

Business **eCom** Management System

System Design Document • ER Diagram • Feature Specification

Version 1.0 | March 2025

18+
Modules

9
Entities

50+
Features

Multi
Device

A complete end-to-end solution for product management, customer relations, payments, deliveries, invoicing, stock control, and analytics — designed to run seamlessly across all mobile devices.

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1 | System Overview

High-level description of Full E-Commerce Platform

Full E-Commerce Platform (Full E-Commerce) is a comprehensive mobile-first platform designed to digitalise every aspect of a product-based business — from stock intake to final delivery and payment collection. The system is structured around nine core data entities and eighteen functional modules that together cover the full customer and product lifecycle.

Attribute	Value
System Name	Full E-Commerce Platform
Version	1.0
Target Platform	Android & iOS (Mobile-first, Multi-device)
Core Entities	Customer, Product, Order, Payment, Delivery, Invoice, Category, Review, Stock
Total Modules	18 functional modules
Authentication	Role-based with PIN / Biometric support
Language Support	Hindi + English (Bilingual UI)

2 | Core Modules & Features

All 18 functional modules at a glance

■ Daily Updates

- Daily items, videos & photos
- Update feed for staff
- Pinned announcements
- Date-wise history

■ Payment Manager

- Cash, UPI, Card, Credit
- Payment status tracking
- Overdue alerts
- Payment history log

■ Product Management

- Product details & images
- Category management
- Offer/discount setup
- Best-seller tagging

■ Delivery Tracker

- Expected delivery date
- Real-time status updates
- Customer delivery view
- Reminder automation

■ Reminders & Alerts

- Payment due reminders
- Delivery alerts
- Stock low warnings
- Daily summary push

■ Customer Profiles

- Full customer details
- Order history
- Purchase patterns
- Regular customer tags

■ Invoice System

- Auto invoice generation
- PDF download/share
- Tax & discount fields
- Invoice history

■ Product Offers

- Item-level discount offers
- Offer validity period
- Bulk offer management
- Flash sale support

■ Category Manager

- Add / edit categories
- Sub-category support
- Category-wise reports
- Active/inactive toggle

■ Best Sellers

- Auto-tag by sales volume
- Best-seller showcase
- Trending products
- Performance chart

■ Replacement System

- Replacement request flow
- Approval workflow
- Replacement history
- Reason categorisation

■ Stock Management

- Real-time stock levels
- Low-stock alerts
- Stock history log
- Quantity schema

■ Review System

- Customer ratings 1-5
- Comment moderation
- Product-wise reviews
- Review analytics

■ Security Module

- Role-based access
- PIN / Biometric login
- Activity audit log
- Session management

■ Multi-Device Sync

- iOS & Android support
- Real-time cloud sync
- Offline mode
- Multiple user logins

■ Reports & Analytics

- Sales summary
- Customer analytics
- Payment reports
- Export to PDF/Excel

■ Media Manager

- Product photos & videos
- Daily update media
- Cloud storage
- Compression support

■ Payment History

- All payment types log
- Customer-wise history
- Date range filter
- Export history

3 | Module Detail Specifications

■ Daily Updates Module

Feature	Description
Daily Items Feed	Staff can post text, image, or video updates each day
Media Attachments	Support for photos (JPG/PNG) and short videos (MP4)
Pin & Announce	Important updates can be pinned to the top of the feed
Date-wise Archive	All past updates stored and searchable by date
Push Notification	Team members receive push alerts on new daily updates

■ Payment Management Module

Feature	Description
Payment Types	Cash, UPI, Credit/Debit Card, Bank Transfer, COD supported
Status Tracking	Pending → Processing → Completed → Failed states
Overdue Alerts	Automatic reminders sent to customer & admin at due date
Payment History	Full date-wise log per customer with filter & export
Partial Payment	Support for advance and instalment payment recording

■ Product & Stock Module

Feature	Description
Product Details	Name, SKU, price, offer price, description, category, media
Stock Quantity Schema	Available, reserved, sold, returned quantities tracked
Low Stock Alert	Push notification when stock falls below minimum threshold
Category Linking	Products linked to categories with sub-category support
Media Gallery	Multiple photos and product demo video per product

