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FoodForTech (FFT) Cafeteria Ordering System

Software Requirement
Specification



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Table of Contents

1. Introduction.....	4
1.1 Purpose.....	4
1.2 Scope.....	4
1.3 Definitions, Acronyms, and Abbreviations	5
1.5 Overview	8
2. Overall Description.....	9
2.1 Product Perspective.....	9
2.2 Product Features (FEs).....	9
2.3 User Classes and Characteristics	11
2.4 Operating Environment.....	12
2.5 Design and Implementation Constraints.....	12
2.6 User Documentation	13
2.7 Assumptions and Dependencies	13
3. Use-Case Diagram with Use-case descriptions (UCs).....	14
3.1 Use-case Diagram	14
3.2 Use-Case Description(s)	19
4. External Interface Requirements.....	34
4.1 User Interfaces	34
4.2 Hardware Interfaces	37
4.3 Software Interfaces	38
4.4 Communications Interfaces	38
5. Other Nonfunctional Requirements	39
5.1 Performance Requirements	39
5.2 Safety Requirements	39
5.3 Security Requirements	40
5.4 Software Quality Attributes	40
6. Other Requirements	41
6.1. Scalability	41
6.2. Portability.....	41
6.3. Compatibility	41
6.4. Maintainability.....	41
6.5. Internationalization	41
6.6. Learnability	42

7. Functional Requirements (FRs)	43
7.1 FR1:.....	43
7.2 FR2:.....	43
7.3 FR3:.....	43
7.4 FR4:.....	44
7.5 FR5:.....	44
7.6 FR6:.....	45
7.7 FR7:.....	45
7.8 FR8:.....	45
7.9 FR9:.....	47
7.10 FR 10: Multiple payment methods	47
7.11 FR 11: Access FFT outside cafeteria intranet.....	47
7.12 FR 12:.....	48
7.13 FR 13:.....	48
7.14 FR 14:.....	48
7.15 FR 15:.....	49
TABLE 2: Traceability Matrix (Use-cases & FRs).	50
8. Functional Modeling (DFDs).....	51
8.1 Context Diagram (level 0)	51
8.2 Level 1	52
8.3 Level 2	53
9. Class Analysis Modeling	69
9.1 Initial Class Diagram (ICs)	69
TABLE 4: Traceability Matrix (FRs and Initial Classes).....	70
9.2 Modified Class Diagram (MCs).....	73
TABLE 5: Traceability Matrix (Initial Classes (IC) and Modified Classes (MC)).....	74
References	77

1. Introduction

1.1 Purpose

The intended audience for the SRS is workers in the tech industry: software engineers, product managers, as well as those wherein every minute in their profession is crucial: they can't afford to miss deadlines, nor can they be at their best if they are hungry because the distance from their workplace to their preferred meal location is long and leaves little room to eat a full meal. We will implement a software product that ensures great output for the organization whilst at the same time ensuring its employees are fed. After all, it will be beneficial as well as rewarding for organizations to implement a system that would allow their employees to buy meals online and have cafeteria staff either deliver the food to said employee's workstation or hold the purchased meal for them at the cafeteria. A system like this would allow employees who utilize the services to cut down on the distance traveled and enhance the likelihood that they will receive their desired choice of food. Both their productivity and the quality of their work lives would be enhanced, thereby increasing the likelihood of employees becoming happy which would, in turn, lead to a more productive output by the employees.

1.2 Scope

FoodForTech (FFT) is the web and mobile application software that will enable technology companies to provide an access to food that will enable their employees to cut down on time spent traveling (e.g., cycling, scooter, etc.) to have a meal. FFT will provide customers (end users) the ability to order the same food served in the company's cafeteria by way of the FFT app installed on their phone or by visiting the website foodfortech.com on their computer or mobile phone's web browser. FFT will permit end users to access the cafeteria menu, make food selections, and beverage selections, submit credit or debit card payments, and, lastly, the option of dining in or ordering takeout.

The goal of FFT is twofold, firstly, it will allow companies to cut back on overtime hours caused by employees missing their scheduled lunch breaks and later deciding to take the lunch break during time-crunching moments of the day when deadlines are due. FFT's second goal will be to save employees time whether the employees have a one-hour lunch break or thirty minutes lunch break, and those employees' workstations are located at a great distance from their company's cafeteria, and as a result of that, it takes them anywhere between twelve to twenty minutes of traveling time to arrive at the cafeteria for their meal; then FFT will fill that role by reducing time traveled for a meal to five minutes, specifically for employees that prefer to eat in the

cafeteria. FFT will serve the role of reducing time traveled by allowing employees to order their food or beverages any time of the day during the company's operating hours.

What will FFT do?

- FFT will utilize third-party services such as DoorDash or UberEats to deliver food picked up from the company's cafeteria to the intended FFT end users' workstation
- If the end user's workstation is in an access-restricted location, based on the end user's instruction, FFT will relay the message and instruct the third-party service DoorDash or UberEats delivery person to await the end user at the specified food drop-off location

What will FFT not do?

- FFT does not prepare the meals or beverages being purchased
- FFT does not regulate the associated technology company's timesheet or lunch break clock-out time
- FFT makes no promises to keep employees from skipping their lunch breaks
- FFT does not tip third-party food deliverers nor does it instruct its end users to do so. The decision is at the end user's discretion

1.3 Definitions, Acronyms, and Abbreviations

COS	Cafeteria Ordering System.
FFT	FoodForTech - is the name of the application software that performs the function of allowing end users to submit a food order and payments.
End users	An employee who uses FFT's mobile app or FFT's website to order food
App	Application - also known as application software.
UML	Unified Modeling Language - outlines a collection of common notations used, notably in object-oriented software development, to

	create diverse visual representations of systems.
CPU	Central processing unit - interprets and executes instructions in the form of machine code.
RAM	Random-access memory - stores operational data and machine code.
HDD/SSD	Hard Disk Drive/Solid State Drive - a device for storing and retrieving digital data.
DoorDash	An American company that operates an online food ordering and food delivery platform.
UberEats	Online food ordering and delivery platform launched by Uber in 2014.
Two-Factor Authentication (2FA)	An identity and access management security method that requires two forms of identification to access resources and data: the end user's device and the code generated by the 2FA. On the organizational side, 2FA gives businesses the ability to monitor and help safeguard their most vulnerable information and networks.
Amazon Web Services (AWS)	Provides on-demand cloud computing platforms and APIs to individuals, companies, and governments.
	It is used for secure communication over a computer network and is widely used on the

Hypertext Transfer Protocol Secure (HTTPS)	Internet.
JSON	An open standard file format and data interchange format that uses human-readable text to store and transmit data objects consisting of attribute-value pairs and arrays.
Megabyte (MB)	Is a measurement of binary data.
Megabits or megabits per second (Mbps)	Is a unit of measurement for data size, most often used in describing data transfer rate. It takes eight megabits to make a megabyte.
Functional Requirements (FRs)	These are the software capabilities that must be implemented for the user to carry out the feature's services or to perform a use case.
Initial Class Diagram (ICs)	Shows the interfaces of the system, and their relationships
Data Flow Diagram (DFD)	A DFD identifies the transformational processes of a system, the collections (stores) of data or physical materials that the system manipulates, and the flows of data or material between processes, stores, and the outside world.

1.5 Overview

The Software Requirements Specification document contains six main sections with each main section having one to seven sub-sections. Each sub-section details and gives a clearer understanding of the main section.

The Software Requirements Specification is organized in numerical order and it deals with FoodForTech's goals, objectives, and purpose of the software system. Additionally, activity diagrams are used to highlight FoodForTech's food ordering process:

- ❖ browsing the cafeteria menu
- ❖ selecting a meal from the menu
- ❖ placing the meal in the shopping cart
- ❖ selecting the preferred time of pickup, delivery, or table reservation
- ❖ finalizing the order and making the payment via a debit card or a credit card

2. Overall Description

2.1 Product Perspective

The project is based on the COS through a web and mobile application FoodForTech has some unique features allowing users to order meals from some nearby restaurant contract with our system. Moreover, FoodForTech provides delivery to your company's designated location in a short time and at a reasonable price compared to other systems. This app will integrate with multiple application delivery, such as DoorDash, Uber, and e.t.c, to improve the user experience by increasing the option to choose from. In addition, users and deliverers can give feedback about the system, food, and restaurant to improve the system's quality and services. Our app can save more time for employees and give them more choices with their meals. FoodForTech can replace the traditional method, such as ordering manually or via telephone.

2.2 Product Features (FEs)

FE-1 - Order meals from the cafeteria menu to be picked up or delivered. End users can go through the FFT website to place a meal order, and choose two options which are pick up or delivery.

- End users may place a meal from the cafeteria menu
- End-users have options to pick up their meals at the local restaurant or the designated location at their company.
- The menu manager gets the requests from end-users and then creates the request for restaurants and deliverers.

FE-2: Order meals from local restaurants to be delivered. Suppose the cafeteria does not satisfy end customers. In that case, they can order from nearby local restaurants, which are contracted with the FFT company, and choose from two options: pick up or deliver.

- End users should be able to place meals from local restaurants contracted with FFT COS.
- End users should be able to choose to be delivered to a designated location.

FE-3: Create, view, modify, and delete meal service subscriptions. End users can register a subscription or cancel it on their profile display. They can see the prices of subscriptions.

- Users can sign up, view, modify, and unsubscribe from meal subscriptions.

FE-4: Register for meal payment options. If the end users choose their company cafeteria, the company will take the meal payment from their salary. Moreover, if the end user chooses to pay with a Visa Card or a MasterCard, then they have to provide their card information.

- Users can add their credit card information so that they can quickly use it during the ordering process

FE-5: Request meal delivery. End users can pick up or deliver by their local restaurant if it is available or a third party such as DoorDash or Uber, etc.

- Users can choose the delivery option and specify the location for the meal to be delivered

FE-6: Create, view, modify, and delete the cafeteria menu. This feature contains a display, which can support managers, or staff who have the responsibility to change their menu, and prices, for their cafeteria.

- Managers or staff who are responsible to manage the menu for their restaurant should be able to create, view, modify, and delete for their restaurant via the FFT COS.

FE-7: Order custom meals that aren't on the cafeteria menu.

- Users can place an order for meals that are not listed on the cafeteria menu

FE-8: Rating: End users can rate their orders and comment on the food and the delivery experience. Rating will display from 0 to 5 stars and have a comment box on the bottom to gather customer feedback for their order.

- Users can rate how satisfied they are with the meal at the restaurant where they had placed the order.
- The rating scale is from 1 to 5 stars with 5 being the best and would recommend it to other people

FE-9: Provide live chat with customer representatives. Live chat will ask customers common questions and try to answer those common questions by putting the answers on the website. However, if the answers cannot satisfy customers, they can choose to chat with our customer support.

- Users can click on the customer service icon to chat with a live customer service representation from 8:00 AM to 5 PM

FE-10: Multiple payment methods. Users can pay with multiple platforms such as Apple Pay, Samsung Pay, Visa Card, MasterCard, Cash (pick up only), or Paypal.

- Users can save multiple credit or debit cards so that they can use them quickly during meal checkout.
- The system will save and store it securely in the database.
- Only only the last four digits of the cards will be displayed.

FE-11: Access FFT outside the cafeteria intranet. End users can use the intranet to access our FFT, and they can still access FFT with the internet, but they cannot choose their company payment methods.

- Users can order the meal anywhere without having to log in to the intranet
- Users have the option to log in via Facebook or Google

2.3 User Classes and Characteristics

Customer: A customer is an employee of a company that signed a contract with our system. Customers can view a menu, select desired items, and order them. After they finish choosing items, they can decide to pick them up at a local restaurant or get them delivered to a designated location in their company. Later, they can pay the bill by multiple provided payment methods via payment gateways.

Deliverers: After a customer pays their bill, if they choose to deliver to the designated location of their company, then deliverers from a local restaurant have a priority to do it. After 3 minutes, if a local restaurant can't confirm delivery, our system will send a request to an external food delivery system like DoorDash, Uber, etc. Later, when deliverers accept a request, they must go to the restaurant to pick up and deliver to a designated location on time.

Cafeteria Staff/ Restaurant Staff: a staff member can be local restaurant staff or cafeteria staff, who is responsible for confirming orders, cooking meals, and packing them for delivery. They need to be trained to use some basic computer to use the app.

Menu Manager: A menu Manager is a local restaurant manager or cafeteria manager responsible for establishing and maintaining the whole week's menu of food items. They can choose which items cannot be delivered and create a special menu for some specific day. Moreover, they can also change the price of items and refuse online orders based on the inventory stocks.

2.4 Operating Environment

OE-1: Final product shall support multiple web browsers including Chrome, Firefox 90+, and Safari 13+.

OE-2: Mobile version shall support both IOS and Android.

OE-3: both web and mobile shall support multiple payment gateways such as Visa, MasterCard

OE-4: Mobile version shall support Android Pay and Apple Pay.

OE-5: FFT COS shall permit user access from the corporate Intranet.

OE-6: The client-side browser must operate within common web-browser environments using Secure Sockets Layer (SSL) / Transport Layer Security (TLS) cryptographic protocols at a minimum encryption level of 128 bits.

Server Side:

- Operating System: Red Hat Enterprise Linux Server 8
- DMBS: PostgreSQL
- Web Server: Apache

Client Side:

- Operating System: Windows/Linux/macOS/ Android / IOS
- Browser: Firefox, Internet Explorer, Chrome, Safari, and Microsoft Edge

2.5 Design and Implementation Constraints

CO-01: All HTML code shall conform to the HTML 5 standard

CO-02: All cascading Style Sheets shall use the latest version of Bootstrap 5, Version 5

CO-03: The system shall use the current version of PostgreSQL while supporting up to two earlier version releases. Currently, those include Version 14, and support versions 13 and 12.

CO-04: Software must be multilingual, including the following languages: English, Spanish, French, German, Japanese, and Mandarin.

CO-05: The system shall comply with all Accessibility, Web Design, and Security policies applicable.

2.6 User Documentation

UD-01: A tutorial will provide a quick start and a walk-thru of major system features.

UD-02: The system shall provide the end-users with the privacy policy

UD-03: An online form will enable users to request help, and frequently asked questions will be screened for the FAQ pages.

UD-04: The user's guide will contain:

UD-04.1: Overview of the system feature, and architecture.

UD-04.2: Instruction for accessing the system

UD-04.3: Samples of screens.

2.7 Assumptions and Dependencies

AS-01: The system is open for breakfast, lunch, and early dinner on weekdays.

AS-02: The restaurant shall provide at least one order online app such as Uber, DoorDash, etc.

AS-03: Deliverers will be available to deliver the food to nearby customers.

