SOFTWARE DESIGN DOCUMENTATION

Document for a

Grocery Purchase Application

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Section 1

INTRODUCTION

1.1 Purpose

This document provides a comprehensive architectural overview of the system, using a number of different models to depict different aspects of the system. It is intended to explain the significant architectural decisions that have been made on the system.

1.2 Scope

The intended audience of this portal is anyone who needs to buy grocery items, efficient delivery, search items, get discounts and manage queries. Any customer can register themselves with the portal and hence get their respective services through this application.

1.3 Overview

In the following sections we outline the software product in higher detail. Section 2 depicts three levels of Data Flow Diagrams to go through the intricacies of the portal.

Section 2

DESIGN CONSIDERATIONS

2.1 Assumptions

1. Users can Sign Up through a third party database or manually.
2. Users can Search the favourite product with some filter and previous purchase history.
3. Mode of payment can be generalised as offline(COD) and online(UPI, Credit Card, Debit Card, Net Banking, Wallet).
4. Before adding to cart, the system checks for availability of the product in stock.
5. Stock Manager can add or remove Area Stock Manager.
6. Delivery Manager can add or remove Area Delivery Manager.

2.2 Constraints

1. Any transaction taking place through the system is limited by the speed of the Internet.
2. Delivery speed depends on the delivery location and delivery scheme.
3. Delivery speed may delay the process significantly due to human factors.
4. The purchasing facility is only available if the customer has a registration with the application.
5. Product out of stock or less stock only shown when the product is less than 2.
6. Free delivery for orders more than Rs. 500 and the delivery type is regular.
7. On case of failed transactions during purchase the deducted amount will be credited back to the user within 24 hours from the transaction time.
8. If the product is damaged or rotten then users can manually (via call or email) register their complaint to the Query Manager.
9. Registered query is then verified by some internal process.
10. Frozen items must take additional packaging.

2.3 Risks

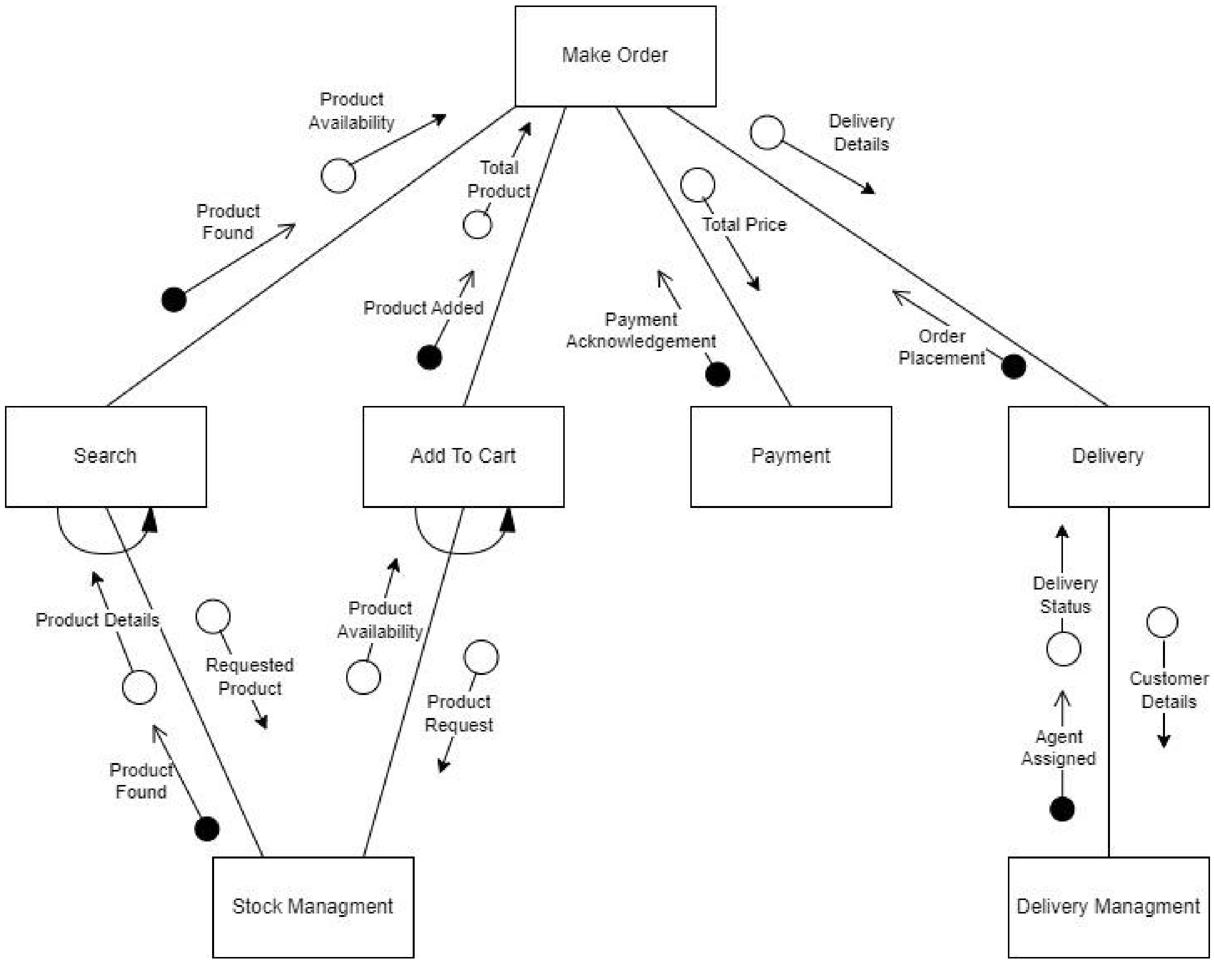
1. If more than 50,000 users access the application at same time then the web application becomes slow.