■ Delivery & Customer Module

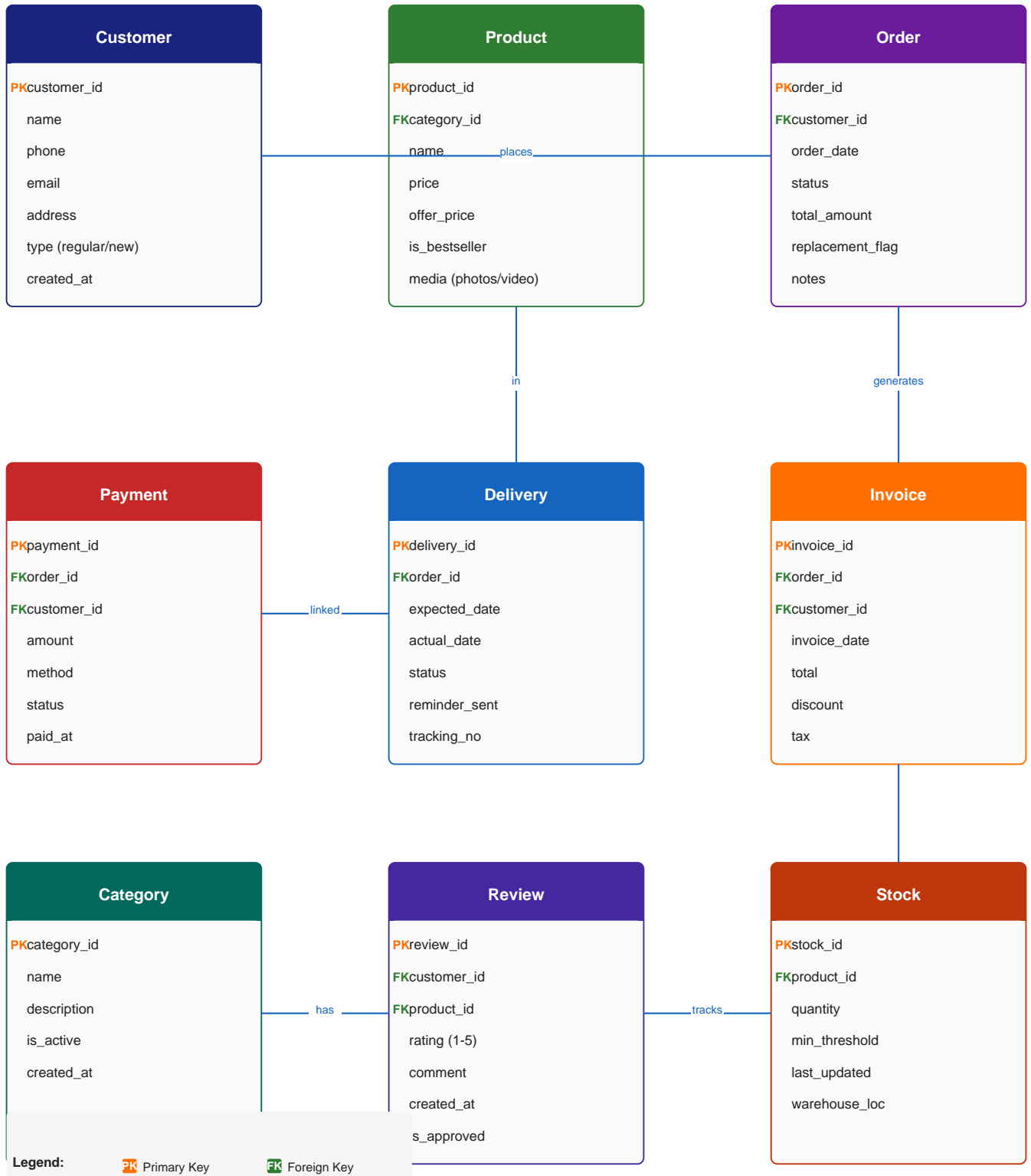
Feature	Description
Delivery Timeline	Expected vs actual delivery date shown to customer
Status Updates	Order Placed → Packed → Shipped → Out for Delivery → Delivered
Reminder Automation	SMS/push reminder 1 day before expected delivery date
Customer History	Full order, payment, and delivery history per customer
Regular Customer Tag	Customers auto-tagged as 'Regular' after configurable orders

■ Replacement & Review Module

Feature	Description
Replacement Request	Customer can raise replacement with reason and photo proof
Admin Approval Workflow	Approve / Reject / Escalate with notes
Replacement Tracking	Full history of all replacements per order/product
Review System	1–5 star rating + text review per product per customer
Moderation	Admin can approve or hide reviews before they go public

4 | ER Diagram — Entity Relationship

Database entity structure and relationships



The diagram above shows 9 core entities and their relationships. PK = Primary Key (orange), FK = Foreign Key (green). Each entity maps directly to a database table.

