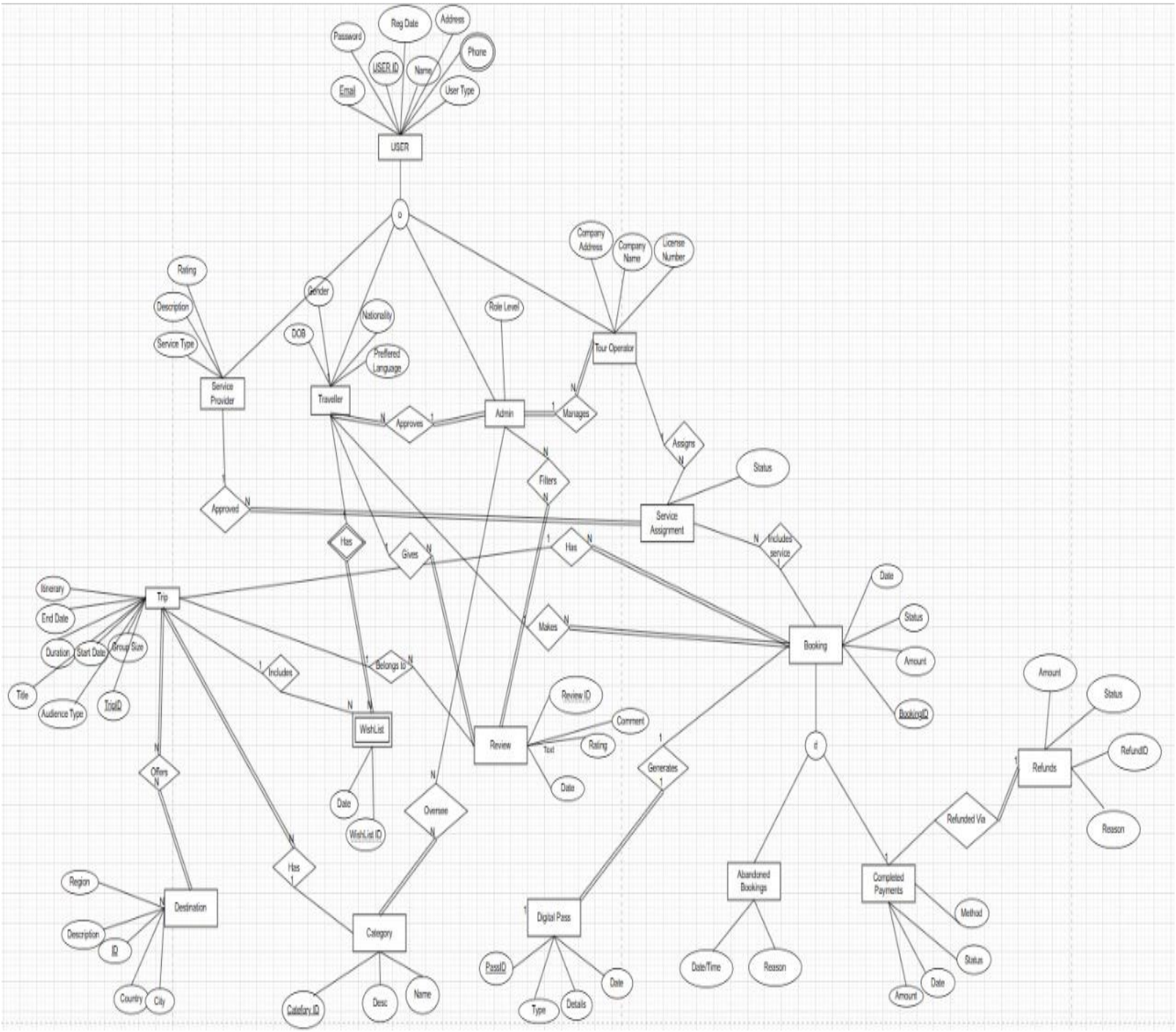
Entity Relationship Diagram



Relational Model

Bold – PK * - FK

- Users(**UserID**, Name, Phone, Address, Email, Password, RegDate, UserType)
- ServiceProvider(**SpID***, ServiceType, Description)
- Admin(**AdminID***, RoleLevel)
- Traveller(**TravellerID***, Gender, DOB, Nationality, PreferredLanguage, AdminID*)
- TourOperator(**TID***, CompanyName, CompanyAddress, LicenseNumber, AdminID*)
- Category(**CategoryID**, Name, Descr)
- Trip(**TripID**, Title, CategoryID*, Itinerary, StartDate, EndDate, Duration, GroupSize, AudienceType)
- Destination(**DestinationID**, Country, City, Region, Description)
- TripDestination(**TripID***, **DestinationID***)
- WishList(**WishListID**, TripID*, TravellerID*, Dated)
- Review(**ReviewID**, Comment, Rating, ReviewDate, TravellerID*, TripID*)

- AdminReviewFilter(**AdminID***, **ReviewID***)
- AdminCategoryOversee(**AdminID***, **CategoryID***)
- Booking(**BookingID**, BookingDate, Status, Amount, TravellerID*, TripID*)
- ServiceAssignment(**AssignmentID**, Status, TourOperatorID*, ServiceProviderID*, BookingID*)
- DigitalPass(**PassID**, PassType, PassDetails, IssueDate, BookingID*)
- AbandonedBooking(**BookingID***, AbandonDateTime, Reason)
- CompletedBooking(**BookingID** *, PaymentMethod, PaymentDate, PaidAmount)
- Refund(**RefundID**, BookingID*, RefundAmount, RefundStatus, RefundReason, RefundDate)

Details of the Data Base

System Overview:

The **TravelEase** database system has been designed to manage and automate operations for a comprehensive **travel management platform**.
The system supports **travelers, tour operators, service providers, and administrators** — ensuring smooth handling of bookings, trips, services, and payments.

