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Faculty of Computing and Information Technology
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Restaurant Catering Management System

Students:

Lara Karrani [2305772]
Hala A.Zubair [2306704]
Mawadah Asiri [2306042]
Alya Jaad [2308524]
Tala AlBadi [2306440]

Table of Contents	
Abstract	3
Introduction	3
Problem Definition	3
Problem Solution	4
Requirements	4
Architectural Diagram	5
Analysis Phase [Interview]	5
Data-Flow Diagrams	12
Context Level & Level-0	12
Level-1	13
Level-1 for 1.0	13
Level-1 for 5.0	13
Level-1 for 7.0	14
Level 2	14
Level-2 for 7.1	14
Use-Case Diagram	15
Scenario-1	16
Scenario-2	17
Scenario-3	18
Scenario-4	20
Scenario-5	21
Activity diagram	23
Sequence diagrams	24
Sequence Diagram for the Use Case (Create Account)	24
Sequence diagram for the Use Case (Receives Order Details)	25
Sequence Diagram for the Use Case (Manager checks with Customer for Confirmation)	25
Sequence diagram for the Use Case (Receive Inventory and Stock Information)	26
Sequence Diagram for the Use Case (Payment)	27
Class Diagram	28
State Diagram	29
User/Website Interfaces	30
Conclusion	34
Future Direction	35
References	35

Abstract

This report presents the design and analysis of a Restaurant Catering Management System for XBite, a local restaurant and catering service in Jeddah. This system aims to show the flow of the catering booking process, improve communication regarding orders between the customers and restaurant, enhance internal operations between the manager and staff members, track the inventory used, and manage orders. The main functions of the system includes: event scheduling, staff management, inventory updates, and processing payments. This proposed system aims to minimize hands-on workload and reduce the rate of possible errors caused by traditional methods used such as Google Forms, and WhatsApp messages. It includes features such as generating detailed reports that will assist the manager in making decisions regarding the staff, orders, stocks, and events. Generally, this system tries to improve customer experience and optimizes the service's efficiency.

Introduction

The system proposed is a system built for a restaurant known as “Xbite” which offers a service of catering for events and parties. The system will make it easy for customers to reach out to the restaurant. This system is built to process incoming data from users about when and what location should the restaurant be at, allowing the customers to select the package regarding how many burger meals should be available for the event. Lastly, the system helps in reducing time and effort. Instead of having to call the restaurant and book a catering reservation. This system makes it easy for customers to book a catering order at any time.

Problem Definition

Restaurants with catering services may face challenges such as miscommunication between the customer and the employee which can lead to incorrect orders, delays due to unexpected traffic, staff shortage for an event, supply shortages, and lastly relying on manual processes where restaurants rely on paper records, phone calls, or in-person coordination.

Problem Solution

Our system is a comprehensive solution for managing restaurant catering operations efficiently. It allows customers to view available booking slots, place orders with detailed event specifications, and manage multiple events simultaneously. The system optimizes staff allocation by assigning chefs, servers, and drivers based on event needs, ensuring balanced workloads and preventing overbooking.

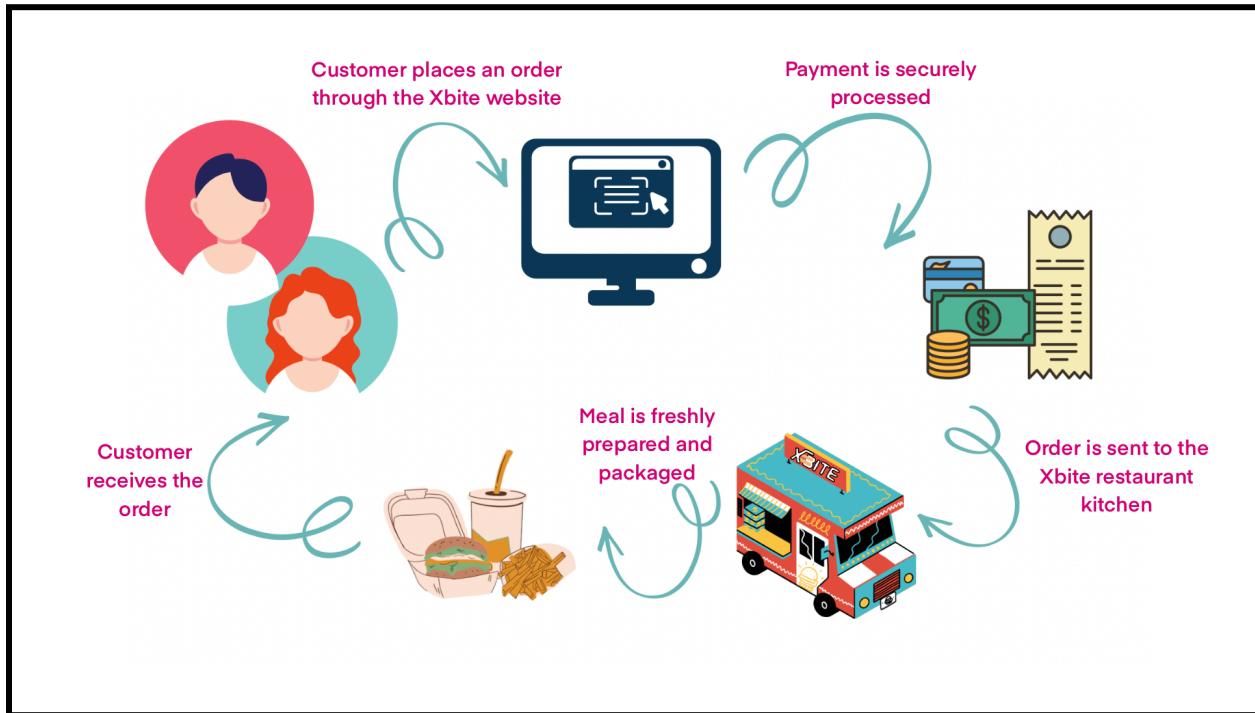
Additionally, it manages inventory by monitoring ingredient stock levels, preventing shortages, and ensuring all necessary supplies are available before events. The system also stores customer profiles, enabling returning clients to reorder based on their preferences quickly.

To streamline financial transactions, it supports online payments, eliminating the need for manual bank transfers. Moreover, it generates insightful reports on sales trends, event profitability, and resource consumption, helping businesses make data-driven decisions. By integrating all these functions, our system enhances efficiency, reduces manual workload, and improves overall catering service management.

Requirements

- Manages orders from customers to cater an event.
- Manages the number of tasks for staff, and the number of events per day, and that they will be placed in the waiting list if someone cancelled.
- Assign a specific number of staff (decided by the manager/supervisor) in catering events based on availability. And registers needed staff on time when assigned by the manager.
- Tracks stock levels and expiration dates for the supplies that are needed and notifies the supervisor if the stock is low or if supplies are expired.
- Allows multiple payment methods : Apple Pay, Credit Card. payment is automatically linked to booking the catering service.
- Provides the manager with a report for each event that contains how many employees have been assigned there ,information regarding the ingredient stocking (burger patties, french fries, chicken patties, drinks), and finally customer satisfaction.

Architectural Diagram(Lara Alaa Karrani)



Analysis Phase [Interview] (Lara Alaa Karrani write this table)

Interview Outline	
Interviewee: Mr.Abdulaziz AlFadel, founder of XBite	Interviewer: <ul style="list-style-type: none"> • Hala A.Zubair • Tala AlBadi • Alya Jaad • Lara Karrani • Mawada Assiri
Location/Medium: X-Bite HeadQuarters	Appointment Date: Date: 11th of February 2025 Time: 2-2:45 pm

Objectives: The objective of this interview is to understand the way the restaurant handles operations regarding their catering services, understand what requirements the customer would like in the system, and ask about how operations are managed.	Reminders: Abdulaziz Alfadel, originally from Jeddah, Saudi Arabia, has lived in Canada since 2008. He holds a Bachelor's in Computer Information Systems from UFV, where he founded the UFV Arab Club. Aziz is the founder of X Bite (Big Bite Food Truck) in Jeddah and works as an Event Manager at Fraser Valley Bubble Ball. He is also passionate about entrepreneurship and community engagement.
General Observations: Mr. Abdulaziz was very confident with his answers. He was interested in the idea as he mentioned that he wanted a system like this but didn't have the time to work on it.	
Questions	
Question 1: Do you think there is a system in use at the moment?	Answer: Unfortunately no, I don't think there is a system that has been implemented and clear so far.