5 | Database Schema Details

Table: customers

Column	Data Type / Constraint	Description
customer_id	INT PK AUTO_INCREMENT	Unique customer identifier
name	VARCHAR(100) NOT NULL	Full name
phone	VARCHAR(15) UNIQUE	Mobile number (login key)
email	VARCHAR(100)	Email address
address	TEXT	Delivery address
type	ENUM('regular','new')	Customer classification
total_orders	INT DEFAULT 0	Count of all orders
created_at	DATETIME	Registration timestamp

Table: products

Column	Data Type / Constraint	Description
product_id	INT PK AUTO_INCREMENT	Unique product identifier
category_id	INT FK → categories	Linked category
name	VARCHAR(200)	Product name
sku	VARCHAR(50) UNIQUE	Stock-keeping unit code
price	DECIMAL(10,2)	MRP / list price
offer_price	DECIMAL(10,2)	Discounted offer price
stock_qty	INT DEFAULT 0	Current available stock
is_bestseller	TINYINT(1) DEFAULT 0	Flag for best-seller badge
media_urls	JSON	Array of photo/video URLs

Table: orders

Column	Data Type / Constraint	Description
order_id	INT PK AUTO_INCREMENT	Unique order identifier
customer_id	INT FK → customers	Placing customer
order_date	DATETIME	Date & time of order
status	ENUM(placed,packed,shipped,delivered,cancelled)	Order state
total_amount	DECIMAL(10,2)	Final billed amount
discount	DECIMAL(10,2)	Total discount applied
replacement_flag	TINYINT(1)	1 if replacement order
notes	TEXT	Special instructions

Table: payments

Column	Data Type / Constraint	Description
payment_id	INT PK AUTO_INCREMENT	Unique payment record
order_id	INT FK → orders	Related order
customer_id	INT FK → customers	Paying customer
amount	DECIMAL(10,2)	Amount paid
method	ENUM(cash,upi,card,transfer,cod)	Payment mode
status	ENUM(pending,completed,failed,refunded)	Payment status
transaction_ref	VARCHAR(100)	UPI/bank reference number
paid_at	DATETIME	Payment timestamp

Table: deliveries

Column	Data Type / Constraint	Description
delivery_id	INT PK AUTO_INCREMENT	Unique delivery record
order_id	INT FK → orders	Related order
expected_date	DATE	Promised delivery date
actual_date	DATE	Actual delivery date
status	ENUM(pending,out_for_delivery,delivered,failed)	Delivery state
tracking_no	VARCHAR(100)	Courier tracking number
reminder_sent	TINYINT(1) DEFAULT 0	1 if reminder was sent

6 | Security Architecture

Access control, data protection & audit

Security Layer	Implementation	Details
Authentication	JWT + Refresh Token	Tokens expire in 24 h; refresh in 7 days
Biometric/PIN	Device-native biometrics	Face ID / Fingerprint / 6-digit PIN
Role-Based Access	3-tier roles	Admin > Manager > Staff with feature gates
Data Encryption	AES-256 at rest	All PII and payment data encrypted
Transport Layer	HTTPS / TLS 1.3	All API calls over encrypted channel
Audit Logging	Activity log table	Every action logged with user, timestamp, IP
Session Control	Auto logout	Session expires after 30 min of inactivity
OTP Verification	SMS OTP on login	Phone number verified on first login

7 | Multi-Device Support

Cross-platform & offline capabilities

Capability	Detail
Android Support	Android 8.0 (Oreo) and above
iOS Support	iOS 13 and above
Real-time Sync	WebSocket / Firebase push for live data sync
Offline Mode	Core features work offline; data syncs when reconnected
Multiple Logins	Up to 5 devices per account simultaneously
Push Notifications	FCM (Android) + APNs (iOS) for all alerts
Data Backup	Automatic daily cloud backup with restore option

8 | Notification & Reminder System

Trigger Event	Channel	Timing	Recipient
Payment Due	Push + SMS	1 day before due	Customer + Admin
Payment Overdue	Push + SMS	On due date +1	Customer + Admin
Delivery Expected	Push + SMS	1 day before	Customer
Order Status Change	Push	Instant	Customer

Stock Low Alert	Push	When below minimum	Admin + Manager
New Order Placed	Push	Instant	Admin
Replacement Approved	Push + SMS	On approval	Customer
Daily Update Posted	Push	On post	All Staff
Daily Payment Summary	Push	6 PM daily	Admin

This document is the official System Design & ER Diagram specification for the Full E-Commerce Platform. All module definitions, schema designs, and security specifications described herein are subject to review and finalization before development commences. | E-Commerce Systems © 2025