2. If the wrong address of the user is given then the delivery may hamper.
3. Sometimes products may damage due to handling or weather.
4. Slips and trips are one of the most common injuries at work, and in warehouses where workers are often working at height, falls are obviously a significant hazard.
5. Warehouses are generally large spaces tightly packed with stored goods - meaning even a small fire can be devastating.

Section 3

ARCHITECTURE

STRUCTURED CHART AND DESCRIPTION



<u>STRUCTURED CHART FOR ORDER MODULE Fig:3.a</u>

STRUCTURED CHART DESCRIPTION

3.1 Make Order

1. Make Order is the root module of this sub-system.
2. It consists of the following sub-modules : Search, Add To Cart, Payment, Delivery, Stock Management and Delivery Management.
3. The function of the Make Order module is to take orders from the user and place the order successfully.

3.2 Search

1. Search is a sub-module of the Make Order module.
2. Search has a sub-module called Stock Management.
3. It checks for the availability of the desired product.

3.3 Add To Cart

1. Add To Cart is a sub-module of the Make Order module.
2. Add To Cart has a sub-module called Stock Management.
3. It checks for availability and alters the quantity of the desired product.

3.4 Payment

1. Payment is a sub-module of the Make Order module.
2. Its function is to make payment for the order.

3.5 Delivery

1. Delivery is a sub-module of the Make Order module.
2. Delivery has a sub-module called Delivery Management.
3. Its functionality is to receive a scheduled agent from the Delivery Management module and deliver the product.

3.6 Stock Management

1. Stock Management is a sub-module of the Search module and Add To Cart module .
2. Its function is to check if the product is available.
3. If the product is available, it gives the control back to the upper module.

