because this was a very small company with few stakeholders, and it was possible for me to meet almost all of them.

I studied in detail the shared excel file which was used to record & track orders. I also examined other documents such as invoices & receipts to primarily identify the types of information that was needed to be accommodated by the new system.

2.3 Functional Requirements

- Browsing & online ordering capability for customers:
 - Ability to explore & select from a list of menu items under each participating restaurant
 - Shopping cart
- Registration, login facility:
 - There are 3 different types of users who can access the system – customers, vendors & staff users. (The available functionality will vary based on the type of user)
 - Customers should be able to register for an account through the application
 - Other types of user accounts (for vendors & staff) can be created, modified or deleted by managerial level staff at Pinto.
- Organizing & updating of displayed information:
 - Participating vendors should have the ability to login & update their individual profiles, covering information such as offered items list, prices, & hours of operation.
 - Pinto's staff should also have the capability of directly updating any existing vendor profile when necessary.
- Order tracking & updating:
 - Each vendor should be able to view any pending or confirmed orders (relevant to them) along with the required quantities & any special customer/staff instructions. Through the app, they can also accept/reject any order based on availability, closing times and other factors.
 - Ability for staff to track customer orders (along with the relevant vendor responses) & to change the status of each order depending on the level of progress achieved.
 - Ability for staff to make any last minute modification to an order on behalf of the customer.
- Entering offline (phone) orders:
 - Staff user should be able to create a new order in the system on behalf of a customer

- Vendors should be able to view and respond to these orders (just like with online orders)
 - Staff can track the vendor responses, change order status, or make any necessary modification to these orders.
- Report generation:
 - Reports ranking the list of vendors in terms of both order count & total sales amounts (with data filtered for any required time range).
 - Similar report to identify the most popular dishes, overall & by vendor (over any time range)
 - Report that lists the most frequent registered clients

2.4 Non Functional Requirements

Non-functional requirements define system properties and constraints, such as Performance, Maintainability, Robustness, Efficiency, Availability and reliability. I have identified the following as non-functional requirements for the system.

- Centralized Database System
 - Allows for the recording of all online orders in a single database located on the server. This reduces data redundancy and promotes centralized administration of all functionalities.
- Performance
 - System should have fast response times for all online transactions
- Security Requirements
 - The system should validate the username and password in order for a user to login and make changes to the system.
 - The system should request the current password of the user in order to let them change to a new password.
- Usability Requirement
 - The system should have a simple, easy to understand user interface that deals with the user.

- The system the functionality of each module should be intuitive & easy to learn.
- Maintainability
 - The structure of the code should permit the addition of new functionality without much difficulty.

2.5 Hardware & Software Specifications

2.5.1 Development Environment:

Hardware Requirements:

- Intel Core i3 CPU (minimum)
- 4GB RAM
- 500 GB Hard Disk
- Internet Connectivity

Software Requirements:

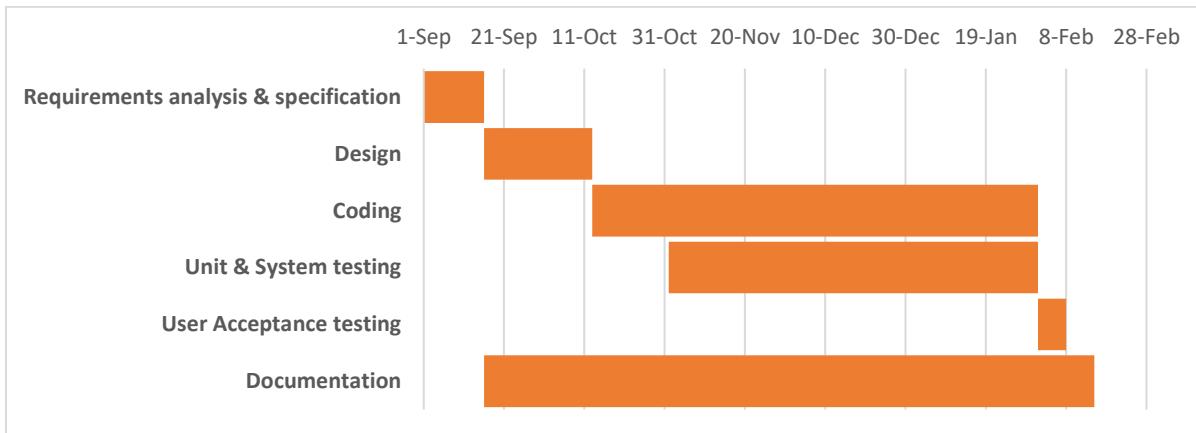
- Microsoft Windows 8 or higher
- Bitnami XAMPP Server
- Notepad ++ or other text editor

2.5.2 Operational Environment

Performance requirements for internet Server:

- Intel Core i7 3.0GHz CPU
- 12 GB RAM
- 500 GB web space
- Apache PHP + MySQL Database support
- Unlimited Bandwidth

2.6 Work Schedule



3. DESIGN

3.1 Introduction

After requirements analysis and specification, the designing phase will commence. This chapter mainly concentrates on how the system will be designed. I primarily used object oriented design concepts to develop the Online Ordering Application.

The system was designed to accommodate 3 main user types or “actors”:

- Admins
- Vendors
- Customers.

The use case diagrams below illustrate a high level view of the required functionality for each of these user types.

After identifying the different user types & their required functionality, I proceeded to decompose the overall functionality of the proposed system into several sub systems or modules as follows:

- Login facility for all 3 user types.
- Product List Updates (for each vendor)
- User account management – updating personal profile and the managerial user's ability to add, delete or modify any type of user
- Order placing, order tracking & order updating
- Reports generation

The activity diagrams for the main functions of each module were drawn next.

The next phase was the database design process. The conceptual data design was performed using an Entity Relationship (ER) diagram. The ER diagram represents the entities in the business environment, the relationships among those entities, and the attributes of both the entities and their relationships.

After the conceptual data model was completed, I started the logical design of the database. Basically, the ER diagram was converted into a set of tables/relations. A separate table was designed for each entity and for the m:n relationship between orders & products. All attributes (fields) & the primary keys were identified. Suitable foreign keys were also identified to help define the logical relationships between the individual tables.

The following sub sections contain the key UML diagrams that were used for the system design.

3.2 UML

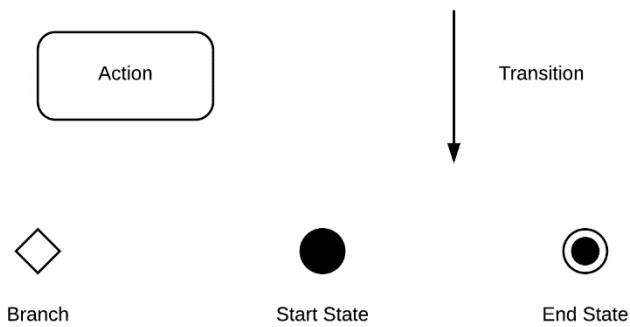
The Unified Modeling Language (UML) was created to forge a common, semantically and syntactically rich visual modeling language for the architecture, design, and implementation of complex software systems both structurally and behaviorally.

3.2.1 Diagrammatical Notations:

Use Case Diagrams



Activity Diagrams

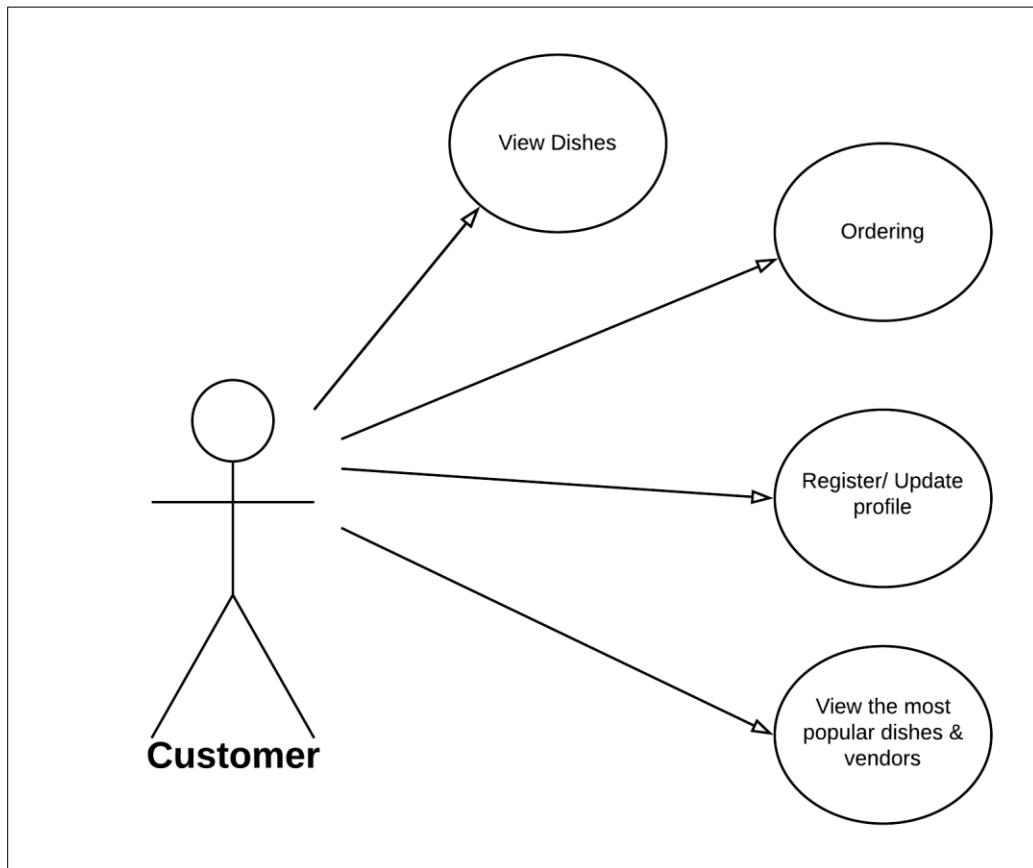


3.2.2 Use Case Diagrams

There are 3 main user types (“Actors”) in the proposed system.

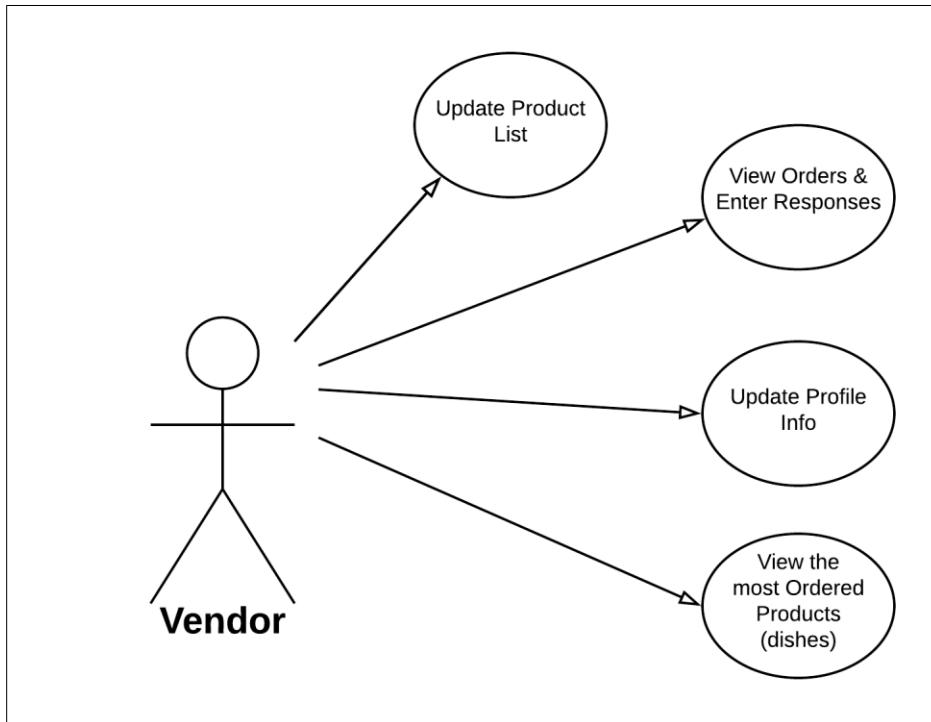
1. Customer
2. Vendor (Restaurant Manager or Representative)
3. Administrator (Pinto Staff User)

- Use case diagram for Customer



Customers can view offered products (i.e. dishes) from each participating restaurant/vendor. They can add their desired items to their shopping cart & proceed with placing an online order. Users should be able to register as customers. Once logged in, they should be able to update their profiles when required. However, it should be also possible for a user to place an online order without having an account.

- Use case diagram for Vendor

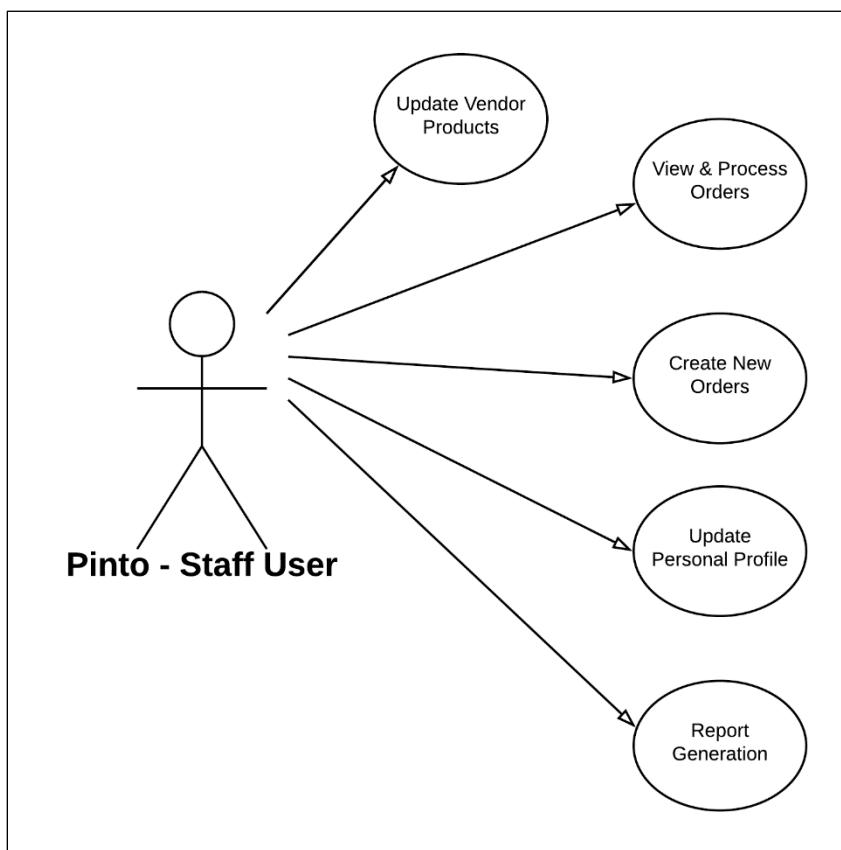
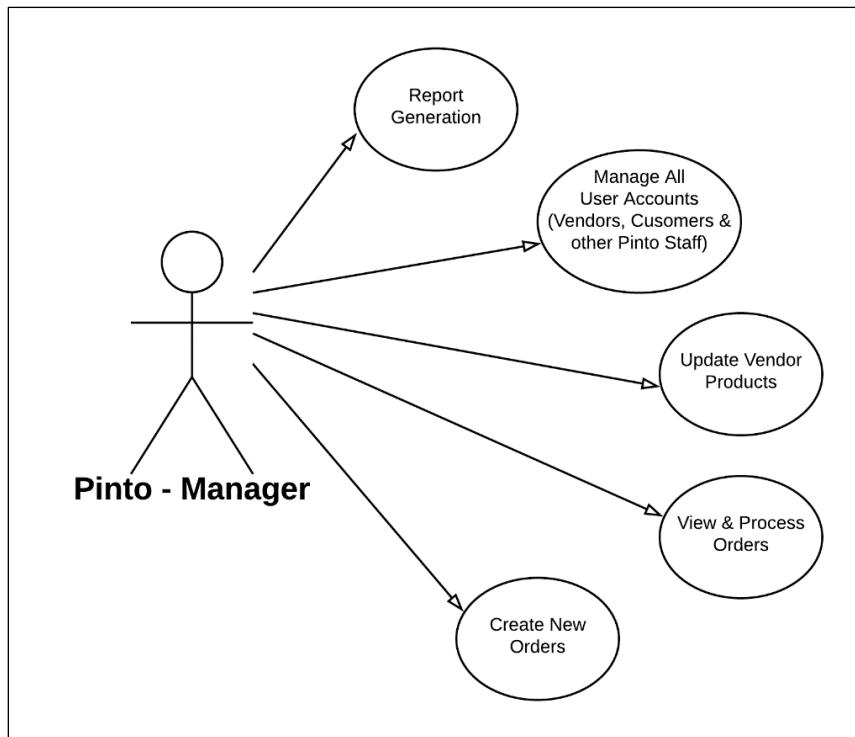


Vendors (i.e. restaurant representatives) should be able to update their offered product lists for the customers to see. At any time, a vendor should be able to view a detailed list of pending orders for their products. Vendors should have the option of posting a response to each ordered item. A vendor should also be able to update their profile information including the pictures that a customer would see when they visit the restaurant's specific page. Vendors should also be able to generate reports in order to identify their best selling products and their busiest days of the week etc.

- Use case diagram for Pinto's Staff (referred to as “Admins Users”)

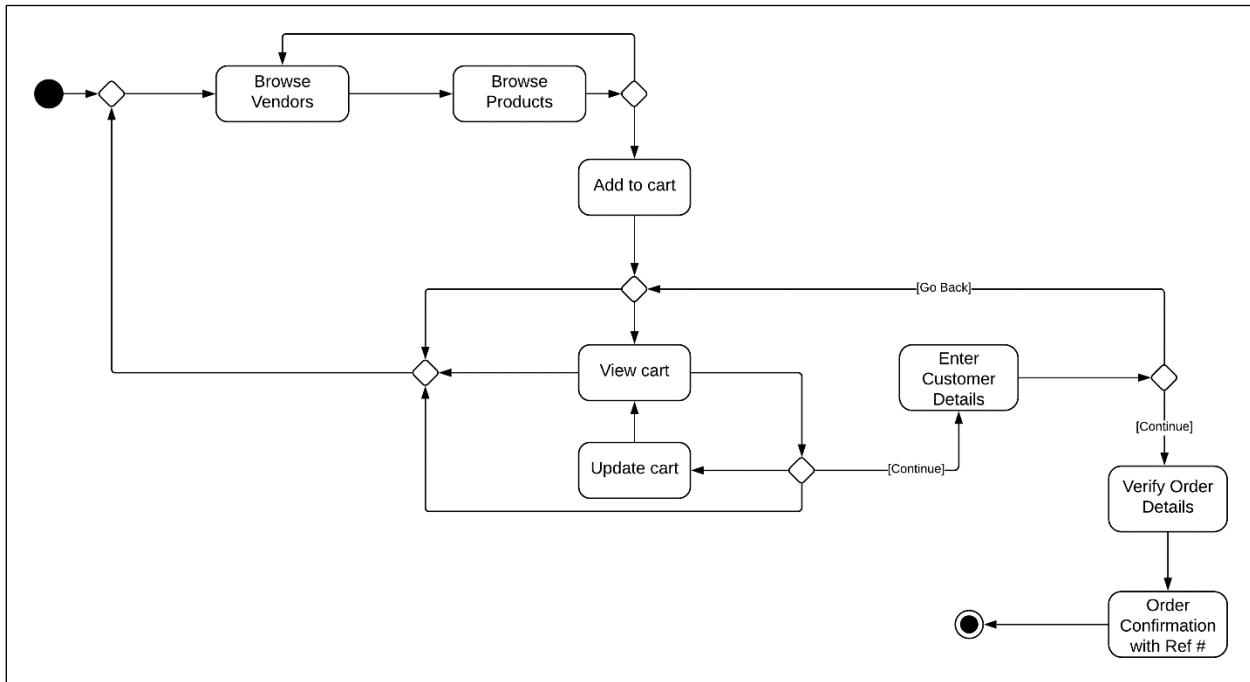
There are two types of Admin users. “Level 1” admin users are managers/executives working at Pinto. “Level 2” admin users are non-managerial staff users at Pinto. All admin users should be able to process customer orders & update the product information on behalf of a vendor. And any admin user (even a non-managerial user) should be able to update a customer’s account, for example when there is a need to reset the password.