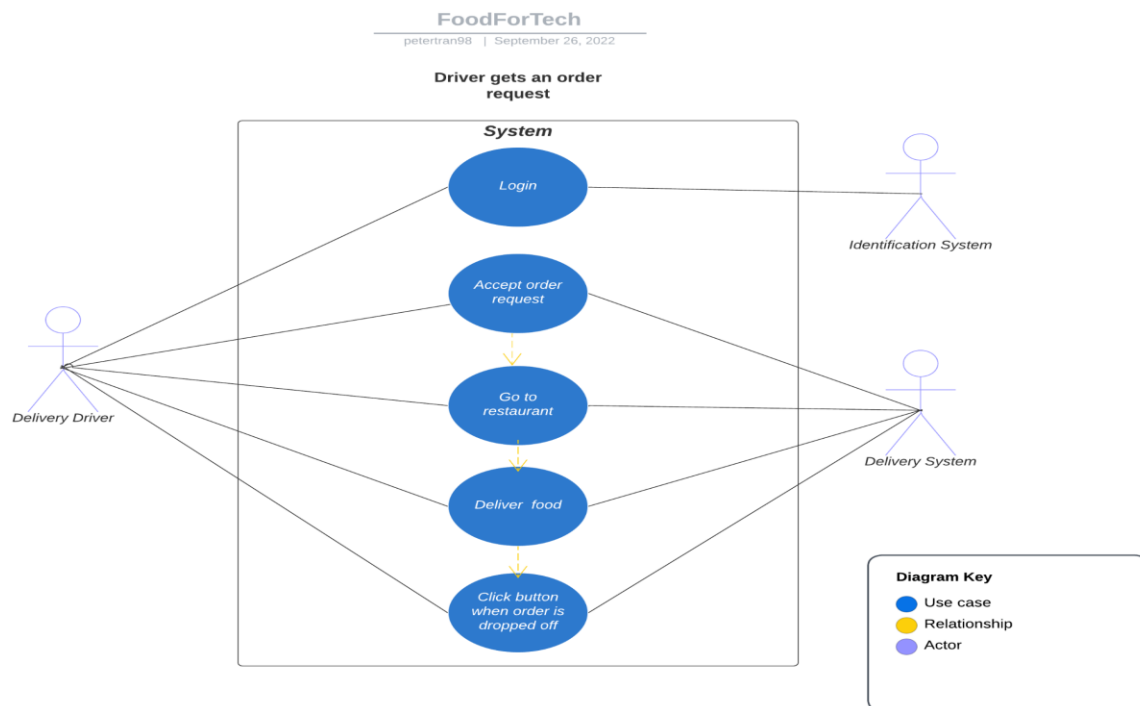
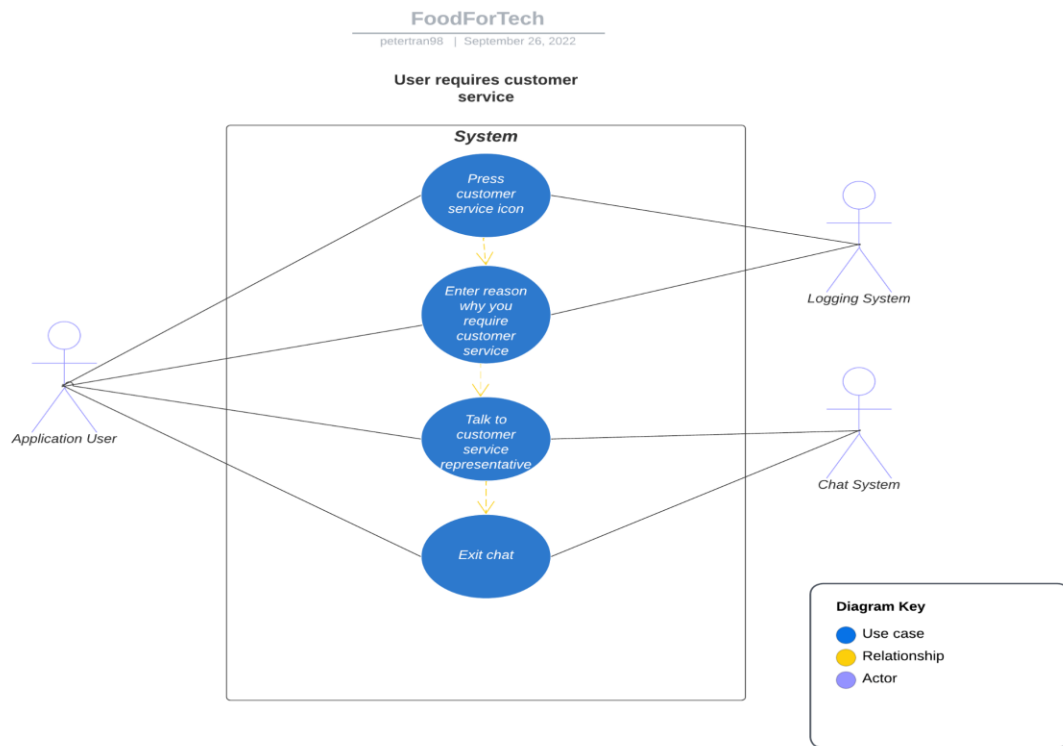
AS-04: Cafeterias and restaurants must have Internet.

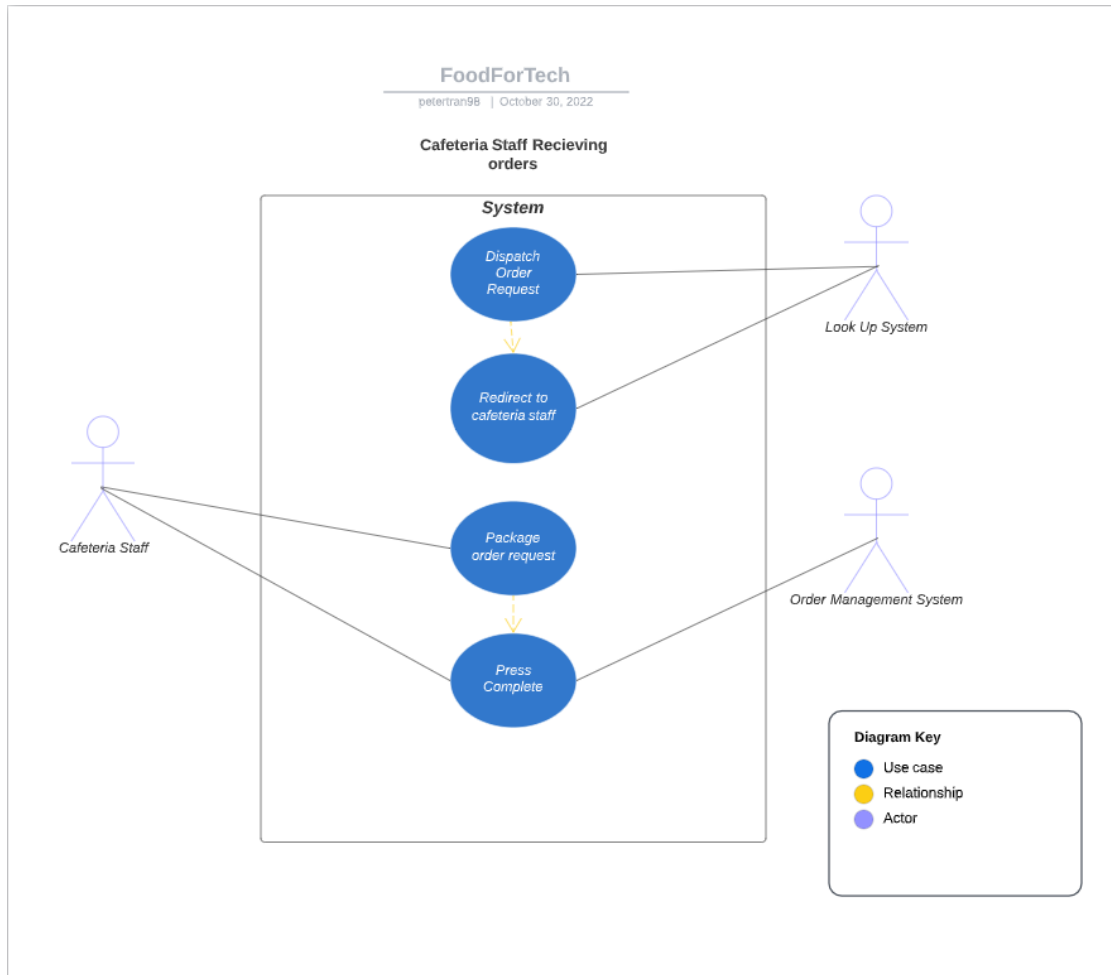
DE-01: The customer and payment gateways are passed with every transaction.

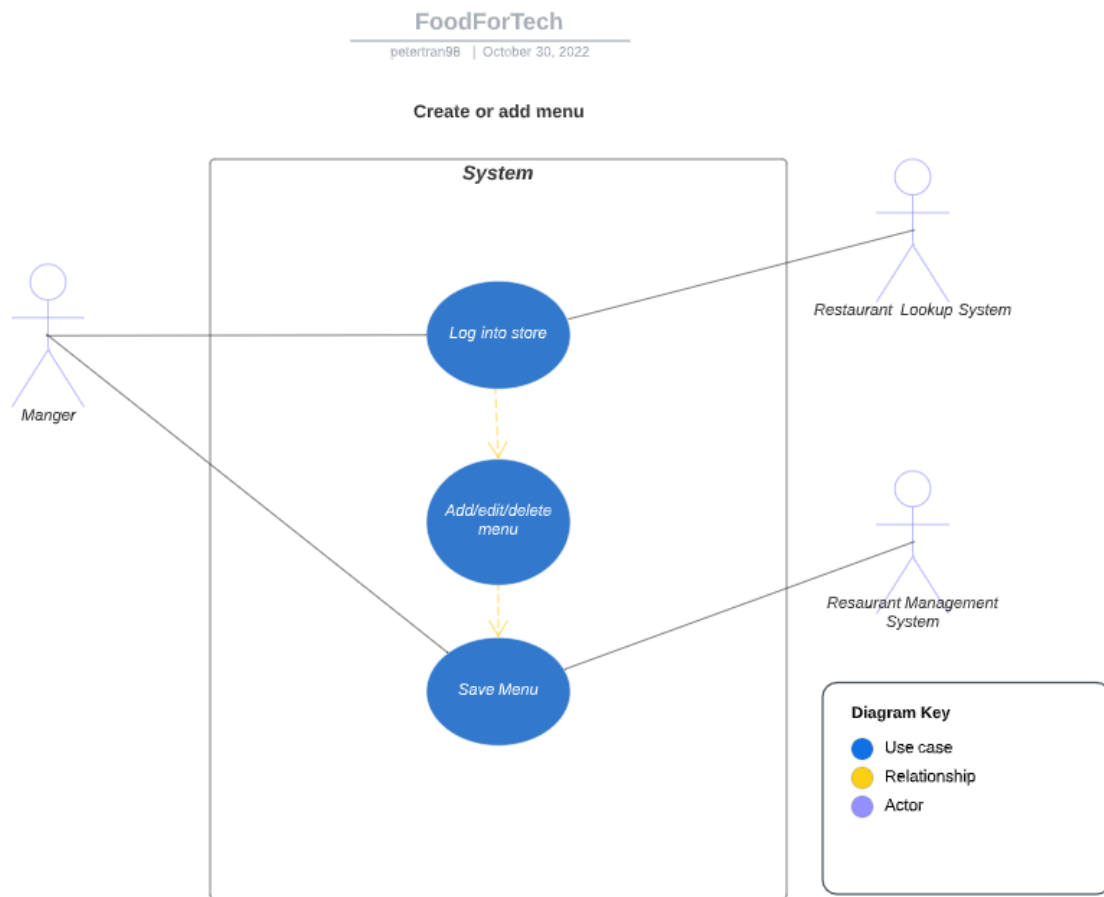
DE-02: The system is dependent on the end-users and the payment gateways and transactions must be approved.

DE-03: The system would be dependent on rules and regulations by government authorities.

DE-04: The system's available items depend on changes in the Cafeteria Inventory System which is another feature of FoodForTech.







CRUD Matrix Diagram: A CRUD Matrix is a data analysis tool that works well for identifying missing requirements. The words "Create, Read, Update, and Delete" are abbreviated as "CRUD." These verbs are to describe the main fundamental system actions that represent how data entities are modified or transferred within your system. Use cases are placed on the left side of a CRUD matrix, and the entities are placed on top. As you add the CRUD acronyms to the diagram, keep an eye out for any vertical rows that are empty. These columns will be used to highlight any requirements that may have been forgotten or ignored. For example, if one of your entities is missing a delete action, you can ask questions such as does this entity have a delete feature?

	Customer	Driver	Menu	Order	Order Item	Store	Customer Service Representative	Payment
User purchase order	RU	CRU	R	CRU	CRU	RUD		CRU
User deliver order	R	CRU	R	R	R	R	CRD	R
User talk to customer service	RU	RU	R	RU	RU	R	CRUD	CRUD
Store adds item to menu			CRUD			CRUD		
User cancel order	R	RUD		RUD	RUD	R	CRUD	RUD

3.2 Use-Case Description(s)

ID and Name:	Enter name and unique identification for the use case		
Created By:	Who was this use case written by	Date Created:	The date on which the use case description was written
Actors:	Internal/External system entity or people that interact with the use case		
Primary Actor (Initiate)	The primary entity that initiates the use case		
Description:	Description of the use case		
Trigger: (Optional)	Event or action that starts this use case		
Preconditions:	<p>A prerequisite that needs to be met before the use case can be implemented.</p> <p>These can include system processes, environments, variables, and events.</p>		
Postconditions:	State the system is in after the use case has been implemented.		
Normal Flow Path:	The basic flow of events for use cases.		

Alternative Flow Path: (Optional)	The alternate path through the normal flow path.
Nonfunctional Requirements	Description of the use case's non-functional performance, security, quality of service, and reliability requirements
Priority:	The importance of the use case in comparison to the rest of the use cases.
Frequency of Use:	How often is the use case being used?
Assumptions:	Statements that are true about the system when the use case is activated?

