Build a Data Mart in SQL (DLBDSPBDM01)

Conception Phase – Abstract

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Abstract

Design and Implementation of an Airbnb-Style Data-Mart

Project Overview

This project delivers a fully–featured relational data-mart that mimics Airbnb's core workflow: user and role management, property listings, availability, bookings, payments, reviews, referrals and dispute handling. The schema contains **22** tightly linked tables and enforces every relationship with InnoDB foreign keys, guaranteeing referential integrity from sign-up to payout.

Technical Implementation

- **Schema design**: 22 third-normal-form tables, UTF-8 (`utf8mb4`) encoding, InnoDB engine.
- **Key features**
  - Multi-role user model: `user_profiles` feeds `guests`, `hosts` and `admin_users`.
  - Booking and payment pipeline: `reservations` → `transactions`, with platform fee separation.
  - Many-to-Many rule and amenity control via junction tables `listing_amenities` and `property_rules`.
  - Recursive admin hierarchy (`admin_users.reports_to`).
  - Triple-table facts captured in `dispute_resolution` and `referral_rewards`.

System Metadata

Total tables	22
Rows inserted	˜600 (min. 20 per table)
Database size	≈ 0.8 MB

Primary subject areas

User management	`user_profiles`, `hosts`, `guests`, `admin_users`
Property management	`property_listings`, `amenities`, `calendar_availability`
Transactions	`reservations`, `transactions`, `commission`
Support & feedback	`property_reviews`, `host_reviews`, `messages`, `support_tickets`

Core Functionality Highlights

- Junction tables handle many-to-many links (e.g. amenities per listing, rules per property).
- Two ternary tables (`dispute_resolution`, `referral_rewards`) model three-party events in a single row.
- Recursive admin chain supports escalations and audit trails.
- Dynamic nightly pricing and availability stored separately for clean time-series analysis.
- Automatic 24-hour payment hold after check-in implemented through status flags in `transactions`.

Outcome

The finished data-mart is both technically sound and practically useful: it loads cleanly, enforces every constraint, and already contains a realistic sample data set; with minor front-end additions it can back a live analytics dashboard or power-user reporting with no further schema changes.