Software Design Description (SDD) for Shop Management System

Version: 1.0

Prepared by

Group Number: 6

Ayaan Sajid Nalakath	B230638CS	ayaan_b230638cs@nitc.ac.in
Edwin Thomas	B230294CS	edwin_b230294cs@nitc.ac.in
Johan John Koshy	B230049CS	johan_b230049cs@nitc.ac.in
Fahad Ahmed Mahdi	B230103CS	fahad_b230103cs@nitc.ac.in

Instructor: Pranesh Das

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1. Introduction

The Software Design Document (SDD) provides a detailed design structure of the Shop Management System, defining how different system components interact. It includes the data model, entity relationships, and system architecture, ensuring a smooth development process.

1.1 Purpose

The purpose of this document is to describe the design specifications for the **Shop Management System** to streamline shop operations, including inventory, sales, and order tracking. This document will serve as a reference for developers to implement the system efficiently.

1.2 Objective

- To develop a user-friendly and efficient system for shop management.
- To automate tasks such as inventory tracking, customer orders, and supplier management.
- To manage sales, invoices, and discount applications effectively.
- To ensure secure transactions and data management.
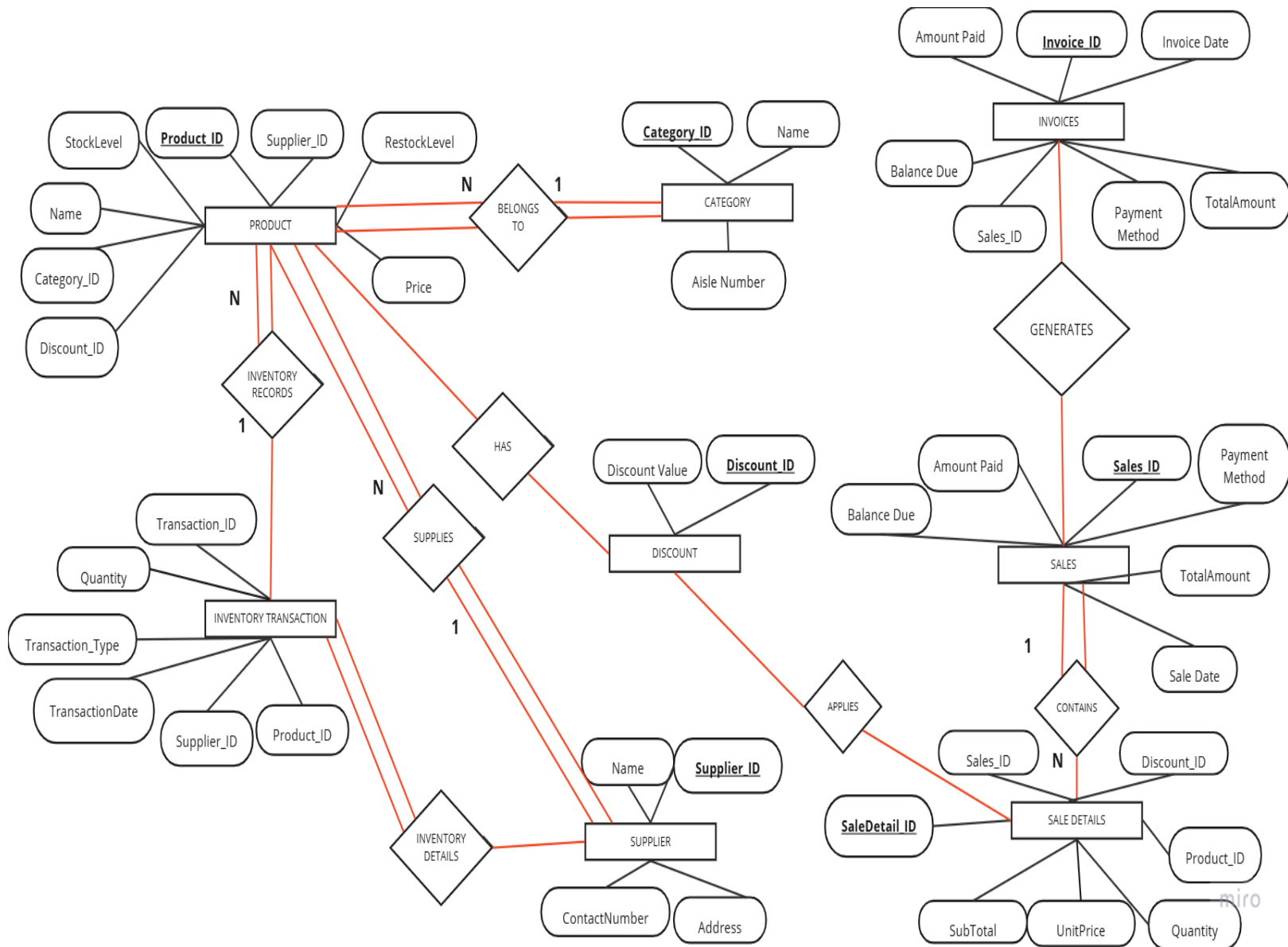
1.3 Scope of the Project