ID and Name:	UC-1 Create an account		
Created By:	Peter Tran	Date Created:	10/29/22
Actors	<ul style="list-style-type: none"> • Customer • Driver • Registration service 		
Primary Actor (Initiate)	<ul style="list-style-type: none"> • Customer • Driver 		
Description:	<ul style="list-style-type: none"> • Prospective clients who want to use the application must first fill out a registration form with a username and password. 		
Trigger: (Optional)	<ul style="list-style-type: none"> • Users click on the registration button 		
Preconditions:	<ul style="list-style-type: none"> • Registration form must be filled out 		
Postconditions:	<ul style="list-style-type: none"> • Success message stating that account has been created 		
Normal Flow:	<ol style="list-style-type: none"> 1. User open application 2. Users navigate to the navigation menu 3. User press register 4. A new registration form is presented 5. User enters username 6. User enters password 7. User enter birthdate 8. User enter username 		

	9. User press login 10. Success dialog is presented		
Alternative Flow Path: (Optional)	<ol style="list-style-type: none"> 1. Start at step 4 2. User enters information 3. User press register 4. Dialog prompt with an error message 5. User fix errors 6. User press register 7. Success dialog is presented 		
Nonfunctional Requirements	<ul style="list-style-type: none"> ● Registering service works in under .5 seconds per click event. 		
Priority:	<ul style="list-style-type: none"> ● Low 		
Frequency of Use:	<ul style="list-style-type: none"> ● Register service must support 100 request minimum per second 		
Assumptions:	<ul style="list-style-type: none"> ● The database is fully functional ● Registration data is stored in a database 		

ID and Name:	UC-2 Login to the system		
Created By:	Peter Tran	Date Created:	10/29/22

ID and Name:	UC-2 Login to the system
Actors:	<ul style="list-style-type: none">● Customer
Description:	<ul style="list-style-type: none">● A registered user wants to log in to the system so they can use the application and all of its features.
Trigger: (Optional)	<ul style="list-style-type: none">● The user clicks on the login button
Preconditions:	<ul style="list-style-type: none">● The user must have completed the registration process and already have an account.
Postconditions:	<ul style="list-style-type: none">● Success message on the upper corner that says “logged in successfully”● The navigation menu has a username listed● The user has access to the application
Normal Flow:	<ol style="list-style-type: none">1. User open application2. Users navigate to the navigation menu3. User press login4. User enters username5. User enters password6. User press login
Alternative Flow Path: (Optional)	<ul style="list-style-type: none">● The user enters the wrong password, and prompt with incorrect password. Repeat step 5.

ID and Name:	UC-2 Login to the system
Priority:	<ul style="list-style-type: none"> • Low
Frequency of Use:	<ul style="list-style-type: none"> • Login service must support 200 request minimum per second
Assumptions:	<ul style="list-style-type: none"> • The database is fully functional • Login Service stores login data in the database • Other systems are fully functional and connected

ID and Name:	UC-3 View and choose Restaurant		
Created By:	Peter Tran	Date Created:	10/29/22
Actors	<ul style="list-style-type: none"> • Customer • Tech Workers • Authentication service • Restaurant Lookup system 		
Primary Actor (Initiate)	<ul style="list-style-type: none"> • Tech Customer 		
Description:	<ul style="list-style-type: none"> • Give users a list of all nearby restaurants and the items on their menus. 		

Trigger: (Optional)	<ul style="list-style-type: none"> The customer requests to view the food menus of all restaurants that are currently open.
Preconditions:	<ul style="list-style-type: none"> The user must be authenticated
Postconditions:	<ul style="list-style-type: none"> The menu of the restaurant is presented after the trigger is activated.
Normal Flow:	<ol style="list-style-type: none"> 1. User open application 2. Users navigate to the navigation menu 3. Users press the restaurant tab 4. Users scroll through restaurants 5. Users click on a restaurant 6. A new page is presented with menu items 7. Users scroll through menu items
Alternative Flow Path: (Optional)	<ol style="list-style-type: none"> 1. Start at step 2 2. Users go to the recently ordered tab 3. The user has presented a list of restaurants that order from recently 4. Users click on a restaurant 5. Users scroll through menu items
Nonfunctional Requirements	<ul style="list-style-type: none"> Gps service is updated once every time user uses the application
Priority:	<ul style="list-style-type: none"> High
Frequency of Use:	<ul style="list-style-type: none"> Main functional requirement, must be operational every time the system is online.

	<ul style="list-style-type: none"> On average 100 requests per minute.
Assumptions:	<ul style="list-style-type: none"> Gps service is working The user is within 30 miles of the restaurant Menu items are presented with pictures and price Menu item data is retrieved from the database

ID and Name:	UC-4 Order items		
Created By:	Peter Tran	Date Created:	11/03/22
Actors:	<ul style="list-style-type: none"> Tech Customers Authentication service Restaurant Lookup system 		
Primary Actor (Initiate)	<ul style="list-style-type: none"> Tech Customers 		
Description:	<ul style="list-style-type: none"> The user add menu items and has gone through the payment process to order items 		
Trigger: (Optional)	<ul style="list-style-type: none"> Click on the “Make Payment” button 		
Preconditions:	<ul style="list-style-type: none"> The user is logged into the system The user has menu items > 0 in the cart System has user’s address and credit card info 		
Postconditions:	<ul style="list-style-type: none"> Success dialog saying, “Order has been placed”. 		

	<ul style="list-style-type: none"> ● Order receipt sent to user's email ● The order management system is in the order received state ● The delivery system is in order pending the state
Normal Flow:	<ol style="list-style-type: none"> 1. All steps in UC-3 normal flow 2. The user adds an item to the cart 3. The user clicks on the cart icon 4. An online payment form is presented 5. Users fill out the online payment form 6. The user presses the next button 7. Selected Menu items are displayed for review 8. The user presses make payment 9. Redirected back to the main page
Alternative Flow Path: (Optional)	
Nonfunctional Requirements	<ul style="list-style-type: none"> ● Order Management System must support up to 200 requests per minute as long as the system is online.
Priority:	<ul style="list-style-type: none"> ● Medium
Frequency of Use:	<ul style="list-style-type: none"> ● The main functional requirement must be operational every time the system is online. ● On average 100 requests per minute.
Assumptions:	<ul style="list-style-type: none"> ● Order Management System is fully operational ● The user is authenticated into the application ● Payment is encrypted and secured ● Order items are saved to the user's profile in the database

ID and Name:	UC-5 Deliver food to Patron		
Created By:	Peter Tran	Date Created:	11/03/22
Actors:	<ul style="list-style-type: none"> • Tech Customers • Deliver Driver • Restaurant • Delivery System • Order Management System • Restaurant Lookup system 		
Primary Actor (Initiate)	<ul style="list-style-type: none"> • Deliver Driver • Restaurant • Tech Customer 		
Description:	<ul style="list-style-type: none"> • Patron accepted order and is in the process of delivering it 		
Trigger: (Optional)	<ul style="list-style-type: none"> • Click on the “Accept order” button 		
Preconditions:	<ul style="list-style-type: none"> • Tech Worker orders food • The delivery driver got matched with Tech Customer and accepted the request • The delivery driver is logged into the system 		
Postconditions:	<ul style="list-style-type: none"> • Review service is activated • The user is logged on • The database attributes for the tech customer, the delivery driver and the associated restaurant are updated to reflect the delivered state. 		

Normal Flow:	<ol style="list-style-type: none"> 1. All steps in UC-4 normal flow 2. The delivery driver accepts the delivery request 3. Deliver driver follow GPS service to restaurant 4. The delivery driver accepts a package from the restaurant 5. Deliver driver press “On the way” button 6. Gps service shows the route to the tech customer’s address 7. Deliver driver follows Gps service 8. Deliver driver reaches the destination 9. Deliver driver drop off food 10. Deliver driver press “Order completed” button 11. Tech customer gets an alert notifying order is delivered.
Alternative Flow Path: (Optional)	
Nonfunctional Requirements	<ul style="list-style-type: none"> ● GPS service must be capable of handling 200 delivery drivers at a given time ● Software system capable of supporting real-time location update
Priority:	<ul style="list-style-type: none"> ● Medium
Frequency of Use:	<ul style="list-style-type: none"> ● The main functional requirement must be operational every time the system is online. ● On average 10 requests per minute.
Assumptions:	<ul style="list-style-type: none"> ● Restaurant received notice of the order ● Restaurant is in the process of making order ● The order was placed by an authenticated customer ● The payment system has received payment.

ID and Name:	UC-6 Rate Order		
Created By:	Peter Tran	Date Created:	11/03/22
Actors:	<ul style="list-style-type: none"> • Tech Customers • Deliver Driver • Restaurant • Rating Service • Order Management System • Restaurant Lookup system 		
Primary Actor (Initiate)	<ul style="list-style-type: none"> • Deliver Driver • Tech Customer 		
Description:	<ul style="list-style-type: none"> • After an order has been fulfilled, the driver, client, and restaurant are all allowed to post reviews. This review will include ratings for the restaurant, the driver, and the clientele. 		
Trigger: (Optional)	<ul style="list-style-type: none"> • After the driver clicks on the “completed order” button. 		
Preconditions:	<ul style="list-style-type: none"> • Delivery state change from false to true before presenting the review form • The restaurant must submit a completed order request. • Payment from the tech customer must go through successfully • Software system’s state has passed UC-4 normal flow • Software system’s state has passed UC-5 normal flow 		
Postconditions:	<ul style="list-style-type: none"> • The user is still authenticated • Review data sent and stored in the database 		

	<ul style="list-style-type: none"> User interface updated to match the new review.
Normal Flow:	<ol style="list-style-type: none"> 1. Deliver driver press the “Completed Order” button 2. The customer, restaurant, and delivery driver gets notified and the review form is prompted 3. Customers, restaurants, and delivery drivers can fill out a form <ol style="list-style-type: none"> a. The customer, restaurant, and delivery driver fill out a form and press the “Submit Review” button b. Customer, restaurant, and delivery driver press the “Decline Review” button
Alternative Flow Path: (Optional)	<ol style="list-style-type: none"> 1. Locate navigation menu 2. Click on previous orders 3. Pick a previous order 4. Select the “Review” button 5. Fill out a review form 6. Click the “Submit Review” button
Nonfunctional Requirements	<ul style="list-style-type: none"> Rating service is online for 23 hours Each rating response gets processed and updated in the database within 10 seconds of submission. The delivery driver must maintain a minimum of 80% satisfaction score
Priority:	<ul style="list-style-type: none"> Low
Frequency of Use:	<ul style="list-style-type: none"> Ideally, every order placed will be reviewed On average 1 request per minute, 24 hours a day.
Assumptions:	<ul style="list-style-type: none"> Users can only review orders they placed or receive The delivery driver has completed the order

	<ul style="list-style-type: none"> • The Tech customer has received an order
--	---

ID and Name:	UC-7 Talk to the customer service representative		
Created By:	Peter Tran	Date Created:	11/04/22
Actors:	<ul style="list-style-type: none"> • Chat moderator • Application User • Chat System 		
Primary Actor (Initiate)	<ul style="list-style-type: none"> • Application User 		
Description:	<ul style="list-style-type: none"> • Users must be authenticated to access customer support. Whenever a user has a question they have the option to talk to a live customer service representative. 		
Trigger: (Optional)	<ul style="list-style-type: none"> • Clicked on the customer support icon located on the navigation menu 		
Preconditions:	<ul style="list-style-type: none"> • User is authenticated • Chat System is online • Chat moderators are available 		
Postconditions:	<ul style="list-style-type: none"> • The status of the current rating service is updated to "Pending review." • The database gets updated to reflect that 		

Normal Flow:	<ol style="list-style-type: none">1. Locate navigation menu2. Click on the customer service icon3. Fill out prompt4. Press the “Talk to Customer Service” button on the form5. Talk to a customer service representative6. When the session is over, press the “End Session” button
Alternative Flow Path: (Optional)	
Nonfunctional Requirements	<ul style="list-style-type: none">● The user waits no more than 10 minutes to hear back from the chat moderator.● User messages are secured and data is protected● Compatible with both Android and Apple phones● Chat system can be ramped up during peak hours
Priority:	<ul style="list-style-type: none">● Low
Frequency of Use:	<ul style="list-style-type: none">● The system receives an average of one request every half hour while it is online.
Assumptions:	<ul style="list-style-type: none">● The chat system is online● User submits question during operation hours● User is authenticated

4. External Interface Requirements

4.1 User Interfaces

UI-1: *Splash Screen*

The splash screen is the introductory window that displays when the user starts the application.

The “Food for Tech” splash screen displays the logo, a fork, and a knife, alongside the app name.

In branding, orange conveys boldness and energy.



Figure 4.1

Splash Screen

UI-2: *Create your Account Screen*

First impressions are crucial - the “create account” screen is one of the first interactions a user will have with the app. Account creation must be user-friendly and easy. If the user encounters too many hurdles when simply creating an account - they will be more likely to discredit the app’s usefulness. In addition, Facebook and Google integration will expedite account creation. This is standard practice in modern applications.

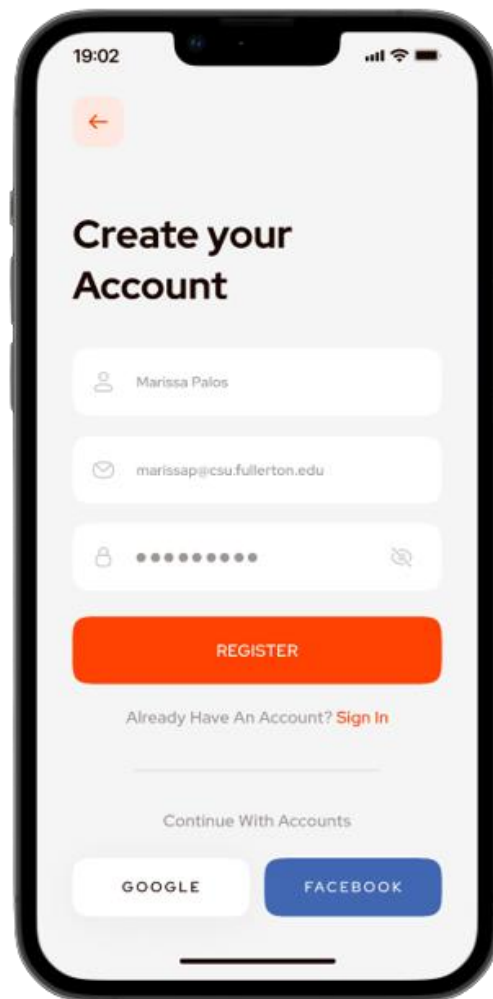


Figure 4.2
Create your Account Screen

UI-3: *Two-Factor Authentication*

The standard for security is two-factor authentication. When a user provides a phone number, an account is secured with two unrelated authentication methods. This prevents data breaches, an incident where information is taken from a system without authorization. FFT incorporates this additional layer of security.

