National Teachers College
629 J Nepomuceno, Quiapo, Manila, 1001 Metro Manila
Bachelor of Science in Information Technology

MindCare Sales & Support

Database Management System

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I. Introduction

1.1 Overview of Project and UN SDG Target

It deals with the development of a web based sales and support system for mental health products and services. The project addresses **United Nations Sustainable Development Goal (UN SDG) Number 3**: Good Health and Well-being, ensuring healthy lives and promoting well-being at all ages. It has contributed to accessible care and community wellness by developing a digital platform where customers are connected with reliable mental health resources, products, and professional support.

1.2 Problem Statement

The fragmented information about the availability of mental health products and services and inefficient support channels imply that many people face difficulties in accessing these. Traditional methods of inquiry, such as in-person or scattered online listings, often lead to delays, misinformation, or unmet needs.

The project, therefore, provides the virtual space at the center of which:

- Customers can browse, buy, and subscribe to their favorite mental health products, which range from therapy kits and wellness journals to guided meditation tools.
- Users can get live chat and ticket-based support for their product queries and guidance regarding mental health.
- The administrator may manage inventories, approve listings, and also monitor customer satisfaction.

It means that this more modern approach allows better visibility, accessibility, and responsiveness because individuals receive their support on time with reliable products.

The system will be developed based on several web development technologies:

- Frontend: HTML, CSS, JavaScript

- Backend: Node.js with Supabase (Postgres)
- Deployment: Netlify
- Development Tools: Docker, Dev Containers, VS Code
- Collaboration: GitHub for version control

Together, these technologies facilitate the building of a scalable, secure, easy-to-use platform that seeks to empower communities through accessible mental health resources.

II. Requirements & Analysis

2.0 Context

The MindCare Sales & Support system extends the idea of a digital marketplace by integrating it with customer service. It comes with a Supabase backend, supports three different user roles-admin, seller, and customer-with product posting, approval workflows, purchases, and support ticket management.

2.1 Functional Requirements (FR) & Non-Functional Requirements (NFR)

Functional Requirements

ID	Requirement	Project Implementation & Alignment
FR1	The system must successfully load and store input data into the relational schema.	DDL/DML operations ensure product listings, purchases, and support tickets are persisted via Supabase RPC calls.
FR2	The system must implement three mandatory DBMS concepts correctly.	Includes triggers for inventory updates, views for sales reports, and stored procedures for transactional purchases.
FR3	The system must execute a transactional operation using a Stored Procedure enforcing ACID properties.	Example: purchase transaction deducts inventory, records payment, and generates receipt atomically.

2.2 Data Requirements

Key Tables: The users table, the products table, the purchases table, the support_tickets table, the product_categories table, the audit_logs table, the product_images table.

- USERS: id (uuid pk), email, role (enum: customer/seller/admin), full_name, phone, created_at. (~1 KB per row, ~10,000 rows initially)

- PRODUCTS: id, seller_id, title, description, price, stock, status (draft/pending/approved/rejected), created_at. (~2 KB per row, ~5,000 rows)

- PURCHASES: id, product_id, customer_id, quantity, total_price, status (pending/paid/shipped), created_at. (~1 KB per row, average 1–3 purchases per product)

- SUPPORT_TICKETS: id, user_id, subject, description, status (open/closed), created_at. (~1 KB per row)

2.3 Schema Normalization Analysis

- Products Table: Achieves 3NF by separating product categories and images into normalized tables.
- Purchases Table: Candidate key is id; business rule enforces uniqueness of (product_id, customer_id, created_at).
- Users Table: 3NF with unique email constraint; no transitive dependencies.

III. Design Specification

3.1 Core DBMS Concepts Used

- Stored Procedure: Handles purchase transactions with BEGIN/COMMIT/ROLLBACK ensuring ACID compliance.
- Trigger: Updates stock levels automatically after purchase.
- View: Generates monthly sales reports for admins.
- Indexing: Applied to searchable fields (product title, category).
- Constraints: CHECK constraints on product price and stock values.