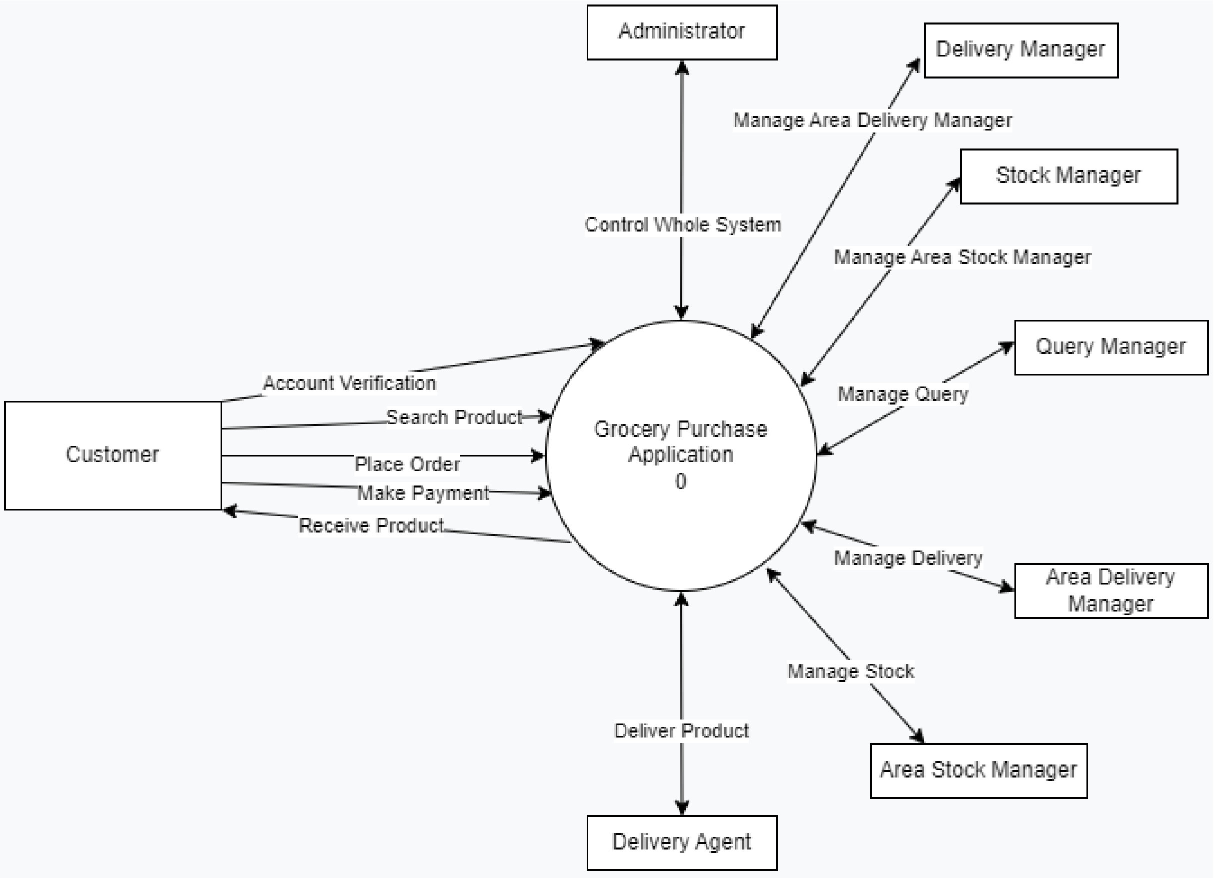
3.7 Delivery Management

1. Delivery Management is a sub-module of the Delivery module .
2. Its function is to assign an agent for each delivery.

Section 4

DATA-FLOW DIAGRAMS

Level 0



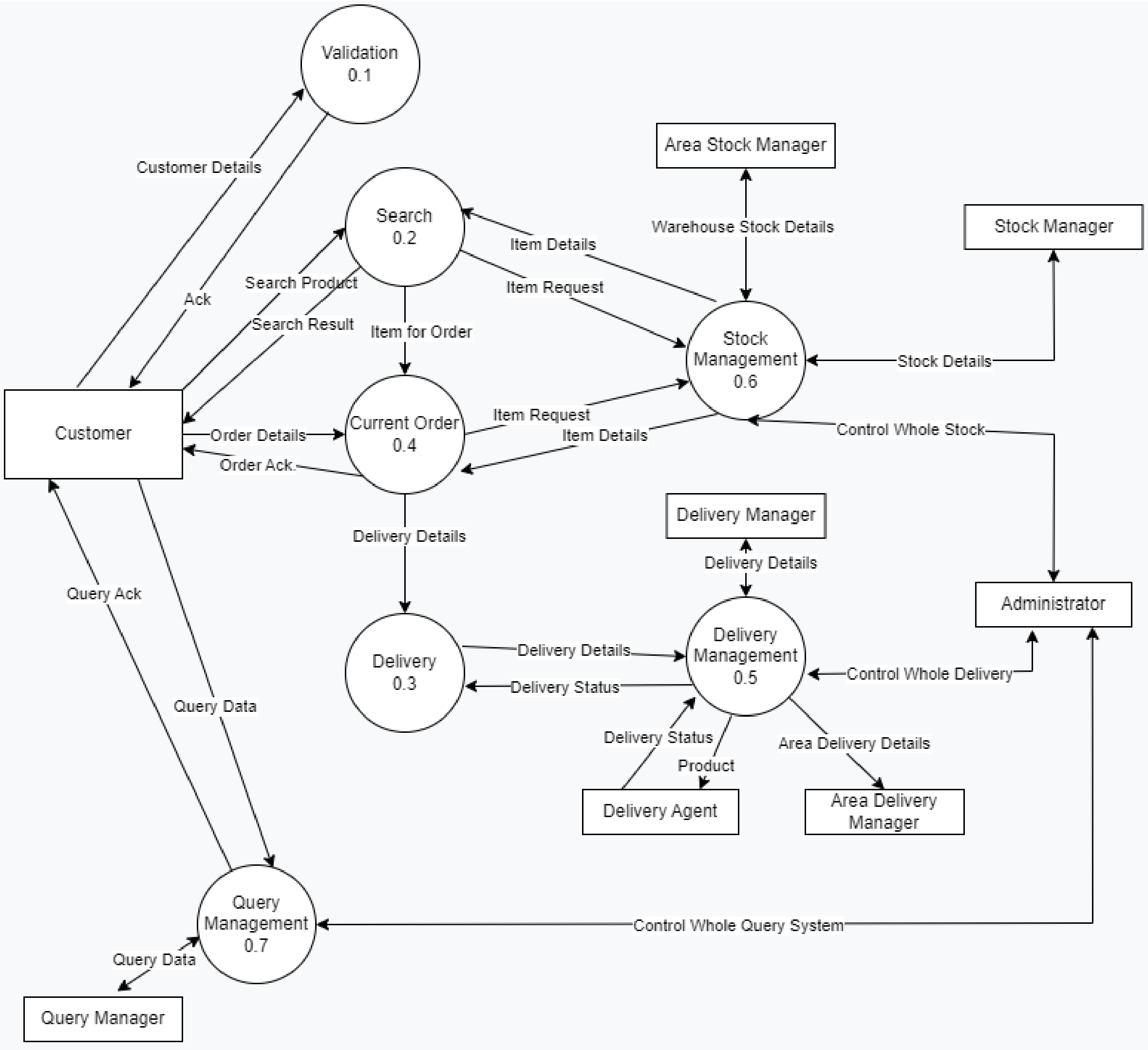
DFD LEVEL 0 Fig: 4.a

4.0 Grocery Purchase Application

1. This diagram represents the top level view of the system. Overall Process has been marked out and all user interaction shown as Grocery Purchase Application(0).
2. The Customer is anybody who wishes to buy or search for a product.

3. Area Stock Manager who has special privileges for managing the Stock in his own warehouse
4. Delivery Agent Deliver the product to the customer.
5. Area Delivery Manager who has special privileges for managing the Delivery for his own warehouse.
6. Query Manager maneges query of the customer and resolves the query.
7. Stock Manager maneges Area Stock Manager.
8. Delivery Manager Maneges Area Delivery Manager.
9. Administrator control the whole system.