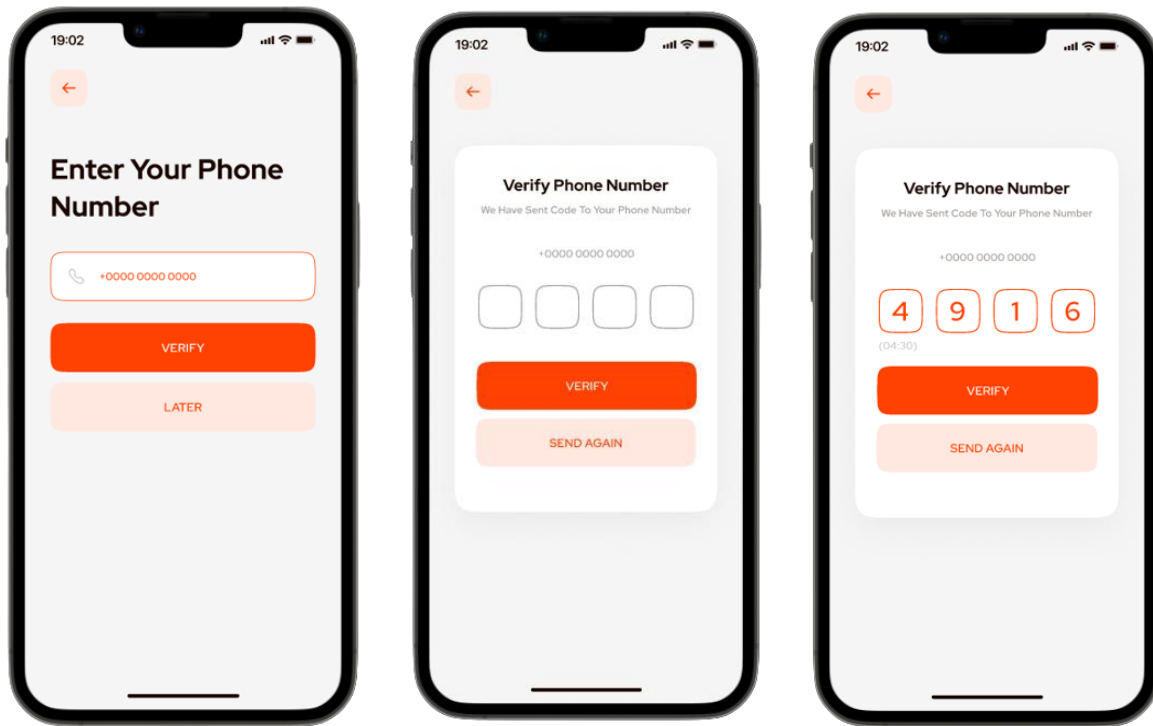


Figure 4.3

Two-Factor Authentication

4.2 Hardware Interfaces

HI-1:

FoodForTech uses Amazon Web Services (AWS) to host our application in a cloud environment. Rather than building and maintaining infrastructure for an on-premises application, FFT lowers costs by paying only for what we use. Owning and operating the infrastructure on which the app is hosted can be expensive. This cost can be mitigated by using Amazon Web Services.

HI-2: *Web Services*

For the Web and Application Server, Amazon EC2 (Amazon Elastic Compute Cloud) will be used. This allows for a virtual environment with the operating system, services, databases, and application platform stack required.

HI-3: *Database Server*

For the Database Server, Amazon S3 (Simple Storage Service) will be used. This allows for the application's data to be stored and retrieved securely.

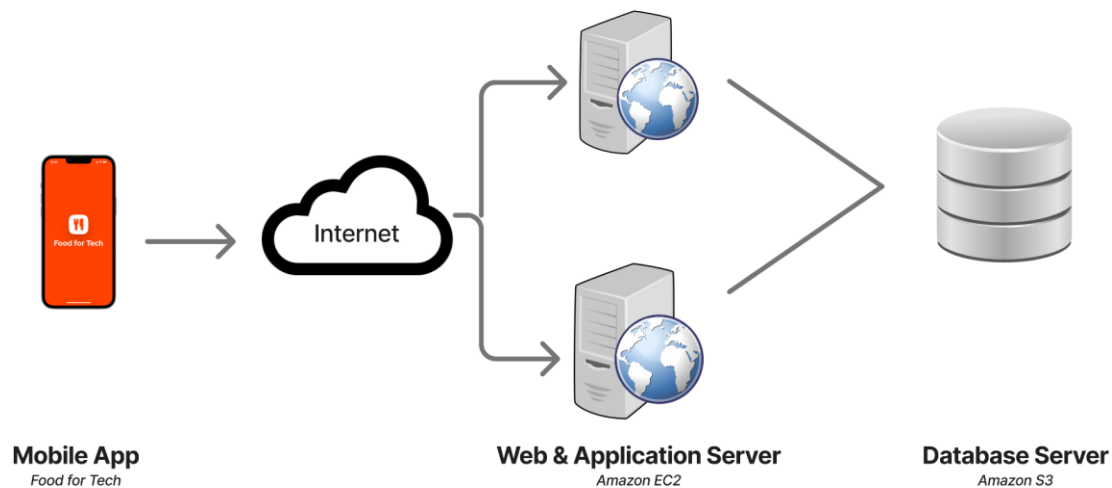


Figure 4.3
AWS Diagram

4.3 Software Interfaces

SI-1: *iOS requirements*

- The FoodForTech app requires iOS 13.0 or higher.

SI-2: It is compatible with the following iOS devices

- iPhone 5S or later
- iPad Air or iPad Air 2
- iPad Mini 2 or later
- iPad Pro (1st generation) or later
- iPad (5th generation) or later
- iPod touch (6th generation)

SI-3: *Android requirements*

- The FoodForTech mobile app requires Android 7.0 or higher.

4.4 Communications Interfaces

CI-1: Communication standards and Network server communications protocols:

For security purposes, HTTPS will be used - which will come with some additional cost of security certificates. JSON will be FoodForTech's data format.

CI-2: Message formatting:

Text and image messaging will be utilized for the restaurant to communicate with the customer, and vice versa.

CI-3: Data transfer rates:

The FoodForTech user can send a file with a maximum file size of 16 MB.

5. Other Nonfunctional Requirements

5.1 Performance Requirements

PER-1: The web pages generated by the FFT COS shall fully download in no longer than 5 seconds over 20 megabits/second Internet connection.

PER-2: The FFT COS shall be able to request and authorize the credit card transactions within 3 seconds, and then display the confirmation message to users no longer than 5 seconds.

PER-3: The maximum number of records stored in the database of the FFT COS shall not exceed 10,000 users. Any existing users that are not active within a year shall be removed from the data. Any transaction data that is created after 6 months shall be removed from the record.

PER-4: The system shall be able to handle a maximum number of 150 concurrent users during the peak hours of lunchtime from 11:30 A.M. to 1:00 A.M. local time.

PER-5: The FFT COS shall be able to request and authorize the credit card transactions within 2 seconds, and then display the confirmation message to users no longer than 5 seconds after the users submit their orders.

PER-6: Each user shall be able to save their credit card information and use it during the checkout within a second.

PER-8: The system shall display a warning message for any older devices that are no longer supported on the homepage each time the user login.

PER-9: The system shall display any error message when users submit the order with a missing required field within 1 second.

PER-10: The system shall alert the user on their devices once the delivery has arrived at the ordering location within 3 seconds.

5.2 Safety Requirements

SEC-1: The system shall require all users to log in for any activities, except viewing the menu.

SEC-2: The system shall block a user's account for 10 minutes after five consecutive unsuccessful login attempts.

SEC-3: The system shall only allow users to log in to one device at a time, and automatically log the users out from other devices.

SEC-4: The system shall restrict patrons from viewing other users' orders.

SEC-5: The system shall store each credit card information and each personal identification securely using encryption.

5.3 Security Requirements

SAF-1: The system shall display a list of all ingredients for each menu item and emphasize the ingredients that are commonly known to cause allergic reactions in many people in the US.

5.4 Software Quality Attributes

AVL-1: The FFT COS shall be available on weekdays from 8:00 A.M. to 5:00 P.M. The maintenance hours shall be scheduled outside of these hours.

ROB-1: The FFT COS shall enable users to recover an incomplete order and continue working on it if the users somehow disconnected from the FFT COS.

6. Other Requirements

6.1. Scalability

SCA-1: The FFT COS shall be able to scale horizontally by adding more virtual machines to the server pool.

SCA-2: The FFT COS shall be able to scale vertically by adding more system resources to the virtual machines, such as CPU, RAM, and disk storage (i.e. HDD or SSD).

6.2. Portability

POR-1: The FFT COS must be able to launch within one environment or another without changing its behavior and performance.

6.3. Compatibility

COM-1: The FFT COS must be able to maintain OS compatibility of two OS versions back.

COM-1: The FFT COS must be compatible with an OS firewall or antivirus protection.

6.4. Maintainability

MAI-1: The FFT COS shall be designed to have minimal downtime during system maintenance.

MAI-2: The FFT COS shall have a modular design in which system components can be updated without taking the entire system offline.

MAI-3: The FFT COS shall be designed in which new updates can be rolled back if there are any issues.

6.5. Internationalization

INT-1: The FFT COS shall be designed to use UTF-8 encoding.

INT-2: The FFT COS code shall be written in a way that software can be translated without changing a line of code.

INT-3: The FFT COS code shall be designed with sufficient space to accommodate long strings in a different language.

INT-4: The FFT COS shall be designed to use either imperial or metric systems in local standards.

INT-5: The FFT COS shall be designed to put words in a different order in the destination language.

INT-6: The FFT COS shall be designed to track and update changes.

6.6. Learnability

LEA-1: The FFT COS shall be designed in which there is no learning or training required for users to use the software.

LEA-2: The FFT COS's use case shall be designed to minimize alternative flows.

7. Functional Requirements (FRs)

7.1 FR1:

Order meals from the cafeteria menu to be picked up or delivered

- a. **Introduction/Functionality:** This functionality will let users order meals from the cafeteria menu with the option to pick up or deliver them to a specific location.
- b. **Traced:** UC-3, UC-4
- c. **Inputs:** The user is logged in to the system, and then chooses the meal from the menu
- d. **Processing:** Users can pay for the meal by entering their credit card information and the bank can process the payment transaction.
- e. **Outputs:** The confirmation dialog will be displayed, and the order information will be stored in the order history.
- f. **Error Handling:** Display an inline error message if there is an error with the credit card information and prompt the user to enter it again.

7.2 FR2:

Order meals from local restaurants to be delivered

- a. **Introduction/Functionality:** This functionality will let users order meals from local restaurants with the option to deliver them.
- b. **Traced:** UC-3, UC-4
- c. **Inputs:** The user is logged in to the FFT COS, and then chooses the meal from the menu.
- d. **Processing:** Users can pay for the meal by entering their credit card information and the bank can process the payment transaction.
- e. **Outputs:** The confirmation dialog will be displayed, and the order information will be stored in the order history.
- f. **Error Handling:** Display an inline error message if there is an error with the credit card information and prompt the user to enter it again.

7.3 FR3:

Create, view, modify, and delete the meal service subscriptions

- a. **Introduction/Functionality:** This functionality allows users to sign up, view, modify, and unsubscribe from meal subscriptions.

b. **Traced:** UC-1, UC-2

c. **Inputs:** The user is logged in to the FFT COS app, and then goes to the subscription to create, view, modify, or delete.

d. **Processing:** based on the user's choice, the FFT COS will add, send, modify, or remove the user's information from the database.

e. **Outputs:** The confirmation dialog will be displayed, and the user's information should be updated accordingly in the subscription.

f. **Error Handling:** Display an error message if users did not provide all the required information.

7.4 FR4:

Register for meal payment options

a. **Introduction/Functionality:** This functionality allows users to add their credit card information so that they can quickly use it during the ordering process.

b. **Traced:** UC-4

c. **Inputs:** The user is logged in to the FFT COS, and then goes to the credit card page.

d. **Processing:** The credit card information should be stored properly in the database.

e. **Outputs:** The confirmation dialog will be displayed, and the credit card information should be added properly on the credit card page.

f. **Error Handling:** Display an error message if the credit card information is invalid.

7.5 FR5:

Request meal delivery

a. **Introduction/Functionality:** This functionality allows users to choose the delivery option and specify the location for the meal to be delivered.

b. **Traced:** UC-4

c. **Inputs:** Users will provide the location for the meal to be delivered.

d. **Processing:** The delivery location will be recorded in the system.

e. **Outputs:** The confirmation dialog will be displayed.

f. **Error Handling:** Display an error message if the location is out of the delivery distance or if there is any missing required information.

7.6 FR6:

Create, view, modify, and delete cafeteria menus

- a. **Introduction/Functionality:** This functionality allows the menu manager to create, view, modify, and delete cafeteria menus.
- b. **Traced:** Add/edit/delete menu
- c. **Inputs:** The menu manager is logged in to the FFT COS to create, view, modify, and delete cafeteria menus.
- d. **Processing:** based on the menu manager's choice, the FFT COS will add, send, modify, or remove the cafeteria menus from the database.
- e. **Outputs:** Display the confirm message, and the cafeteria menu should be updated accordingly.
- f. **Error Handling:** Display an error message if managers did not provide all the required information.

7.7 FR7:

Order custom meals that aren't on the cafeteria menu

- a. **Introduction/Functionality:** This functionality allows users to place an order for meals that are not listed in the cafeteria menu.
- b. **Traced:** UC-3, UC-4
- c. **Inputs:** The user is logged in to the FFT app, then selects the type of food and the available ingredients to customize the meal.
- d. **Processing:** the system should store the information and save it in the database.
- e. **Outputs:** Display the confirm message.
- f. **Error Handling:** Display an error if the required field is missing.

7.8 FR8:

Rating

- a. **Introduction/Functionality:** This functionality allows users to rate how satisfied they are with the meal at the restaurant where they had placed the order. The rating scale is from 1 to 5 stars with 5 being the best and would recommend it to other people.
- b. **Traced:** UC-6

- c. **Inputs:** Users can click on the stars for the rating with 5 stars being the most satisfied.
- d. **Processing:** The system stores each user's rating and calculates the average rate.
- e. **Outputs:** Display the confirmation message “Thank you for your rating.”
- f. **Error Handling:** Prompt users to select 1-5 stars if they submit without any rating number.

7.9 FR9:

Provide live chat with customer service representatives

- a. **Introduction/Functionality:** This functionality allows users to live chat with customer service representatives during the available work hours if they have any questions or issues that they need to resolve with the system.
- b. **Traced:** UC-7
- c. **Inputs:** The user is logged in to FFT
- d. **Processing:** The system will alert the customer service representative when the users connect to live chat.
- e. **Outputs:** Display a message that a customer service representative will be available as soon as possible.
- f. **Error Handling:** Display an error message if there is a disconnection during the conversation.