3.2 ER Diagram

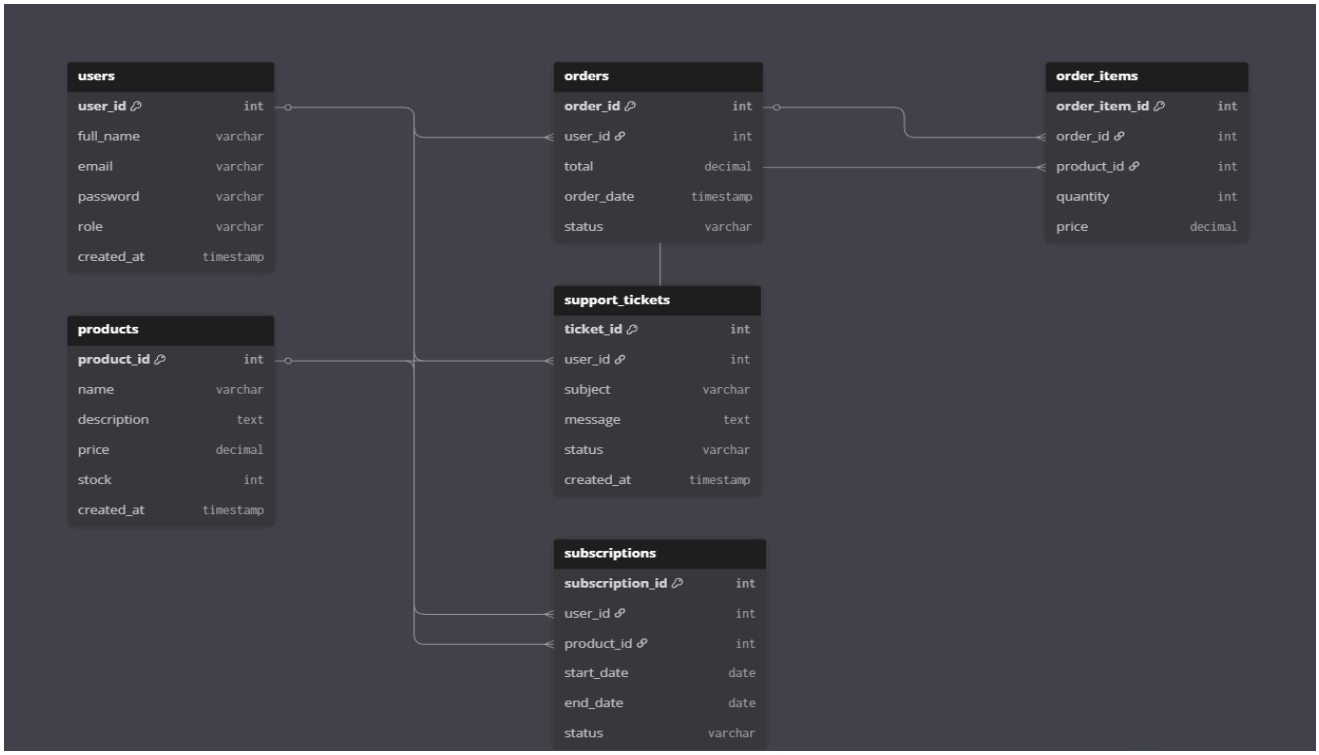
Conceptual: Users interact with products, submit purchases, and raise support tickets. Sellers manage product listings, while admins oversee approvals and reports.

Logical: Relationships defined through foreign keys: users → products, products → purchases, users → support_tickets.

Physical: Implemented in Postgres with normalized tables, indexes, and constraints to ensure integrity.

Cardinalities:

- Seller creates Products: 1-to-many
- Products receive Purchases: 1-to-many
- Customers submit Support Tickets: 1-to-many
- Products have Product Images: 1-to-many



The diagram shows the Entity–Relationship (ER) model of a sales system that manages users, orders, products, and related transactions.

A User can make multiple Orders, and each order belongs to only one user. Every Order contains one or more Products, while a product can appear in many different orders. Products are also grouped under a Product Category, where one category can have many products.

Users can make payments for their orders, and each payment records details such as the payment method and amount. A user can also have multiple Addresses, which store location information like city, state, and country.