The only difference is that managerial users (Level 1 admins) additionally have the ability to manage the accounts of vendors & other admin users. They can even create new vendors/admins & delete existing accounts.

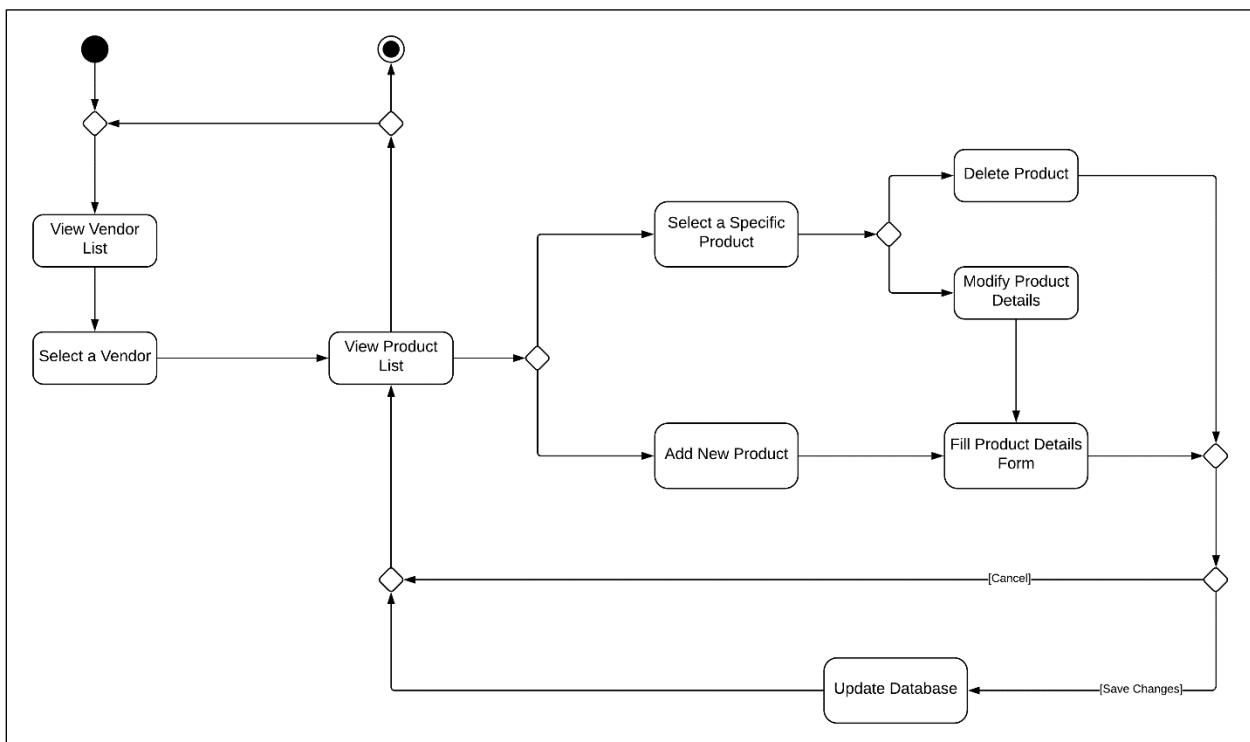


Activity Diagrams

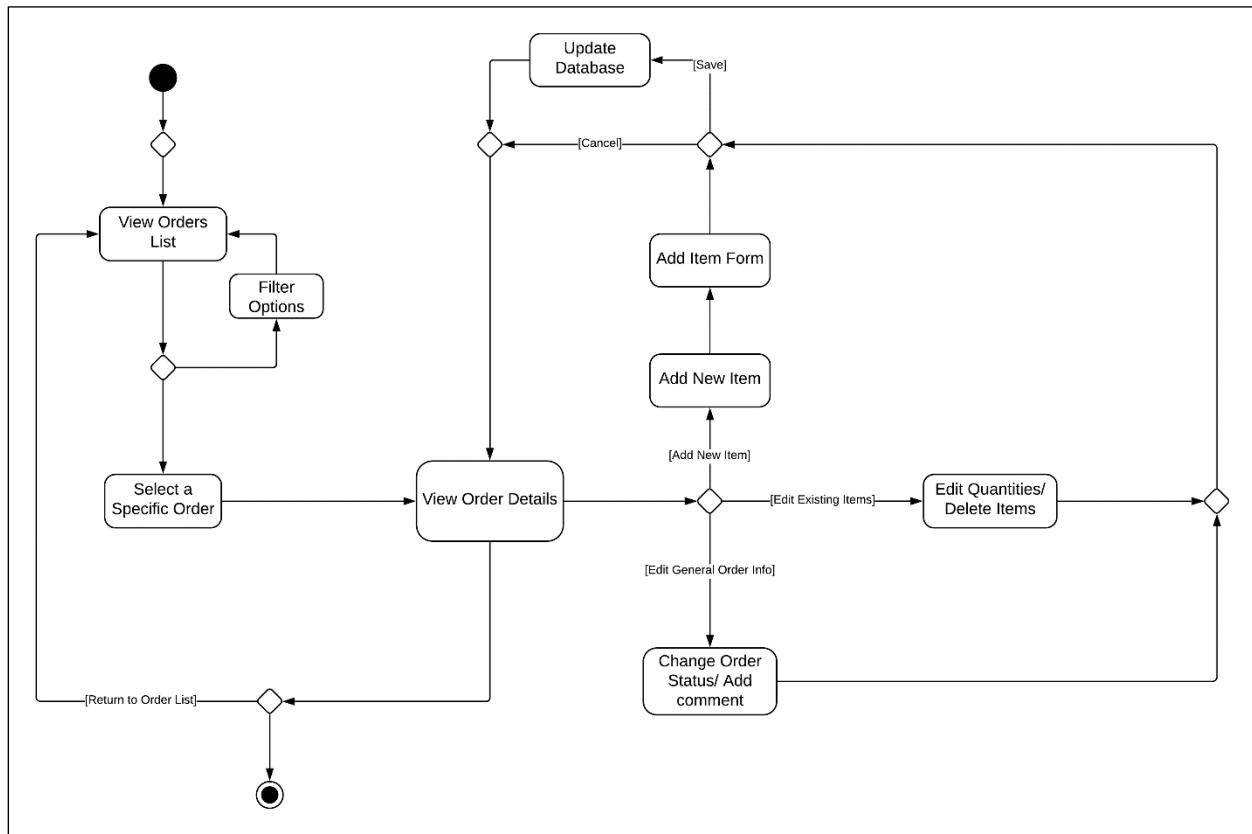
- Activity diagram for Placing an Online Order (Customer)



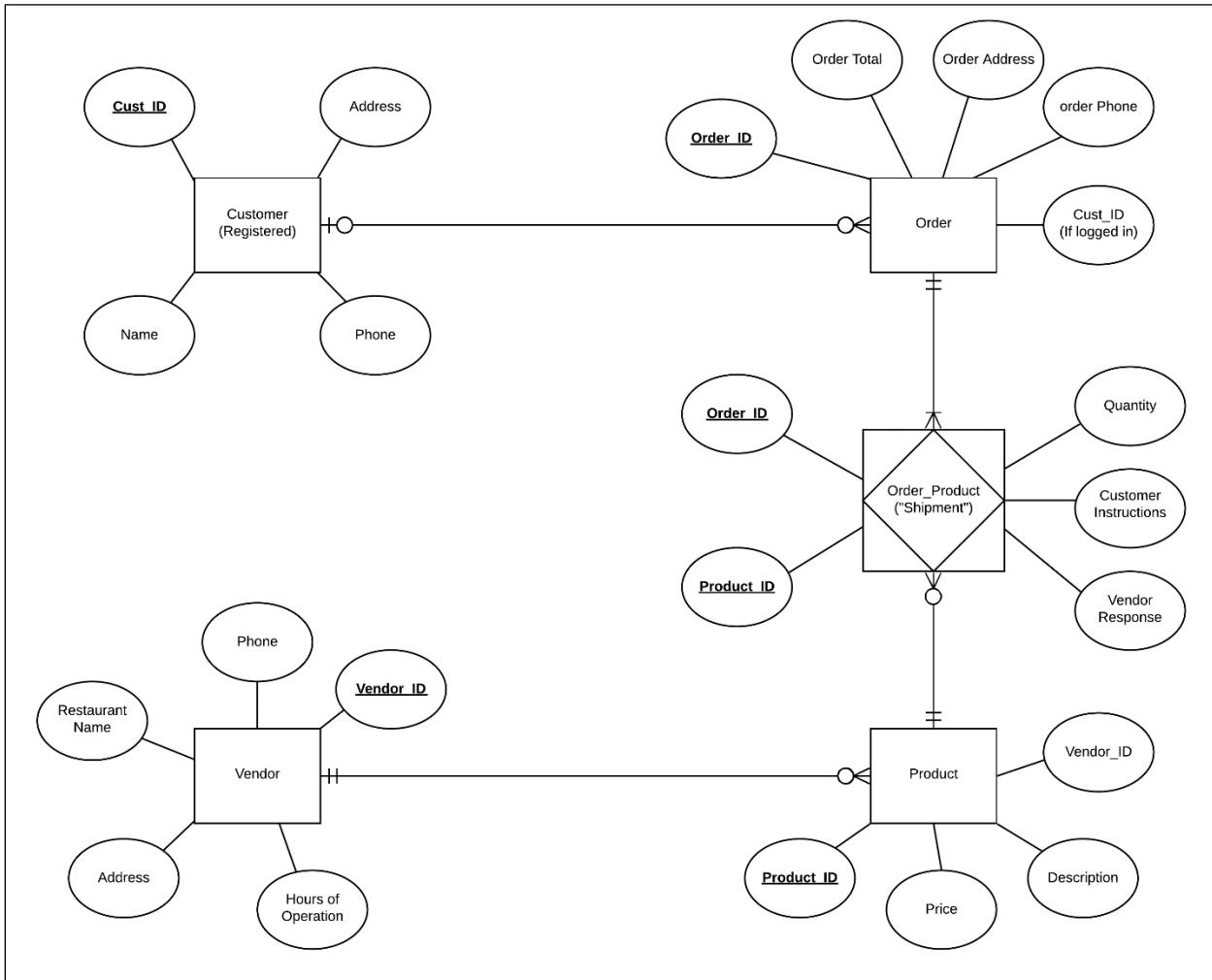
- Activity diagram for Updating Product Information (Vendor/Admin)



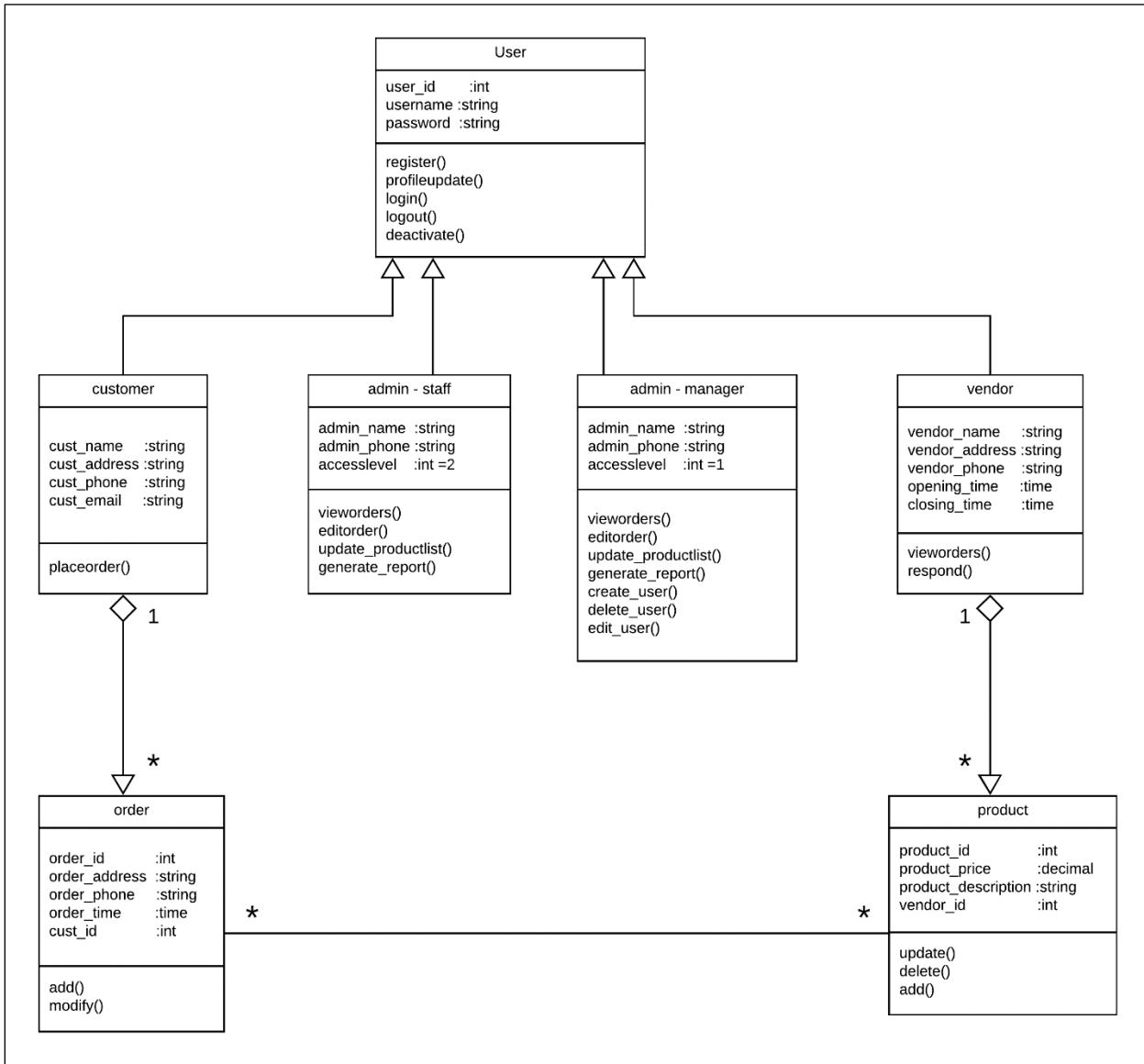
- Activity diagram for Updating Order Details (Admin)



Entity Relationship Diagram



Class Diagram



3.3 Database and Table Structure

The database for the online ordering system runs on MySQL 5 Database Server. The MySQL database has become the world's most popular open source database because of its high performance, high reliability and ease of use. For these reasons, I decided to user MySQL as the database management system for my application.

3.3.1 Database Model

Database Name: Pinto

Tables:

1. customer
2. cust_login
3. admin
4. admin_login
5. vendor
6. vendor_login
7. orders
8. products
9. order_product

3.3.2 Table Models

01. customer:

- This table contains data related to all registered customers, including their names, addresses, phone numbers & registration dates ("join_date")
- Primary key is: cust_id

Column	Type	Null	Default	Comments	MIME
cust_id	int(10)	No			
cust_name	varchar(50)	No			
cust_address	varchar(255)	No			
cust_city	enum('Colombo 1', 'Colombo 2', 'Colombo 3', 'Colombo 4', 'Colombo 5', 'Colombo 6', 'Colombo 7', 'Colombo 8', 'Colombo 9', 'Colombo 10', 'Colombo 11', 'Colombo 12', 'Colombo 13', 'Colombo 14', 'Colombo 15')	No			
cust_joindate	datetime	No			
cust_phone	varchar(13)	No			
cust_email	varchar(50)	Yes	NULL		
Comments	text	Yes	NULL		
cust_isactive	enum('0', '1')	No	1		
cust_dateinactive	datetime	Yes	NULL		

Indexes:

Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
PRIMARY	BTREE	Yes	No	cust_id	2	A	No	

02. cust_login

- This is a separate table that stores the login details of each registered customer.
- The username field will be the primary key & the cust_id field will serve as the foreign key which references the (more detailed) customer table.

Column	Type	Null	Default	Comments	MIME
cust_username	varchar(50)	No			
cust_password	char(41)	No			
cust_id	int(10)	No			

Indexes:

Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
PRIMARY	BTREE	Yes	No	cust_username	1	A	No	
cust_username	BTREE	Yes	No	cust_username	1	A	No	
cust_id	BTREE	No	No	cust_id		A	No	

03. vendor

- This table stores the details of each participating vendor/restaurant.
- Information such as vendor name, address, phone, hours of operation, date of registration (“join_date”) etc.
- The primary key is vendor_id

Column	Type	Null	Default	Comments	MIME
vendor_id	int(10)	No			
vendor_name	varchar(50)	No			
vendor_address	varchar(255)	No			
vendor_city	enum('Colombo 1', 'Colombo 2', 'Colombo 3', 'Colombo 4', 'Colombo 5', 'Colombo 6', 'Colombo 7', 'Colombo 8', 'Colombo 9', 'Colombo 10', 'Colombo 11', 'Colombo 12', 'Colombo 13', 'Colombo 14', 'Colombo 15')	No			
vendor_joindate	Datetime	No			
vendor_phone	varchar(13)	No			
vendor_email	varchar(50)	Yes	NULL		
Comments	Text	Yes	NULL		
vendor_isactive	enum('0', '1')	No	1		
vendor_dateinactive	Datetime	Yes	NULL		
weekday_start	Time	Yes	NULL		
weekday_end	Time	Yes	NULL		
sat_start	Time	Yes	NULL		
sat_end	Time	Yes	NULL		
sun_start	Time	Yes	NULL		
sun_end	Time	Yes	NULL		

Indexes:

Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
PRIMARY	BTREE	Yes	No	vendor_id	5	A	No	

04. vendor_login

- This is a separate table for storing each vendor's login information.
- Primary key is: vendor_username
- The field: vendor_id will be the foreign key that references the vendor table.

Column	Type	Null	Default	Comments	MIME
vendor_username	varchar(50)	No			
vendor_password	char(41)	No			
vendor_id	int(10)	No			

Indexes:

Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
PRIMARY	BTREE	Yes	No	vendor_username	3	A	No	
vendor_username	BTREE	Yes	No	vendor_username	3	A	No	
vendor_id	BTREE	No	No	vendor_id		A	No	

05. admin

- Employees at Pinto are considered “Admin Users.” Their information will be stored in this “admin” table.
- There are two types of Admin users. “Level 1” admin users are managers/executives working at Pinto. They will have the highest privilege level as users. “Level 2” admin users are non-managerial staff users at Pinto.
- In addition to processing orders, updating product lists etc, these admin users can all change the account information of any customer. (Eg: to reset a forgotten password upon request)
- However, managerial users (Level 1 admins) will additionally have the ability to manage the accounts of vendors & other admin users. They can even create new vendors/admins & delete existing accounts.
- The field that distinguishes between the two different admin user types is called: admin_level
- The primary key for the admin table is: admin_id

Column	Type	Null	Default	Comments	MIME
admin_id	int(10)	No			
employee_id	varchar(20)	No			
admin_name	varchar(50)	No			
admin_level	tinyint(3)	No	1		
admin_joindate	datetime	No			
admin_phone	varchar(13)	No			
admin_email	varchar(50)	Yes	NULL		
comments	text	Yes	NULL		
admin_isactive	enum('0', '1')	No	1		
admin_dateinactive	datetime	Yes	NULL		

Indexes:

Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
PRIMARY	BTREE	Yes	No	admin_id	7	A	No	
employee_id	BTREE	Yes	No	employee_id	7	A	No	

06. admin_login

- This is a separate table which stores the login details of the admin users.
- Primary key is: admin_username & the foreign key: admin_id references the admin table.