7.10 FR 10: Multiple payment methods

- a. **Introduction/Functionality:** This functionality allows users to save multiple credit or debit cards so that they can use them quickly during meal checkout.
- b. **Traced:** UC-4
- c. **Inputs:** Users provide the credit or debit card information that they want to save.
- d. **Processing:** The system securely stores each card's information.
- e. **Outputs:** Display all the card information and only the last four digits of the cards.
- f. **Error Handling:** Display an error message if the credit card information is invalid.

7.11 FR 11: Access FFT outside cafeteria intranet

- a. **Introduction/Functionality:** This functionality allows users to order meals anywhere without having to log in to the intranet. Users also have the option to log in via Facebook or Google.
- b. **Traced:** UC-2
- c. **Inputs:** The user is logged in to the system from the FFT user account or the Facebook or Google account.
- d. **Processing:** The system will allow users to log in if the login info is valid
- e. **Outputs:** Display the FFT homepage after the user has logged in.

- f. **Error Handling:** If the login information is invalid, prompt the user to enter the information again.

7.12 FR 12:

Accept order request

- a. **Introduction/Functionality:** This functionality allows the delivery driver to view the meal order placed and accept the order requested. The driver can look at the restaurant's address.
- b. **Traced:** UC-5
- c. **Inputs:** The meal order requested from the patron including the restaurant address.
- d. **Processing:** The system will alert the restaurant about the food delivery driver's information.
- e. **Outputs:** Display a confirmation message that the meal order has been accepted.
- f. **Error Handling:** there is no error handling for this functionality.

7.13 FR 13:

Pickup meal from the restaurant for the delivery

- a. **Introduction/Functionality:** This functionality allows the delivery driver to get an alert from the restaurant owner whenever the meal order is ready to pick up.
- b. **Traced:** UC-5
- c. **Inputs:** Confirmation that the meal order is ready to pick up from the restaurant.
- d. **Processing:** The system will alert the delivery driver after the restaurant owner has confirmed that the meal order is ready.
- e. **Outputs:** Display a message with the order number and restaurant address.
- f. **Error Handling:** Display an error message if there is any issue with sending the confirmation message that the food is ready to pick up.

7.14 FR 14:

Packaging order request from the customer

- a. **Introduction/Functionality:** This functionality allows the cafeteria staff to view each meal order from the patrons. They should be able to prepare and pack the food based on each of the orders.
- b. **Traced:** Package order request

- c. **Inputs:** The meal order from the patrons.
- d. **Processing:** The system shall include each meal order information under a separate link with unique identification.
- e. **Outputs:** Display the meal order information when the cafeteria staff clicks on the link.
- f. **Error Handling:** Display an error if there is any issue with loading an order.

7.15 FR 15:

Tracking meal order status

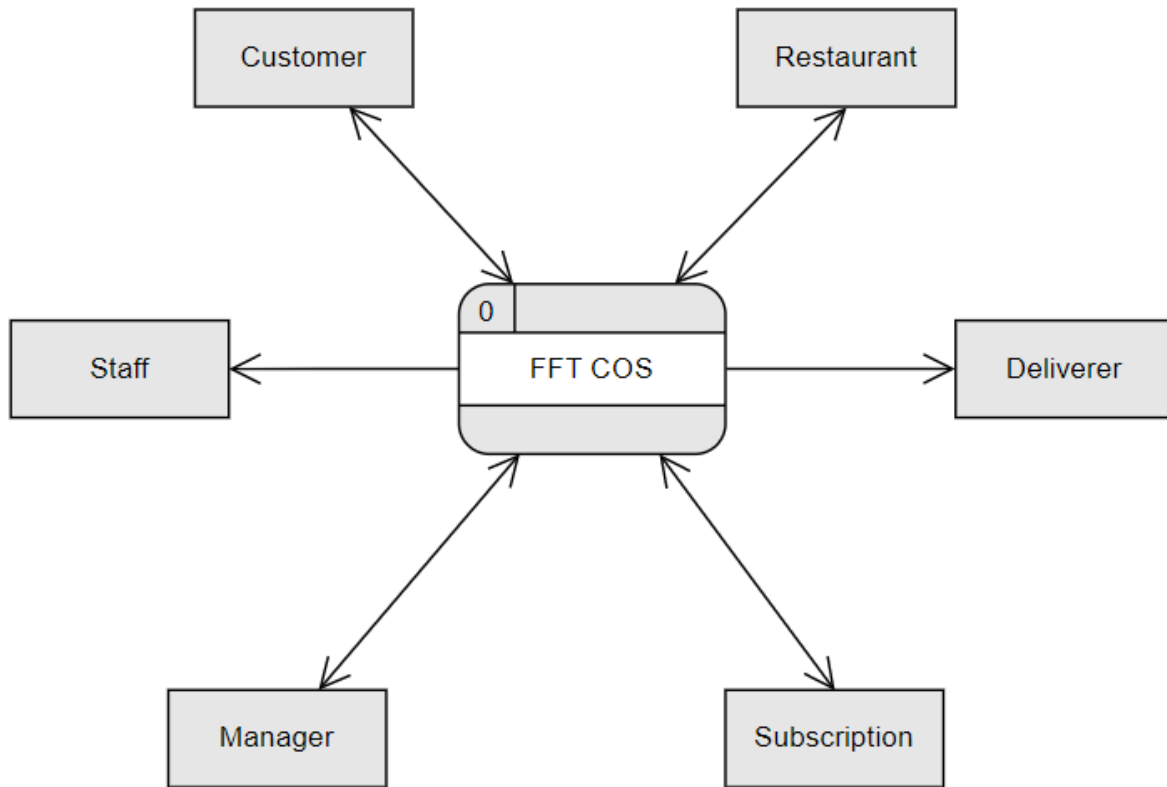
- a. **Introduction/Functionality:** This functionality allows patrons to track the meal order status and track where it is during the delivery.
- b. **Traced:** Wait for the product
- c. **Inputs:** The meal order status from the restaurant and the current location from the GPS.
- d. **Processing:** The system automatically updates the meal order status and the location of the delivery.
- e. **Outputs:** The patrons can view if the meal order for delivery has been accepted, is in preparation, or if delivery includes the current location.
- f. **Error Handling:** Display an error message if the current location cannot load properly.

TABLE 2: Traceability Matrix (Use-cases & FRs).

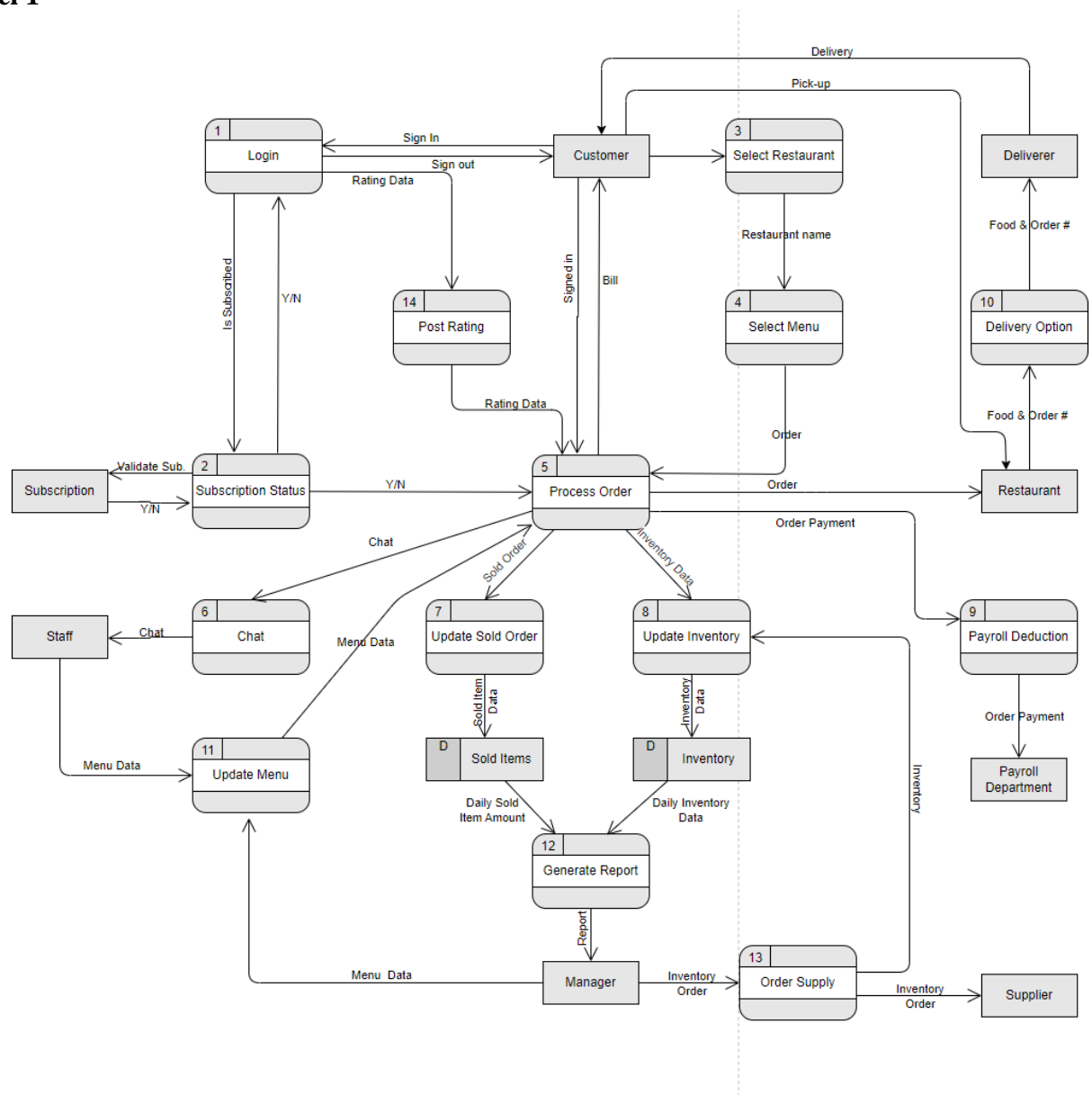
	Related Functional Requirements (FRs)
UC-01	FR-3
UC-02	FR-3 , FR-11
UC-03	FR-1, FR-2, FR-7
UC-04	FR-1, FR-2, FR-4, FR-5, FR-7, FR-10
UC-05	FR-12, FR-13
UC-06	FR-8
UC-07	FR-9