<p>Question 2: Can you explain the catering process from how customers reach out to the restaurant till the time the staff reaches the destination ? How you manage the staff, supplies, delivery, and getting orders from customers.</p>	<p>Answer: We currently use a simple system. It starts first with a google drive link. The customer contacts us first through whatsapp or through our social media platforms. Then we send a google form where the customer fills the form and after submission, we get in contact with the customer before finalizing the payments to ensure the customer is committed.</p> <p>If so, we send transaction information to the customer to finalize the payment.</p> <p>After the customer finalizes the payment, we ask for the location of the event.</p> <p>There is a second check up right before the event to again make sure the customer is committed and we take the information regarding the location (google maps link, picture of the house..etc), and an emergency phone number.</p>
<p>Question 3: What are the biggest challenges the restaurant faces in managing catering orders?</p>	<p>Answer: The biggest challenges that the restaurant has faced was when a double booking occurs (caused by saudi national day, or holidays), when a customer mixes up between the section of day and the month in the form. And when we tend to, sometimes due to overbooking, miss an event which is something we tend to sometimes face.</p>

<p>Question 4: Do you think Implementing a system that will help in organizing the restaurant's operations regarding your catering service will be beneficial for you?</p>	<p>Answer: Yes it will, and we thought about implementing it before but we didn't get the chance to implement it or start. And we would be happy for you to implement it.</p>
<p>Question 5: Have you faced an issue with the amount of customers that would like to call for catering reservations? If yes, do you think this system will make it easy for both the restaurant and the customer to get in touch regarding reservations?</p>	<p>Answer: Yes we have faced an issue with the amount of customers especially during Ramadan, Eid, and the national holidays which leads to our catering services to be overbooked.</p>
<p>Question 6: Would you like us to add a chatbot that will act as customer service 24/7 to help the customers?</p>	<p>Answer: No, I personally don't recommend it.</p>
<p>Question 7: Do you want an automatic scheduling system that assigns staff based on availability and experience?</p>	<p>Answer: Yes, if you made that happen or possible that would be great. Because we want to manage the number of employees signed up for the event so having a system that includes such a feature would be nice.</p>

Question 8: Would you prefer a web-based system, a mobile application, or both?	Answer: I prefer implementing a website because it would be easier for the customers to use it for booking.
Question 9: Do you want us to make the application easy for people with special needs?	Answer: Yes of course.
Question 10: What kind of reports/analytics would help you manage your business better?	Answer: Reports regarding the time and date of the event. Reports also regarding the number of meals which will make it easy to calculate the average number of orders.
Question 11: How do you currently handle inventory and stock management?	Answer: We have a simple system that helps us monitor the inventory and stocks. It is a separate system from the restaurant found in the headquarters.

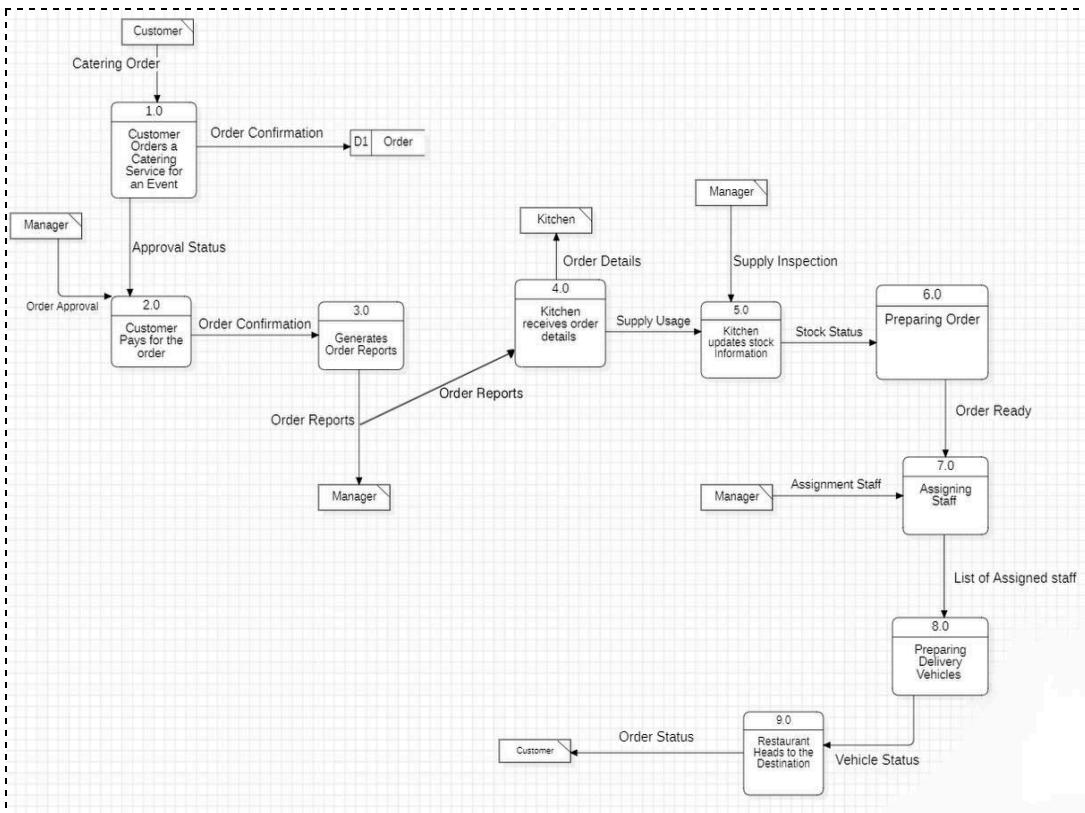
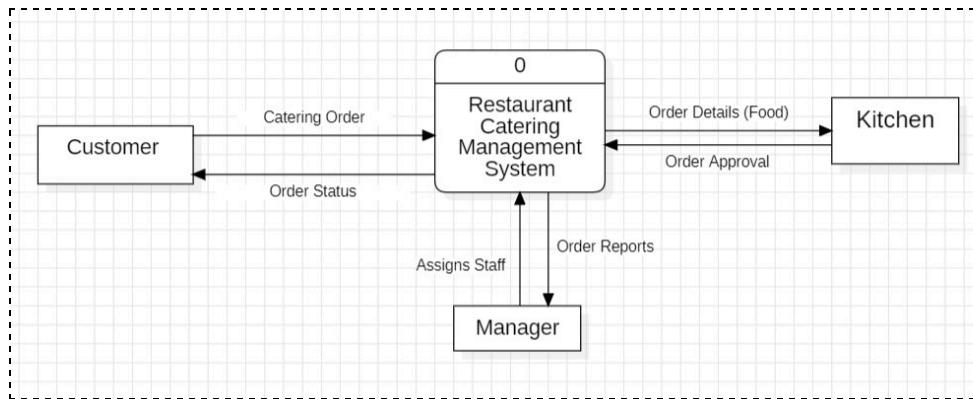
<p>Question 12: Do you face any challenges in managing multiple catering events simultaneously?</p>	<p>Answer: We did face challenges but we got past it.</p> <p>We try to maintain and we already have a capacity regarding the number of events that we can handle in a day. We try to keep a maximum of 10 events a day and not exceed that.</p>
<p>Question 13: How do you handle last-minute changes or cancellations in catering orders?</p>	<p>Answer: We are usually flexible with our customers and we don't face issues regarding cancellations from customers that much.</p>
<p>Question 14: What communication tools do you currently use to coordinate between the kitchen, staff, and delivery teams?</p>	<p>Answer: We usually communicate through whatsapp messages or phone calls.</p> <p>But during events the supervisor and his team communicate through walkie talkies.</p>
<p>Question 15: Would you be interested in a loyalty program for recurring catering customers?</p>	<p>Answer: We don't have this program at the moment but it's such a great idea.</p>
<p>Question 16: What factors contribute to delays in catering deliveries, and how do you handle them?</p>	<p>Answer: Delivery wise, one of factors that contribute to a delay is unexpected traffic so we tend to let the staff leave earlier.</p>
<p>Question 17: Would you like the system to include automated reminders for upcoming events and necessary preparations?</p>	<p>Answer: That is such a great idea, it would be great if the system can notify us 24 hours prior to an event about an upcoming event that is happening on the next day.</p> <p>And notifications that will be sent to the team members who are assigned to a specific event</p>

	<p>that they have an upcoming event in the next 24 hours as a reminder.</p>
<p>Question 18: How do you currently handle refunds or customer complaints related to catering services?</p>	<p>Answer: We rarely do refunds unless the cancellation was reasonable.</p> <p>Regarding customer complaints (if there was any during an event) we provide them with more meals with no charge to satisfy the customer.</p>
<p>Question 19: Do you have any options/features you would like us to add? What are they?</p>	<p>Answer:</p> <ul style="list-style-type: none"> - A feature regarding managing the stocks and inventory is we would like an icon that includes all the summary of the stocks and supplies used in a specific event. Where each event has its own icon that has the summary of the supplies and stocks used in an event (the number of beef patties, number of chicken patties, bread etc..) - We would like you to add an online payment feature (Apple pay or through entered credit card information) - Allow the customer to split the payment into 4 interest payments through Tabby and Tamara.