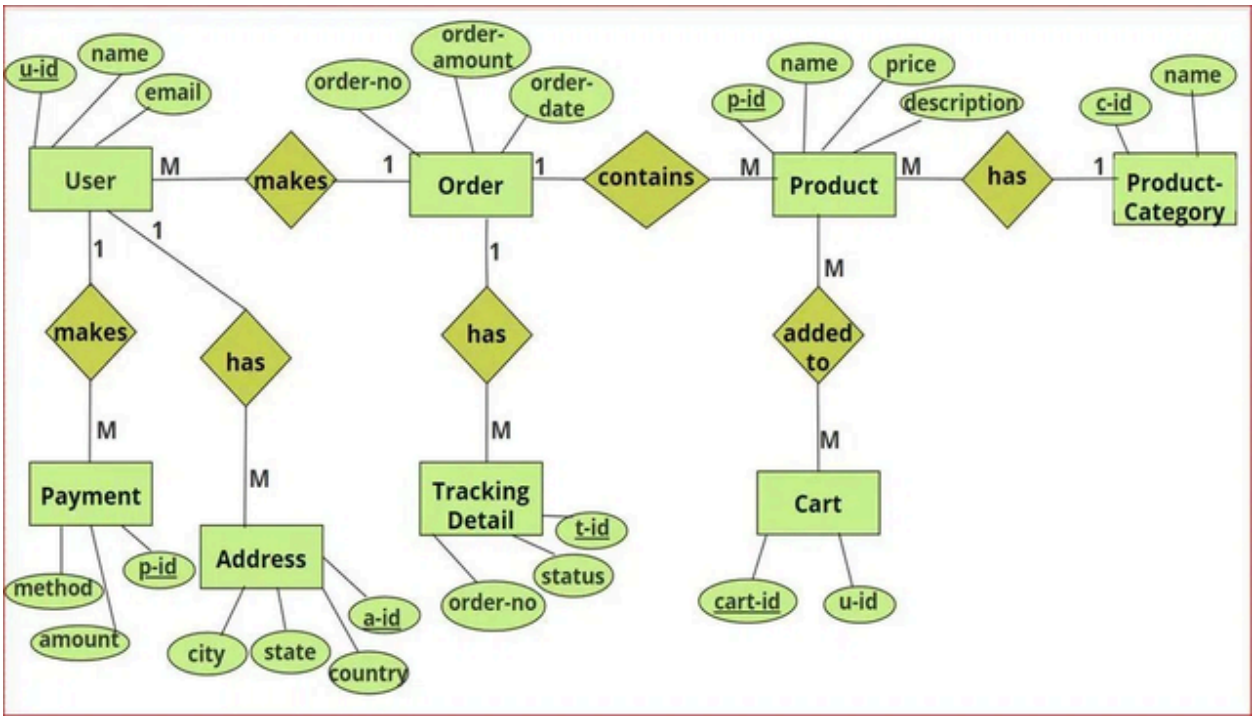
Each order has Tracking Details that record the order status and tracking ID. Products can be added to a Cart, allowing users to collect items before placing an order. A cart belongs to one user but may contain many products.

Overall, the diagram shows how the system organizes customer purchases, product management, payment processing, and order tracking in a structured and efficient way.

3.3 Transaction Flowchart

Flowchart highlights purchase transaction:

- BEGIN TRANSACTION → Deduct stock → Record purchase → Generate receipt → COMMIT if successful, ROLLBACK if error.



The system's most critical component, the User, is represented as the primary entity. A user consists of a unique user ID, a name, and an email address. A user is able to place several orders, make a variety of payments, and have different shipping addresses.

An Order is linked to the creator who is a user. An order is characterized by an order number, order date, and total amount. A single order can be formed by many products and the same product can also be included in different orders.

A Product is the representation of the goods that are being sold. Each product is defined by a product ID, name, price and description. A product is classified under one product category and can be added to an unlimited number of carts and included in an unlimited number of orders.

The Product Category is the means of bringing together similar products. Each category is identified by a unique category ID and has a name associated with it, and one category can have many products under it.

A Cart is identified as being owned by a particular user. Every cart has a specific cart ID and user ID. Various products can be found in the same cart, and the same product can be found in different user carts as well.

A Payment is associated with a user. A payment has a unique payment ID, a payment method specified, and an amount attached to it. A user is allowed to pay several times for his/her orders.

An Address is where the user’s location is recorded. An address contains an address ID, city, state, and country. A user can have more than one address.

The Tracking Detail is used to trace the delivery of an order. Each tracking detail records a unique tracking ID, order number, and status. An order can receive multiple tracking updates as it transitions from processing to delivery.

To sum up, this diagram illustrates user activities such as browsing products, submitting orders, processing payments, and order delivery tracking in an e-commerce system.

VI. Testing

The MindCare Sales & Support system demonstrates how a well-designed DBMS can support sustainable development by improving access to mental health products and services. By integrating normalized schemas, secure transactions, automated workflows, and responsive support, the project provides a reliable platform for both customers and sellers.

This system directly contributes to UN SDG No. 3 by promoting well-being and ensuring that mental health resources are accessible, affordable, and supported by efficient digital tools.