It covers all real-world requirements mentioned in the project description, with future-proof scalability for reports, analytics, notifications, and more.

Key Entities Developed:

Entity	Description
Users	Stores all users' core information (Travellers, Admins, Service Providers, Tour Operators).
Traveller	Specific details of Travelers (DOB, Gender, Nationality, Preferred Language).
Admin	System Administrators managing categories, reviews, travelers, and operators.
ServiceProvider	Details of service providers like Hotels, Transport, Guides.
TourOperator	Companies offering trip packages and managing service assignments.
Trip	Trip information including itinerary, audience type, duration, dates.
Destination	Cities, regions, and countries attached to trips.

Entity	Description
TripDestination	M:N relationship between Trips and Destinations.
Category	Categories classifying trips (Adventure, Leisure, Cultural, etc.).
Wishlist	Trips saved by Travelers for future consideration.
Review	Feedback and ratings given by Travelers on Trips.
AdminReviewFilter	Admins filtering and managing reviews.
AdminCategoryOversee	Admins overseeing Trip Categories.
Booking	Details of traveler trip reservations (Completed or Abandoned).
ServiceAssignment	Assignment of service providers by Tour Operators to bookings.
DigitalPass	E-tickets, vouchers, and activity passes generated after booking completion.
AbandonedBooking	Separate tracking of incomplete/canceled bookings with reasons.

Entity	Description
CompletedBooking	Payment details of fully processed bookings.
Refund	Refund processing attached with CompletedBookings.

Key Design Decisions Made:

- **Unified Users Table:**
  - A single parent table (Users) created, classified by UserType.
  - Related Traveller, ServiceProvider, TourOperator, and Admin as extensions.
- **Booking Status Classification:**
  - Bookings are classified as **Completed** or **Abandoned**.
  - Abandoned bookings handled separately through AbandonedBooking.
- **Service Assignment Management:**
  - ServiceAssignment created to track how TourOperators assign ServiceProviders to Bookings.
  - Covers all services: hotels, guides, transport.

- **Review and Wishlist as Weak Entities:**
    - Review and Wishlist dependent on Traveler and Trip relationships.
- **Payments and Refunds Separation:**
    - Payments split into CompletedBooking and Refund for fine-grained financial tracking.
- **Trip and Destination M:N Relation:**
    - A Trip can belong to multiple Destinations.
    - Managed through a join table TripDestination.
- **Digital Pass System:**
    - Automatically generated after booking confirmation.
    - Supports multiple types: E-tickets, hotel vouchers, activity passes.
- **Audience Types Supported:**
    - Solo Trips
    - Group Trips
    - Corporate Trips
- **Service Provider Types Supported:**
    - Hotels
    - Transport Services

    - Guides
    - Tour Services
- **Abandoned Booking Reason Tracking:**
    - Captures user behavior during incomplete booking flows.

Data Population:

- **Users:** 50–60 diverse users.
- **Travellers:** Major proportion (around 25–30 users).
- **Tour Operators:** About 10 operators (for diverse service management).
- **Service Providers:** 10 high-quality services provided.
- **Trips:** 50+ trips with different durations and categories.
- **Bookings:** Over 100 bookings inserted covering both Completed and Abandoned scenarios.
- **Refunds:** Realistic refunds generated for certain payment failures or trip issues.
- **Service Assignments:** Logical service mapping by Operators to Trips and Travelers.

- **Wishlist and Reviews:** Travelers interacting actively with Trips they like and rate.

Integrity Constraints and Rules Applied:

- **Primary Key** and **Foreign Key** constraints fully maintained.
- **Cascading Updates** and **Deletes** properly configured.
- **Unique Constraints** for Email, License Numbers.
- **Check Constraints** for:
  - Gender values (Male, Female)
  - UserTypes (Traveller, Admin, Service Provider, Tour Operator)
  - Booking Status (Completed, Abandoned)
  - Refund Status (Pending, Completed, Rejected)
  - Audience Types (Solo, Group, Corporate)
- **Default Values** set where required (e.g., preferred language).

Scalability and Future Enhancements:

The database structure is scalable to support:

- Notifications, Reminders, and Marketing Campaigns
- Loyalty Programs and Reward Points
- Real-Time Trip Availability
- Dynamic Trip Pricing
- AI-powered Personalized Trip Recommendations
- Deep Travel Analytics (most booked trips, user behavior, abandoned reasons analysis)

This database design provides a **robust, normalized, and fully relational structure** to support the current and future needs of a modern travel management platform.