Column	Type	Null	Default	Comments	MIME
admin_username	varchar(50)	No			
admin_password	char(41)	No			
admin_id	int(10)	No			

Indexes:

Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
PRIMARY	BTREE	Yes	No	admin_username	3	A	No	
admin_username	BTREE	Yes	No	admin_username	3	A	No	
admin_id	BTREE	No	No	admin_id		A	No	

07. Orders

- Each record in the orders table will represent a unique order which has been placed by (or on behalf of) a customer.
- Contains order information such as: customer name, address, phone, order time, order total & order status.
- Primary key is: order_id
- The foreign key: cust_id will reference the customer table. (cust_id will be NULL if the order is placed by a customer who has either not registered or has not logged in)

Column	Type	Null	Default	Comments	MIME
order_id	int(10)	No			
order_total	decimal(8,2)	No			
order_cust	varchar(50)	No			
order_address	varchar(255)	No			

order_city	enum('Colombo 1', 'Colombo 2', 'Colombo 3', 'Colombo 4', 'Colombo 5', 'Colombo 6', 'Colombo 7', 'Colombo 8', 'Colombo 9', 'Colombo 10', 'Colombo 11', 'Colombo 12', 'Colombo 13', 'Colombo 14', 'Colombo 15')	No			
order_phone	varchar(13)	No			
order_time	datetime	No			
order_instructions	text	Yes	NULL		
comments	text	Yes	NULL		
order_status	enum('Pending', 'Confirmed', 'Cancelled', 'Delivered')	No	Pending		
status_updateime	datetime	No			
cust_id	int(10)	Yes	NULL		

08. products

- Each record in the products table is a separate food item.
- The fields contain information such as: name of product, price, description, image location & the associated restaurant/vendor.
- Primary key is: product_id
- The foreign key: vendor_id references the vendor table. This links each product with the restaurant that offers it.
- Deleted entities such as products, vendors etc will be hidden from view in the application, but they will NOT be removed from the database table. These records need to be preserved in order to be able to generate accurate reports. When the authorized user

deletes an entity, instead of deleting the relevant record, its “..._isactive” field will simply be set to zero.

Column	Type	Null	Default	Comments	MIME
product_id	int(10)	No			
product_name	varchar(50)	No			
product_desc	text	Yes	NULL		
product_price	decimal(8,2)	No			
product_dateadded	datetime	No			
comments	text	Yes	NULL		
product_isactive	enum('0', '1')	No	1		
product_dateinactive	datetime	Yes	NULL		
availability	enum('0', '1')	No	1		
vendor_id	int(10)	No			

Indexes:

Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
PRIMARY	BTREE	Yes	No	product_id	22	A	No	
vendor_id	BTREE	No	No	vendor_id		A	No	

09. order_product

- The order_product table relates instances (records) from the orders table with instances (records) from the products table.
- This table is designed to represent the m:n relationship between the “Orders” entity & the “Products” entity.
- This is where the quantity & special instructions for each ordered item can be recorded. (An order may comprise of several different items. Therefore, this information cannot be stored within a single row in the orders table)
- Each record in the order_product table represents a unique item which is a part of a single order.

- The foreign keys: order_id & product_id reference the orders table & the products table respectively.
- The combination of these two foreign keys will serve as the primary key of the order_product table.

Column	Type	Null	Default	Comments	MIME
order_id	int(10)	No			
product_id	int(10)	No			
unit_price	decimal(8,2)	No			
Quantity	tinyint(3)	No	0		
cust_instructions	varchar(255)	Yes	NULL		
vendor_response	enum('Accept', 'Reject')	Yes	NULL		
vendor_comments	varchar(255)	Yes	NULL		
comments	text	Yes	NULL		

Indexes:

Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
PRIMARY	BTREE	Yes	No	order_id		A	No	
				product_id	15	A	No	
product_id	BTREE	No	No	product_id		A	No	

3.4 User Interfaces & the Work Flow for Key Transactions

3.4.1. Introduction

This section illustrates the main user interfaces that each type of user will encounter while using the system. The user interfaces were designed to be intuitive and simple. Even though a greater priority was given to the functional requirements, it was still considered important to maintain consistency in styles and appearance across different screens.

The following standard principles were adopted for the system's UI design:

- User Familiarity – The system should use terms & concepts familiar to most people who will use the system.
- Consistency - Consistent sequences of actions should be required in similar situations. Identical terminology should be used in prompts, menus, and help screens.
- Recoverability - The system should provide some resilience to user errors and allow the user to recover from errors.
- User Guidance – System should provide helpful feedback when user makes an error.
- Minimal Surprise – User should be able to predict the work flow involved in comparable transactions.

Mostly, HTML elements were used for the system's graphical user interface. CSS was used to style these elements. I used consistent styles for comparable elements (eg: tables, buttons etc) even across different modules.

For operations involving multiple steps (such as adding a new vendor to the system or placing an order), a vertical navigation panel was used in order to show the user's level of progress. This panel would list the sequence of steps involved and the current step (the user is on) will always be highlighted.

Most transactions involving forms offer the “Go Back” option before saving, in order to allow the user to either change her mind or recover from a mistake. Additionally, once a change has been successfully saved, the user will be prompted to an informative confirmation screen.

The home screen features a large banner at the top showing a dish being prepared. Below the banner, the text "List of participating Vendors" is displayed. Three vendor logos are shown: "CAFE BEVERLY FUSION 475" (Cafe Beverly), "THE KINGSBURY COLOMBO - SRI LANKA" (The Kingsbury Pizza), and "CHINESE DRAGON CAFE SINCE 1942 ...Meal to Remember...." (Chinese Dragon Cafe).

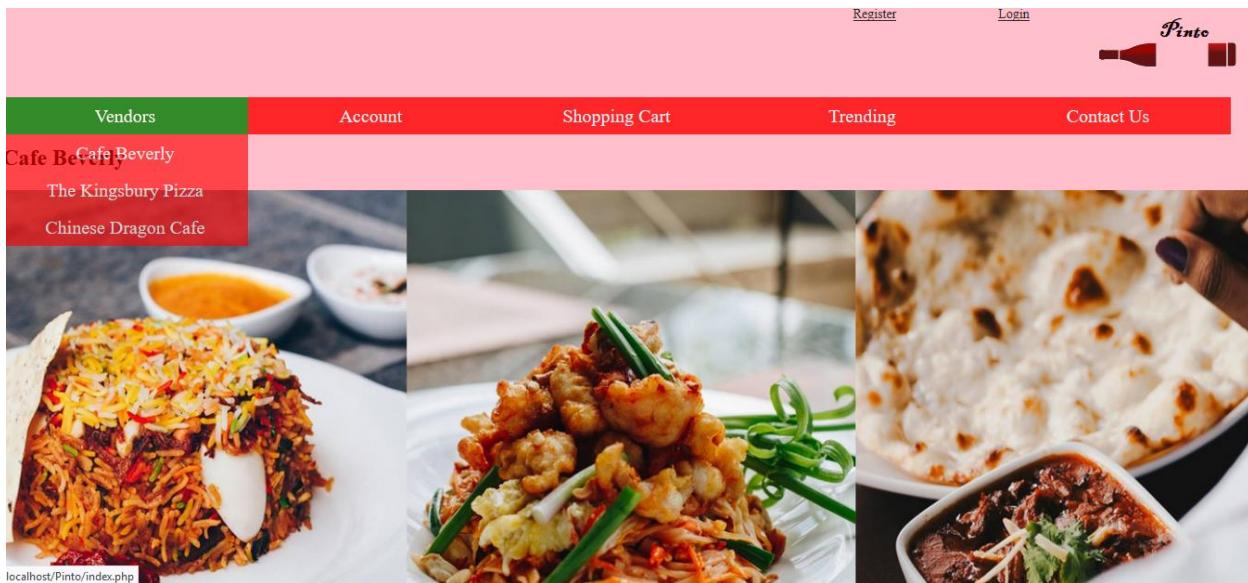
In addition to the navigation menu, the home screen greets the user with a nice picture. Below this image, the user will see a list of all participating vendors accompanied by their company logos. By clicking on a vendor, a customer will be able to view all products (i.e. dishes) offered by that restaurant. (The system will treat anyone who has not logged in as a customer. Therefore, it is possible for a customer to place online orders without actually creating an account.)

The vendor page for "Cafe Beverly" shows three images of their dishes: a biryani dish, a stir-fried dish with shrimp and vegetables, and a bowl of soup. Below these images is a table titled "Cafe Beverly - Product List".

Item	Description	Price	
Signature Club Sandwich	The king among sandwiches!	1000.00	 1 <input type="button" value="Add to Cart"/>

Vendors	Account	Shopping Cart	Trending	Contact Us
Item	Description	Price		
Signature Club Sandwich	The king among sandwiches!	1000.00		1 <input type="button" value="Add to Cart"/>
Bistro Seafood Burger	Recommended for seafood & burger lovers alike!	800.00		1 <input type="button" value="Add to Cart"/>
Caesar Salad with Chicken	Made from the healthiest of ingredients!	1000.00		1 <input type="button" value="Add to Cart"/>
Grilled Chicken Sub	Guaranteed to satisfy your taste buds!	700.00		1 <input type="button" value="Add to Cart"/>

To enable convenient access, the same list of vendors will also be available from the first menu item (“Vendors”) in the navigation bar.



All screens display the company logo in the top right corner. Additionally, they all contain a horizontal navigation menu bar to facilitate easy access to the required functions. The options in the navigation menu have been designed to change depending on which type of user has logged into the system. For instance, the Shopping Cart menu item is only available for customers. However, for Pinto staff members (“Admins”) and Vendors, this item becomes “View Orders.”



Above the main navigation menu, the login/logout options are also available in all screens. The customer registration link will be hidden if the user is already logged in.

3.4.2 Placing and Viewing Orders

Customer:

When an item has been added to the cart, the link to the Shopping Cart will become highlighted in the navigation panel. Additionally, for that particular item, the “Add to Cart” button will get replaced by two different options: “Change Quantity” & “Remove from Cart.”

Vendors	Account	Shopping Cart	Trending	Contact Us
Item	Description	Price		
Nasi Goreng	Our most popular dish!	550.00		<input type="button" value="1 ▾ Add to Cart"/>
Fried Rice with Chicken		450.00		<input type="button" value="1 ▾ Add to Cart"/>
Fried Rice with Shrimp	Seafood made from the freshest ingredients!	450.00		<input type="button" value="2 ▾ Change Quantity"/> <input type="button" value="Remove from Cart"/>

In the same session, the customer can browse different restaurants (i.e. vendors) and add items from any combination of these places to her cart. Once satisfied with the selection of items, she can begin the order checkout process by following the highlighted link to the shopping cart.

The Shopping Cart & Order Checkout screens come with a vertical navigation panel (on the left hand side) to help the user identify which step in the order checkout process she is currently on. In the above screen shot, the words "shopping cart" are highlighted (in the grey colored panel) because we are currently in the first step of the process. From this shopping cart view, in addition to changing the quantities or removing items, the user will also have the opportunity to add any special instructions to each separate order item.

Item	Instructions	Quantity	Price	Action
Fried Rice with Shrimp (From: Chinese Dragon Cafe)		2	900.00	Update Delete
Nasi Goreng (From: Chinese Dragon Cafe)	NOT TOO SPICY!	1	550.00	Update Delete
Tuscan Pesto Chicken & Bacon (From: The Kingsbury Pizza)		1	1,800.00	Update Delete
Total			3,250.00	

The Shopping Cart & Order Checkout screens come with a vertical navigation panel (on the left hand side) to help the user identify which step in the order checkout process she is currently on. In the above screen shot, the words "shopping cart" are highlighted (in the grey colored panel) because we are currently in the first step of the process. From this shopping cart view, in addition to changing the quantities or removing items, the user will also have the opportunity to add any special instructions to each separate order item.

The next step involves entering the customer information, including the address and phone number. The system will automatically fill this information (from the database) if the customer is logged in. In any case, user can type over any existing filled field. At any stage before confirming the order, the customer will be able to either continue to the next step, or go back to the previous step using the buttons located near the top.

The next step involves entering the customer information, including the address and phone number. The system will automatically fill this information (from the database) if the customer is logged in. In any case, user can type over any existing filled field. At any stage before confirming the order, the customer will be able to either continue to the next step, or go back to the previous step using the buttons located near the top.

Vendors	Account	Shopping Cart	Trending	Contact Us																							
Shopping Cart Customer Info Verify Order Order Summary Return to Home page		Shopping Cart Please Confirm Your Order Details																									
		<input type="button" value="Go Back"/>		<input type="button" value="Confirm"/>																							
		<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Item</th> <th style="text-align: center;"></th> <th style="text-align: left;">Instructions</th> <th style="text-align: center;">Quantity</th> <th style="text-align: center;">Price</th> </tr> </thead> <tbody> <tr> <td>Nasi Goreng (From: Chinese Dragon Cafe)</td> <td style="text-align: center;"></td> <td>NOT TOO SPICY!</td> <td style="text-align: center;">2</td> <td style="text-align: center;">1,100.00</td> </tr> <tr> <td>Tuscan Pesto Chicken & Bacon (From: The Kingsbury Pizza)</td> <td style="text-align: center;"></td> <td></td> <td style="text-align: center;">1</td> <td style="text-align: center;">1,800.00</td> </tr> <tr> <td>Delivery Cost</td> <td></td> <td></td> <td></td> <td style="text-align: center;">250.00</td> </tr> <tr> <td>Total</td> <td></td> <td></td> <td></td> <td style="text-align: center;">3,150.00</td> </tr> </tbody> </table>	Item		Instructions	Quantity	Price	Nasi Goreng (From: Chinese Dragon Cafe)		NOT TOO SPICY!	2	1,100.00	Tuscan Pesto Chicken & Bacon (From: The Kingsbury Pizza)			1	1,800.00	Delivery Cost				250.00	Total				3,150.00
Item		Instructions	Quantity	Price																							
Nasi Goreng (From: Chinese Dragon Cafe)		NOT TOO SPICY!	2	1,100.00																							
Tuscan Pesto Chicken & Bacon (From: The Kingsbury Pizza)			1	1,800.00																							
Delivery Cost				250.00																							
Total				3,150.00																							
		Customer Details																									
		Customer Name Diane Sparrow Address 30 Wickramasinge Road City Colombo 7		Phone (077)7332020																							

The next screen (“Verify Order”) provides a complete summary of the order. The ordered items will be displayed in detail in a neat table followed by the delivery details. The user can check whether all information is correct and if there is a need for any revision, she can press the “Go Back” button to return to either of the previous screens (steps) in order to make the required change. Because PHP session variables have been used to store the order information, there will be no need to reenter any information when returning to these screens. From the Verify Order view, if the user presses “Confirm,” the order will be saved into the database. The user will then be automatically redirected to the final screen (“Order Summary”) of this order checkout process.

The screenshot shows a user interface for an ordering system. At the top, there are navigation links: Vendors, Account, Shopping Cart (highlighted in yellow), Trending, and Contact Us. Below these, a sidebar on the left contains links for Shopping Cart, Customer Info, Verify Order, and Order Summary. A "Return to Home page" link is also present. The main content area displays a success message: "Your order has been successfully submitted!" followed by "Your Order reference number is: 9". Below this, a table details the order items:

Item	Instructions	Quantity	Price
Nasi Goreng (From: Chinese Dragon Cafe)	NOT TOO SPICY!	2	1,100.00
Tuscan Pesto Chicken & Bacon (From: The Kingsbury Pizza)		1	1,800.00
Delivery Cost			250.00
Total			3,150.00

Below the table, a section titled "Customer Details" shows the customer's name and address: Diane Sparrow, 30 Wickramasinge Road.

The final order summary screen (after confirmation) will display the same order information, but this time will additionally include the Order ID as a reference number. This will mark the end of the customer's ordering process.

3.4.3 Vendor's Order Tracking:

Each vendor will have a separate vendor account in the system. A vendor will be able to track existing orders at any time using the “View Orders” link located in the main navigation bar.

The screenshot shows a vendor's view of pending orders. At the top, there are navigation links: Vendors, Account, View Orders (highlighted in red), Reports, and Contact Us. The main content area is titled "View Orders". It includes a "Filter Orders By:" section with dropdown menus for "Order Status" (set to "All") and "Time Range" (set to "Past Day"), and an "Apply" button. Below this, a table lists three pending orders:

Order ID	Order Time	Order Status	Product	Quantity	Instructions	Enter Response	Enter Comments	Action
11	2018-02-09 11:51:07	Pending	Smoked Salmon & Avocado	2	Extra Veggies please!	No Response		Update
10	2018-02-09 11:34:04	Pending	Pepperoni Pizza	1		No Response		Update
9	2018-02-09 11:18:25	Pending	Tuscan Pesto Chicken & Bacon	1		No Response		Update

In this page, the available order information is restricted to only include those ordered items which are relevant to the given vendor. A single record in the table will represent a separate product for a separate order. The list of records can be filtered by Order Status &/or Time Range.

View Orders								
Filter Orders By:			Order Status	All	Time Range	Past Day	Apply	
Order ID	Order Time	Order Status	Product	All Open Pending Only	Instructions	Enter Response	Enter Comments	
11	2018-02-09 11:51:07	Pending	Smoked Salmon & Avocado	2	Extra Veggies please!	No Response		Update
10	2018-02-09 11:34:04	Pending	Pepperoni Pizza	1		No Response		Update
9	2018-02-09 11:18:25	Pending	Tuscan Pesto Chicken & Bacon	1		No Response		Update

For each item ordered, the vendor will see the quantity and any special customer instructions. The vendor will be able to enter a response & further comments for each record. As seen below, the possible responses include: Accept, Reject & No Response (the default).

View Orders								
Filter Orders By:			Order Status	All	Time Range	Past Day	Apply	
Order ID	Order Time	Order Status	Product	Quantity	Instructions	Enter Response	Enter Comments	
11	2018-02-09 11:51:07	Pending	Smoked Salmon & Avocado	2	Extra Veggies please!	Accept		Update
10	2018-02-09 11:34:04	Pending	Pepperoni Pizza	1		Reject	Sorry - Not Available Today!	Update
9	2018-02-09 11:18:25	Pending	Tuscan Pesto Chicken & Bacon	1		Accept	No Response No Response Accept Reject	Update

A timely vendor response will assist Pinto's staff users when they are processing the order.

3.4.4 Admin User's (i.e. Pinto Staff) Order Tracking & Processing:

Pinto's staff users can view & update customer orders by following the "View Orders" Menu item.

Order ID	Order Time	Order Status	Customer	City	Phone	Instructions	Total	Action
11	2018-02-09 11:51:07	Pending	Dinesh Chandimal	Colombo 8	(011)2238379		4750.00	<button>Process</button>
10	2018-02-09 11:34:04	Pending	Gehan Perera	Colombo 5	(071)5364412	Near ESOFT School	3450.00	<button>Process</button>
9	2018-02-09 11:18:25	Pending	Diane Sparrow	Colombo 7	(077)7332020	House located opposite Sadeepa Book Shop	3150.00	<button>Process</button>

The list of orders can be filtered by Order Status &/or Time Range. Each record in the table will represent a separate order. The user can edit or simply view additional information pertaining to a given order by pressing the "Process" button next to the relevant record.

Item	Instructions	Vendor Response	Vendor Comments	Price	Quantity	Action
Nasi Goreng (From: Chinese Dragon Cafe)	NOT TOO SPICY!	Reject	Sold out for the day!	1,100.00	2	<button>Update</button> <button>Delete</button>

The top part of the "process order" screen displays the customer's information. As shown above, there are two fields enabling the Pinto staff users to change the order status and to add their own comments regarding the order.

Vendors	Account	View Orders	Reports	Contact Us			
Enter Comments: <input type="text"/>		Order Status: <input type="button" value="Pending"/> <input type="button" value="Update"/>					
Items Ordered							
Item	Instructions	Vendor Response	Vendor Comments	Price	Quantity	Action	
Nasi Goreng (From: Chinese Dragon Cafe)		NOT TOO SPICY!	Reject	Sold out for the day!	1,100.00	<input type="button" value="2"/>	<input type="button" value="Update"/> <input type="button" value="Delete"/>
Tuscan Pesto Chicken & Bacon (From: The Kingsbury Pizza)			Accept		1,800.00	<input type="button" value="1"/>	<input type="button" value="Update"/> <input type="button" value="Delete"/>
Delivery Cost				250.00			
Total				3,150.00			

Information pertaining to each of the ordered items will be displayed in the table below the general order information. In addition to the quantities and customer instructions, the Pinto staff user will get to see any vendor responses to these items. An item record that is rejected by the vendor will not be automatically deleted. The Pinto staff will still see this record, but the "Reject" response will be highlighted in red (as shown above).