8. Functional Modeling (DFDs)

8.1 Context Diagram (level 0)

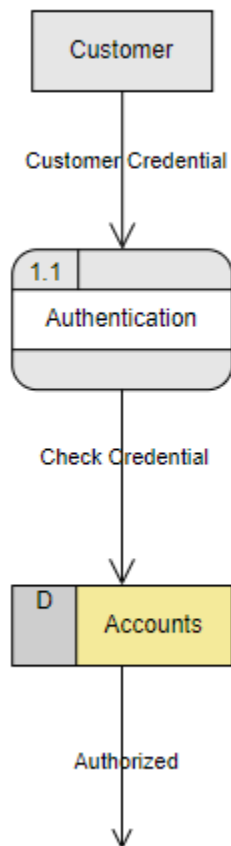


8.2 Level 1

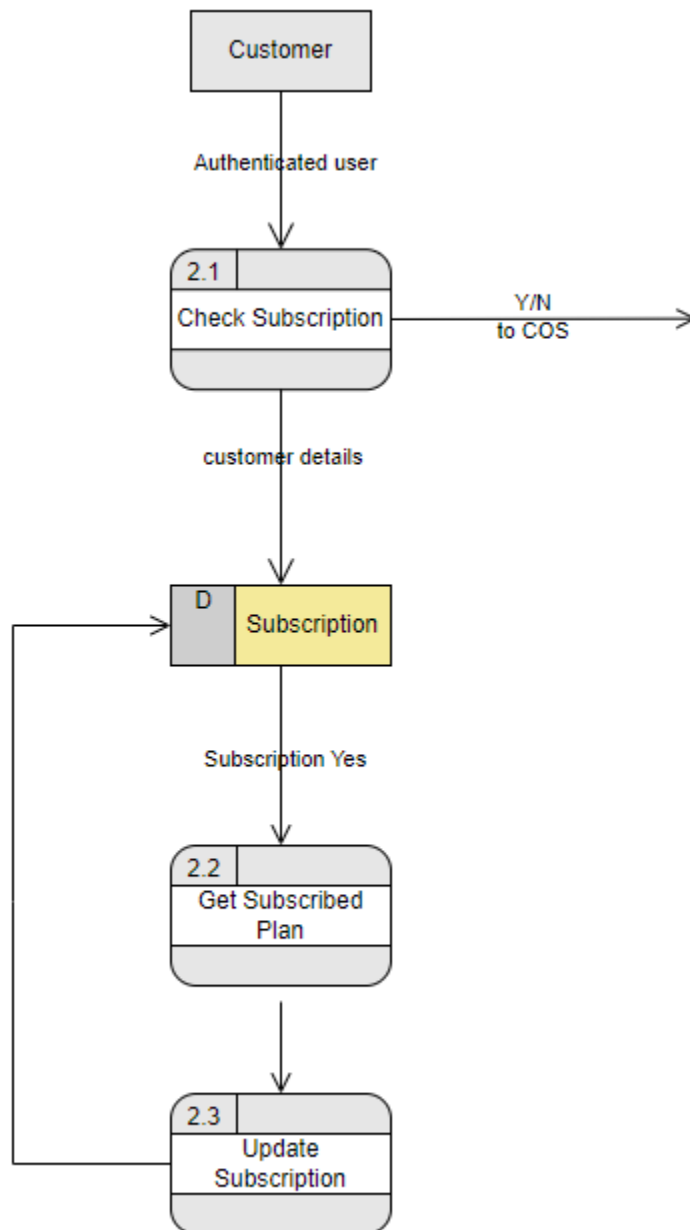


8.3 Level 2

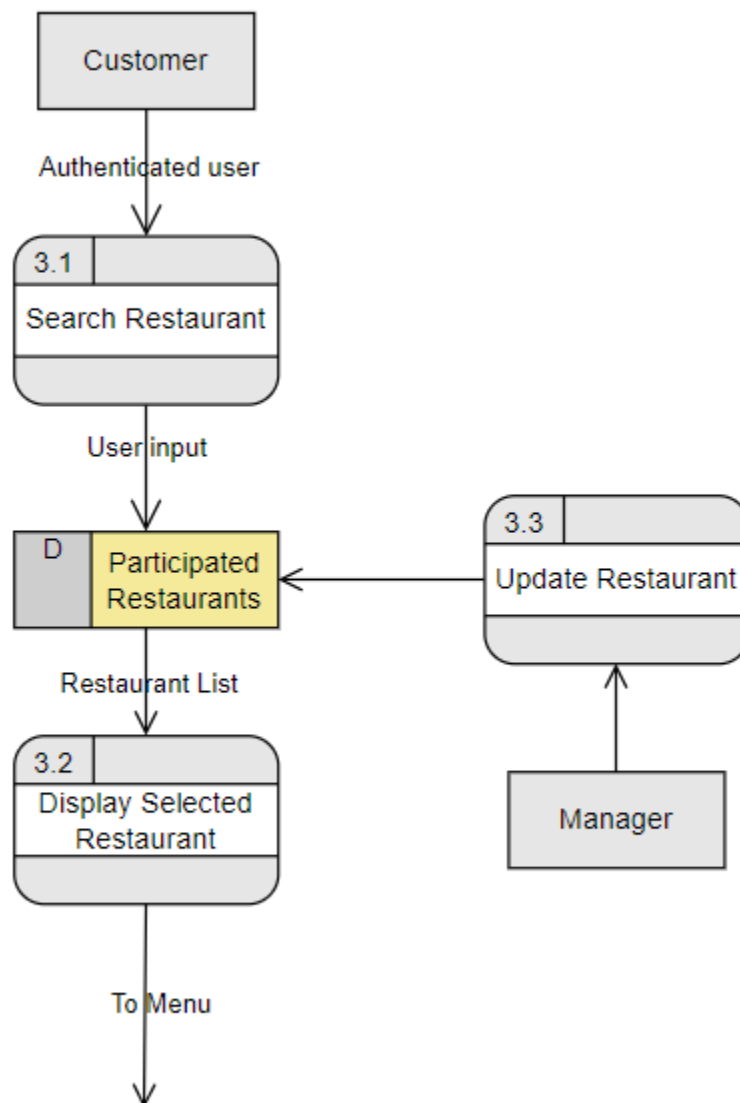
1. Log in



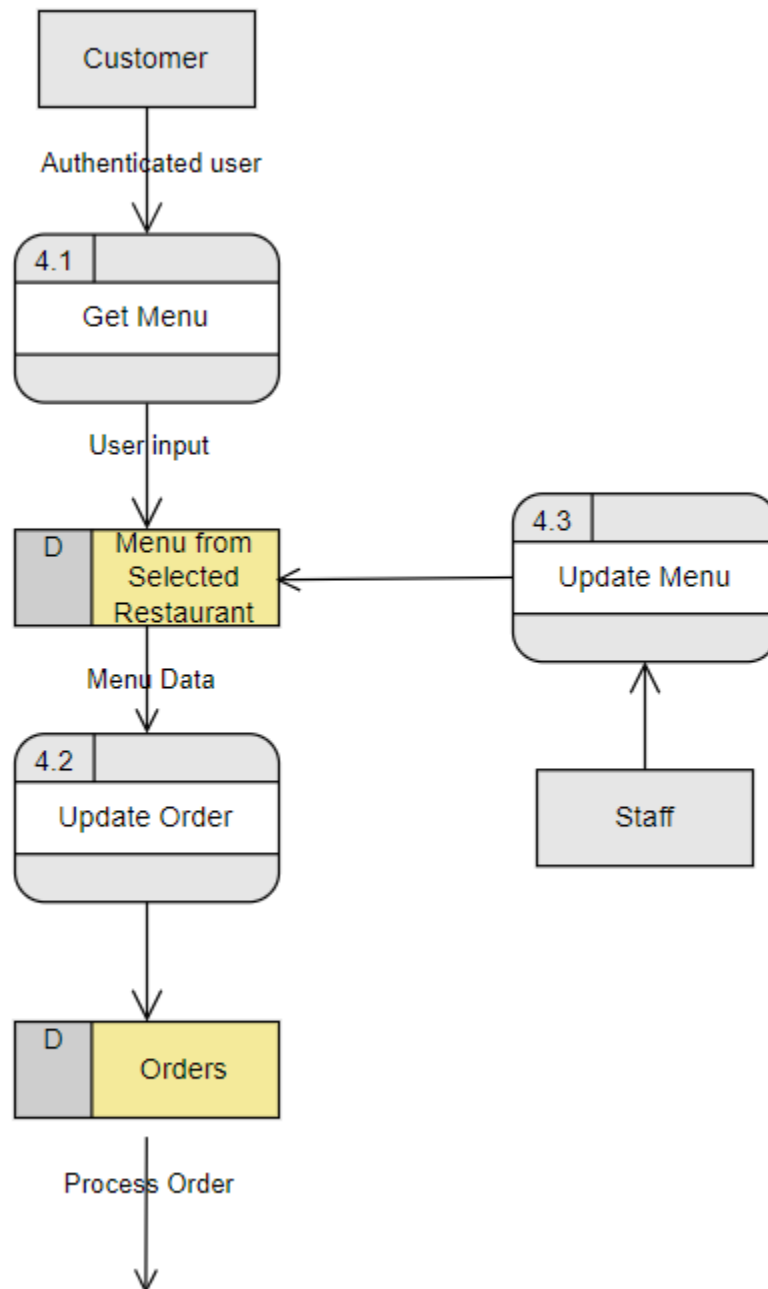
2. Check Subscription



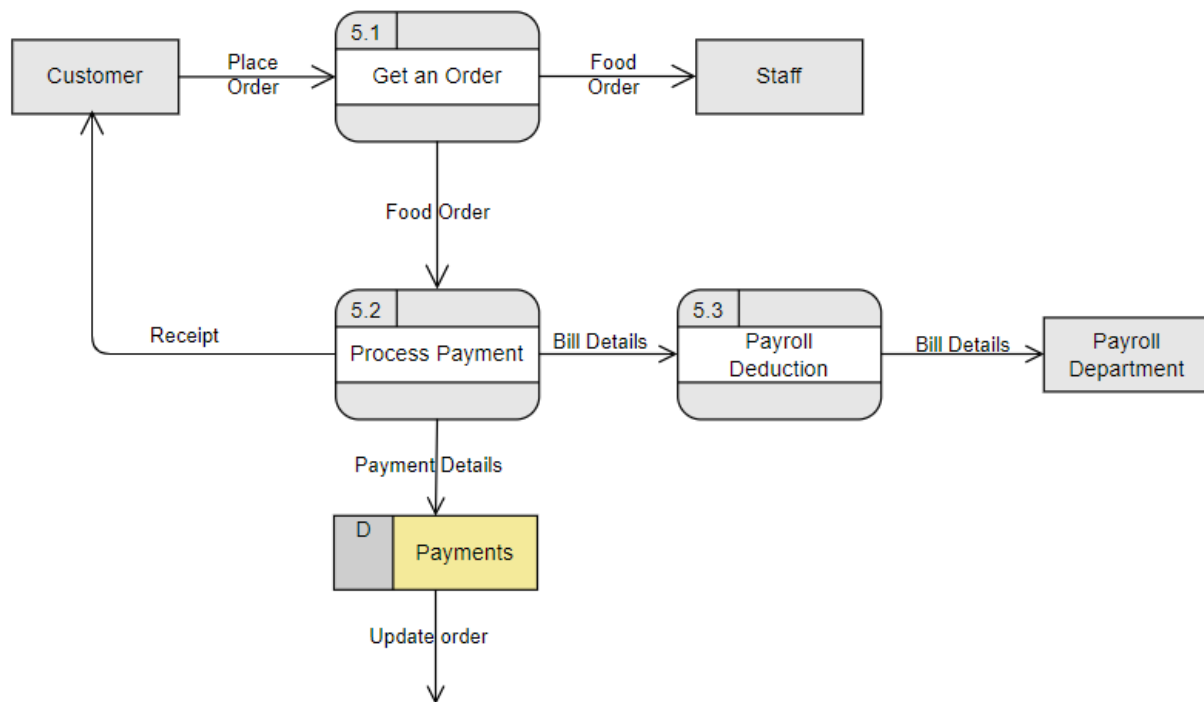
3. Select Restaurant



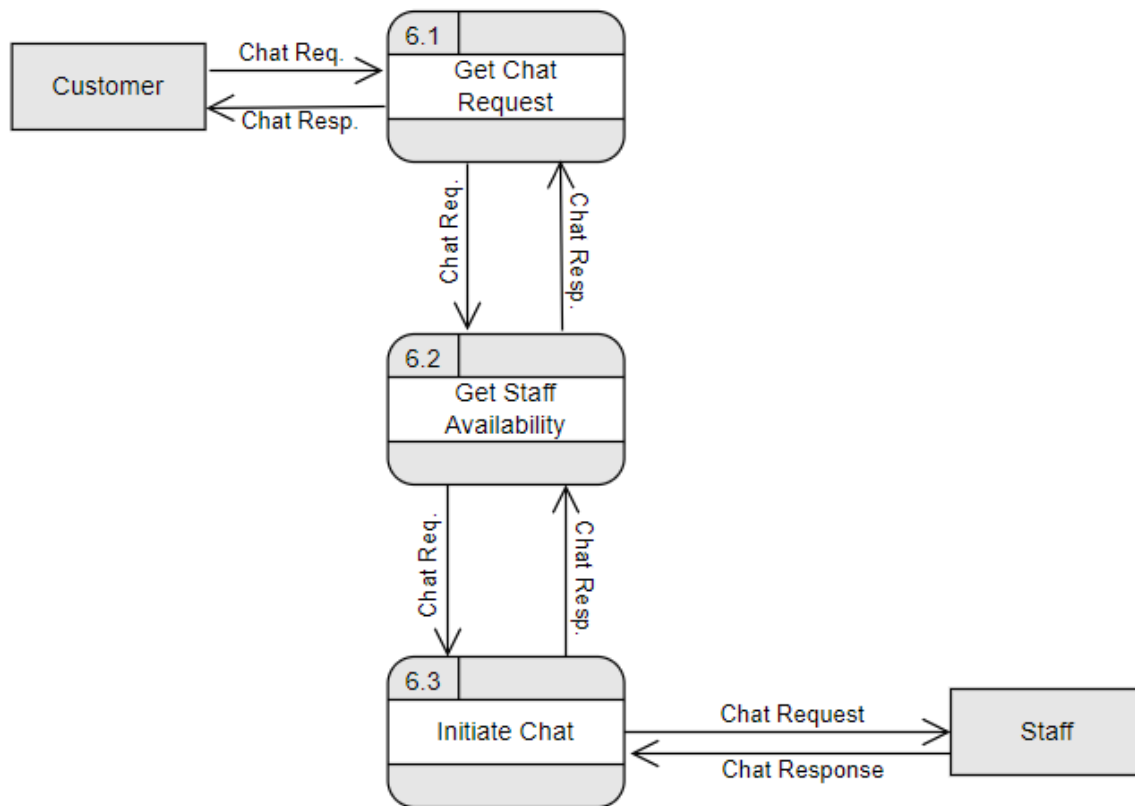
4. Select Menu



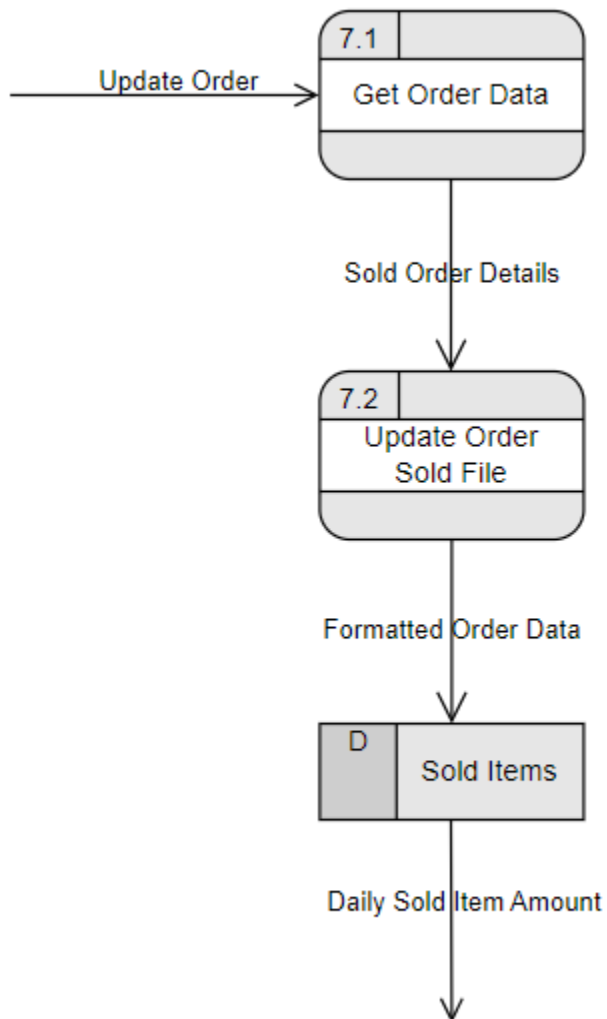
5. Process an order



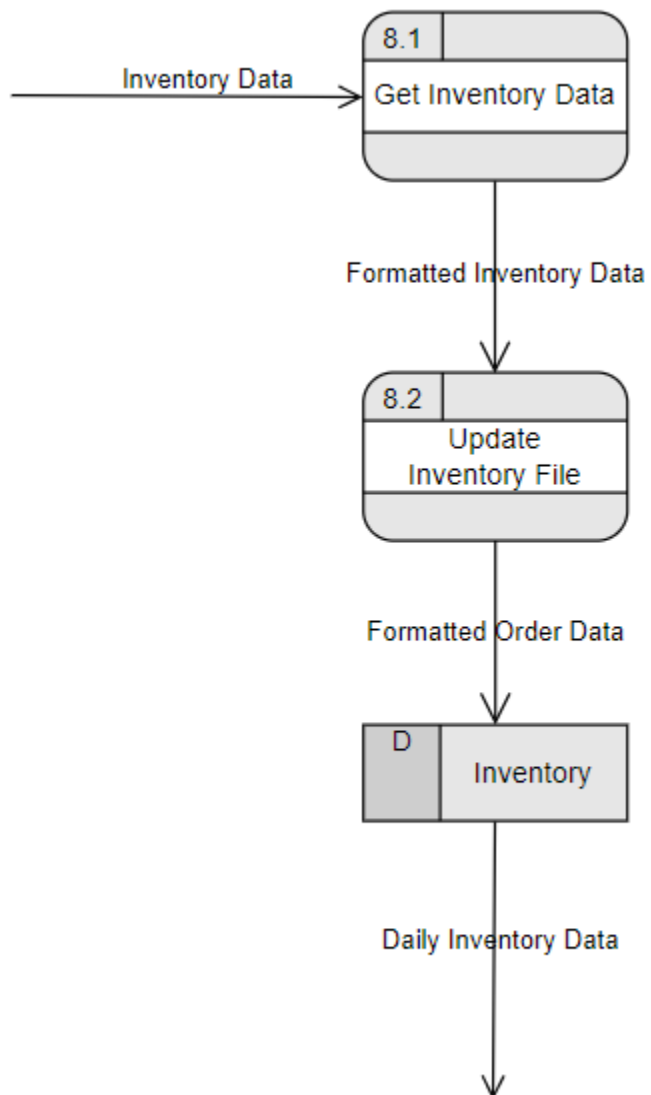
6. Process a chat



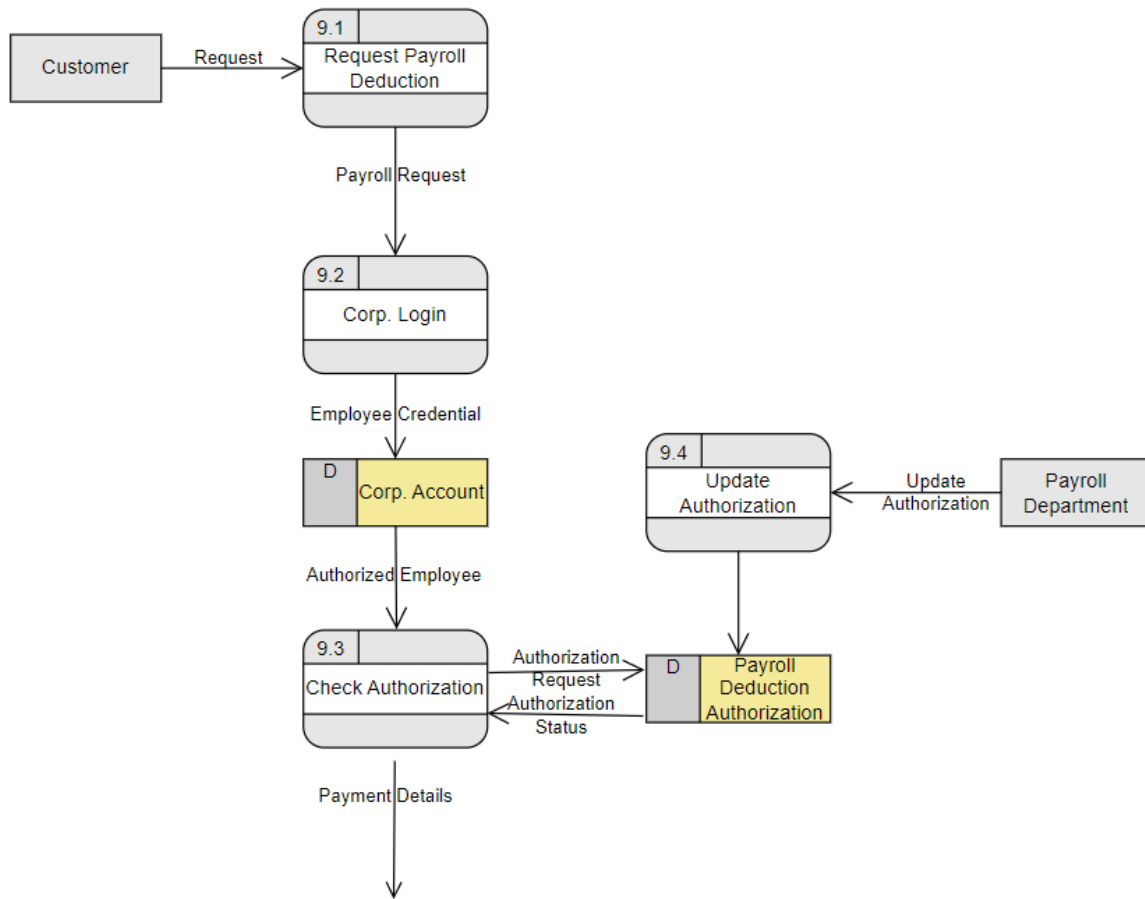
7. Update Sold Orders



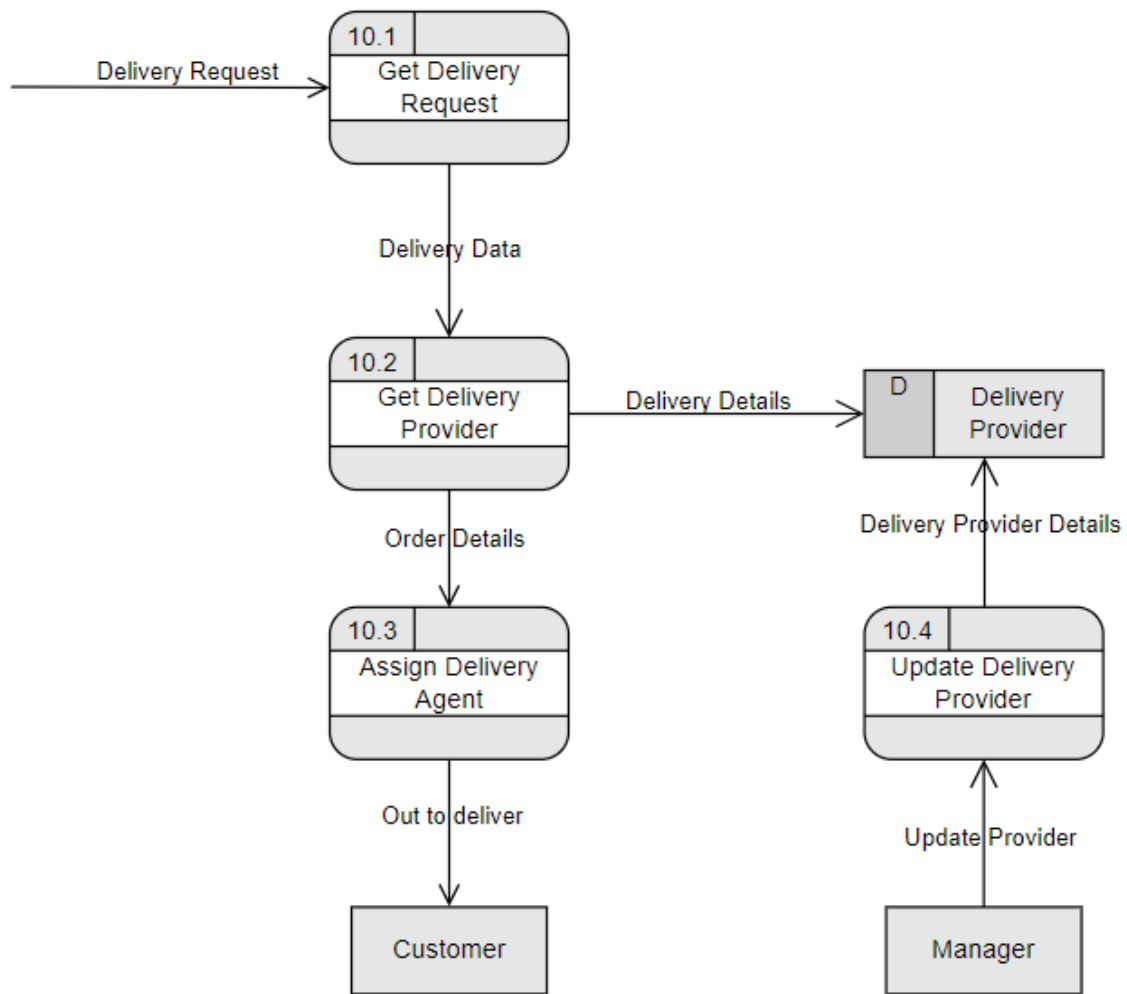
8. Update Inventory



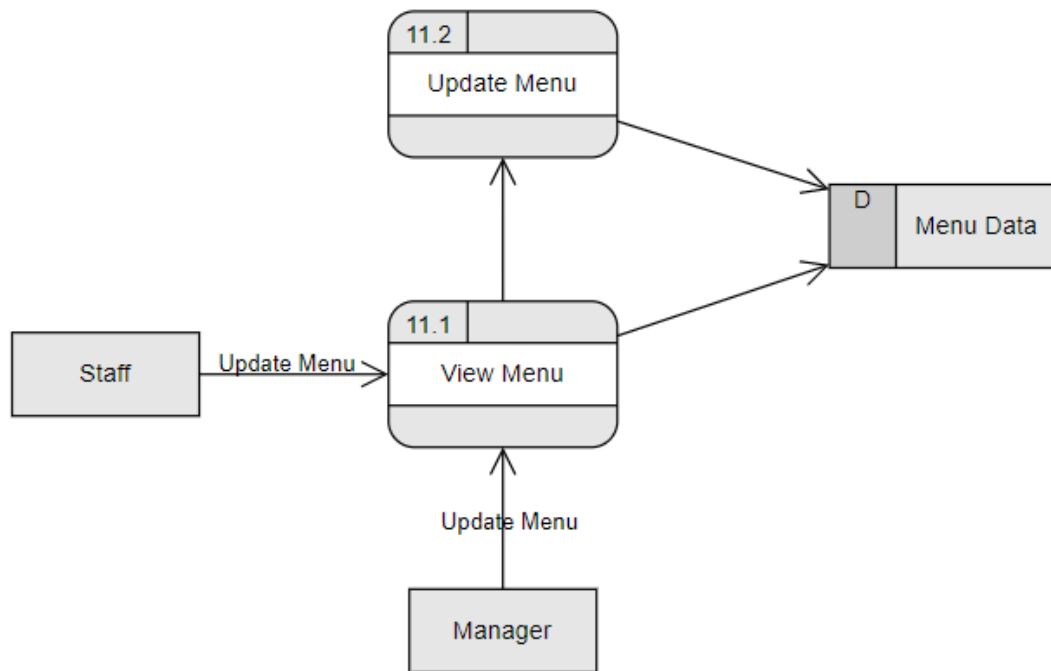
9. Payroll Process



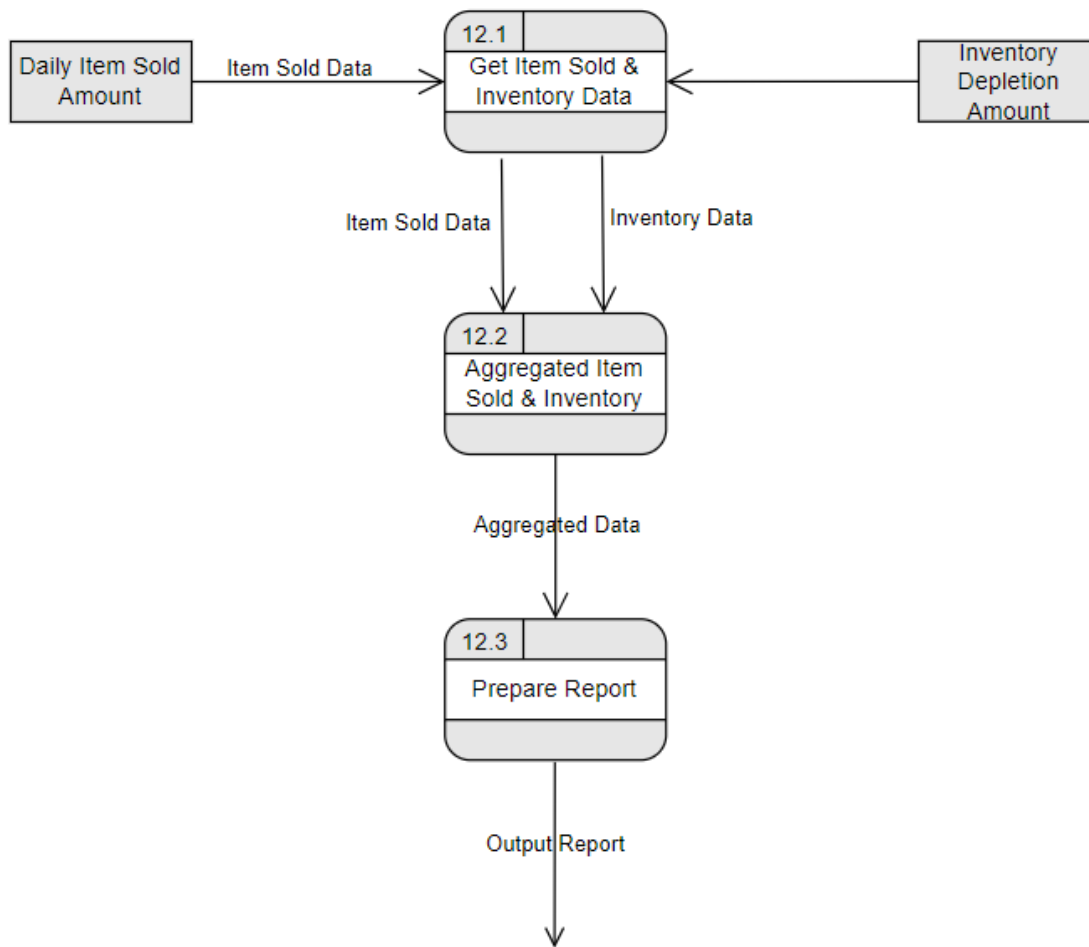
10. Delivery Process



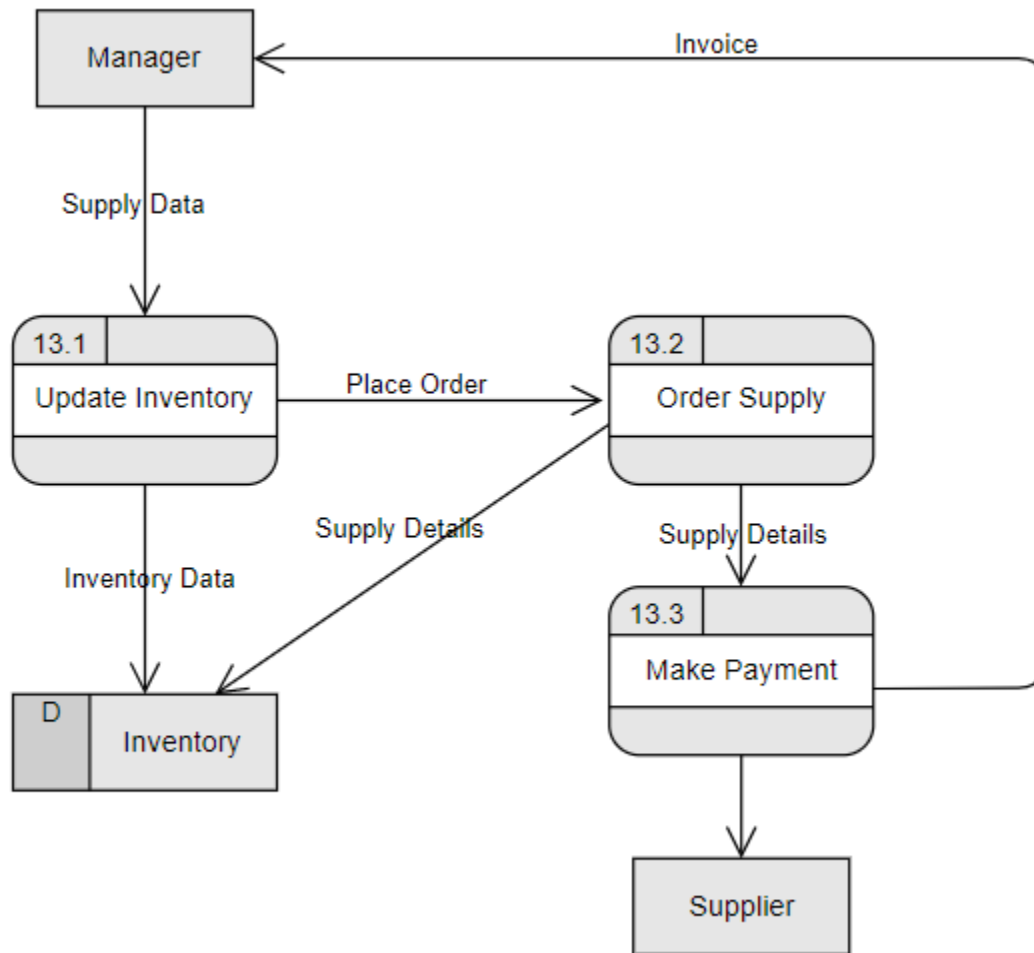
11. Update Menu



12. Generate Report



13. Order Supply



14. Rating Process

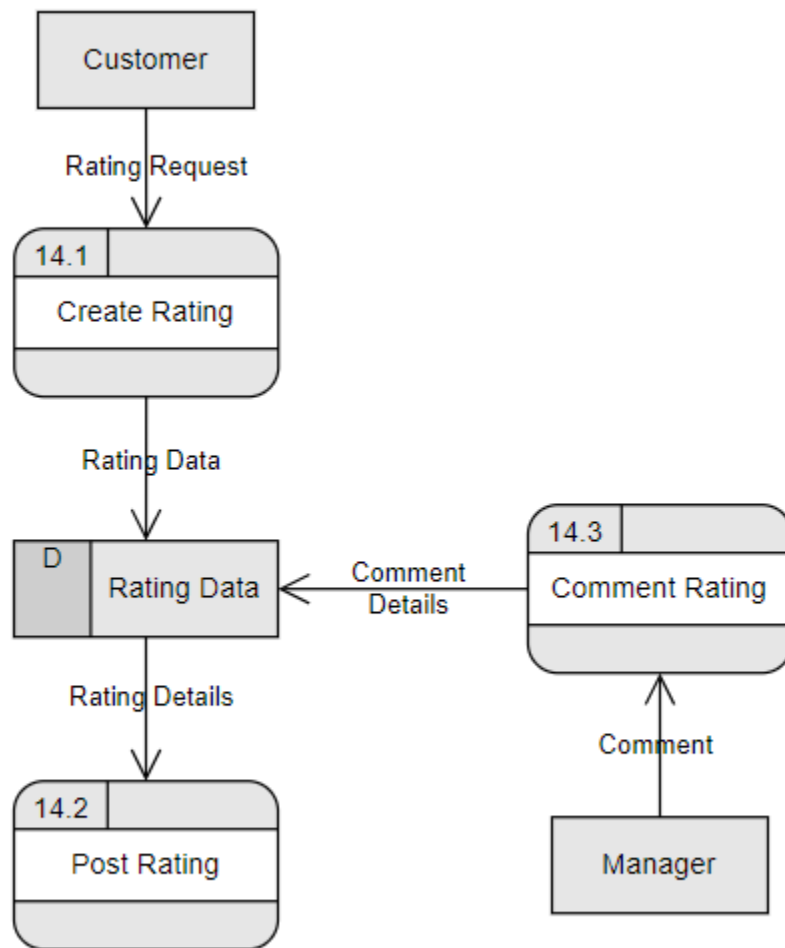


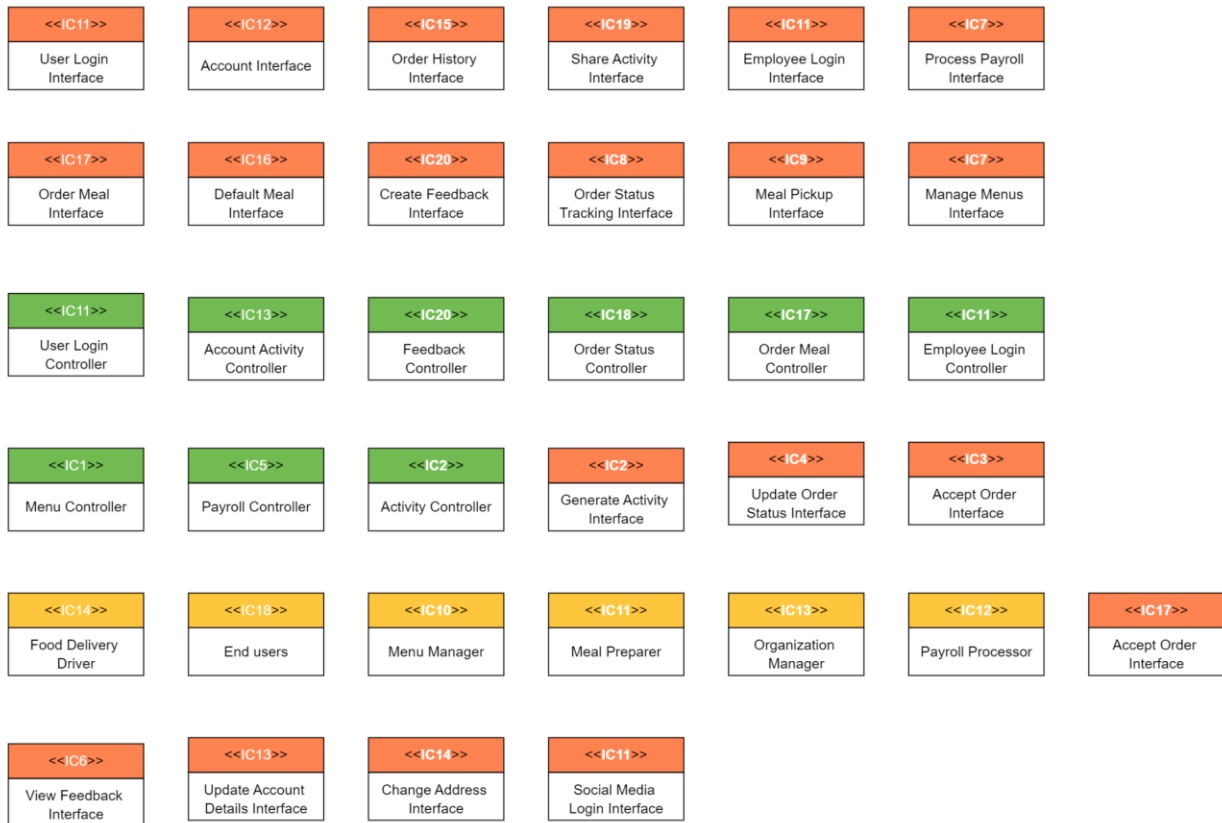
TABLE 3: Traceability Matrix (FRs and DFD Processes)

Functional Requirements (FRs)	All Related Processes in DFD
FR1	1, 2, 3, 4, 5, 9, 10
FR2	1, 2, 3, 4, 5, 9, 10
FR3	1, 2, 9
FR4	1, 2, 9
FR5	1, 2, 3, 4, 5, 9, 10
FR6	1, 11
FR7	1, 2, 3, 5, 9
FR8	1, 14
FR9	1, 6
FR10	1, 9
FR11	1

FR12	1, 5
FR13	10
FR14	10
Fr15	1, 2, 10

9. Class Analysis Modeling

9.1 Initial Class Diagram (ICs)



KEY	
Color Code	Class Name
<div style="width: 40px; height: 15px; background-color: orange; border: 1px solid black;"></div>	BOUNDARY CLASS (IC1...)