- The system is designed to manage shops of various sizes, from small businesses to larger stores.
- Features include inventory management, customer order processing, supplier tracking, invoice generation, and discount handling.
- Secure user authentication and role-based access control for administrators and employees.
- The system should support multiple payment methods (cash, card, online payments).
- Real-time tracking of sales, stock levels, and supplier deliveries.

1.4 Overview of Project

The Shop Management System is a web-based application designed to computerize and simplify the management of a shop. The system will allow shop administrators to manage products, track orders, handle customers, coordinate suppliers, and apply discounts efficiently.

2. Data Design

2.1 Entity Relationship Diagram

2.2 Conceptual Schema

PRODUCTS

Product_id	Stock_level	RestockLevel	Price	Discount_id	Category_id	Name	Supplier_id

INVENTORY TRANSACTION

Transaction_id	Quantity	Transaction_type	Transaction_date	Supplier_id	Product_id

SUPPLIER

Supplier_id	Name	ContactNumber	Address

DISCOUNT

Discount_value	Discount_id

CATEGORY

Category_id	Name	Aisle_Number

SALE DETAILS

Sales_id	Saledetails_id	Subtotal	UnitPrice	Quantity	Discount_id	Product_id

SALES

Balance_due	Amount_paid	Sales_id	Sale_date	Total_Amount	Payment_method

INVOICES

Invoice_id	Invoice_date	Amount_paid	Sales_id	Balance_Due	TotalAmount	Payment_method

3. Entities and Attributes

This section describes the **key entities** in the system, their **attributes**, and how they interact.

3.1 Product

Attribute	Type	Key Type
ProductID	BigInt	Primary Key
ProductName	Varchar	Non-Key
CategoryID	BigInt	Foreign Key
Price	Decimal	Non-Key
StockLevel	BigInt	Non-Key
RestockLevel	BigInt	Non-Key
SupplierID	BigInt	Foreign Key
DiscountID	BigInt	Foreign Key

3.2 Category

Attribute	Type	Key Type
CategoryID	BigInt	Primary Key
CategoryName	Varchar	Non-Key
AisleNumber	BigInt	Non-Key

3.3 Sales

Attribute	Type	Key Type
SalesID	BigInt	Primary Key
SalesDate	DateTime	Non-Key
TotalAmount	Decimal	Non-Key

PaymentMethod	Varchar	Non-Key
AmountPaid	Decimal	Non-Key
BalanceDue	Decimal	Non-Key

3.4 Sale Details

Attribute	Type	Key Type
SaleDetailID	BigInt	Primary Key
SalesID	BigInt	Foreign Key
ProductID	BigInt	Foreign Key
Quantity	BigInt	Non-Key
UnitPrice	Decimal	Non-Key
Subtotal	Decimal	Non-Key
DiscountID	BigInt	Foreign Key

3.5 Invoice

Attribute	Type	Key Type
InvoiceID	BigInt	Primary Key
SalesID	BigInt	Foreign Key
InvoiceDate	DateTime	Non-Key
TotalAmount	Decimal	Non-Key
AmountPaid	Decimal	Non-Key
BalanceDue	Decimal	Non-Key
PaymentMethod	Varchar	Non-Key

3.6 Discount

Attribute	Type	Key Type
DiscountID	BigInt	Primary Key
DiscountValue	Decimal	Non-Key

3.7 Supplier

Attribute	Type	Key Type
SupplierID	BigInt	Primary Key
SupplierName	Varchar	Non-Key
ContactNumber	Varchar	Non-Key
Address	Varchar	Non-Key

3.8 Inventory Transaction

Attribute	Type	Key Type
TransactionID	BigInt	Primary Key
ProductID	BigInt	Foreign Key
TransactionType	Varchar	Non-Key
Quantity	BigInt	Non-Key
TransactionDate	DateTime	Non-Key
SupplierID	BigInt	Foreign Key