End of Questions

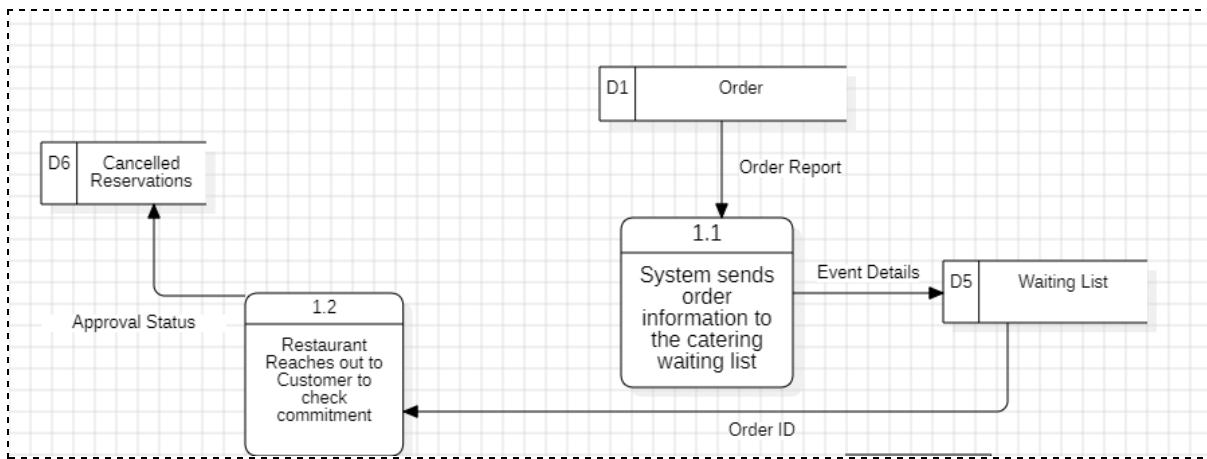
Data-Flow Diagrams

Context Level & Level-0 (Lara Alaa Karrani)