Level 1

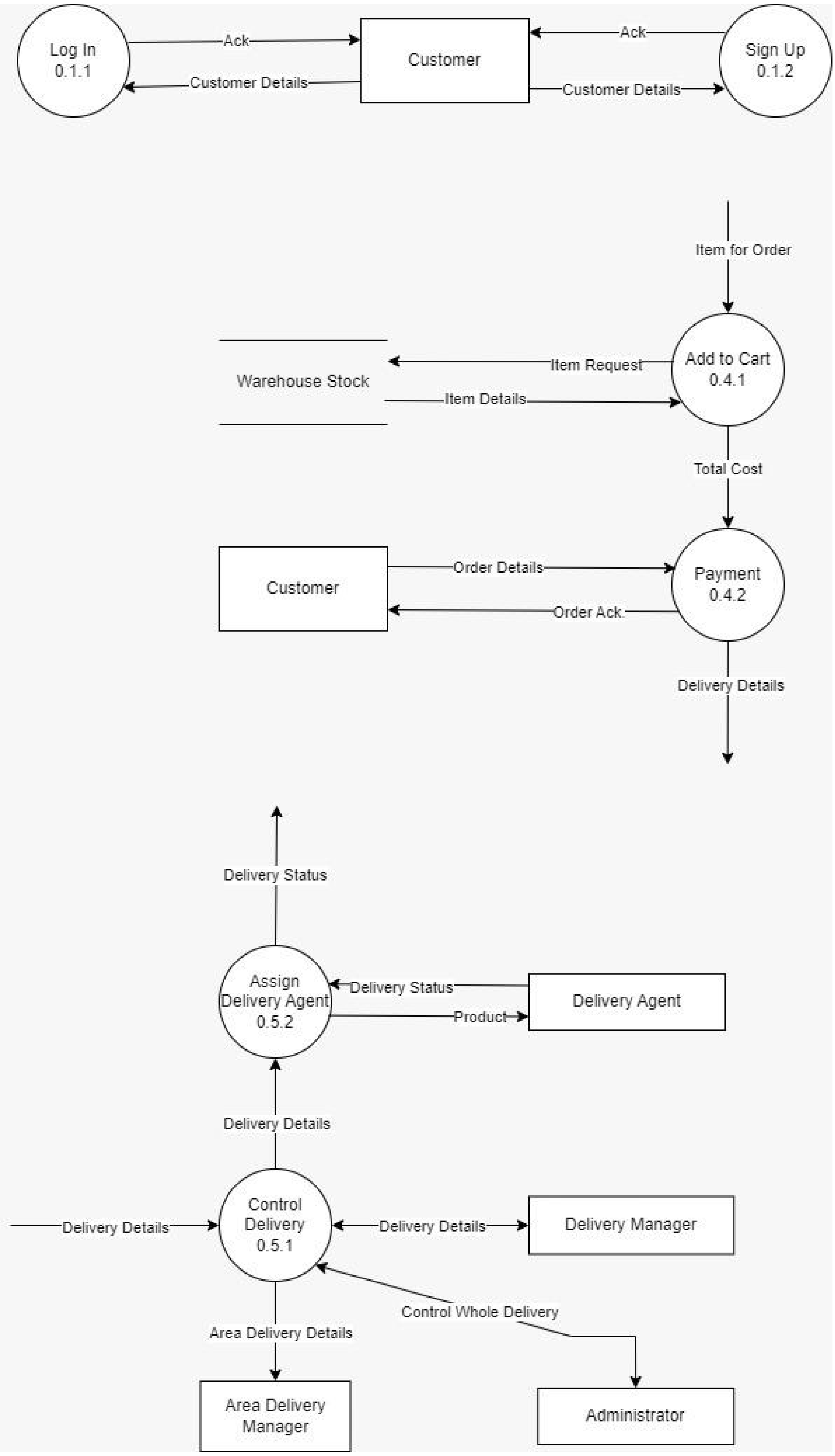


DFD LEVEL 1 Fig: 4.b

Here we decompose level 0 DFD Process Grocery Purchase Application(0) to 7 sub processes to understand data flow better.

1. **Validation 0.1**
   Customer gives his personal login or sign up data to validate his account and receive Validation Acknowledgement.
2. **Search 0.2**
   Customers give the name of the product to the search process and it sends item requests to the Stock Management(0.6). Then it get Item details according to Item available or not. Then it shows the result to the customer.
3. **Delivery 0.3**
   From Current Order(0.4) the Delivery details come to delivery. Then it sends the data to Delivery Management(0.5). It maintains a delivery status by getting the information from Delivery Management(0.5).
4. **Current Order 0.4**
   By Current Order(0.4) registered customers can place the order. The required product comes from Search(0.2) then it checks the availability from Stock Management(0.6). Then the order is confirmed and Data goes to Delivery(0.3).
5. **Delivery Management 0.5**
   From Delivery(0.3) it gets the data of the Customer. It is managed by the Area Delivery Manager who will allocate delivery to each Delivery agent. Delivery Manager and Administrator are supervisors of the system.
6. **Stock Management 0.6**
   Stock Management(0.6) gives the stock report to the Search(0.2) and Current Order(0.4) when the process wants the stock availability. It is managed by the Area Stock Manager and supervised by the Administrator and Stock Manager.
7. **Query Management 0.7**
   This Process is controlled by the Query Manager. Customer log complaint and Query Manager solve the query. It is supervised by the Administrator.

Level 2



DFD LEVEL 2 Fig: 4.c

Here we decompose level 1 DFD Processes sub processes to understand data flow better.

1. **Log In 0.1.1**

   The Validation(0.1) process is decomposed into Log In(0.1.1). Registered customer can Login into his account with his proper login information.

2. **Sign Up 0.1.2**

   The Validation(0.1) process is decomposed into Sign Up(0.1.2). Non Registered customers can Sign Up to create his new account with his proper Sign Up information.

3. **Add to Cart 0.4.1**

   By decomposing Current Order(0.4) we get the Add to Cart(0.4.1) process. It gets data for required products from Search(0.2). Then it checks the stock availability. Send the total price of order to the Payment(0.4.2).

4. **Payment 0.4.2**

   By decomposing Current Order(0.4) we get the Payment(0.4.2) process. It gets the order details from Customer after payment, passes delivery details to Delivery(0.3) and sends the Customer Order Acknowledgement.