<div style="width: 40px; height: 15px; background-color: green; border: 1px solid black;"></div>	CONTROL CLASS (IC1...)
<div style="width: 40px; height: 15px; background-color: yellow; border: 1px solid black;"></div>	ENTITY CLASS (IC10...)

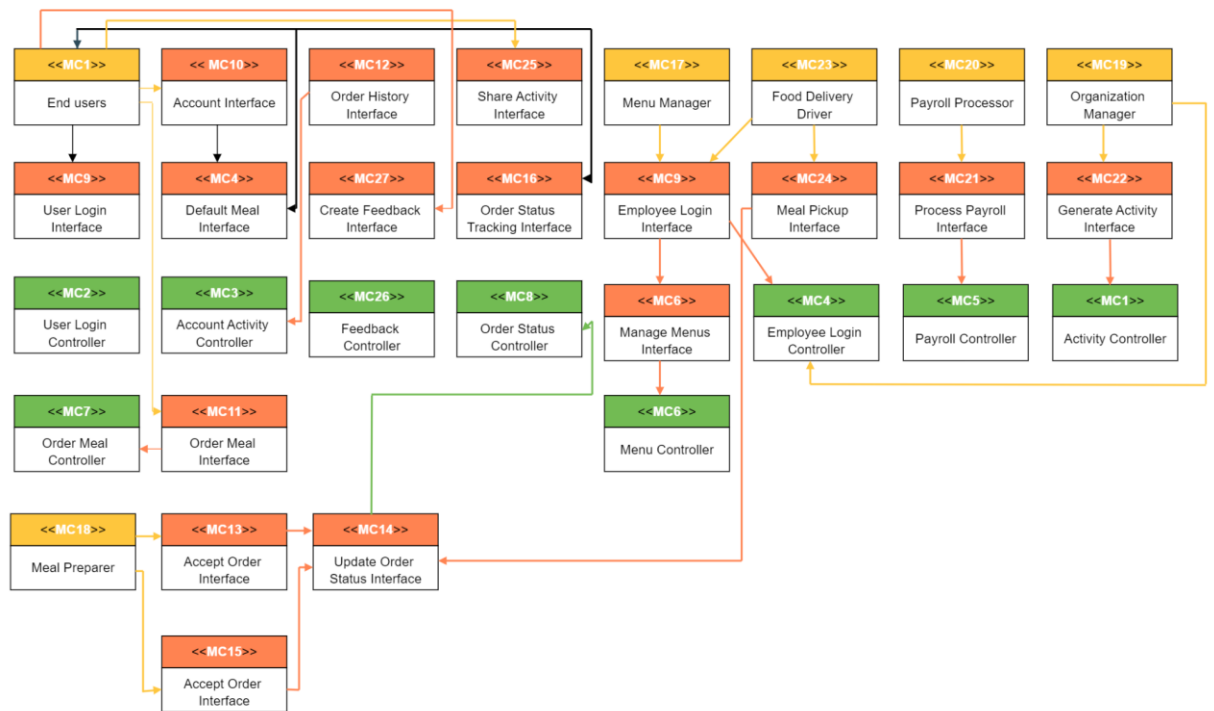
TABLE 4: Traceability Matrix (FRs and Initial Classes)

Functional Requirements (FRs)	Related Initial Classes (ICs)
FR1	<<IC11>> User Login Interface: Food is ordered from the cafeteria for pickup or delivery
FR2	<<IC12>> Account Interface: Meal service subscription: option to update delivery address, create, view, or change the payment method
FR3	<<IC7>> Process Payroll Interface Meal payment options: credit/debit card
FR4	<<IC1>> Accept Order Interface Accept order request
FR5	<<IC18>> End users Meal delivery request awaiting acceptance from delivery driver
FR6	<<IC10>> Menu Manager Ordering meals both on and not on the cafeteria menu

FR7	<p><<IC2>> Order Meal Controller</p> <p>Creating, viewing, modifying, or deleting cafeteria menus</p>
FR8	<p><<IC20>> Feedback Controller</p> <p>Customer service satisfaction rating, the individual that ordered the food can rate his or her experience using the FoodForTech app.</p>
FR9	<p><<IC20>> Create Feedback Interface</p> <p>Live chat with customer service representatives</p>
FR10	<p><<IC7>> Process Payroll Interface</p> <p>Multiple payment methods: debit card, credit card, PayPal, etc.</p>