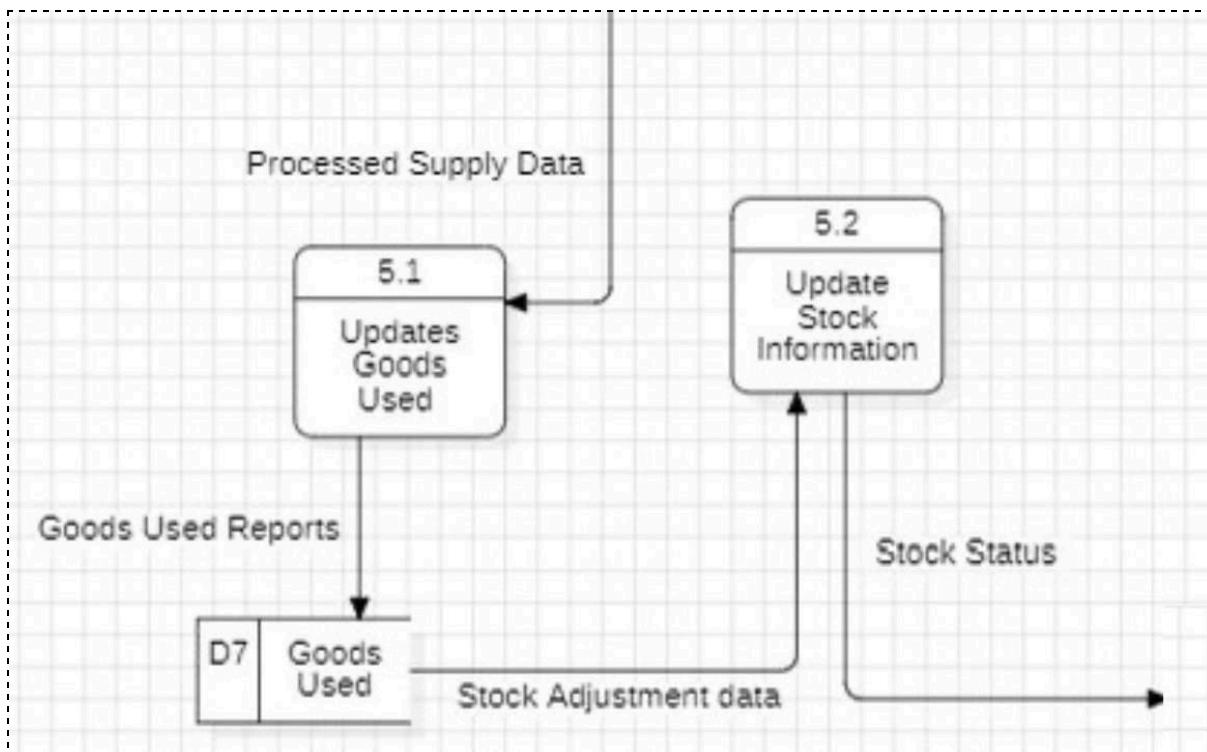


Level-1

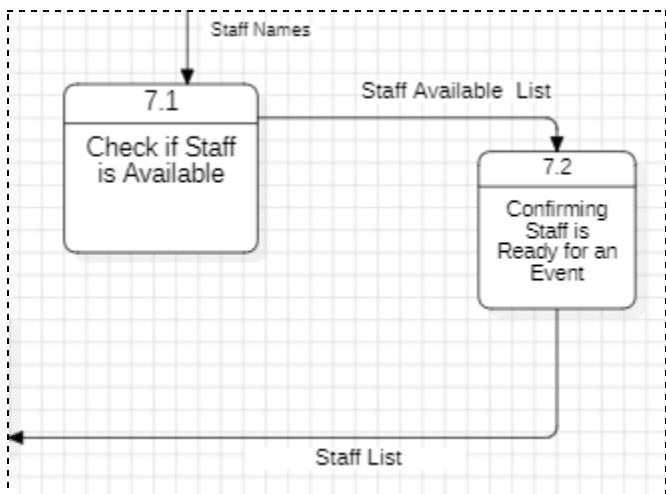
Level-1 for 1.0



Level-1 for 5.0

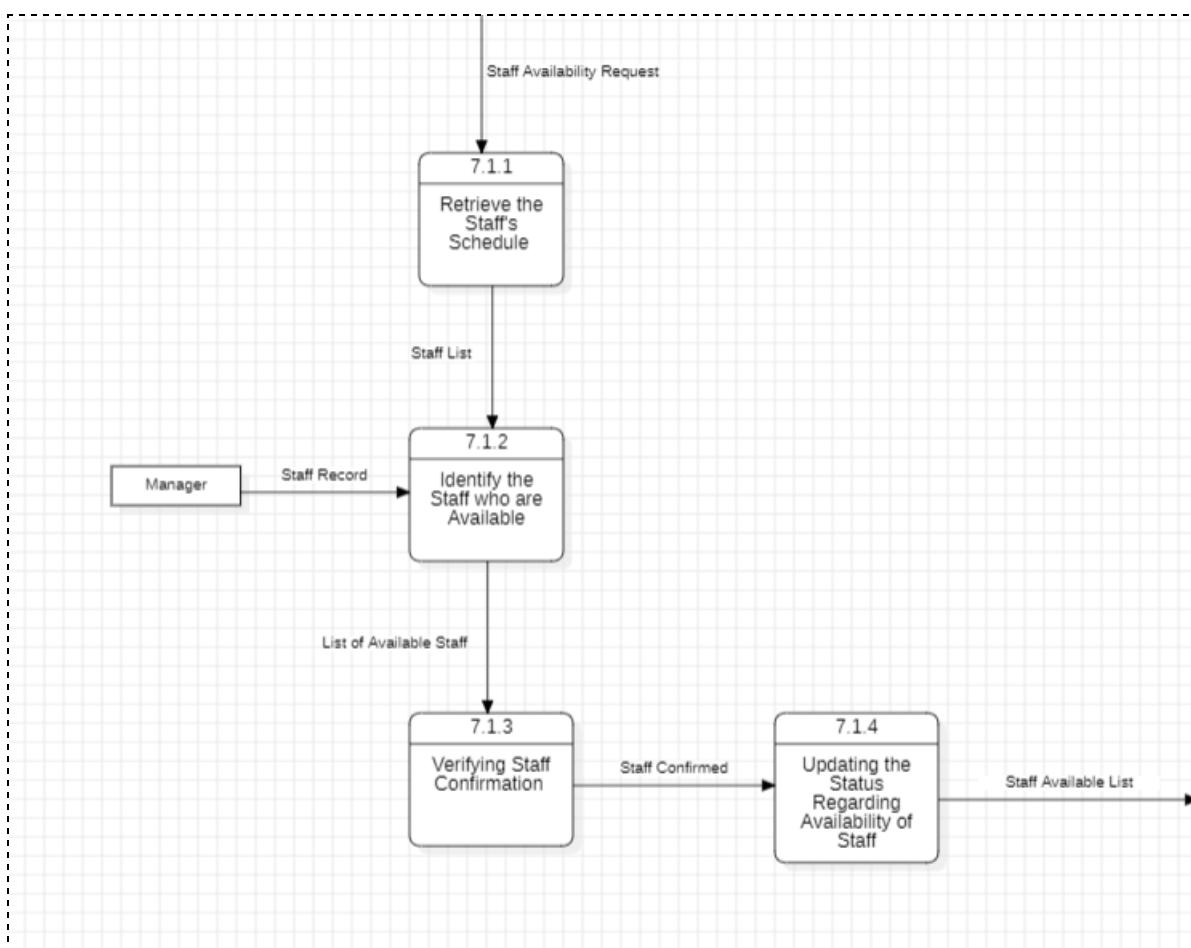


Level-1 for 7.0

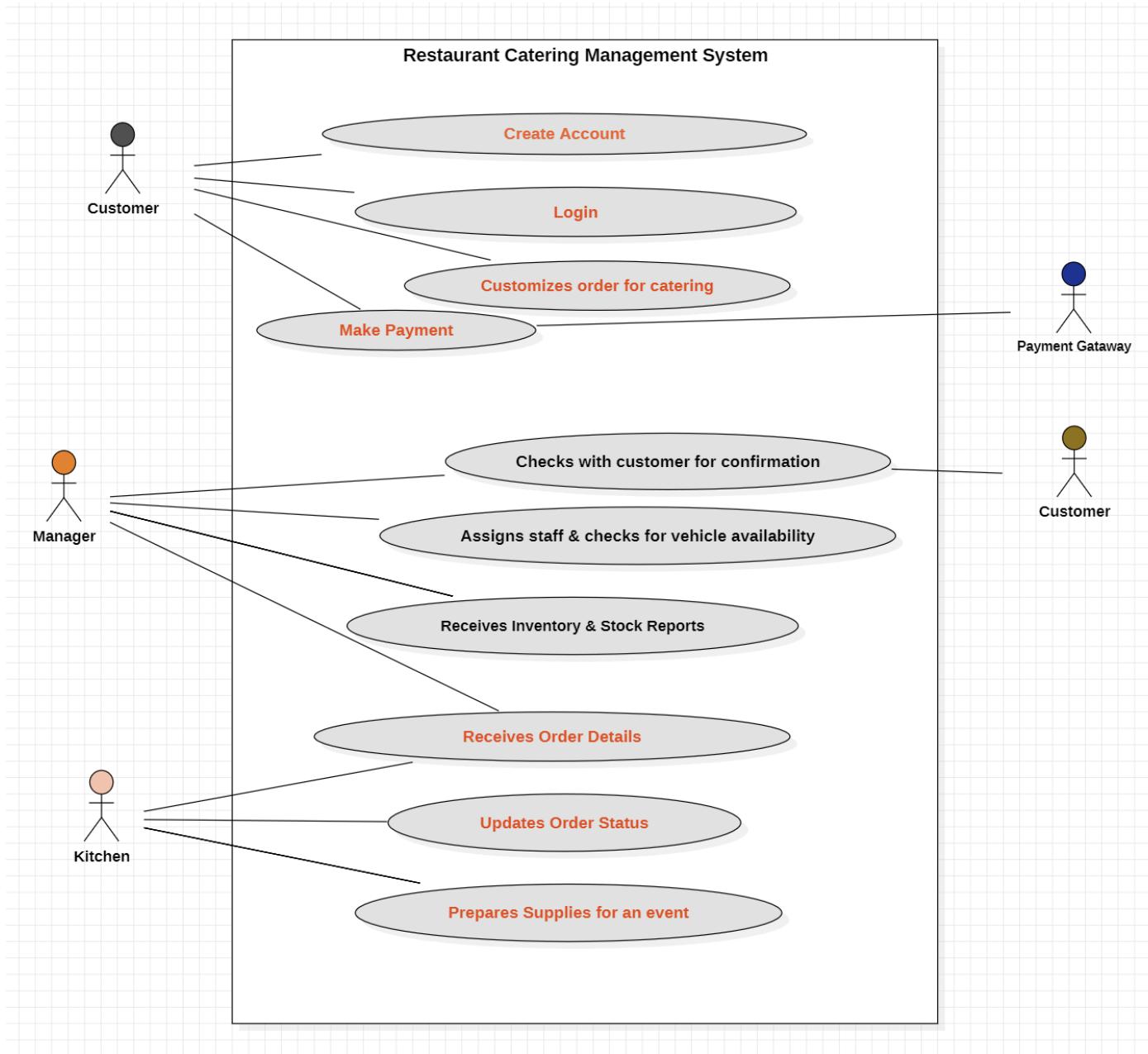


Level 2

Level-2 for 7.1



Use-Case Diagram



Scenarios

Scenario-1

Use Case Title: Creating a user account
Primary Actor: The Customer
Level: Kite (Summary)
Stakeholders: Customer, The System Manager
Precondition: Customer enters the system's registration page
Minimal Guarantee: Rollback of any incomplete registration
Success Guarantee: Account is successfully created and activated
Trigger: The customer starts the registration process
Main Success Scenario: <ol style="list-style-type: none">Customer searches the registration pageCustomer enters needed details (such as: name, email, password, phone number...)System verifies the uploaded informationCustomer submits the registration formNow system creates a new account
Extensions: <ol style="list-style-type: none">1a. Registration page is unavailable<ul style="list-style-type: none">1a1. Customer tries again in another time1a2. Customer contacts customer service

2a. Error with registered data (weak password, unavailable email, missing fields)

- 2a1. System notifies the customer about the error
- 2a2. Customer corrects the input and tries again.

Scenario-2 (Lara Alaa Karrani)

Use Case Title: Customizing an Order for Catering

Primary Actor: Customer

Level: Kite (summary)

Stakeholders: Customer, Catering Service, Payment Provider

Precondition: Customer accesses the catering order page

Minimal Guarantee: Rollback of any uncompleted customization

Success Guarantee: Order is customized and ready for checkout

Trigger: Customer starts customizing an order

Main Success Scenario:

1. Customer selects a catering package.
2. Customer customizes order details (menu items, portion sizes, dietary preferences, etc.).
3. System validates customization options and availability.
4. Customer reviews the final customized order.
5. Customer confirms customization and proceeds to checkout.
6. System saves the customized order and updates the total price.
7. Customer completes the payment process.

Extensions:

- 1a. No catering packages available.
 - 1a1. Customer exits the site or tries again later.
- 2a. Customer abandons order before checkout.
 - 2a1. System saves draft order for later.
 - 2a2. Customer quits site.
- 3a. Payment fails.
 - 3a1. System notifies customer of failure.
 - 3a2. Customer retries payment or selects a different method.

Scenario-3

Use Case Title: Assigning Staff and Checking Vehicle Availability

Primary Actor: Staff Manager

Level: Kite (summary)

Stakeholders: Staff Manager, Employee, Vehicle System

Precondition: Staff Manager accesses the system

Minimal Guarantee: Rollback of any uncompleted assignment or check

Success Guarantees: Staff assigned successfully ,vehicle availability confirmed

Trigger: Staff Manager initiates assignment process

Main Success Scenario:

1. The system is accessed by the staff manager.
2. The staff manager verifies which employees are available for assignment.
3. The staff manager looks over the vehicles that are available for the assignment.
4. Staff Manager assigns staff to a task and links it to an available vehicle
5. The system updates records and verifies the assignment.

Extensions:

1a. System login fails.

- 1a1. Staff Manager retries login.
- 1a2. Staff Manager resets credentials if required.

2a. No staff available for assignment.

- 2a1. Staff Manager reschedules the task.
- 2a2. Staff Manager assigns backup staff.

3a. No vehicle available for the assignment.

- 3a1. Staff Manager searches for an alternative vehicle.
- 3a2. Staff Manager reschedules assignment.

4a. Assignment transaction is interrupted.

- 4a1. System rolls back changes. Staff Manager retries.
- 4a2. Staff Manager exits without completing the process.

- 5a. System fails to confirm the assignment.
- 5a1. Staff Manager manually verifies records.
 - 5a2. Staff Manager reattempts assignment.

Scenario-4

Use Case Title: Receives Inventory & Stock Reports
Primary Actor: Manager
Level: kite (Summary)
Stakeholders: Manager, Suppliers, Staff
Precondition: Manager logs into the system
Minimal Guarantee: Inventory data is viewed but not altered
Success Guarantees: Accurate and updated inventory and stock reports are received
Trigger: Manager accesses the inventory management section
<p>Main Success Scenario:</p> <ol style="list-style-type: none"> 1. Manager logs in and accesses the Inventory Management section. 2. The system displays current inventory levels and stock reports. 3. Manager reviews stock and identifies low-stock items. 4. If needed, Manager places restocking orders, and the system generates purchase orders. 5. The system updates inventory levels and notifies staff of changes. 6. Manager logs out after verifying inventory is sufficient.
<p>Extensions:</p> <p>1a. Login fails</p> <ul style="list-style-type: none"> ● 1a1. Manager resets password or contacts IT. <p>2a. Inventory section is unavailable</p>