Although the customer can make no further edits to her order at this point, Pinto's staff can still edit the cart items using this table. Quantities can be updated & items can be removed as appropriate, after communicating with customers/vendors over the phone. The most likely action for a rejected item will be either to delete the product from the order or to reduce its quantity (after consulting with both the vendor & customer). In the above example, the rejected item was removed.

JafarB Logout 

Vendors	Account	View Orders	Reports	Contact Us			
Enter Comments: <input style="width: 100%; height: 40px;" type="text"/>		Order Status: Pending <input style="float: right;" type="button" value="Update"/>					
Items Ordered							
Item	Image	Instructions	Vendor Response	Vendor Comments	Price	Quantity	Action
Tuscan Pesto Chicken & Bacon (From: The Kingsbury Pizza)			Accept		1,800.00	<input style="width: 40px; height: 25px;" type="button" value="1"/>	<input type="button" value="Update"/> <input type="button" value="Delete"/>
Delivery Cost					250.00		
Total					2,050.00		
<input type="button" value="Add New Item"/>							

The “Add New Item” button located below the “Items Ordered” table provides a convenient way for the admin user (i.e. Pinto staff) to make a last-minute addition to the customer’s cart. Pressing this button will open a mini form in the bottom part of the same page as shown below.

Vendors	Account	View Orders	Reports	Contact Us			
Enter Comments: <input style="width: 100%; height: 40px;" type="text"/>		Order Status: Pending <input style="float: right;" type="button" value="Update"/>					
Items Ordered							
Item	Image	Instructions	Vendor Response	Vendor Comments	Price	Quantity	Action
Tuscan Pesto Chicken & Bacon (From: The Kingsbury Pizza)			Accept		1,800.00	<input style="width: 40px; height: 25px;" type="button" value="1"/>	<input type="button" value="Update"/> <input type="button" value="Delete"/>
Delivery Cost					250.00		
Total					2,050.00		
Add New Item Select Vendor: <input style="width: 200px;" type="text" value="Chinese Dragon Cafe"/> Select Item: <input style="width: 200px;" type="text"/> Select Quantity: <input style="width: 40px; height: 25px;" type="button" value="1"/>					<input type="button" value="Cancel"/> <input type="button" value="Add"/>		
Customer Instructions:							

The “Add New Item” form enables the selection of a vendor, followed by the selection of a product offered by that vendor. The available options in the “Select Item” drop down will depend on which vendor has been selected!

Vendors	Account	View Orders	Reports	Contact Us			
<input type="text" value="Enter Comments..."/>			<input type="button" value="Order Status: Pending"/>	<input type="button" value="Update"/> <input type="button" value="Delete"/>			
Items Ordered							
Item		Instructions	Vendor Response	Vendor Comments	Price	Quantity	Action
Fried Rice with Chicken (From: Chinese Dragon Cafe)		Not spicy!			900.00	<input type="button" value="2"/>	<input type="button" value="Update"/> <input type="button" value="Delete"/>
Tuscan Pesto Chicken & Bacon (From: The Kingsbury Pizza)			Accept		1,800.00	<input type="button" value="1"/>	<input type="button" value="Update"/> <input type="button" value="Delete"/>
Delivery Cost					250.00		
Total					2,950.00		
<input type="button" value="Add New Item"/>							

Once the “Add Item” form is submitted, the same “order process” page will be reloaded with new item added to the table. Once satisfied with the modifications to the current order, the Pinto representative can return to the order list by pressing the “Go Back to Order List” option at the top of the page.

3.4.5 Admin User’s (i.e. Pinto Staff) ability to Add a New Order:

Vendors	Account	View Orders	Reports	Contact Us				
View Orders								
Filter Orders By:		Order Status	<input type="button" value="All"/> <input type="button" value="Time Range"/> <input type="button" value="Past Day"/>	<input type="button" value="Apply"/>				
<input type="button" value="Add New Order"/>								
Order ID	Order Time	Order Status	Customer	City	Phone	Instructions	Total	
11	2018-02-09 11:51:07	Pending	Dinesh Chandimal	Colombo 8	(011)2238379		4750.00	<input type="button" value="Process"/>
10	2018-02-09 11:34:04	Pending	Gehan Perera	Colombo 5	(071)5364412	Near ESOFT School	3450.00	<input type="button" value="Process"/>
9	2018-02-09 11:18:25	Pending	Diane Sparrow	Colombo 7	(077)7332020	House located opposite Sadeepa Book Shop	2950.00	<input type="button" value="Process"/>

In addition to updating existing online orders, the system allows Pinto’s staff users to add a brand new order on behalf of a customer. This facility can be accessed via the “Add New Order” button located near the top of the View Orders page. This adds a greater degree of versatility to the application because Pinto’s staff users will have the option to enter offline (phone) orders into the system.

When the admin user (staff) is adding a new customer order using the system, the screen layout is almost identical to the customer's order checkout pages. The same progression of steps will be indicated in the side panel. The only difference lies in how an item is first added to the cart. Unlike for the customer, the admin user will have an additional button called "Add New Item" to directly add something to the cart instead of having to browse through the different restaurants and their product lists.

Pressing the "Add New Item" button will open a mini form (the same form available in the order processing screen).

The "Add New Item" form enables the selection of a vendor, followed by the selection of a product offered by that vendor. As soon as an item is added, it will be displayed as a record in the shopping cart.

Shopping Cart

Customer Info
Verify Order
Order Summary

[Return to Order List](#)

Shopping Cart

[Empty Cart](#) [Checkout](#)

Item	Instructions	Quantity	Price	Action
Tuscan Pesto Chicken & Bacon (From: The Kingsbury Pizza)		1	1,800.00	Update Delete
Total			1,800.00	

Add New Item

Select Vendor: Select Item: Select Quantity:

Customer Instructions

[Cancel](#) [Add](#)

The remaining steps are exactly the same for an admin user (i.e. Pinto staff) as for a customer.

3.4.6 Updating the Product List for a Vendor

Vendors can login to the application and update their own product lists. Access controls are in place to prevent a vendor from editing the products of other vendors. A given vendor will only be able to see the items offered by other restaurants in view-only mode, but not in an editable mode. However, Pinto's staff users will be able to edit the product list of any vendor.

Cafe Beverly

Item	Description	Price	Image	Action
Signature Club Sandwich	The king among sandwiches!	1000.00		Edit Delete

Cafe Beverly - Product List

[Add New Product](#)

Vendors	Account	View Orders	Reports	Contact Us
Cafe Beverly - Product List				
Add New Product				
Item	Description	Price		
Signature Club Sandwich	The king among sandwiches!	1000.00		Edit Delete
Bistro Seafood Burger	Recommended for seafood & burger lovers alike!	800.00		Edit Delete
Caesar Salad with Chicken	Made from the healthiest of ingredients!	1000.00		Edit Delete

Each product record can be deleted or edited as necessary. Additionally, there is an “Add New Product” button which enables the user to add a new product record to the existing list. Both editing & adding options will lead to a similar form where the user will be prompted to enter or modify product details. A new image can also be uploaded for the product.

Vendors	Account	View Orders	Reports	Contact Us
Product by Cafe Beverly				
Product Name	<input type="text" value="Grilled Chicken Sub"/>	Price	<input type="text" value="700.00"/>	
Guaranteed to satisfy your taste buds!				
Description (Limit: 255 characters)	<input type="text"/> <small>.as</small>			
Upload Image	<small>Supported file types are: JPG,GIF & PNG only To avoid distortion, please choose an image with equal height & width</small>			
	<input type="button" value="Browse..."/>	<small>No file selected.</small>		
	<input type="button" value="Cancel"/>	<input type="button" value="Edit"/>		

- Please refer to Appendix B for more User Interfaces

3.5 Reports

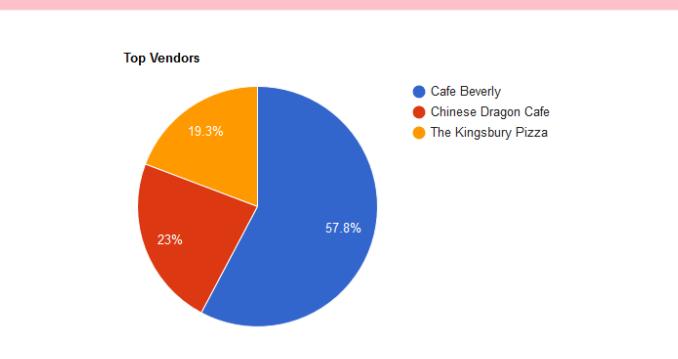
There are currently 2 types of reports offered by the system – Top Vendors & Top Products. Google Charts were used to create both pie charts. These reports help identify the top performing vendors & products over any selected period of time. The data used for the reports can be filtered using several options. The performance of a product or a vendor can be judged based on two

different methods. These alternative ranking options are represented by the radio button choices above the charts. The “Order Count” option means that you are simply counting the total number of items delivered. On the other hand, the “Total Sales” option additionally considers the price of each individual product.

Vendors Account Shopping Cart Trending Contact Us

Popular Vendors

Ranking based on: Order Count by Vendor Total Sales by Vendor
 Time Range: Past Month

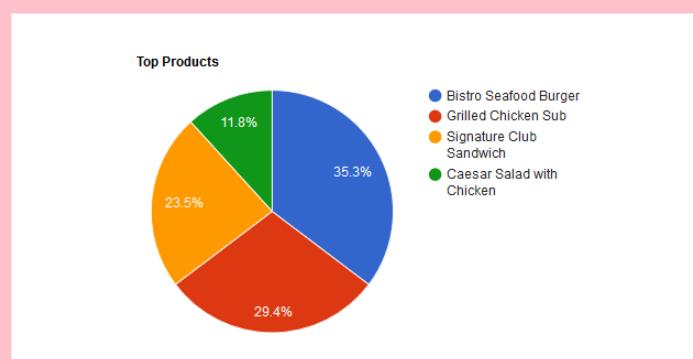


Vendor Name	Total Sales
Cafe Beverly	5400.00
Chinese Dragon Cafe	2150.00

Vendors Account Shopping Cart Trending Contact Us

Popular Products (for Cafe Beverly)

Ranking based on: Quantity Sold by Product Total Sales by Product
 Select Vendor:
 Time Range: Enter Custom Range



Product Name	Number of Sold Items
Bistro Seafood Burger	6
Grilled Chicken Sub	5
Signature Club Sandwich	4

4. IMPLEMENTATION

4.1 Introduction

"Implementation is the systematically structured approach to effectively integrate software based service or component into the workflow of an organizational structure."

This chapter focuses on how the deliverables of the project will be implemented in the live environment, which is a completely functioning Online Ordering system. Furthermore this chapter explains on the implementation approach, implementation requirements and how users were trained.

4.2 Implementation Process

Since the existing system had no mechanism in place for dealing with online orders, the main feature of my application essentially introduced a new business process to the company. So, for the main (online ordering) feature, a parallel adoption strategy would not have made sense. Similarly, Pilot adoption was also ruled out because Pinto is a small company with few employees. Even though the online ordering capability did not already exist, replacing all existing processes with the full breadth of the new system's functionality was considered too risky. Therefore, I decided to use a Phased Adoption strategy where integration of the new system is performed incrementally as a series of manageable steps.

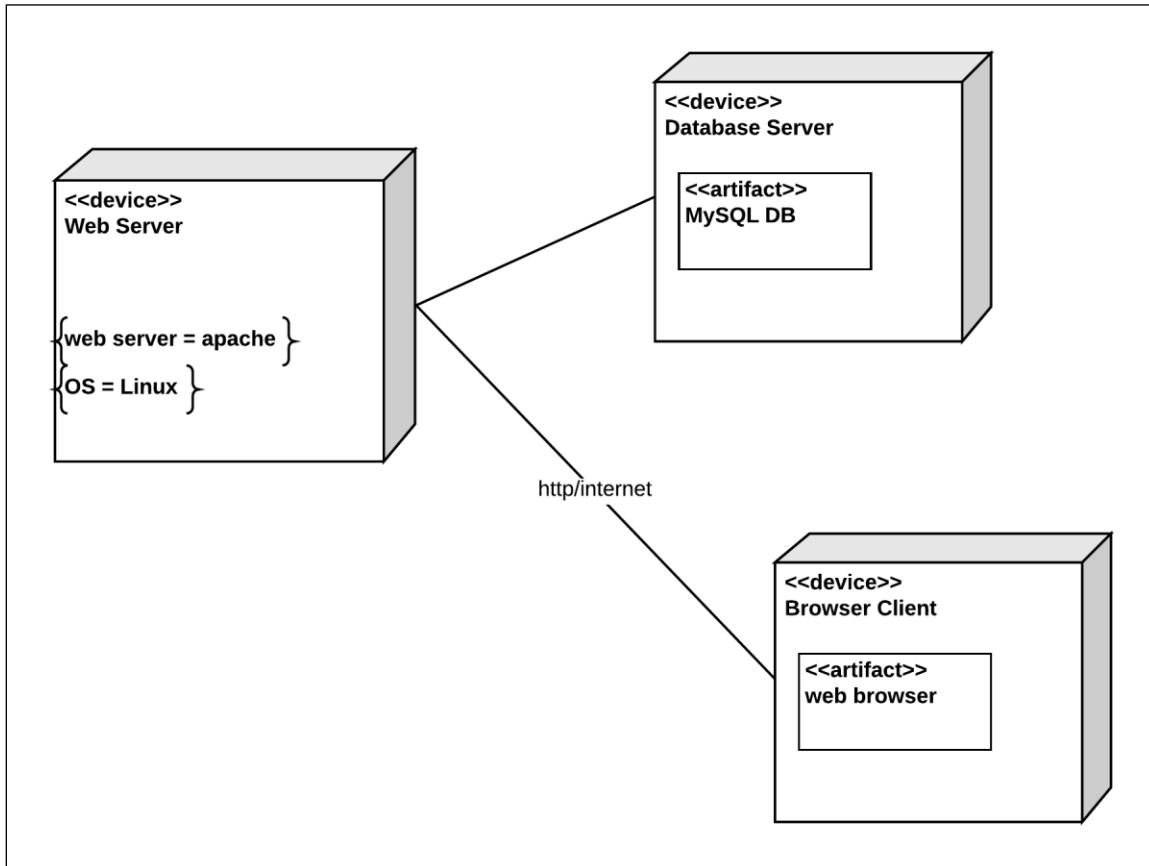
Phased Rollout (by Module) generally involves strategically implementing the different modules (of the system), one at a time. In this method, the core modules are generally integrated first. Although the time line is longer, this method is less risky compared to a direct/cutover adoption approach. Also, compared to other methods, identifying specific issues with the new system is easier when adopting a phased conversion strategy.

As with most implementation approaches, the plan was first discussed and finalized with the management. The necessary hardware & software upgrades were planned and obtained for the staff users' PCs. Next, staff were trained on how to operate the (new) Online Ordering System. The system was then hosted on an external server that was conformant with the technical requirements mentioned below. This included migrating the scripts & the database. I then performed another round of testing to ensure that the system was working as expected in this new environment.

After setting up the system in the live environment, the following sequence of “phases” were enacted in order to gradually introduce the functionalities of the new system into the working environment:

1. Initially only admin users (staff/managers at Pinto) were granted access to the system. Admin accounts were created for each staff & managerial user. These users then used their admin privileges to create vendors in the system. In this phase, it was these staff users who (with the consent of the vendors) populated the product information for each participating vendor.
2. Access restrictions to the website were then eased in order to allow customers to place online orders for the first time. Now 2 of the 3 user types had access to the system. Online orders were viewed by staff & processed. For order confirmation, vendors were reached via phone just like before.
3. In this third stage, in addition to the above functions, offline orders (i.e. orders placed by customers over the phone) were also entered into the system by staff. The process of recording phone orders on an Excel file was discarded.
4. For the final stage of adoption, vendors will be invited to login to the web site & directly update their respective information. They will also be able to respond to pending orders through the system. This will happen once admin users (i.e. Pinto staff) become fully confident with the new system.

4.3 Hardware & Software Installation



Hardware and Software configuration has to be done according to specifications defined in the Requirements Analysis stage. For users of the system, there is no need for special performance hardware because it is web based. However, a high performance server is required to efficiently handle concurrent users and their simultaneous transactions.

Following is a brief summary of all the necessary checks:

- Setup Checks on software.
- Verify correct hardware and operating system configuration
- Verify Successful network connectivity to main server.
- Apache/MySQL server installation
- Confirm connection to server
- Finalize hardware and software installation

Hardware Specifications – Client

Since there is no special software installation to be performed on client computers, the following hardware requirements are adequate for a client pc:

- Intel celeron processor CPU
- Computer memory 2GB
- 60GB Hard Disk Drive
- Internet connection
- UPS
- Printer
- Monitor

Software Specifications – Client

Because the system is a web application, it is compatible with any operating system capable of supporting the latest browsers. Operating systems such as Microsoft Windows, Linux, Mac OS or even android or ios devices can be used. The system was successfully tested on the following browsers:

- Mozilla Firefox
- Google Chrome
- Safari
- Microsoft Edge
- Internet Explorer 11
- Google chrome on android OS
- Safari on IOS

Hardware Specifications – Server

Due to the need to handle hundreds of concurrent users, transactions and queries, the server should consist of high performance hardware adhering to the following requirements:

- 16 Core AMD Opteron™ Processor 6376
- Memory of 16 GB
- 1GB VGA
- 1 TG Raid Hard Disk Drive

- SSD caching
- Internet connection speed 10Mbps to 10Gbps
- Printer
- UPS
- Monitor

Software Specifications – Server

Minimum requirements:

- Windows or Linux as OS
- Server which includes: Apache server (PHP) & MySQL server

4.4 Training

Training of the end users is one of the most important steps for a successful system implementation. Even if the system's functionality and configurations are complete & free of major errors, the launch of the new system will be viewed as unsuccessful if the end users do not know how to use it, or feel uncomfortable with it.

Training workshops were carried out in the early stages of implementation. Each user was taught how to handle the system and perform all required transactions. All users at Pinto received thorough training on functions related to order tracking, editing, updating of product information and customer passwords. In addition, the managerial users were trained on all the account management & report generation features. Also, in the coming weeks, a compact user manual will be printed and delivered primarily to help future employees quickly adjust to using the system.

5. TESTING

5.1 Introduction

Testing is the process of evaluating a system or its component(s) with the intent to find whether it satisfies the specified requirements or not. Testing is executing a system in order to identify any gaps, errors, or missing requirements in contrary to the actual requirements.

According to ANSI/IEEE 1059 standard, Testing can be defined as- A process of analyzing a software item to detect the differences between existing and required conditions (that is defects/errors/bugs) and to evaluate the features of the software item

5.2 Testing Strategies

For the Online Ordering System, I have primarily used 2 main testing methods. Black Box & White Box testing.

- Black Box Testing – This method of testing does not use any knowledge of the inner workings of the software system. Typically, while performing a black-box test, a tester will interact with the system's user interface by providing inputs and examining outputs. Test cases are generally derived based on analysis of the system specifications.
- White Box Testing – This method of testing requires a thorough knowledge of the source code. Under white box testing, the code is tested for security issues, poorly structured paths, and the flow of specific inputs through the code. White box testing involves checking a series of predefined inputs against expected outputs. Generally, every statement & conditional branch is tested at least once. White box testing strategies usually include a comprehensive set of test cases for statement coverage, branch coverage & sometimes, path coverage.

I applied white box testing methods primarily to test form input validations and to ensure that all branches of code were covered by the set of proposed test cases. For example, I entered various valid & invalid values as inputs for the date/time fields in order to check whether the code for validating these inputs is working properly. Additionally, a diverse range of inputs were selected to make each condition in the code (if/else conditions, individual cases of switch statements, & looping conditions) become true as well as false.

I used black box testing concepts primarily at the integration testing & system testing levels. Test cases were designed to check whether the system's components conform to the business requirements.