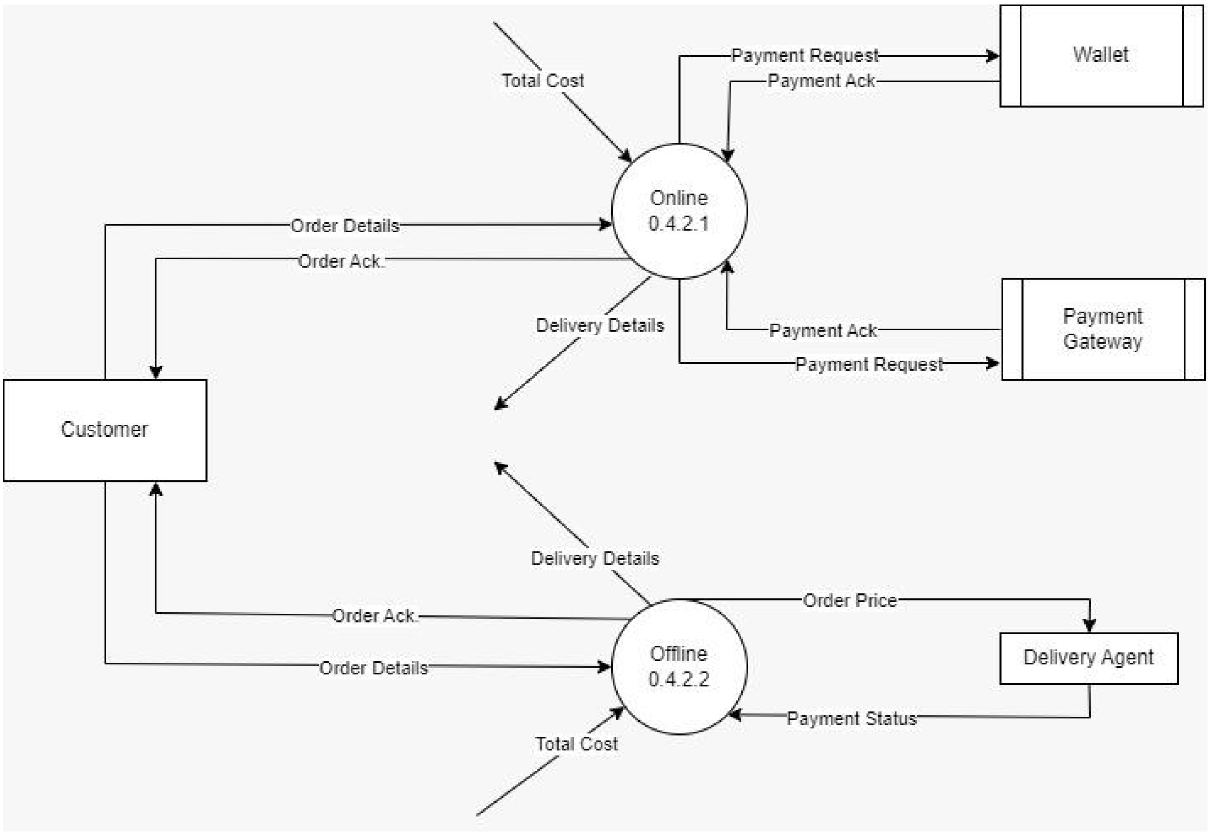
5. **Control Delivery 0.5.1**

   Delivery Management(0.5) decomposes into Control Delivery(0.5.1). It gets delivery details from Delivery(0.3). It passes delivery details to the Assign Delivery Agent(0.5.2). It is managed by the Area Delivery Manager who will allocate delivery to each Delivery agent. Delivery Manager and Administrator are supervisors of the system.

6. **Assign Delivery Agent 0.5.2**

   Delivery Management(0.5) decomposes into Assign Delivery Agent(0.5.2). It gets delivery details from Control Delivery(0.5.1). It gives delivery status to Delivery(0.3). Delivery Agent gets the Product and sends the delivery status to this process.

Level 3



DFD LEVEL 3 Fig: 4.d

Here we decompose level 2 DFD Processes sub processes to understand data flow better.

1. **Online 0.4.2.1**

   We Decompose Payment 0.4.2 into Online(0.4.2.1). It gets Order Details from Customers and sends payment request Wallet or Payment Gateway. Get payment acknowledgement from Wallet or Payment Gateway. Get total cost from Add to Cart(0.4.1). Send delivery details to Delivery(0.3).

2. **Offline 0.4.2.2**

   We Decompose Payment 0.4.2 into Offline(0.4.2.2). It gets Order Details from Customers and sends order price Delivery Agent. Get payment status from Delivery Agent. Get total cost from Add to Cart(0.4.1). Send delivery details to Delivery(0.3).