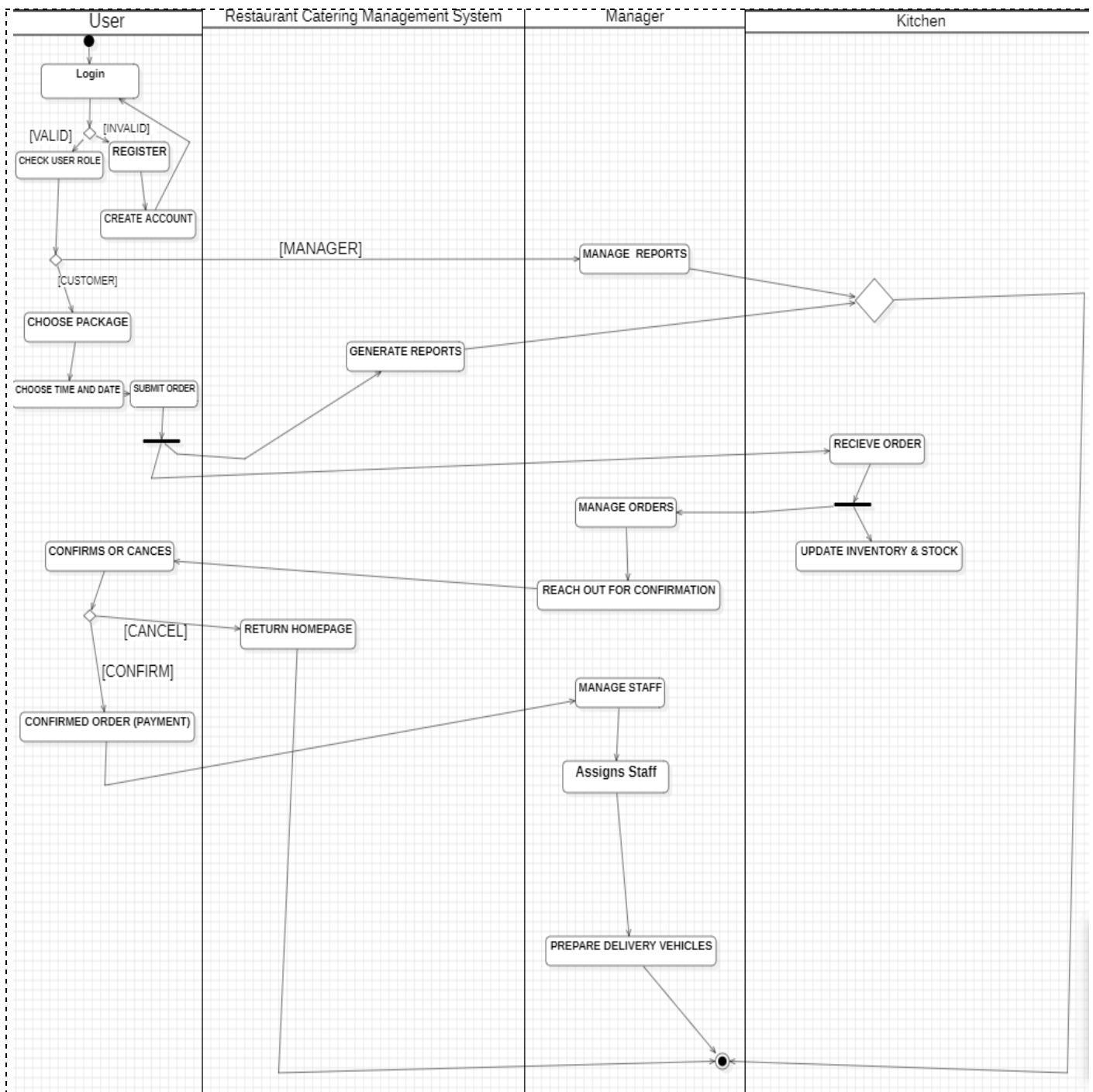
- 2a1. Manager tries later or contacts IT.
- 3a. System fails to fetch data
- 3a1. Manager retries or contacts support.
- 5a. Critical low stock
- 5a1. System alerts Manager, who places urgent orders.
- 6a. Order placement fails
- 6a1. Manager retries or contacts suppliers directly.

Scenario-5(Lara Alaa Karrani)

Use Case Title : Preparing Supplies for an Event
Primary Actor: Event coordinator
Level: Kite (summary)
Stakeholders: Event Coordinator, Suppliers, Inventory System
Precondition: Event Coordinator accesses the supply management system
Minimal Guarantee: Rollback of any uncompleted supply order
Success Guarantees: Supplies are prepared and confirmed for the event
Trigger: Event Coordinator starts supply preparation
<p>Main Success Scenario:</p> <ol style="list-style-type: none"> 1. Event Coordinator logs into the system. 2. The Event Coordinator reviews the list of required supplies for the event. 3. Event Coordinator checks current inventory for available supplies. 4. The Event Coordinator places orders for missing supplies with suppliers. 5. System confirms order placement and updates records.
Extensions:

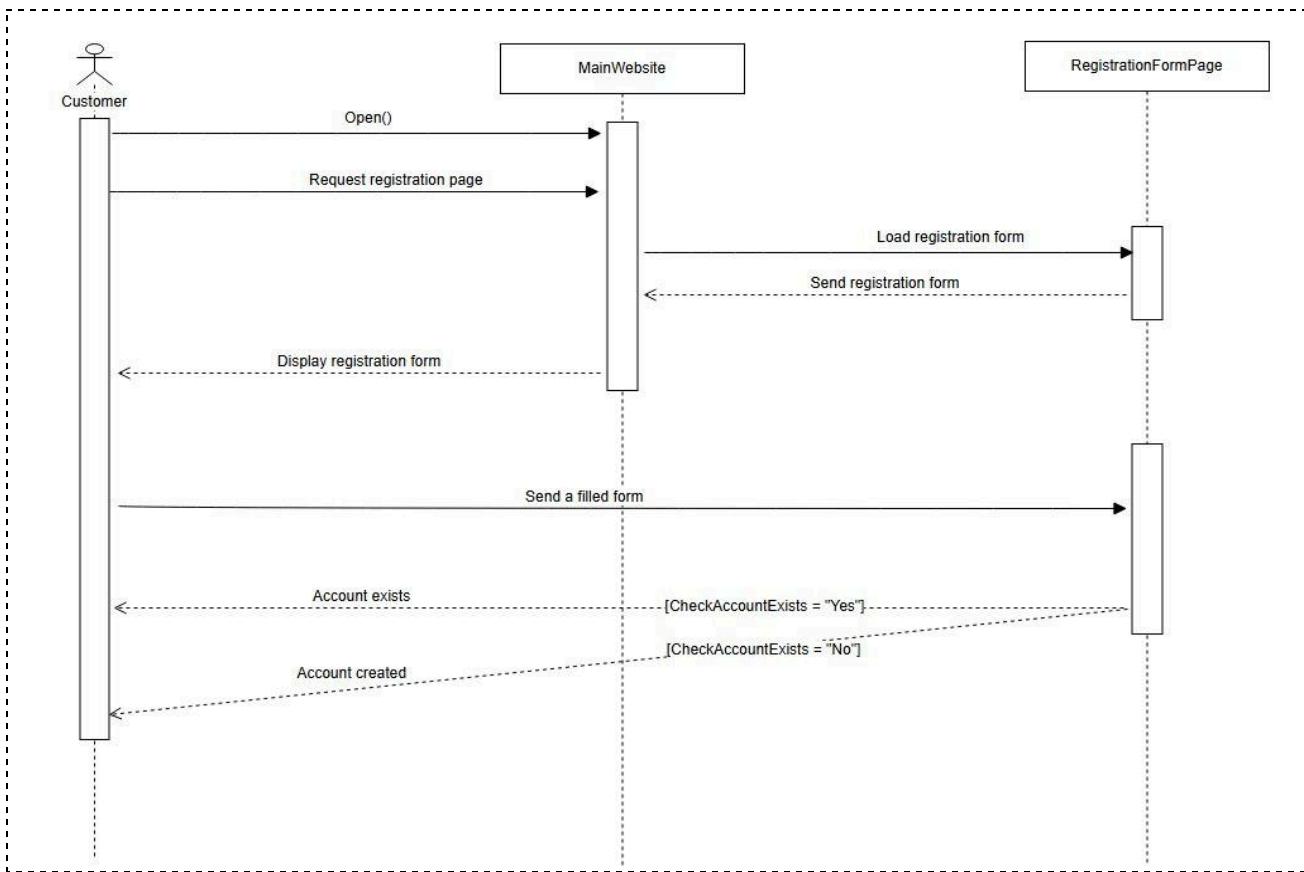
- 1a. System login fails.
 - 1a1. Event Coordinator retries login.
 - 1a2. Event Coordinator resets credentials if required.
- 2a. Supply list is incomplete or incorrect.
 - 2a1. The list is manually updated by the event coordinator.
 - 2a2. The event coordinator asks the event team for confirmation.
- 3a. Inventory system is unavailable.
 - 3a1. Event Coordinator re-tries after some time.
 - 3a2. Based on previous events, the event coordinator makes an estimate of the supplies.
- 4a. Suppliers are out of stock.
 - 4a1. Event Coordinator searches for alternative suppliers.
 - 4a2. Depending on availability, the event coordinator adjusts the order quantity.
- 5a. Order confirmation fails.
 - 5a1. The Event Coordinator contacts the supplier for manual confirmation.
 - 5a2. The order process is attempted again by the event coordinator.