5.3 Levels of Testing

Testing was performed at several different levels/stages of the development process:

- Unit Testing - A unit is the smallest testable part of software. It usually has one or a few inputs and usually a single output. This is the first level of software testing & is performed prior to integration testing. At this level, the cost of fixing a detected defect is significantly less than at higher levels.
- Integration Testing – This is a level of software testing where individual units are combined and tested as a group.
- System Testing – This is the process of testing an integrated system as a whole, to verify that it meets specified requirements. The “integrated system” comprises hardware as well as software components. System testing is the third level of software testing performed after integration testing & before acceptance testing.
- Acceptance Testing – This is the final level of testing where the system is tested to evaluate its compliance with the business requirements and assess whether it is acceptable for delivery.

I performed unit testing simultaneously while writing the code. White box testing method was primarily used for unit testing.

Since the application did not have any formal interfaces between the modules, requirements for integration testing were considered to be fulfilled once specific test cases were either performed individually, or combined & performed in a logical sequence, resembling a realistic business work flow. For example, I was able to test the combined functionality of various modules by performing a sequence of tasks starting with an admin user's creation of a new vendor in the system & ending with a customer placing orders for items offered by that new vendor.

System testing was performed after the application was successfully hosted on an external server. In general, the same test cases (performed during integration testing) were reused in order to evaluate the functionality experienced by each of the three different user types. Additionally, the

test cases related to (remote) database connectivity & security (see below tables) were executed. Mainly, black box testing methods were adopted.

Once the release of system was completed, acceptance testing was performed by the client (under my guidance), mostly in an unstructured, ad-hoc manner.

5.4 Test Cases

- Please refer to Appendix C for snapshots of test results.**

Test Case Number	01
Test Case Type	Unit Test
Test Case Name	Database Connectivity
Description	Run the mysqli_connect function with relevant database connection parameters such as DB server address, user name and password
Test Data	
Valid	Invalid
Run the mysqli_select_db function with correct database name. (Eg: Pinto)	Run the mysqli_select_db function with incorrect database name. (Eg: Pinto5)
Expected Results	
Valid	Invalid
Returns an object which represents the connection to a MySQL Server	Throw error message "Unable to connect to MySQL" and stop the script.

Test Case Number	02
Test Case Type	Security Test
Test Case Name	Login to Online Ordering System
Description	Authentication of a user belonging to any one of the 3 user types (customer, vendor or admin)
Test Data	
Valid	Invalid
Enter correct login information on the correct login for the relevant user type. (Eg: vendor should login using the vendor's login form)	Incorrect login information (wrong username & password combination) or correct login information entered in the wrong login form (Eg: vendor attempting to login using the customer's login form)
Expected Results	
Valid	Invalid
Successfully logs the user into the system. Available options in the Navigation menu and module access should be based on the account holder's user type.	Login to the system denied with an error message.

Test Case Number	03
Test Case Type	Integration Test - Customer' Online Ordering
Test Case Name	Customer's Shopping Cart
Description	
<p>1. Add several different items (including products p,q,r,s & t) from at least two different vendors to the shopping cart.</p> <p>2.1 Follow the highlighted link to the shopping cart & verify the items & quantities in the cart</p> <p>2.2 Add an instruction/comment for product p in the cart. (Remember to press Update)</p> <p>2.3 Delete an item (say q) from the cart</p> <p>2.4 Change quantity of product r.</p> <p>3.1 Leave the Shopping Cart & visit the page of the vendor who offers product q. Make sure that the (deleted) product q once again has the "Add to Cart" button enabled next to it. (Instead of the "Remove from Cart" button)</p> <p>3.2 Visit the vendor offering product r & verify that the new quantity is displayed next to that product.</p> <p>3.3 Pick another product from the cart (say s) & change its quantity from the relevant vendor's product page itself.</p> <p>3.4 Similarly, delete another cart item (say t) before returning to the shopping cart.</p> <p>4. Return to the Shopping Cart & verify that the changes made in the previous step are correctly reflected.</p> <p>5. Verify the total amount in the last row of the Shopping Cart.</p>	
Expected Results	
<p>1. As soon as the first item is added, the "Shopping Cart" link in the Navigation Menu should become highlighted.</p> <p>2. Customer's shopping cart contents should update based on items added from the various vendor pages. It should also update when changes are made in the shopping cart itself.</p> <p>3. Changes made from the Shopping Cart should also be reflected when the user revisits the individual vendor pages. For example, "Add to Cart" button should become enabled once again for any items removed from the cart.</p> <p>4. Changes made to the cart's contents from the individual vendor product lists should be reflected</p>	

when returning to the shopping cart. (For example, deletions & quantity updates)

5. The "Total" value should update continually as changes are made to the cart.

Test Case Number	04
Test Case Type	Integration Test - Customer' Online Ordering
Test Case Name	Customer's Order Checkout Process
Description	
<p>1. Add several items (at least 4 different products) to the shopping cart.</p> <p>2. Follow the link to the cart. Enter special instructions for at least one item. Press "Checkout" button to proceed to the next step in the ordering process.</p> <p>3. In the "Customer Info" form, enter invalid data to check for form validation controls:</p> <p>3.1 Leave the Name field empty & press Continue</p> <p>3.2 Leave the Address field empty & press Continue</p> <p>3.3 Leave the Phone field empty & press Continue</p> <p>3.4 Enter a number that is less than/greater than 10 digits as the phone number. Press Continue.</p> <p>4. Now enter valid data for all required fields in the "Customer Info" form. Press Continue.</p> <p>5. Check the order details displayed in the "Verify Order" screen.</p> <p>6.1 Press "Go Back." Check the validity of the data automatically displayed in the "Customer Info" form.</p> <p>6.2 Change at least one of the following fields: Name, Phone or Address.</p> <p>7.1 Press "Go Back" again to return to the Shopping Cart view. Verify the contents.</p> <p>7.2 Delete an item in the cart.</p> <p>7.3 Change the quantity of another item.</p> <p>7.4 Add special instructions for another item.</p> <p>8. Continue through the steps once again until the "Verify Order" screen is reached. Check whether the Order details have updated to reflect all the changes made.</p>	

Expected Results	
1. Link to the Shopping Cart should become highlighted.	
2. Shopping Cart contents should update based on the items & their quantities added.	
3. When invalid data is entered in the "Customer Info" form, the user should be returned to the same screen with appropriate error messages. These messages should appear above the form in red font & they should precisely indicate which input field(s) has the invalid value.	
4. The "Verify Order" screen should appear.	
5. The "Verify Order" screen should display a complete & accurate summary of the order.	
6. When revisiting the "Customer Info" form, all previously entered values should automatically populate the fields.	
7. Shopping Cart should remain the same as when it was last updated. User should be able to still modify its contents.	
8. The "Verify Order" screen should now reflect any recent changes made to both the cart's contents and to the customer's contact information.	

Test Case Number	05
Test Case Type	Integration Test - Customer' Online Ordering
Test Case Name	Confirming & Saving an Order
Description	
<p>1. Add several items (at least 4 different products) to the shopping cart. Select products x & y from vendor A. Select products p & q from vendor B. Quantities should be 1 each for vendor A's products & 2 each for those added from vendor B's product list.</p> <p>2. Follow the link to the cart. Enter special instructions for products y & q. Press "Checkout" button to proceed to the next step in the ordering process.</p> <p>3. Fill the "Customer Info" form with valid data. Additionally enter general Instructions for the order. (For example, mention a landmark near the address location) Press Continue.</p> <p>4. Check the order details displayed in the "Verify Order" screen. Press "Confirm" to confirm the order.</p> <p>5. Check the details displayed in the Order Summary screen. Make a note of the Order Reference Number.</p> <p>6.1 Login as vendor A & follow the "View Orders" link from the main navigation menu. Look for two</p>	

separate records (rows) with the Order ID matching the Order Reference Number mentioned above.

6.2 Login as vendor B & follow the "View Orders" link from the main navigation menu. Look for two separate records (rows) with the Order ID matching the Order Reference Number mentioned above.

7. Now login as a Pinto staff user (i.e. an admin user) & follow the "View Orders" link. This time, look for a single record corresponding to the above order. Once found, press "Process" on the relevant row to view all details corresponding to the above order.

Expected Results

1. Link to the Shopping Cart should become highlighted.

2. Shopping Cart contents should reflect the correct items, quantities & any special instructions.

Once the "Checkout" button is pressed, the "Customer Info" screen should appear.

3. The "Verify Order" screen should appear.

4. The "Verify Order" screen should display a complete & accurate summary of the order. Once confirmed, the user should automatically get redirected to the final Order Summary screen.

5. Order summary should be complete & accurate. A reference number for the order should be displayed on top.

6.1 In the "View Orders" screen, vendor A should see two records pertaining to the above order.

There should be one record for product x & another for product y. The customer's instructions for product y should also be displayed in the corresponding record. Vendor A should not be able to see any of the records pertaining to other products offered by different vendors. (Eg: information related to products p & q from vendor B should not be available)

6.2 Vendor B should also see two records as a result of our order. These records should correspond to the products p & q. Information related to vendor A's products (x & y) should not be available.

7. Staff user should be able to locate exactly one record representing our order. Once the "Process" button is pressed, all order details including the contact information & all ordered items (x, y, p & q) should become available to the (Pinto) staff user.

Test Case Number	06
Test Case Type	Integration Test - Vendor's Order Tracking
Test Case Name	Viewing & Responding to an ordered item (Vendor)
Description	
<p>1. Create a new order either as a customer or as an admin user (on behalf of a customer). Include products x & y from vendor A. Quantity should be 2 for x & 1 for y. Enter special instructions for both products. Make a note of the Order Reference number (i.e. Order ID).</p> <p>2. Login as vendor A & follow the "View Orders" link from the main navigation menu. Look for two separate records (rows) with the Order ID matching the Order Reference Number mentioned above.</p> <p>3. Enter "Accept" as the Vendor Response for item x & "Reject" as the Vendor Response for item y. Additionally, enter a reason under "Vendor Comments" for item y. (Eg: "Requested Item is not available today")</p> <p>4. Now login as a Pinto staff user (i.e. an admin user) & follow the "View Orders" link. This time, look for a single record corresponding to the above order. Once found, press "Process" on the relevant row to view all details corresponding to the above order.</p> <p>5. Look at the "Ordered Items" table below the general order (contact) information. For each of its records, check the accuracy of the quantity, customer instructions, vendor response etc.</p>	
Expected Results	
<p>1. Order summary should be complete & accurate. A reference number for the order should be displayed on top.</p> <p>2. In the "View Orders" screen, vendor A should see two records pertaining to the above order. There should be one record for product x & another for product y. The customer's instructions for each product should also be displayed in the corresponding records. Quantities should also be correctly displayed - 2 for x & 1 for y.</p> <p>3. The information in the Vendor Response & Comments columns should update based on the changes made.</p> <p>4. Staff user should be able to locate exactly one record representing our order. Once the "Process" button is pressed, all order details including the contact information & the ordered items (x, y) should become available to the (Pinto) staff user.</p> <p>5. There should be a separate record (row) in the table for each unique item ordered. Customer instructions & quantities should be correct for both products x & y. In addition, the Vendor</p>	

Response column should display "Accept" for product x & "Reject" (in red font) for product y. The vendor's comment for product y should also be visible.

Test Case Number	07
Test Case Type	Integration Test - Admin Order Tracking & Updating
Test Case Name	Process Order screen
Description	
<p>1. Execute Test Case No. 5</p> <p>2. Login as a Pinto staff user (i.e. an admin user) & follow the "View Orders" link. Locate the order & open the "Process Order" screen for the order.</p> <p>3.1 Change the Order Status to "Confirmed"</p> <p>3.2 Change the Order Status to "Cancelled"</p> <p>3.3 Change the Order Status to "Delivered"</p> <p>3.4 Change the Order Status to "Pending" once again.</p> <p>4.1 From the "Ordered Items" table, change the quantity of x to be 3.</p> <p>4.2 Delete product y</p> <p>5.1 Press the "Add New Item" located below the table.</p> <p>5.2 Try to submit the form without selecting a product.</p> <p>5.3 Try to add a product (x, p or q) that is already in the "Ordered Items" table</p> <p>5.4 Add product z from vendor A with special instructions & a quantity of 5.</p> <p>6. Now login to the application as Vendor A & follow the "View Orders" link from the main navigation menu. Look for any records (rows) with the Order ID matching the Order Reference Number mentioned above.</p>	
Expected Results	

1. Make a note of the Order Reference Number.

2.1 Staff user should be able to locate exactly one record representing our order. Once the "Process" button is pressed, all order details including the contact information & the ordered items (x, y, p & q) should become available to the (Pinto) staff user. Order Status should be "Pending" by default.

2.2 In the "Ordered Items" table (located below the general order info) there should be a separate record (row) for each unique item ordered. Any customer instructions & quantities should be correctly displayed for all 4 products - x, y, p & q. In addition, there should be options available to either delete or change the quantity of each item in the table.

2.3 Below the table, there should be a button called "Add New Item"

3.1 None of the available information or options should change (except the value of the Order Status field) when the status is changed to "Confirmed"

3.2-3.3 The update quantity/delete options should not be available for the table items. Also the "Add New Item" button should become hidden. (This is because both "Cancelled" & "Delivered" would mean that the order is in a "Closed" state, & therefore, modifications should not be allowed)

3.4 All options should become enabled once again when the status is reverted to "Pending."

4. The "Ordered Items" table should now display only 3 records for the remaining items (x, p & q). The quantity of x should now read as 3. The Total amount should update correctly when the records are modified.

5.1 The "Add New Item" mini-form should open in the bottom part of the screen.

5.2 The "Add New Item" form should reload with an appropriate error message prompting the user to select a product.

5.3 The "Add New Item" form should reload with an appropriate error message when attempting to add a product that is already in the list of ordered items.

5.4 An additional record corresponding to product z should now display in the "Ordered Items" table. The total amount should update.

6. In her "View Orders" screen, vendor A should see two records pertaining to the above order. There should be one record for product x & another for the newly added product z. Quantities should also be correctly displayed - 3 for x & 5 for z. The special instructions associated with product z should also be displayed.

Test Case Number	08
Test Case Type	Integration Test – Admin Order Tracking & Updating
Test Case Name	Adding a New (offline) Order on behalf of a customer
Description	
<p>1. Login as a Pinto staff user (i.e. an admin user) & follow the "View Orders" link.</p> <p>2.1 Press the "Add New Order" button.</p> <p>2.2 There should be no items in the cart. If however, this is not the case, press "Empty Cart" to delete any existing items.</p> <p>3. In the "Shopping Cart" tab, press the "Add New Item" button each time you want to add a new product to the cart. To complete this test step, add products x & y from vendor A. Add products p & q from vendor B. Quantities should be 1 each for vendor A's products & 2 each for those added from vendor B's product list. Add special instructions to both x & y.</p> <p>4.1 (For validation) Press "Add New Item" again & this time try to submit the form without selecting a product.</p> <p>4.2 (For validation) Press "Add New Item" again & try to add a product (x, y, p or q) that is already in the shopping cart.</p> <p>5.1 Now change the quantity of x to 3 from the shopping cart table. Also, change the special instructions for this item and save changes by pressing "Update" next to the record.</p> <p>5.2 Delete item y from the cart by pressing "Delete" next to its record.</p> <p>6. Press "Checkout" button to proceed to the next step in the ordering process.</p> <p>7. Fill the "Customer Info" form with valid data. Additionally enter general Instructions for the order. (For example, mention a landmark near the address location) Press Continue.</p> <p>8.1 Check the order details displayed in the "Verify Order" screen. Press "Confirm" to confirm the order.</p> <p>8.2 Check the details displayed in the Order Summary screen. Make a note of the Order Reference Number.</p>	

- 9.1 Login as vendor A & follow the "View Orders" link from the main navigation menu. Look for a single record (for item x) where the Order ID matches the Order Reference Number mentioned above.
- 9.2 Login as vendor B & follow the "View Orders" link from the main navigation menu. Look for two separate records (for items p & q) where the Order ID matches the Order Reference Number mentioned above.
10. Now login as a Pinto staff user (i.e. an admin user) & follow the "View Orders" link. This time, look for a single record corresponding to the above order. Once found, press "Process" on the relevant row to view all details corresponding to the above order.

Expected Results

1. A table containing a list of recent orders should be displayed. There should be an "Add New Order" button located above the table.
2. An Order Checkout screen with a left side navigation panel indicating a sequence of steps should appear. The first step "Shopping Cart" should appear in bold font. The cart should be empty & there should be an "Add New Item" button located below the cart.
3. Each time a new item is added, the shopping cart should get populated with a new record. At the end, there should be 4 records representing the 4 items added. Quantities should be 1 each for x & y, and 2 each for p & q. Special instructions added to x & y should also be displayed in the relevant rows.
 - 4.1 The "Add New Item" form should reload with an appropriate error message prompting the user to select a product.
 - 4.2 The "Add New Item" form should reload with an appropriate error message when user is attempting to add a product that is already in the list of ordered items. There should be no change whatsoever in the cart's contents.
5. Shopping Cart's contents should update based on the changes made.
6. The "Customer Info" tab should open.
7. The "Verify Order" screen should display a complete & accurate summary of the order. Once confirmed, the user should automatically get redirected to the final Order Summary screen.

8. Order summary should be complete & accurate. A reference number for the order should be displayed on top.
- 9.1 In the "View Orders" screen, vendor A should see a single record pertaining to the above order. In this record the product should be x & quantity 3. Special Instructions should also be the same that were last updated before placing the order. Vendor A should not be able to see any of the records pertaining to other products offered by different vendors. (Eg: information related to products p & q from vendor B should not be available)
- 9.2 Vendor B should see two records as a result of our order. These records should correspond to the products p & q. Quantity should be 2 for each item. Information related to vendor A's products (x) should not be available.
10. Staff user should be able to locate exactly one record representing our order. Once the "Process" button is pressed, all order details including the contact information & all ordered items (x, p & q) should become available to the (Pinto) staff user.

CRITICAL APPRAISAL

6.1 Introduction

Critical appraisal is the process of systematically examining developed software to judge its value and relevance. This chapter aims to examine both the system and the process, in order to identify their strengths & weaknesses. The Online Ordering System was developed to allow customers to place online orders and also to automate the communication between customers, vendors & staff. The developed product is a completely web-based system with a centralized database, hosted on an external server. No special hardware is required by the system's users. Any modern web browser would allow access to the system. The following sub sections provide a detailed critical analysis of the system.

6.2 System Evaluation

In order to effectively perform an evaluation, I have to carefully compare the developed system against the project proposal. There were minor gaps between the requirements stated in the proposal and the functionality offered in this initial system release. The gaps occurred mainly due to the time constraints and my failure to accurately estimate the project timeline.

Objectives Covered

The released system meets all of the following objectives:

- Public Website
- Ability for customers to easily access updated menu information for each participating vendor/restaurant.
- Online ordering capability for customers.
- Ability to accommodate 3 different user types (admins/staff, vendors & customers), each with the required level of functionality.
- Ability for vendors to view & accept/reject any pending orders.
- Online communication capability between vendors & admins/staff once an order is placed.
- Facility for vendors (i.e. restaurant managers) to keep their profiles updated. This includes offered menu items, updated images, operating hours etc.
- Ability for staff/admins to edit order details at any time.

- Ability to enter & track offline orders in addition to online orders. Staff/admin users have the option of creating a brand new order in the system (in order to represent an order placed via phone call).
- Report generation capability.

Objectives Not Covered

The system was released without meeting the following requirements stated in the proposal:

- Controls to change the availability status of each offered product. (Selection of any “unavailable” items should be disabled for customers)

Strengths & Weaknesses

Many strengths & weaknesses are identified during testing & deployment. Some may be identified later during live operation.

Following strengths can be identified due to the web based nature of the application:

- Deployment is quick & easy. The scripts (& database) simply needed to be uploaded to the server of the external web hosting company. (For this release, we decided to rent server space from a commercial web hosting provider)
- High performance & fast response times
- Allows concurrent access for many users from various devices
- Comprehensive backup & recovery system

The Online Ordering Application & its database run on Apache & MySQL servers respectively. Since they are fast & light weight, the system is able to handle many users & transactions simultaneously.