Section 5

DATABASE DESIGN

A.Entity-Relationship Diagram

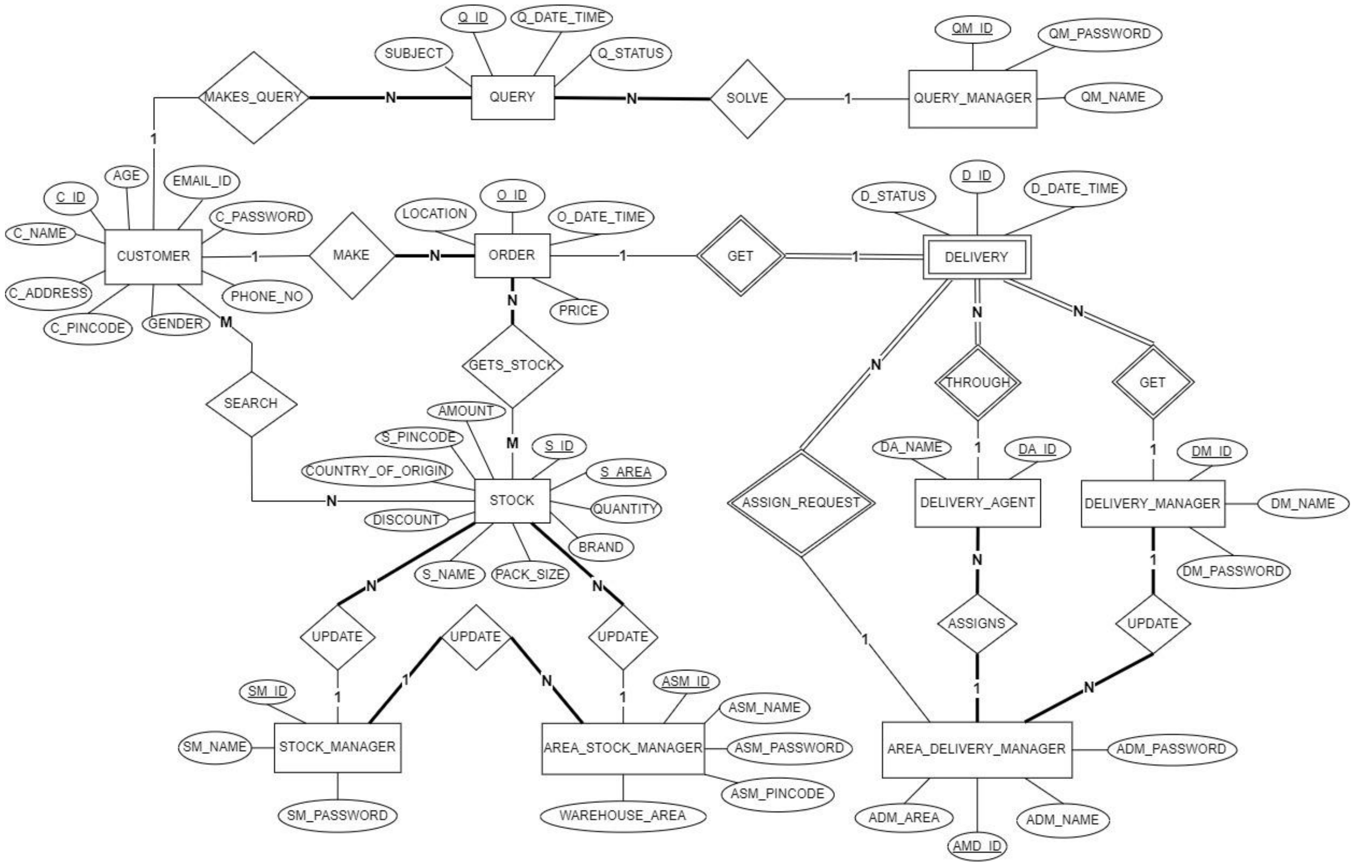


Figure no:- 5.a

B.Relational Schema

1. * CUSTOMER (C_ID, C_NAME, AGE, C_ADDRESS, C_PASSWORD, GENDER, EMAIL_ID, PHONE_NO ,PINCODE)

2. * STOCK_MANAGER (SM_ID, SM_NAME, SM_PASSWORD)

3. * AREA_STOCK_MANAGER (ASM_ID, ASM_PASSWORD, ASM_NAME, ASM_PINCODE, SM_ID)