Activity diagram

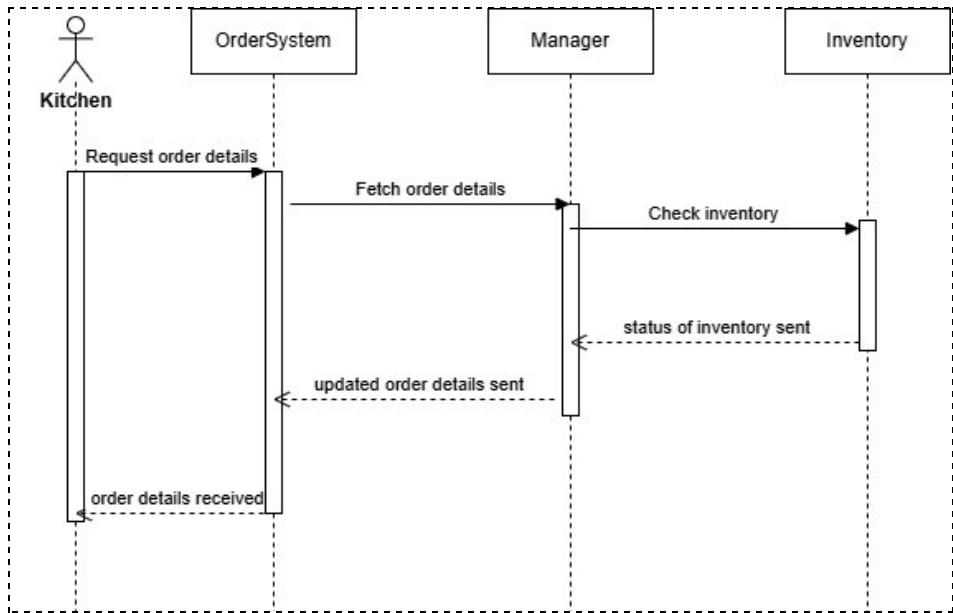


Sequence diagrams

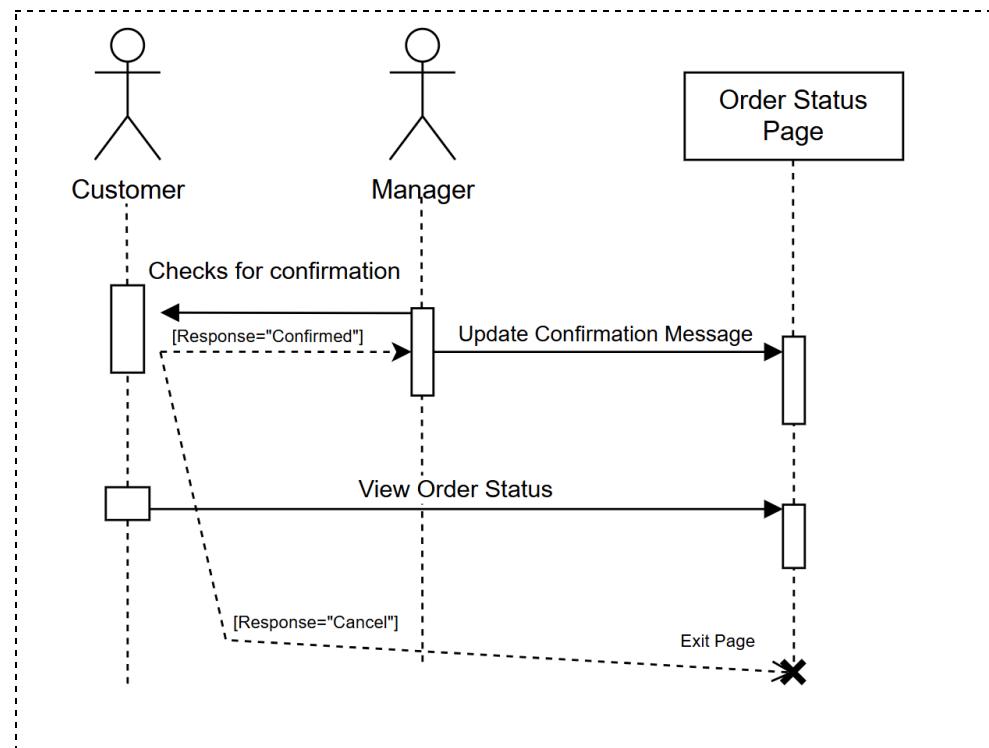
Sequence Diagram for the Use Case (Create Account)



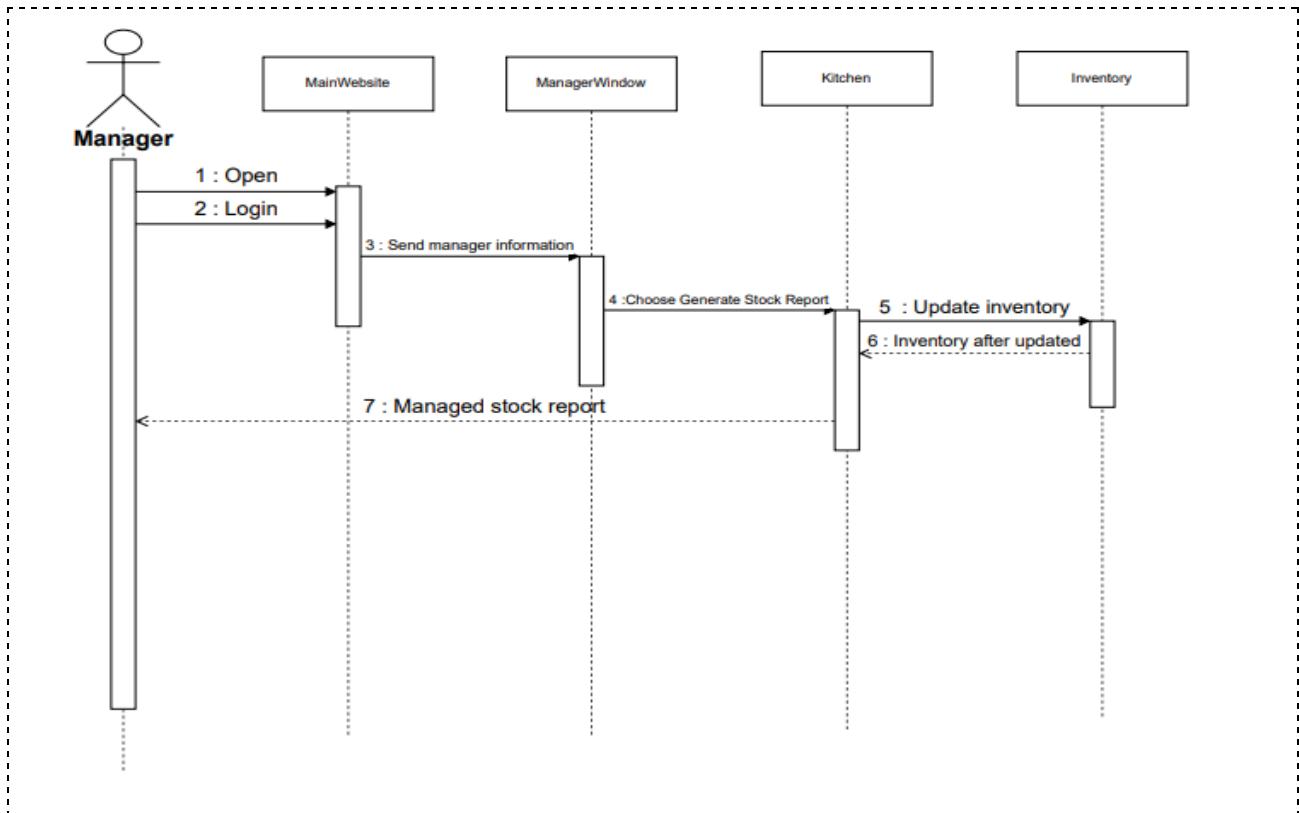
Sequence diagram for the Use Case (Receives Order Details)(Lara Alaa Karrani)



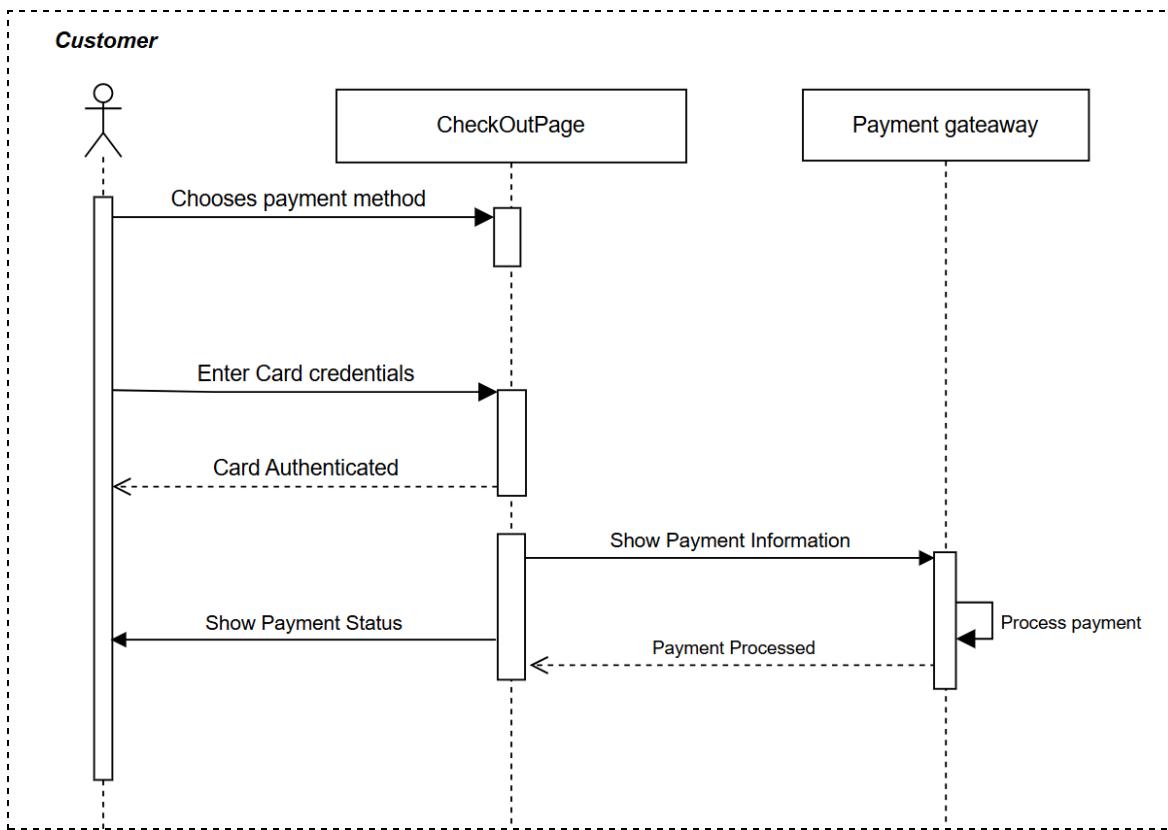
Sequence Diagram for the Use Case (Manager checks with Customer for Confirmation)