I have also identified the following weakness in the system:

- The GUI is not very attractive compared to other sites offering similar services. In spite of the fact that almost all functional requirements have been fulfilled, customers visiting the website may not be impressed by its appearance.

Future improvements have been discussed in the “Future Expandability” section below.

6.3 Lessons Learnt

Project Management

Even though the system release was completed by the deadline, one or two planned functionalities had to be skipped. The development phase consumed much longer than initially planned. This was because of my lack of prior programming experience. I had to learn PHP from the beginning. Even after gaining adequate familiarity with the programming language, certain seemingly mundane modules took far longer to implement than expected. The module dealing with profile updates & account management function (for the admin users) is a key example of this. Even though the operations were repetitive (simple database update & retrieval queries), these modules required a very detailed level of planning & consideration. On the other hand, the main feature of the application, the module dealing with ordering & processing orders, took only a fraction of the time (compared to the account management module) even though the operations were more complex.

The lessons learned from this project will greatly help future planning efforts for similar undertakings.

Design & Choice of Tools

PHP is a popular, open source technology when it comes to web development. It is a server-side scripting language. PHP runs on various platforms (Windows, Linux, Unix, Mac OS X, etc.) & is compatible with almost all modern servers. Compared to Java & C, PHP is a flexible, loosely typed language. For example, it supports dynamic array lengths (the length of an array does not have to be declared in advance). As such, it offers more freedom & is less intimidating to the beginner web developer. And PHP is considered faster than other web development languages such as ASP and JSP. It also supports object oriented concepts. For these reasons I chose PHP as the programming language for the project.

MySQL is probably the most popular open source relational database management system available. It is very stable and has a big community that helps maintain, debug and upgrade it. Its key commands are few & easy to learn. MySQL commands can be easily issued using standard PHP functions. For these reasons, I chose MySQL as the DBMS.

Frameworks are inherently complex and it can take several months to learn to use them. Choosing the most appropriate framework could also be an arduous task. I had no practical knowledge of

frameworks & learning to use frameworks from scratch would have added an unknown level of variability to the project's time line. (It might have been a time saving endeavor, but I could not risk the opposite outcome) As a result, I wrote every single line of code for this application except for the use of Google Charts in the reporting module.

Testing & Validation

I performed unit testing simultaneously while writing the code. White box testing method was primarily used for unit testing. Test cases were written (by the author) for the integration testing & system testing stages. While I was working on the implementation of the application, I relied on another person to execute these test cases. This was after I educated the tester on the (expected) functionality of the system.

6.4 Future Expandability

Although the system was successfully implemented recently, further improvements for future releases are already being discussed. I am still in the process of collecting user feedback regarding the system. So far, we are considering the following additional requirements for future releases:

Non-Functional:

- Improvements to the GUI – Different background colors, even a large image as the background in certain pages. Improved formatting & alignment of elements. Instead of an image, we could have an admin-customizable slide show (using JavaScript) in the home page.

Functional:

- Ability for a single vendor to create multiple user accounts. Currently only a single account is allowed per vendor.
- Email notifications & automatic password reset option via email. Currently the system allows an admin user (i.e. a staff member) to login & reset a forgotten password on behalf of a customer or vendor.
- Ability for customers to rate & review restaurants & dishes.

- Facility for vendors to self-register. Currently, a managerial user (i.e. level 1 admin user) can create a new vendor in the system & a corresponding user account for that vendor.
- Facility to prevent the submission or orders outside of the stated operating hours of the relevant restaurant.
- An advanced report to identify the busiest times within any given day of the week, in order to better schedule staff & drivers.

6.5 Conclusion

Developing the Online Ordering Application for Pinto Delivery Solutions has given me valuable experience as a beginning web developer. I am confident that my application is able to meet almost all the functional requirements stated in the project proposal. So far, all reported bugs have been fixed within just a few days of being discovered.

I believe that my application will help the company greatly expand its customer base thanks to its online ordering capability. It should also help improve the communication flow between vendors, staff & customers, thereby limiting the need for lengthy phone conversations between those parties. Additionally, customers will have convenient access to updated menu information under each participating restaurant. The company (Pinto) will also have a single, well organized database containing all order history, which in turn will help produce vital information to aid with future decision making.

However, there are a few short comings, especially with regard to the plainness of the user interface. Additionally, as the stakeholders & users gain more experience with my application, they will suggest new & modified requirements for the system. As mentioned before, a set of new functionalities have already been identified for future releases of the system.

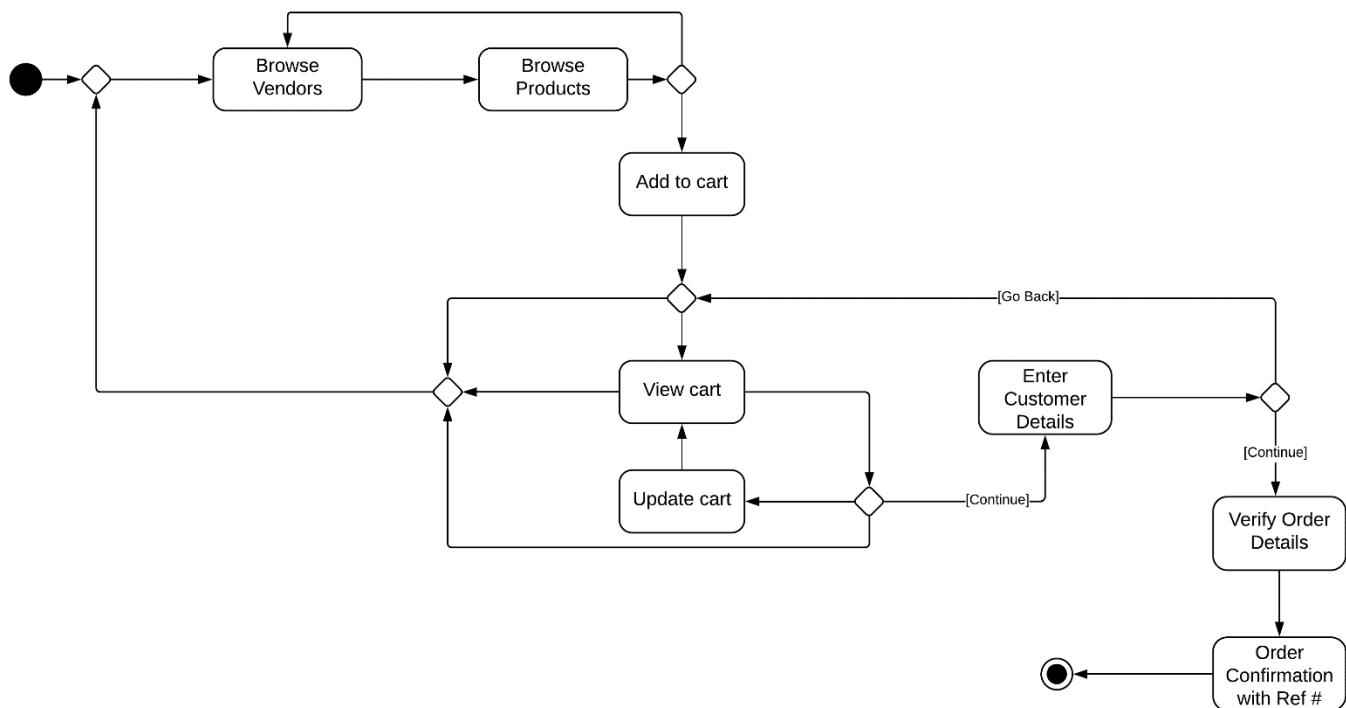
I am thoroughly satisfied that I was able to produce a fully functional system within the expected time frame. I am also looking forward to making the aforementioned enhancements to further improve the client's business processes.

APPENDICES

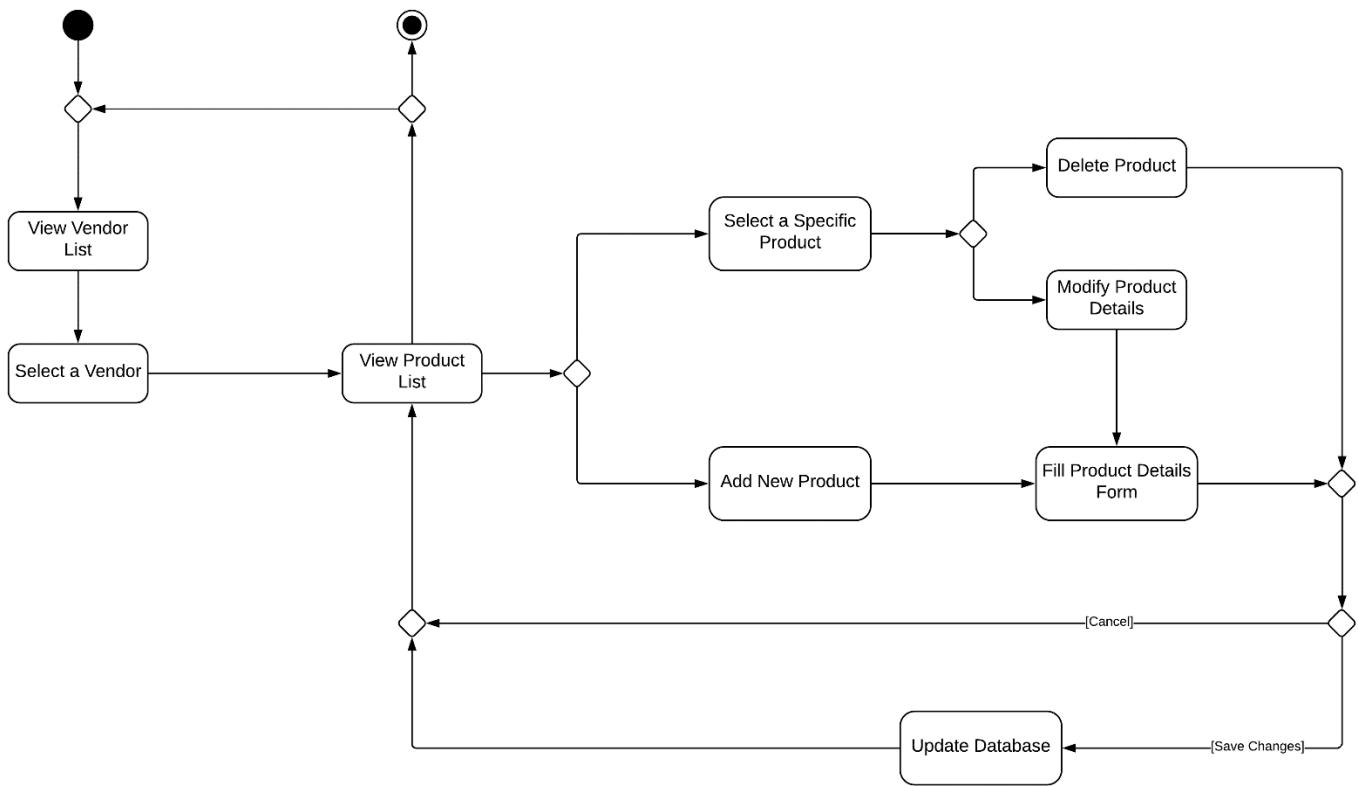
Appendix A

Activity Diagrams

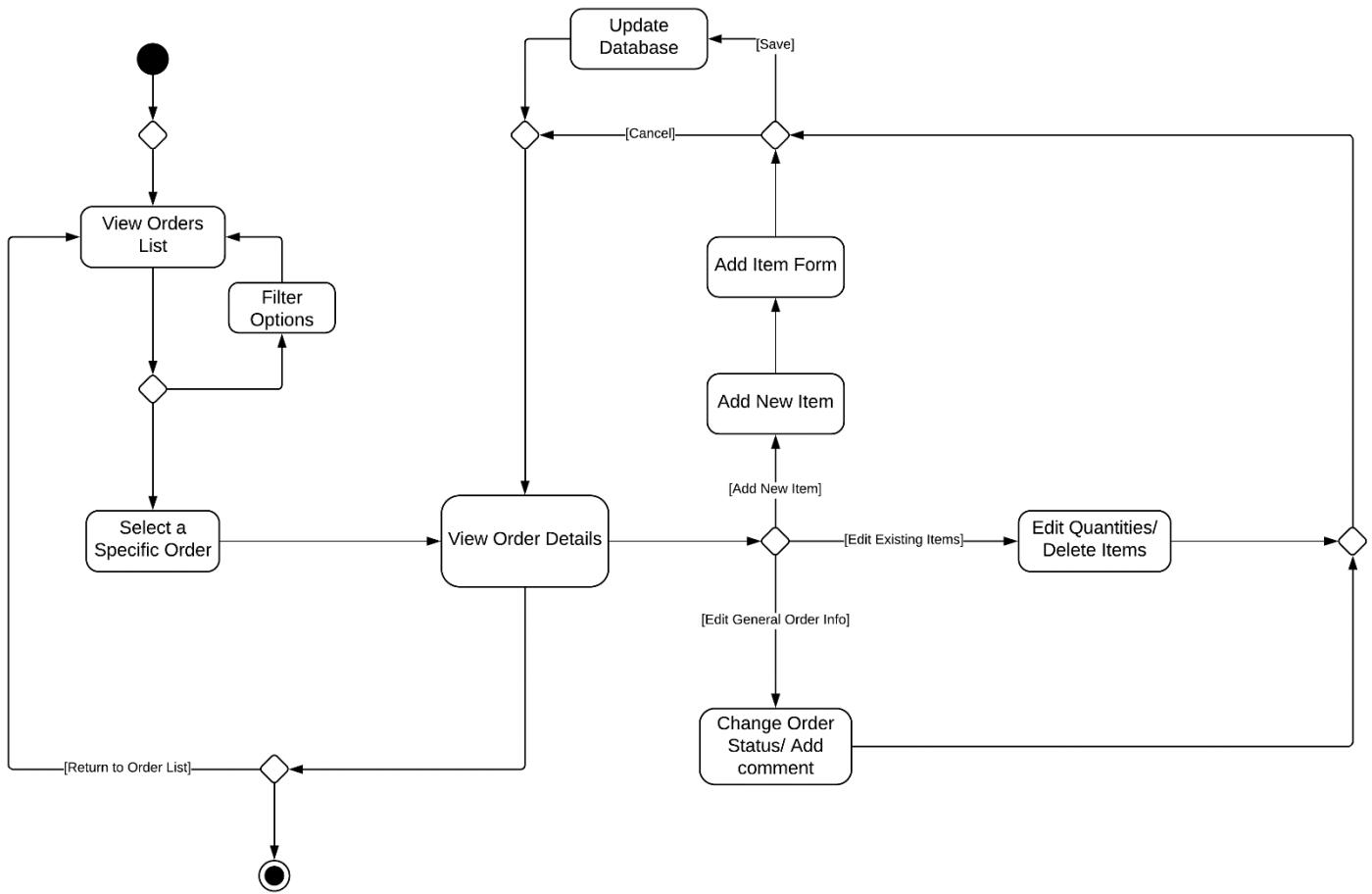
- Activity diagram for Placing an Online Order (Customer)



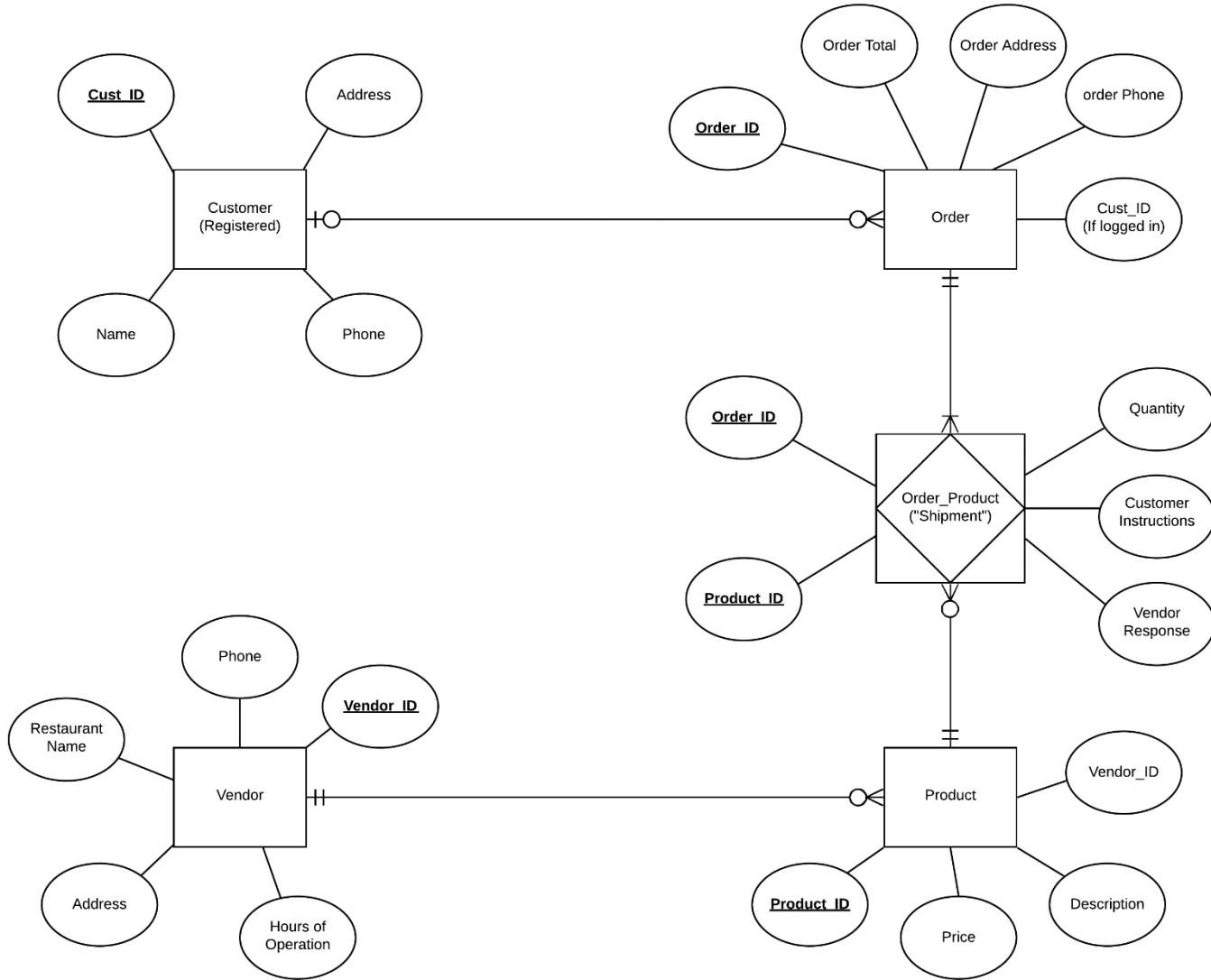
- Activity diagram for Updating Product Information (Vendor/Admin)



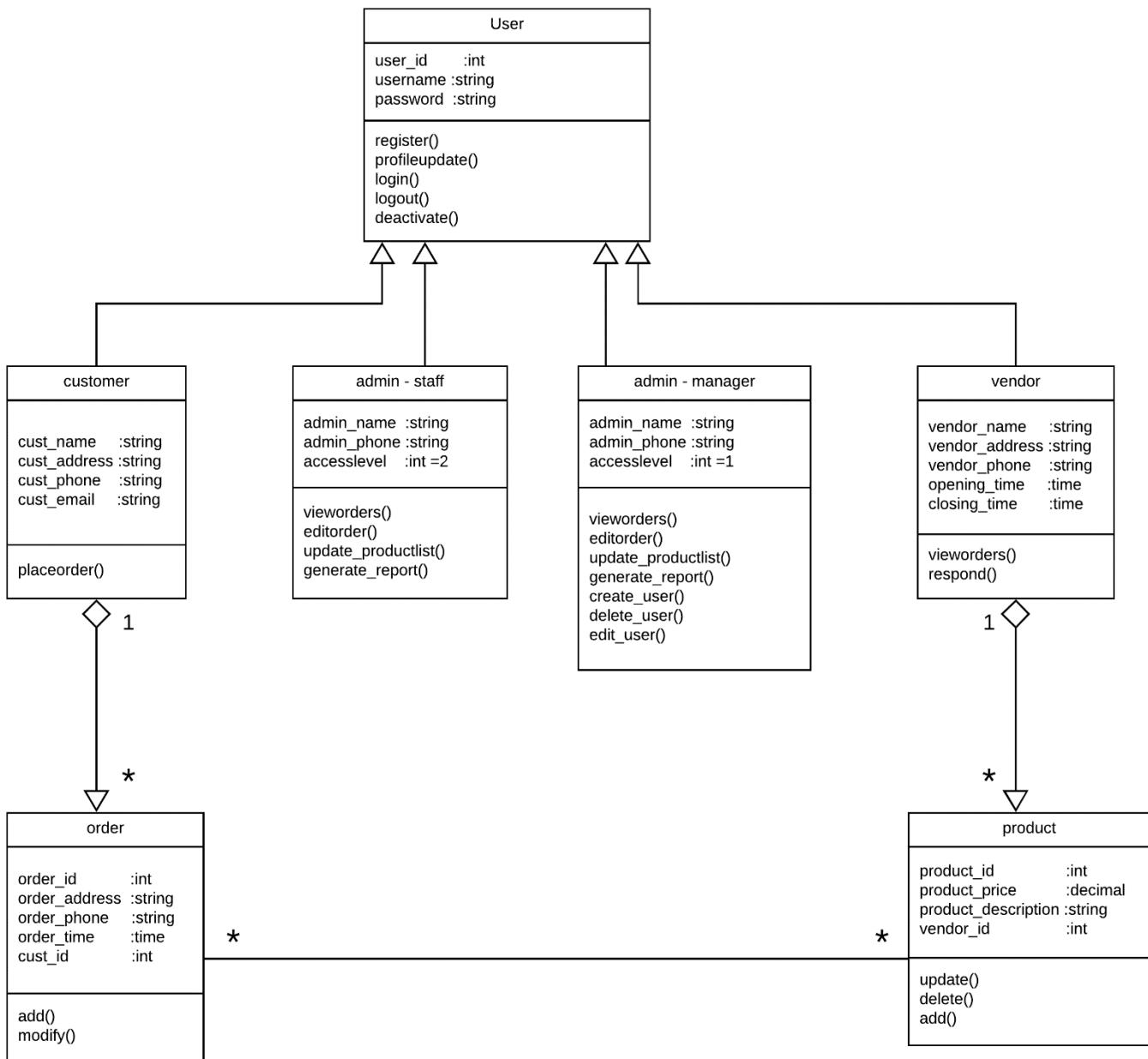
- Activity diagram for Updating Order Details (Admin)



Entity Relationship Diagram



Class Diagram



Appendix B

MORE USER INTERFACES:

Profile Updates & Adding New Users

Any user will be able to update his/her personal profile while logged in. The below screen shot displays the typical profile update page for a customer.