4. DELIVERY_MANAGER (DM_ID, DM_NAME, DM_PASSWORD)

5. AREA_DELIVERY_MANAGER (ADM_ID, ADM_NAME, ADM_AREA, ADM_PASSWORD, DM_ID)

6. DELIVERY_AGENT (DA_ID, DA_NAME, ADM_ID)

7. QUERY_MANAGER (QM_ID, QM_NAME, QM_PASSWORD)

8. * STOCK (S_ID, S_PINCODE, S_NAME, PACK_SIZE, QUANTITY, COUNTY_OF_ORIGIN, AMOUNT, DISCOUNT, BRAND, SM_ID, ASM_ID)

9. SEARCH (C_ID, S_ID, S_AREA)

10. ORDER (O_ID, PRICE, O_DATE_TIME, LOCATION, C_ID)

11. QUERY (Q_ID, Q_STATUS, SUBJECT, Q_DATE_TIME, QM_ID, C_ID)

12. GETS_STOCK (O_ID, S_ID, S_AREA)

13.DELIVERY (D_ID, D_DATE_TIME, D_STATUS, O_ID, DM_ID, DA_ID, ADM_ID)

Implemented Schema

- Schema number 1 : CUSTOMER
- Schema number 2 : STOCK_MANAGER
- Schema number 3 : AREA_STOCK_MANAGER
- Schema number 8 : STOCK

Description

- Black underline indicate primary key of this schema
- Red underline indicate foreign key of this schema

Section 6

Traceability Matrix

S_NO	REQ_ID	REQ_DESC	SCENARIO	TEST_DATA_DESC	TEST_CASE_DESC	TEST RESULT	DEFECT_ID
1	FB 1.0	LOG IN	1.CUSTOMER_LOG_IN	EMAIL ID. / PHONE NO. & PASSWORD	CHECK CUSTOMER CREDENTIALS	PASS	
			2.AREA_STOCK_MANAGER	PINCODE & PASSWORD	CHECK AREA_STOCK_MANAGER CREDENTIALS	PASS	
			3.STOCK_MANAGER	ID. & PASSWORD	CHECK STOCK_MANAGER CREDENTIALS	PASS	
2	FB 2.0	REGISTRATION	CUSTOMER REGISTRATION	CUSTOMER DATA	VALIDATE CUSTOMER DETAILS	PASS	
3	FB 3.0	ADD PRODUCT	1.AREA_STOCK_MANAGER ADD PRODUCT	PRODUCT	PRODUCT DETAILS WITH RESPECT TO NAME,BRAND,QUANTITY,AMOUNT,DISCOUNT ETC	FAIL	D01
			2.STOCK_MANAGER ADD PRO	PRODUCT	PRODUCT DETAILS WITH RESPECT TO NAME,BRAND,QUANTITY,AMOUNT,DISCOUNT ETC	FAIL	D02
4	FB 4.0	SEARCH PRODUCT	1.AREA_STOCK_MANAGER SEARCH PRODUCT	PRODUCT	SEARCH PRODUCT BY NAME	PASS	
			2.STOCK_MANAGER SEARCH PRODUCT	PRODUCT	SEARCH PRODUCT BY NAME	PASS	
			3.CUSTOMER SEARCH PRODUCT	PRODUCT	SEARCH PRODUCT BY NAME	PASS	

5	FB 5.0	UPDATE PRODUCT	1.AREA_STOCK_MANAGER UPDATE PRODUCT	PRODUCT ID. , UPDATE CRITERIA	PRODUCT ID, UPDATE CRITERIA LIKE NAME,BRAND, DISCOUNT,AMOUNT ETC	FAIL	D03
			2.STOCK_ MANAGER UPDATE PRODUCT	PRODUCT ID. , UPDATE CRITERIA	PRODUCT ID, UPDATE CRITERIA LIKE NAME,BRAND, DISCOUNT,AMOUNT ETC	FAIL	D04
6.	FB 6.0	SEARCH AREA STOCK MANAGER	STOCK MANAGER SEARCH AREA STOCK MANAGER DETAILS	AREA STOCK MANAGER DETAILS	VIEW AREA STOCK MANAGER DETAILS	PASS	

DEFECT_DESCRIPTION

D01 , D02 , D03 ,D04

- Product name must contain alphanumeric value and white space.
- Brand name must contain alphanumeric value and white space.
- Country names must contain the alphabet and white space.
- All integer valued field like quantity,amount, discount,pack size,pin code should be
  Non negative value.

3.