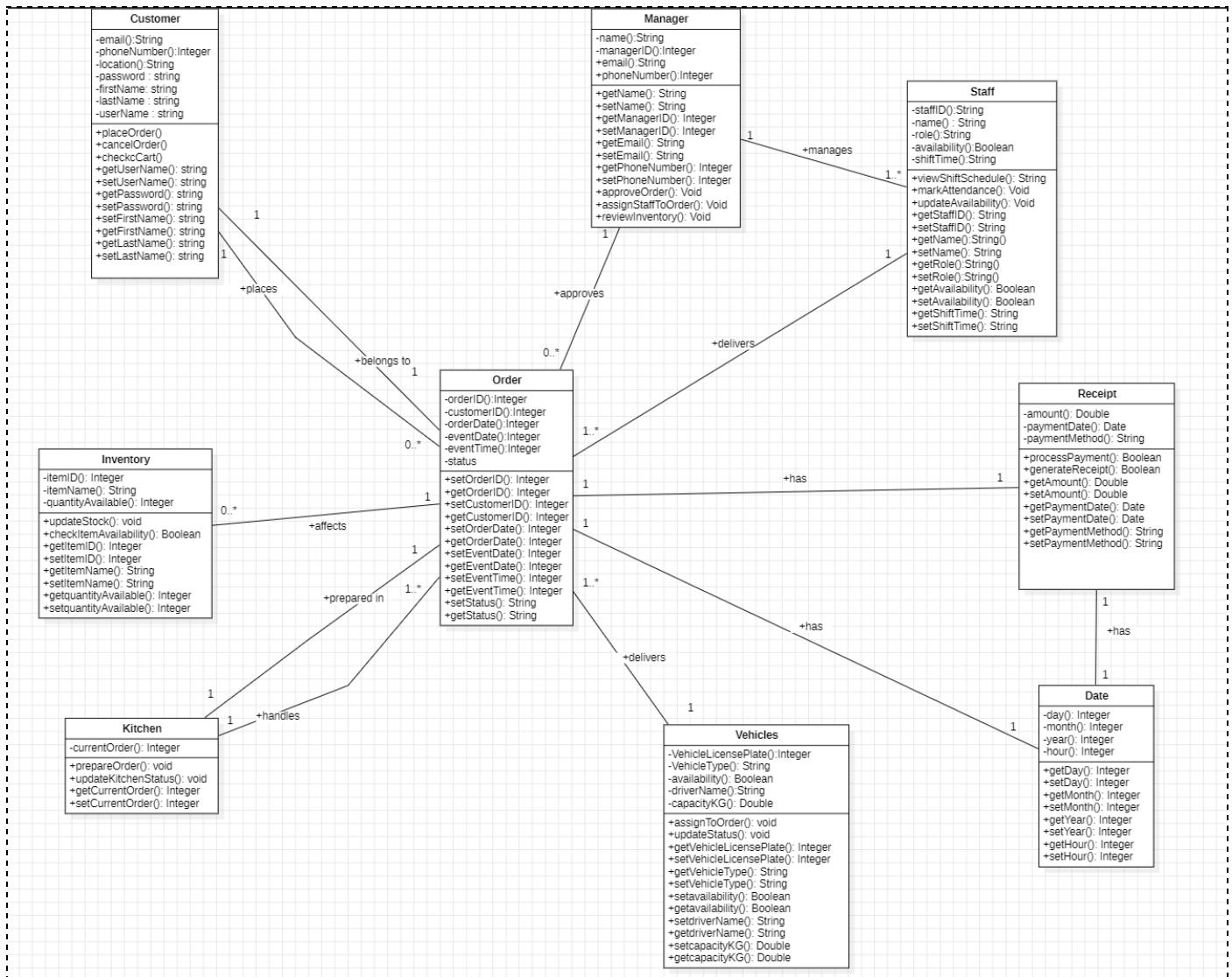
Sequence diagram for the Use Case (Receive Inventory and Stock Information) (Lara Alaa Karrani)



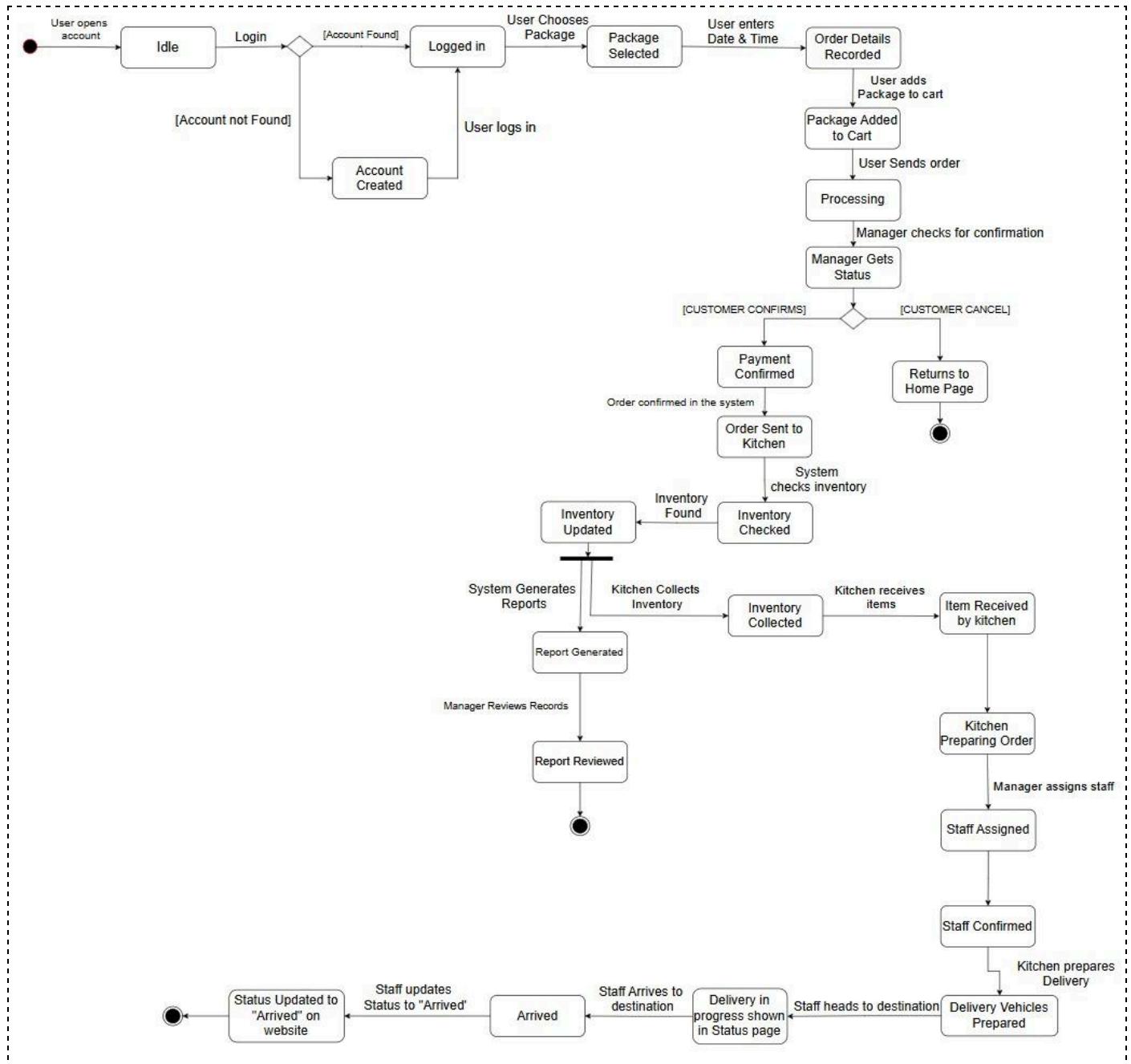
Sequence Diagram for the Use Case (Payment)



Class Diagram



State Diagram(Lara Alaa Karrani)



User Interface (Website)

(Home Page)

The screenshot shows the XBITE website homepage with the following layout:

- Header:** Navigation links for Home, Packages, Offers, Loyalty Program, Login, and Create Account.
- Offer Of The Week:** A promotional box featuring an "EXCLUSIVE OFFER!" graphic and text: "Buy 1 Family Package and get the second one half priced!"
- Search Bar:** A search bar with a magnifying glass icon and a microphone icon for voice search.
- XBITE Logo:** The XBITE logo is prominently displayed.
- Gallery:** A section showing four hands holding different types of sandwiches.
- News:** A news card about the XBITE presence at the Islamic Arts Biennale Jeddah, with details about the event dates (May 20-23), time (5pm-11pm), and location.

(Create Account Page)



Create new Account

[Already Registered? Login](#)

NAME

EMAIL

PASSWORD

DATE OF BIRTH
▼

sign up



Login

[Sign in to continue](#)

EMAIL

PASSWORD

login

(Choose Package Page)(Lara Alaa Karrani)

The screenshot shows a mobile application interface for food delivery. At the top, there is a navigation bar with icons for Home, Packages, Offers, and Loyalty Program, along with Login and Create Account buttons. Below the navigation bar is a large image of a burger with lettuce and meat.