Customer Name	Gehan Perera
Address	340/11 Kuruppu Lane
City	Colombo 8
Email	gehan@yahoo.com
Phone	(011)2697606

Users can update their general information &/or passwords. An admin user can also make changes on behalf of a customer, for example in the case of a forgotten password.

The following screen shots pertain to a vendor user type.

Lahiru (from The Kingsbury Pizza) Logout 

Vendors Account View Orders Reports Contact Us



The Kingsbury Pizza

Company Name	The Kingsbury Pizza		
Address	Janadhipathi Mawatha		
City	Colombo 1	Phone	(011)2332332
Email			
Comments			

Hours of Operation

Weekdays	
Start	09:00
End	23:00
Saturdays	
Start	09:00
End	20:00
Sundays	
Start	09:00
End	20:00

[Return to Product page](#)

Lahiru (from The Kingsbury Pizza) Logout 

Vendors Account View Orders Reports Contact Us



The Kingsbury Pizza

Company Name	The Kingsbury Pizza		
Address	Janadhipathi Mawatha		
City	Colombo 1	Phone	(011)2332332
Email			
Comments			

Hours of Operation (Please enter times in 24hr clock format)

Weekdays	
Start Time	09:00
End Time	23:00
Saturdays	
Start Time	09:00
End Time	20:00
Sundays	
Start Time	09:00
End Time	20:00

[Save Changes](#)

[Return to Product page](#)

In addition to updating general information & password, a vendor will also be able to upload images to greet customers who visit that restaurant's product page.

The screenshot shows a vendor profile page for "The Kingsbury Pizza". At the top, there's a navigation bar with links for Vendors, Account, View Orders, Reports, and Contact Us. The main content area features a large image of a poolside lounge area with umbrellas and a prominent "HONEY" sign. On the left, a sidebar provides options to View Profile, Edit General Info, Change Password, and Upload Images, with the "Upload Images" option currently selected. A logo for "THE KINGSBURY COLOMBO - SRI LANKA" is displayed. Below the sidebar is a "Return to Product page" link.

There are two types of Admin users. “Level 1” admin users are managers/executives working at Pinto. “Level 2” admin users are non-managerial staff users at Pinto. In addition to updating their own profiles, these admin users can all change the account information of any customer. Managerial users (Level 1 admins) additionally have the ability to manage the accounts of vendors & other admin users. They can even create new vendors/admins & delete existing accounts.

The below screen shots illustrate some of the account management pages available to a managerial user.

The screenshot shows a managerial user account management page. At the top, it displays the user's name "JafarB" and a "Logout" link. The interface includes a navigation bar with links for Vendors, Account, View Orders, Reports, and Contact Us. The main content area features a large image of a hand holding a cheeseburger next to a cocktail glass. A vertical sidebar on the left lists account management options: Personal Profile, Manage Admins, Manage Vendors, and Customer List, with "Manage Vendors" currently highlighted.

JafarB Logout 

Vendors Account View Orders Reports Contact Us

List of Active Vendors

[Add New Vendor](#)

 Cafe Beverly	 The Kingsbury Pizza	 Chinese Dragon Cafe
Edit Delete	Edit Delete	Edit Delete

JafarB Logout 

Vendors Account View Orders Reports Contact Us

Manage Admin Users

[Add New Admin User](#)

Employee ID	Name	User Type
EX000002	Jafar Basha	Mngr/Exec
MN000000	Anura DeSilva	Mngr/Exec
ST000004	Arjuna Jayasingha	Staff

Appendix C

TEST RESULT SNAPSHOTS:

Test Case 2 (User Authentication)

The screenshot shows the application's header with navigation links: 'Register', 'Login', and a logo featuring a bottle and glasses.

Vendors	Account	Shopping Cart	Trending	Contact Us
---------	---------	---------------	----------	------------

Administrator Login

Username

Password

Vendor Login

Username

Password

(Incorrect Login)

The screenshot shows the application's header with a user session indicator 'Lahiru (from The Kingsbury Pizza)', 'Logout' link, and a logo.

Vendors	Account	View Orders	Reports	Contact Us
---------	---------	-------------	---------	------------

The Kingsbury Pizza

The Kingsbury Pizza - Product List

(Successful Login)

Test Case 3 (Shopping Cart)

Register Login 

Vendors	Account	Shopping Cart	Trending	Contact Us
Cafe Beverly - Product List				
Item	Description	Price	Image	
Signature Club Sandwich	The king among sandwiches!	1000.00		3 <input type="button" value="Change Quantity"/> <input type="button" value="Remove from Cart"/>
Bistro Seafood Burger	Recommended for seafood & burger lovers alike!	800.00		1 <input type="button" value="Add to Cart"/>
				

Vendors	Account	Shopping Cart	Trending	Contact Us																				
Shopping Cart Customer Info Verify Order Order Summary Return to Home page	Shopping Cart <div style="display: flex; justify-content: space-between;"> <input type="button" value="Empty Cart"/> <input type="button" value="Checkout"/> </div> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #e67e22; color: white;"> <th>Item</th> <th>Instructions</th> <th>Quantity</th> <th>Price</th> <th>Action</th> </tr> </thead> <tbody> <tr> <td>Signature Club Sandwich (From: Cafe Beverly)</td> <td>Light on the Veggies</td> <td>3 <input type="button" value=""/></td> <td>3,000.00</td> <td style="text-align: center;"> <input type="button" value="Update"/> <input type="button" value="Delete"/> </td> </tr> <tr> <td>Grilled Chicken Sub (From: Cafe Beverly)</td> <td></td> <td>1 <input type="button" value=""/></td> <td>700.00</td> <td style="text-align: center;"> <input type="button" value="Update"/> <input type="button" value="Delete"/> </td> </tr> <tr> <td>Piri Piri Chicken (From: The Kingsbury Pizza)</td> <td></td> <td>1 <input type="button" value=""/></td> <td>1,600.00</td> <td style="text-align: center;"> <input type="button" value="Update"/> <input style="border: 2px solid red; background-color: red; color: white;" type="button" value="Delete"/> </td> </tr> </tbody> </table>				Item	Instructions	Quantity	Price	Action	Signature Club Sandwich (From: Cafe Beverly)	Light on the Veggies	3 <input type="button" value=""/>	3,000.00	<input type="button" value="Update"/> <input type="button" value="Delete"/>	Grilled Chicken Sub (From: Cafe Beverly)		1 <input type="button" value=""/>	700.00	<input type="button" value="Update"/> <input type="button" value="Delete"/>	Piri Piri Chicken (From: The Kingsbury Pizza)		1 <input type="button" value=""/>	1,600.00	<input type="button" value="Update"/> <input style="border: 2px solid red; background-color: red; color: white;" type="button" value="Delete"/>
Item	Instructions	Quantity	Price	Action																				
Signature Club Sandwich (From: Cafe Beverly)	Light on the Veggies	3 <input type="button" value=""/>	3,000.00	<input type="button" value="Update"/> <input type="button" value="Delete"/>																				
Grilled Chicken Sub (From: Cafe Beverly)		1 <input type="button" value=""/>	700.00	<input type="button" value="Update"/> <input type="button" value="Delete"/>																				
Piri Piri Chicken (From: The Kingsbury Pizza)		1 <input type="button" value=""/>	1,600.00	<input type="button" value="Update"/> <input style="border: 2px solid red; background-color: red; color: white;" type="button" value="Delete"/>																				

(Updating from the cart)

Item	Description	Price	
Tuscan Pesto Chicken & Bacon	Oven roasted chicken, pesto pizza sauce, bacon, button mushrooms, red onion, crushed garlic, Roma tomatoes and mozzarella garnished with pesto aioli, parmesan and fresh herbs.	1800.00	
Piri Piri Chicken	Piri piri sauce, oven roasted chicken, Spanish onion, crushed garlic, red capsicum, cherry tomatoes, mozzarella and African spice garnished with aioli shallots, cashew nuts and lemon wedges.	1600.00	

(Confirming the previous item removal & changing quantity from outside the cart view)

Item	Instructions	Quantity	Price	Action
Signature Club Sandwich (From: Cafe Beverly)	Light on the Veggies	3	3,000.00	Update Delete
Grilled Chicken Sub (From: Cafe Beverly)		1	700.00	Update Delete
Tuscan Pesto Chicken & Bacon (From: The Kingsbury Pizza)		3	5,400.00	Update Delete
Total			9,100.00	

(Confirming the quantity change)

Test Case 4 (Customer's Online Ordering)

Vendors	Account	Shopping Cart	Trending	Contact Us																								
		<h3 style="text-align: center;">Shopping Cart</h3> <p style="text-align: right;">Empty Cart Checkout</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; padding: 5px;">Item</th> <th style="text-align: center; padding: 5px;">Image</th> <th style="text-align: left; padding: 5px;">Instructions</th> <th style="text-align: center; padding: 5px;">Quantity</th> <th style="text-align: center; padding: 5px;">Price</th> <th style="text-align: center; padding: 5px;">Action</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">Signature Club Sandwich (From: Cafe Beverly)</td> <td style="text-align: center; padding: 5px;"></td> <td style="text-align: left; padding: 5px;"></td> <td style="text-align: center; padding: 5px;">1</td> <td style="text-align: center; padding: 5px;">1,000.00</td> <td style="text-align: center; padding: 5px;">Update Delete</td> </tr> <tr> <td style="padding: 5px;">Grilled Chicken Sub (From: Cafe Beverly)</td> <td style="text-align: center; padding: 5px;"></td> <td style="text-align: left; padding: 5px;">Extra Lettuce please</td> <td style="text-align: center; padding: 5px;">2</td> <td style="text-align: center; padding: 5px;">1,400.00</td> <td style="text-align: center; padding: 5px;">Update Delete</td> </tr> <tr> <td colspan="6" style="text-align: center; padding: 10px;">...</td> </tr> </tbody> </table>			Item	Image	Instructions	Quantity	Price	Action	Signature Club Sandwich (From: Cafe Beverly)			1	1,000.00	Update Delete	Grilled Chicken Sub (From: Cafe Beverly)		Extra Lettuce please	2	1,400.00	Update Delete					
Item	Image	Instructions	Quantity	Price	Action																							
Signature Club Sandwich (From: Cafe Beverly)			1	1,000.00	Update Delete																							
Grilled Chicken Sub (From: Cafe Beverly)		Extra Lettuce please	2	1,400.00	Update Delete																							
...																												
		Return to Home page																										

Vendors	Account	Shopping Cart	Trending	Contact Us								
		<h3 style="text-align: center;">Customer Info</h3> <p>Please enter your name Address cannot be blank. Please enter a valid phone number.</p> <p style="text-align: center;">Please Enter the Delivery Details</p> <p style="text-align: left; margin-left: 10px;"> Go Back Continue </p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;">Customer Name</td> <td style="width: 75%;"><input type="text"/></td> </tr> <tr> <td>Address</td> <td><input type="text"/></td> </tr> <tr> <td>City</td> <td> <input type="text" value="Colombo 1"/> <input style="width: 100px;" type="text"/> </td> </tr> <tr> <td>Special Instructions</td> <td><input type="text"/></td> </tr> </table>			Customer Name	<input type="text"/>	Address	<input type="text"/>	City	<input type="text" value="Colombo 1"/> <input style="width: 100px;" type="text"/>	Special Instructions	<input type="text"/>
Customer Name	<input type="text"/>											
Address	<input type="text"/>											
City	<input type="text" value="Colombo 1"/> <input style="width: 100px;" type="text"/>											
Special Instructions	<input type="text"/>											
		Return to Home page										

(Form Validations)

Vendors	Account	Shopping Cart	Trending	Contact Us																				
		<h3 style="text-align: center;">Please Confirm Your Order Details</h3> <p style="text-align: right;">Go Back Confirm</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; padding: 5px;">Item</th> <th style="text-align: center; padding: 5px;">Image</th> <th style="text-align: left; padding: 5px;">Instructions</th> <th style="text-align: center; padding: 5px;">Quantity</th> <th style="text-align: center; padding: 5px;">Price</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">Signature Club Sandwich (From: Cafe Beverly)</td> <td style="text-align: center; padding: 5px;"></td> <td style="text-align: left; padding: 5px;"></td> <td style="text-align: center; padding: 5px;">1</td> <td style="text-align: center; padding: 5px;">1,000.00</td> </tr> <tr> <td style="padding: 5px;">Grilled Chicken Sub (From: Cafe Beverly)</td> <td style="text-align: center; padding: 5px;"></td> <td style="text-align: left; padding: 5px;">Extra Lettuce please</td> <td style="text-align: center; padding: 5px;">2</td> <td style="text-align: center; padding: 5px;">1,400.00</td> </tr> <tr> <td colspan="5" style="text-align: center; padding: 10px;">...</td> </tr> </tbody> </table>			Item	Image	Instructions	Quantity	Price	Signature Club Sandwich (From: Cafe Beverly)			1	1,000.00	Grilled Chicken Sub (From: Cafe Beverly)		Extra Lettuce please	2	1,400.00				
Item	Image	Instructions	Quantity	Price																				
Signature Club Sandwich (From: Cafe Beverly)			1	1,000.00																				
Grilled Chicken Sub (From: Cafe Beverly)		Extra Lettuce please	2	1,400.00																				
...																								
		Return to Home page																						

(Order Verify Screen – top part)

Vendors	Account	Shopping Cart	Trending	Contact Us
		 Smoked Salmon & Avocado (From: The Kingsbury Pizza)		
		Delivery Cost Total	1	1,900.00
				250.00
				6,350.00
Customer Details				
		Customer Name Anton Silva Address 26 Kotta Road City Colombo 8	Phone (011)2254449	
		Special Instructions Near the Borella Private Hospital		

(Order Verify Screen – bottom part)

Vendors	Account	Shopping Cart	Trending	Contact Us
Please Enter the Delivery Details				
Go Back		Continue		
Customer Info Verify Order Order Summary		Customer Name Anton Silva Address 26 Kotta Road City Colombo 8		
Return to Home page		Phone (011)2254449 Special Instructions Near the Borella Private Hospital		

(Confirm previously entered information when returning to the Customer Infor screen)

Vendors	Account	Shopping Cart	Trending	Contact Us															
Shopping Cart																			
Customer Info Verify Order Order Summary		Empty Cart Checkout																	
Return to Home page		<table border="1"> <thead> <tr> <th>Item</th> <th>Instructions</th> <th>Quantity</th> <th>Price</th> <th>Action</th> </tr> </thead> <tbody> <tr> <td>Signature Club Sandwich (From: Cafe Beverly)</td> <td></td> <td>1</td> <td>1,000.00</td> <td> Update Delete </td> </tr> <tr> <td>Grilled Chicken Sub (From: Cafe Beverly)</td> <td>Extra Lettuce please</td> <td>2</td> <td>1,400.00</td> <td> Update Delete </td> </tr> </tbody> </table>	Item	Instructions	Quantity	Price	Action	Signature Club Sandwich (From: Cafe Beverly)		1	1,000.00	Update Delete	Grilled Chicken Sub (From: Cafe Beverly)	Extra Lettuce please	2	1,400.00	Update Delete		
Item	Instructions	Quantity	Price	Action															
Signature Club Sandwich (From: Cafe Beverly)		1	1,000.00	Update Delete															
Grilled Chicken Sub (From: Cafe Beverly)	Extra Lettuce please	2	1,400.00	Update Delete															

(Returning to the shopping cart to delete a couple of items)

Vendors	Account	Shopping Cart	Trending	Contact Us																									
Please Confirm Your Order Details																													
<input type="button" value="Go Back"/> <input type="button" value="Confirm"/>																													
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Item</th> <th></th> <th>Instructions</th> <th>Quantity</th> <th>Price</th> </tr> </thead> <tbody> <tr> <td>Tuscan Pesto Chicken & Bacon (From: The Kingsbury Pizza)</td> <td></td> <td></td> <td>1</td> <td>1,800.00</td> </tr> <tr> <td>Smoked Salmon & Avocado (From: The Kingsbury Pizza)</td> <td></td> <td></td> <td>1</td> <td>1,900.00</td> </tr> <tr> <td>Delivery Cost</td> <td></td> <td></td> <td></td> <td>250.00</td> </tr> <tr> <td>Total</td> <td></td> <td></td> <td></td> <td>3,950.00</td> </tr> </tbody> </table>					Item		Instructions	Quantity	Price	Tuscan Pesto Chicken & Bacon (From: The Kingsbury Pizza)			1	1,800.00	Smoked Salmon & Avocado (From: The Kingsbury Pizza)			1	1,900.00	Delivery Cost				250.00	Total				3,950.00
Item		Instructions	Quantity	Price																									
Tuscan Pesto Chicken & Bacon (From: The Kingsbury Pizza)			1	1,800.00																									
Smoked Salmon & Avocado (From: The Kingsbury Pizza)			1	1,900.00																									
Delivery Cost				250.00																									
Total				3,950.00																									
Customer Details																													
<table style="width: 100%;"> <tr> <td>Customer Name</td> <td>Anton Silva</td> </tr> <tr> <td>Address</td> <td>26 Kotta Road</td> </tr> <tr> <td>City</td> <td>Colombo 8</td> </tr> <tr> <td colspan="2" style="text-align: right;">Phone (011)2254449</td> </tr> </table>					Customer Name	Anton Silva	Address	26 Kotta Road	City	Colombo 8	Phone (011)2254449																		
Customer Name	Anton Silva																												
Address	26 Kotta Road																												
City	Colombo 8																												
Phone (011)2254449																													

(Updated Order Verification Screen)

Test Case 5 (Confirming & Saving an Order)