FR11	<p><<IC13>> Account Activity Controller</p> <p>Access the FFT app outside the organization's intranet</p>
FR12	<p><<IC14>> Food Delivery Driver</p> <p>The food deliverer picks up a meal from cafeteria/restaurant to deliver</p>
FR13	<p><<IC11>> Meal Preparer</p> <p>Packaging order request from the customer</p>

FR14	<<IC8>> Order Status Tracking Interface: Tracking meal status
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9.2 Modified Class Diagram (MCs)



KEY	
Color Code	Class Name
	BOUNDARY CLASS (MC9...)
	CONTROL CLASS (MC1...)
	ENTITY CLASS (MC1...)

TABLE 5: Traceability Matrix (Initial Classes (IC) and Modified Classes (MC))

Initial Classes (IC)	Related Modified Classes (MCs)
IC1	<<MC17>> Menu Manager
IC2	<<MC1>> Activity Controller
IC3	<<M13>> Accept Order Interface
IC4	<<M14>> Update Order Status Interface
IC5	<<MC5>> Payroll Controller
IC6	<<MC27>> Create Feedback Interface
IC7	<<MC7>> Order Meal Controller
IC8	<<MC16>> Order Status Tracking Interface
IC9	<<MC23>> Food Delivery Driver

IC10	<<MC17>> Menu Manager
IC11	<<MC2>> User Login Controller
IC12	<<MC10>> Account Interface
IC13	<<MC3>> Account Activity Controller
IC14	<<M10>> Account Interface
IC15	<<MC12>> Order History Interface
IC16	<<MC4>> Default Meal Interface
IC17	<<MC8>> Order Status Controller
IC18	<<MC16>> Order Status Tracking Interface

IC19	<<MC25>> Share Activity Interface
IC20	<<MC26>> Feedback Controller

References

Wiegers, K., & Beatty, J. (2013, August 15). Software Requirements (Developer Best Practices) (3rd ed.). Microsoft Press.