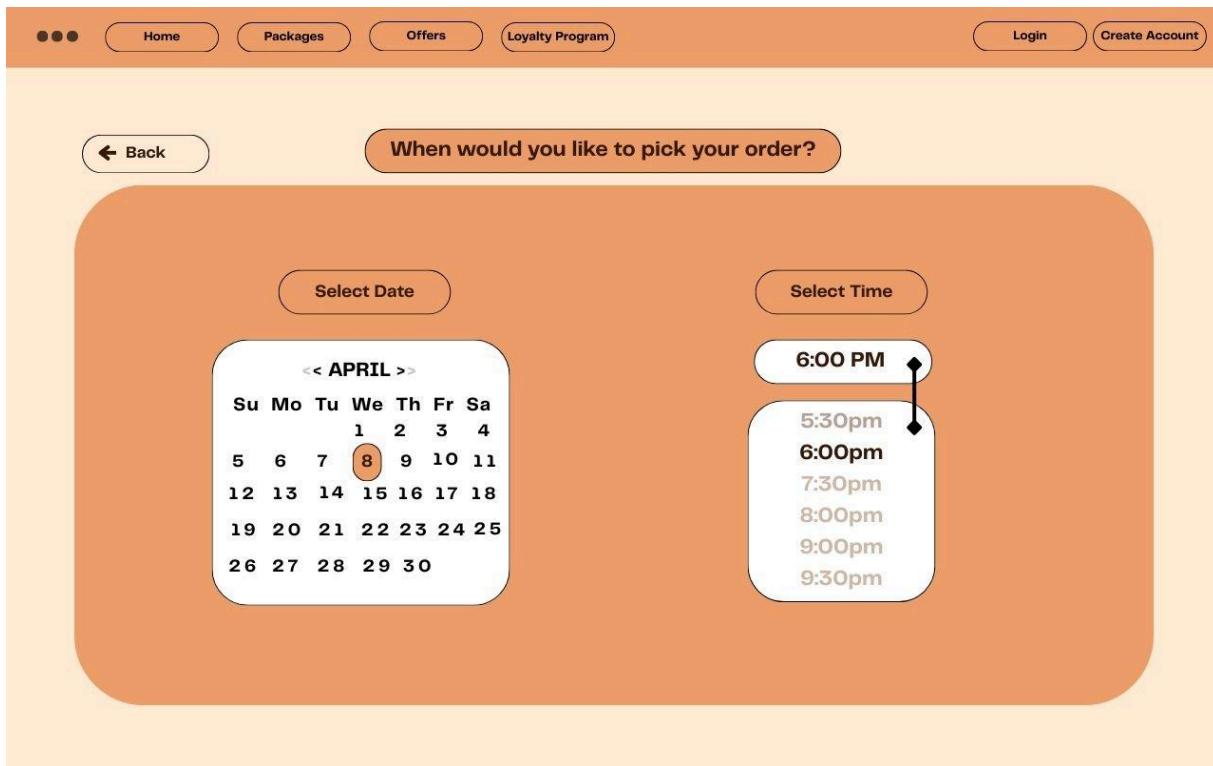
Search bar: Search your favorite food....

Three package options are displayed:

- Family Package**: 15 either chicken or beef burger meals (meal includes burger, french fries, and drink of choice). Rating 4.5. Price 300SAR. Includes a meal kit box labeled "BITE".
- Event Beef Package**: 50 Beef burger meals(meal includes burger, french fries, and drink of choice). Rating 4.8. Price 1200SAR. Includes a meal kit box labeled "BITE".
- Event Chicken Package**: 50 chicken burger meals (meal includes burger, french fries, and drink of choice). Rating 4.2. Price 1000SAR. Includes a meal kit box labeled "BITE".

At the bottom, there are social media sharing icons (Facebook, Instagram, Twitter) and a "See More" button.

(Determine Date and Time Page)



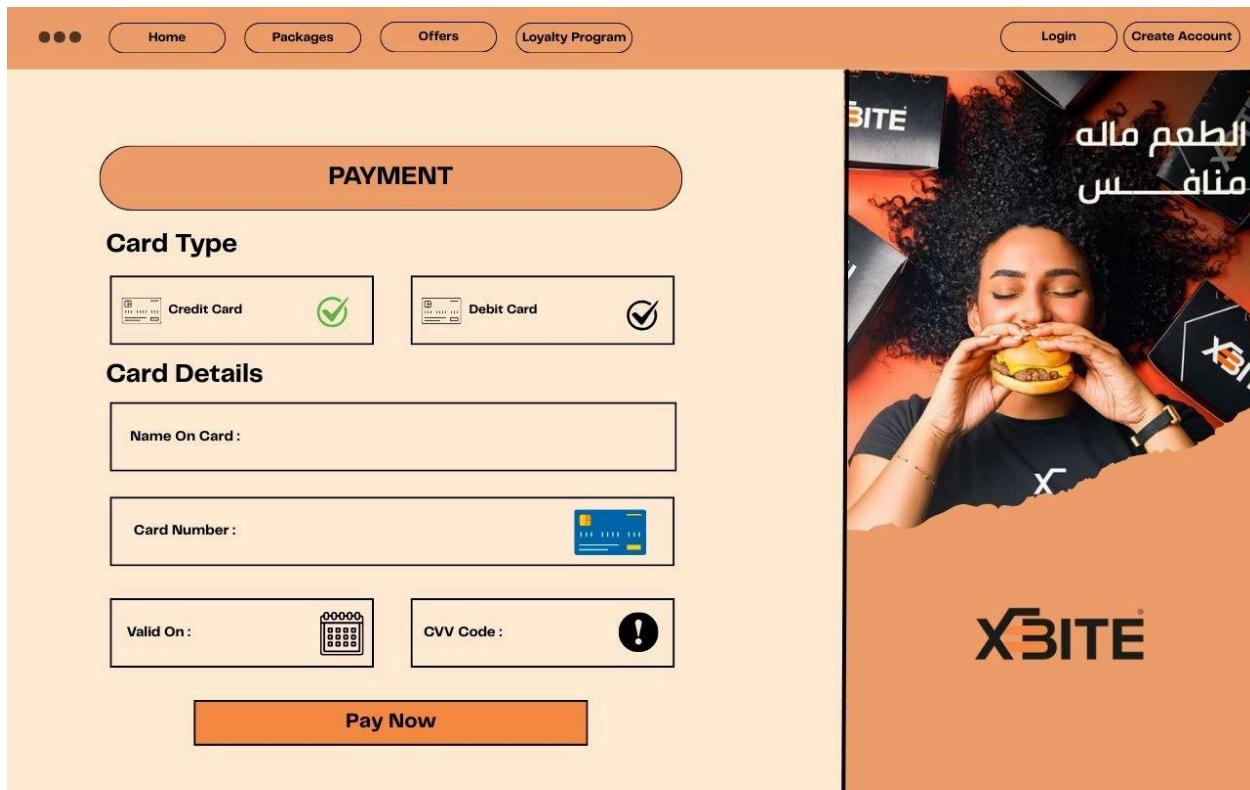
(Cart Page)

The screenshot shows the "SHOPPING CART" page. At the top, there are navigation links: Home, Packages, Offers, Loyalty Program, Login, and Create Account. The main area displays a "SHOPPING CART" section with a sub-section "HOME / SHOPPING CART" and the Xbite logo. Below this, a progress bar indicates step 1 (SHOPPING CART) and step 2 (PAYMENT). The shopping cart summary table lists two items:

NAME	PRICE	QTY.	TOTAL
Event Chicken Package	1000SAR	- 1 +	1000SAR
Event Beef Package	1200SAR	- 1 +	1200SAR
SUBTOTAL - 2200SAR			

At the bottom, there are "CONTINUE SHOPPING" and "CHECKOUT" buttons.

(Payment Page)



Conclusion

In conclusion, this system aims to address the challenges that Xbite faces in managing their catering services. Using a user-friendly web interface, customers can choose their desired packages, customize their orders like the date and time of the event, and payment can be conducted online after confirming with the manager. The system helps in assigning staff, vehicles, provides reports to help the manager in simplifying overall management, and finally updates inventory simultaneously. This proposed idea helps in transforming traditional ways which might lead to errors to an improved digital solution that will reduce errors as much as possible and make the catering process simple for both the customers and the restaurant. Xbite is known for their good reputation regarding their food so it needs to handle high demand periods, prevent miscommunication between the customer and the restaurant, and ensure everything is delivered correctly while also being on time. Our project consists of the functional and non-functional requirements and helps in showing how this system design, if implemented, it

will help in the operational services regarding the services to provide good overall customer services.

Future Direction

To further enhance the system, several future improvements can be considered:

1. **Mobile Application:** Creating a mobile-friendly version of the platform to give employees and clients quick access to information and services.
2. **AI-Powered Recommendations:** Integrating machine learning algorithms to suggest catering packages based on customer history or popular trends.
3. **Live Order Tracking:** Allowing customers to track the location and status of their orders in real-time.
4. **Different payment methods :** expanding payment options by adding platforms such as Tabby and Tamara, which allow customers to split payment over time.
5. **Multi-language Support:** Adding language options to improve accessibility for non-Arabic or non-English speakers.
6. **Customer Loyalty Program:** Implementing a points-based rewards system to encourage repeat orders and strengthen customer relationships.

By following these directions, the system can evolve into an all-comprehensive catering management platform and cover all user needs.

References

- System Analysis & Design Courses
- Modern Systems Analysis And Design Book

STUDENTS' CONTRIBUTIONS

Lara Karrani	20%
Hala A.Zubair	20%
Alya Jaad	20%
Mawadah Asiri	20%
Tala AlBadi	20%