Vendors	Account	Shopping Cart	Trending	Contact Us															
Please Confirm Your Order Details																			
<input type="button" value="Go Back"/> <input type="button" value="Confirm"/>																			
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Item</th> <th></th> <th>Instructions</th> <th>Quantity</th> <th>Price</th> </tr> </thead> <tbody> <tr> <td>Signature Club Sandwich (From: Cafe Beverly)</td> <td></td> <td>Light on the Veggies</td> <td>3</td> <td>3,000.00</td> </tr> <tr> <td>Grilled Chicken Sub (From: Cafe Beverly)</td> <td></td> <td></td> <td>1</td> <td>700.00</td> </tr> </tbody> </table>					Item		Instructions	Quantity	Price	Signature Club Sandwich (From: Cafe Beverly)		Light on the Veggies	3	3,000.00	Grilled Chicken Sub (From: Cafe Beverly)			1	700.00
Item		Instructions	Quantity	Price															
Signature Club Sandwich (From: Cafe Beverly)		Light on the Veggies	3	3,000.00															
Grilled Chicken Sub (From: Cafe Beverly)			1	700.00															

(Verify Order Screen – top part)

Vendors	Account	Shopping Cart		Trending	Contact Us
		Pepperoni Pizza (From: The Kingsbury Pizza)			1 1,600.00
		Delivery Cost			250.00
		Total			10,950.00
Customer Details					
		Customer Name	Felix Mendis		
		Address	56 Dharmapala Mawatha		
		City	Colombo 7		
			Phone (077)8552020		
		Special Instructions	Opposite the Library		

(Verify Order Screen – bottom part)

Vendors	Account	Shopping Cart		Trending	Contact Us
		Your order has been successfully submitted!			
		Your Order reference number is: 14			
		Item	Instructions	Quantity	Price
		Signature Club Sandwich (From: Cafe Beverly)		Light on the Veggies	3 3,000.00
		Grilled Chicken Sub (From: Cafe Beverly)			1 700.00

(Final Order Summary screen)

Kanchana (from Cafe Beverly) [Logout](#) 

Vendors	Account	View Orders			Reports	Contact Us					
View Orders											
Filter Orders By: <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Order Status</td> <td>All</td> <td>Time Range</td> <td>Past Day</td> <td>Apply</td> </tr> </table>			Order Status	All	Time Range	Past Day	Apply				
Order Status	All	Time Range	Past Day	Apply							
Order ID	Order Time	Order Status	Product	Quantity	Instructions	Enter Response	Enter Comments				
14	2018-02-23 05:13:02	Pending	Signature Club Sandwich	3	Light on the Veggies	No Response	Update				
14	2018-02-23 05:13:02	Pending	Grilled Chicken Sub	1		No Response	Update				

(Vendor A's View Orders Screen)

Lahiru (from The Kingsbury Pizza) [Logout](#) 

Vendors	Account	View Orders			Reports	Contact Us					
View Orders											
Filter Orders By: <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Order Status</td> <td>All</td> <td>Time Range</td> <td>Past Day</td> <td>Apply</td> </tr> </table>			Order Status	All	Time Range	Past Day	Apply				
Order Status	All	Time Range	Past Day	Apply							
Order ID	Order Time	Order Status	Product	Quantity	Instructions	Enter Response	Enter Comments				
14	2018-02-23 05:13:02	Pending	Tuscan Pesto Chicken & Bacon	3		No Response	Update				
14	2018-02-23 05:13:02	Pending	Pepperoni Pizza	1		No Response	Update				

(Vendor B's View Orders Screen)

JafarB [Logout](#) 

Vendors	Account	View Orders			Reports	Contact Us																					
View Orders																											
Filter Orders By: <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Order Status</td> <td>All</td> <td>Time Range</td> <td>Past Day</td> <td>Apply</td> </tr> </table>			Order Status	All	Time Range	Past Day	Apply																				
Order Status	All	Time Range	Past Day	Apply																							
Add New Order <table border="1"> <thead> <tr> <th>Order ID</th> <th>Order Time</th> <th>Order Status</th> <th>Customer</th> <th>City</th> <th>Phone</th> <th>Instructions</th> <th>Total</th> <th></th> </tr> </thead> <tbody> <tr> <td>14</td> <td>2018-02-23 05:13:02</td> <td>Pending</td> <td>Felix Mendis</td> <td>Colombo 7</td> <td>(077)8552020</td> <td>Opposite the Library</td> <td>10950.00</td> <td>Process</td> </tr> </tbody> </table>										Order ID	Order Time	Order Status	Customer	City	Phone	Instructions	Total		14	2018-02-23 05:13:02	Pending	Felix Mendis	Colombo 7	(077)8552020	Opposite the Library	10950.00	Process
Order ID	Order Time	Order Status	Customer	City	Phone	Instructions	Total																				
14	2018-02-23 05:13:02	Pending	Felix Mendis	Colombo 7	(077)8552020	Opposite the Library	10950.00	Process																			

(Admin User's Order View)

Vendors	Account	View Orders	Reports	Contact Us			
Customer Details							
Go Back to Order List							
Order ID:	14	Customer Name	Felix Mendis	Order Time:	2018-02-23 05:13:02		
Address	56 Dharmapala Mawatha			City	Colombo 7		
Special Instructions	Opposite the Library			Phone	(077)8552020		
Enter Comments:				Order Status:	Pending <input type="button" value="Update"/>		
Items Ordered							
Item		Instructions	Vendor Response	Vendor Comments	Price	Quantity	Action
Signature Club Sandwich (From: Cafe Beverly)		Light on the Veggies			3,000.00	<input type="button" value="3"/>	<input type="button" value="Update"/> <input type="button" value="Delete"/>

(Admin User's detailed Order View)

Vendors	Account	View Orders	Reports	Contact Us
				
Grilled Chicken Sub (From: Cafe Beverly)			700.00	<input type="button" value="1"/> <input type="button" value="Update"/> <input type="button" value="Delete"/>
Tuscan Pesto Chicken & Bacon (From: The Kingsbury Pizza)			5,400.00	<input type="button" value="3"/> <input type="button" value="Update"/> <input type="button" value="Delete"/>
Delivery Cost			1,600.00	<input type="button" value="1"/> <input type="button" value="Update"/> <input type="button" value="Delete"/>
Total			250.00	
			10,950.00	
Add New Item				

(Admin User's detailed Order View)

Test Case 6 (Vendor's Order Tracking)

Vendors Account Shopping Cart Trending Contact Us

Shopping Cart
Customer Info
Verify Order
Order Summary

[Return to Home page](#)

Your order has been successfully submitted!
Your Order reference number is: 15

Item	Instructions	Quantity	Price	
Nasi Goreng (From: Chinese Dragon Cafe)		Not too spicy!	2	1,100.00
Dragon's Devilled Pork (From: Chinese Dragon Cafe)		Extra Hot!	1	400.00
Delivery Cost				250.00
Total				1,750.00

Customer Details

Customer Name: Umesh Raginda
Address: 23 Sri Vimalasiri Mawatha

Customer's Order Summary screen

Dragon46 (from Chinese Dragon Cafe) Logout 

Vendors Account View Orders Reports Contact Us

View Orders

Filter Orders By: Order Status: All Time Range: Past Day Apply

Order ID	Order Time	Order Status	Product	Quantity	Instructions	Enter Response	Enter Comments	
15	2018-02-26 22:09:54	Pending	Nasi Goreng	2	Not too spicy!	<input type="button" value="No Response"/>	<input type="button" value="Update"/>	
15	2018-02-26 22:09:54	Pending	Dragon's Devilled Pork	1	Extra Hot!	<input type="button" value="No Response"/>	<input type="button" value="Update"/>	

Vendor's Order View

Dragon46 (from Chinese Dragon Cafe) [Logout](#) 

Vendors	Account	View Orders			Reports	Contact Us		
View Orders								
Filter Orders By:		Order Status	<input type="button" value="All"/> <input type="button" value="Time Range"/>	<input type="button" value="Past Day"/>	<input type="button" value="Apply"/>			
Order ID	Order Time	Order Status	Product	Quantity	Instructions	Enter Response	Enter Comments	
15	2018-02-26 22:09:54	Pending	Nasi Goreng	2	Not too spicy!	<input type="button" value="Accept"/>	<input type="button" value="Update"/>	
15	2018-02-26 22:09:54	Pending	Dragon's Devilled Pork	1	Extra Hot!	<input type="button" value="Reject"/>	<input type="button" value="Update"/>	Item is unavailable today!

Vendor's Order View after including responses

JafarB [Logout](#) 

Vendors	Account	View Orders			Reports	Contact Us		
View Orders								
Filter Orders By:		Order Status	<input type="button" value="Pending Only"/> <input type="button" value="Time Range"/>	<input type="button" value="Any Time"/>	<input type="button" value="Apply"/> <input type="button" value="Add New Order"/>			
Order ID	Order Time	Order Status	Customer	City	Phone	Instructions	Total	
15	2018-02-26 22:09:54	Pending	Umesh Raginda	Colombo 4	(077)8552020		1750.00	<input type="button" value="Process"/>
14	2018-02-23 05:13:02	Pending	Felix Mendis	Colombo 7	(077)8552020	Opposite the Library	10950.00	<input type="button" value="Process"/>
11	2018-02-09 11:51:07	Pending	Dinesh Chandimal	Colombo 8	(011)2238379		4050.00	<input type="button" value="Process"/>
10	2018-02-09 11:34:04	Pending	Gehan Perera	Colombo 5	(071)5364412	Near ESOFT School	3450.00	<input type="button" value="Process"/>
9	2018-02-09 11:18:25	Pending	Diane Sparrow	Colombo 7	(077)7332020	House located opposite Sadeepa Book Shop	2950.00	<input type="button" value="Process"/>
6	2018-02-04 09:20:49	Pending	Dinesh Yapa	Colombo 5	(077)7331818	Near gas station	5850.00	<input type="button" value="Process"/>

Staff user's Order View Screen

Vendors	Account	View Orders	Reports	Contact Us			
<p>Order ID: 15</p> <p>Address 23 Sri Vimalasiri Mawatha</p> <p>Special Instructions</p> <p>Enter Comments: <input type="text"/></p>	<p>Customer Name Umesh Raginda</p>	<p>Order Time: 2018-02-26 22:09:54</p> <p>City Colombo 4</p> <p>Phone (077)8552020</p>	<p>Order Status: <input type="button" value="Pending"/> <input type="button" value="Update"/></p>				
Items Ordered							
Item		Instructions	Vendor Response	Vendor Comments	Price	Quantity	Action
Nasi Goreng (From: Chinese Dragon Cafe)		Not too spicy!	Accept		1,100.00	<input type="button" value="2"/>	<input type="button" value="Update"/> <input type="button" value="Delete"/>
Dragon's Devilled Pork (From: Chinese Dragon Cafe)		Extra Hot!	Reject	Item is unavailable today!	400.00	<input type="button" value="1"/>	<input type="button" value="Update"/> <input type="button" value="Delete"/>

Staff User's detailed order view for that specific order. (Customer instructions & vendor responses are displayed)

Test Case 7 (Admin Order Tracking & Updating)

Vendors	Account	Shopping Cart	Trending	Contact Us															
<p>Shopping Cart</p> <p>Customer Info</p> <p>Verify Order</p> <p>Order Summary</p> <p>Return to Home page</p>	<p>Your order has been successfully submitted!</p> <p>Your Order reference number is: 16</p> <table border="1"> <thead> <tr> <th>Item</th> <th></th> <th>Instructions</th> <th>Quantity</th> <th>Price</th> </tr> </thead> <tbody> <tr> <td>Signature Club Sandwich (From: Cafe Beverly)</td> <td></td> <td></td> <td>1</td> <td>1,000.00</td> </tr> <tr> <td>Bistro Seafood Burger (From: Cafe Beverly)</td> <td></td> <td>Well done</td> <td>1</td> <td>800.00</td> </tr> </tbody> </table>				Item		Instructions	Quantity	Price	Signature Club Sandwich (From: Cafe Beverly)			1	1,000.00	Bistro Seafood Burger (From: Cafe Beverly)		Well done	1	800.00
Item		Instructions	Quantity	Price															
Signature Club Sandwich (From: Cafe Beverly)			1	1,000.00															
Bistro Seafood Burger (From: Cafe Beverly)		Well done	1	800.00															

Customer's order

JafarB Logout 

[Vendors](#) [Account](#) [View Orders](#) [Reports](#) [Contact Us](#)

View Orders

Filter Orders By: Order Status: Time Range:

Order ID	Order Time	Order Status	Customer	City	Phone	Instructions	Total	
16	2018-02-27 00:05:22	Pending	Dananjaya Silva	Colombo 6	(011)2254660	Near Shopping Mall	4450.00	<input type="button" value="Process"/>
15	2018-02-26 22:09:54	Pending	Umesh Raginda	Colombo 4	(077)8552020		1750.00	<input type="button" value="Process"/>

Staff (Admin) user's order view

[Vendors](#) [Account](#) [View Orders](#) [Reports](#) [Contact Us](#)

Enter Comments:
 Order Status:

Items Ordered

Item	Image	Instructions	Vendor Response	Vendor Comments	Price	Quantity	Action
Fried Rice with Chicken (From: Chinese Dragon Cafe)					900.00	<input type="button" value="2"/>	<input type="button" value="Update"/> <input type="button" value="Delete"/>
Singapore Fried Meehoo (From: Chinese Dragon Cafe)		Extra hot sauce please!			1,500.00	<input type="button" value="2"/>	<input type="button" value="Update"/> <input type="button" value="Delete"/>
Signature Club Sandwich (From: Cafe)					1,000.00	<input type="button" value="1"/>	<input type="button" value="Update"/> <input type="button" value="Delete"/>

Order Status – Pending (All buttons enabled)

Vendors	Account	View Orders	Reports	Contact Us			
Enter Comments:			Order Status: <input type="button" value="Confirmed"/> <input type="button" value="Update"/>				
Items Ordered							
Item		Instructions	Vendor Response	Vendor Comments	Price	Quantity	Action
Fried Rice with Chicken (From: Chinese Dragon Cafe)					900.00	2	<input type="button" value="Update"/> <input type="button" value="Delete"/>
Singapore Fried Meehoon (From: Chinese Dragon Cafe)		Extra hot sauce please!			1,500.00	2	<input type="button" value="Update"/> <input type="button" value="Delete"/>
Signature Club Sandwich (From: Cafe)					1,000.00	1	<input type="button" value="Update"/> <input type="button" value="Delete"/>

Order Status – Confirmed (All buttons enabled)

Vendors	Account	View Orders	Reports	Contact Us			
Enter Comments:			Order Status: <input type="button" value="Cancelled"/> <input type="button" value="Update"/>				
Items Ordered							
Item		Instructions	Vendor Response	Vendor Comments	Price	Quantity	Action
Fried Rice with Chicken (From: Chinese Dragon Cafe)					900.00	2	
Singapore Fried Meehoon (From: Chinese Dragon Cafe)		Extra hot sauce please!			1,500.00	2	
Signature Club Sandwich (From: Cafe)					1,000.00	1	

Order Status – Cancelled (Cannot change items or add new items)

Vendors	Account	View Orders	Reports	Contact Us			
Enter Comments:			Order Status: Delivered	Update			
Items Ordered							
Item	Image	Instructions	Vendor Response	Vendor Comments	Price	Quantity	Action
Fried Rice with Chicken (From: Chinese Dragon Cafe)					900.00	2	
Singapore Fried Meehoon (From: Chinese Dragon Cafe)		Extra hot sauce please!			1,500.00	2	
Signature Club Sandwich					1,000.00	1	

Order Status – Delivered (Cannot change items or add new items)

Vendors	Account	View Orders	Reports	Contact Us			
Items Ordered							
Item	Image	Instructions	Vendor Response	Vendor Comments	Price	Quantity	Action
Fried Rice with Chicken (From: Chinese Dragon Cafe)					900.00	2	Update Delete
Singapore Fried Meehoon (From: Chinese Dragon Cafe)		Extra hot sauce please!			1,500.00	2	Update Delete
Signature Club Sandwich (From: Cafe Beverly)					3,000.00	3	Update Delete
Delivery Cost					250.00		
Total					5,650.00		

(Status changed back to Pending & edits made to the items)

Vendors	Account	View Orders	Reports	Contact Us
Singapore Fried Meehoon (From: Chinese Dragon Cafe)		Extra hot sauce please!	1,500.00	2 <input type="button" value="Update"/> <input type="button" value="Delete"/>
Signature Club Sandwich (From: Cafe Beverly)			3,000.00	3 <input type="button" value="Update"/> <input type="button" value="Delete"/>
Delivery Cost			250.00	
Total			5,650.00	
Add New Item				

Vendors	Account	View Orders	Reports	Contact Us
Signature Club Sandwich (From: Cafe Beverly)			3,000.00	3 <input type="button" value="Update"/> <input type="button" value="Delete"/>
Delivery Cost			250.00	
Total			5,650.00	
Add New Item				
Select Vendor	<input type="text" value="Cafe Beverly"/>	<input style="border: 2px solid red; width: 150px; height: 20px;" type="text" value="Select Item"/>	<input style="border: 2px solid red; width: 150px; height: 20px; margin-left: 10px;" type="text" value="Select Quantity 1"/>	
Customer Instructions	<input style="width: 400px; height: 40px; margin-top: 10px;" type="text"/>			
<input type="button" value="Cancel"/>	<input style="border: 2px solid red; background-color: #f0f0f0; width: 100px; height: 25px; float: right; margin-top: -20px;" type="button" value="Add"/>			

Attempting to submit the Add Item form without selecting an item

Vendors	Account	View Orders	Reports	Contact Us
Signature Club Sandwich (From: Cafe Beverly)			3,000.00	3 <input type="button" value="Update"/> <input type="button" value="Delete"/>
Delivery Cost			250.00	
Total			5,650.00	
Add New Item				
Please select an item to Add!				
Select Vendor	<input type="text"/>	<input style="border: 2px solid red; width: 150px; height: 20px; margin-left: 10px;" type="text"/>	<input style="border: 2px solid red; width: 150px; height: 20px; margin-left: 10px;" type="text"/>	
Customer Instructions	<input style="width: 400px; height: 40px; margin-top: 10px;" type="text"/>			
<input type="button" value="Cancel"/>	<input style="border: 2px solid red; background-color: #f0f0f0; width: 100px; height: 25px; float: right; margin-top: -20px;" type="button" value="Add"/>			

Vendors	Account	View Orders	Reports	Contact Us
Signature Club Sandwich (From: Cafe Beverly)			3,000.00	3 <input type="button" value="Update"/> <input type="button" value="Delete"/>
Delivery Cost			250.00	
Total			5,650.00	

Add New Item

Please select an item to Add!

Select Vendor Select Item Select Quantity

Customer Instructions

Attempting to add an item that is already in the Ordered Items List

Vendors	Account	View Orders	Reports	Contact Us
Signature Club Sandwich (From: Cafe Beverly)			3,000.00	3 <input type="button" value="Update"/> <input type="button" value="Delete"/>
Delivery Cost			250.00	
Total			5,650.00	

Add New Item

This product is already part of the order. Please adjust the quantity as needed from the Item List table above.

Select Vendor Select Item Select Quantity

Customer Instructions

Vendors	Account	View Orders	Reports	Contact Us
Singapore Fried Meehoon (From: Chinese Dragon Cafe)		Extra hot sauce please!	1,500.00 2	Update Delete
Signature Club Sandwich (From: Cafe Beverly)			3,000.00 3	Update Delete
Caesar Salad with Chicken (From: Cafe Beverly)			5,000.00 5	Update Delete
Delivery Cost			250.00	
Total			10,650.00	
Add New Item				

(New Item successfully added by staff)

View Orders								
Filter Orders By:			Order Status	All	Time Range	Past Day	Apply	
Order ID	Order Time	Order Status	Product	Quantity	Instructions	Enter Response	Enter Comments	
16	2018-02-27 00:05:22	Pending	Signature Club Sandwich	3		No Response		Update
16	2018-02-27 00:05:22	Pending	Caesar Salad with Chicken	5		No Response		Update

Vendor's View Orders screen reflects the changes made by the staff/admin