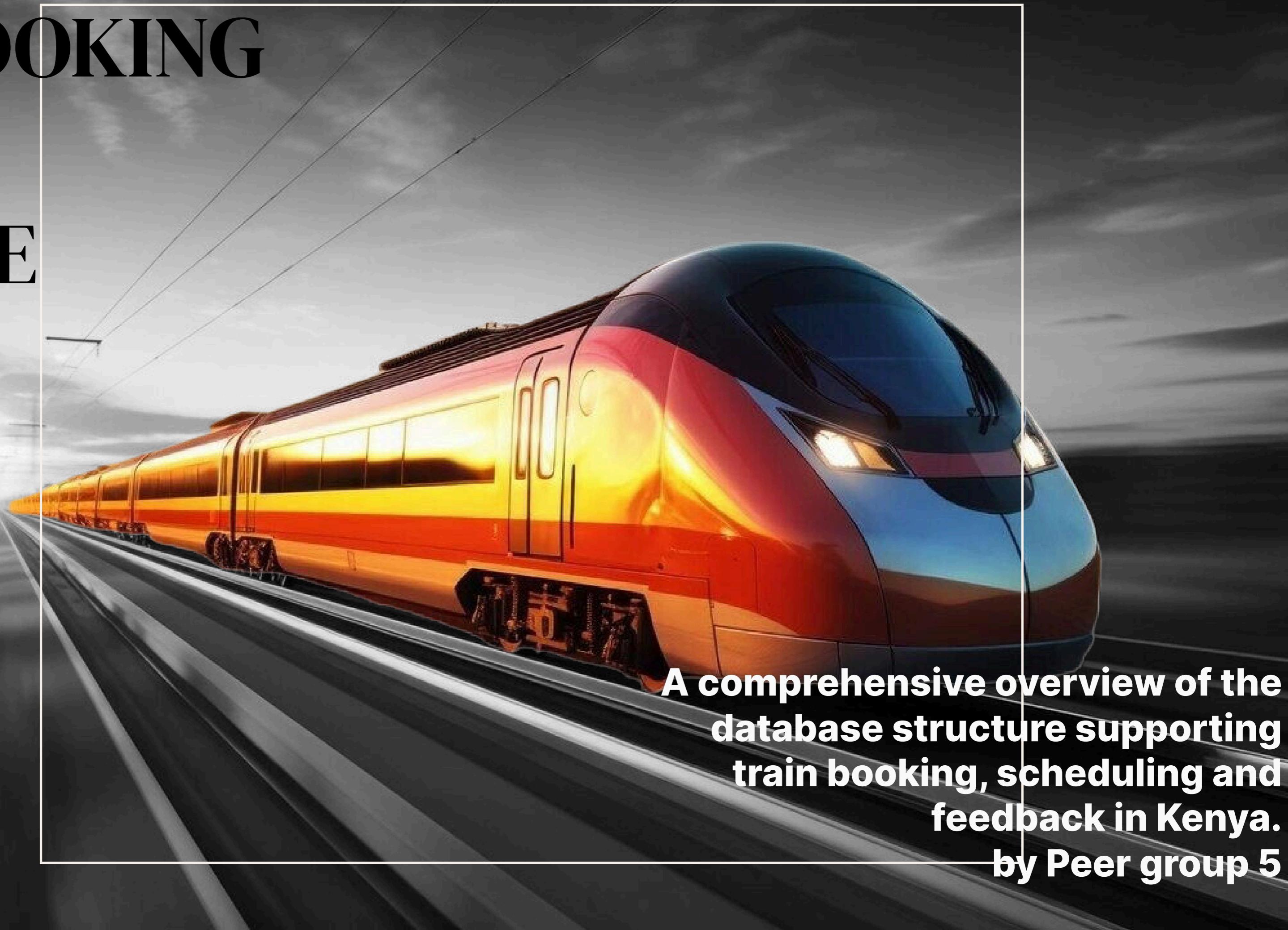


TRAIN BOOKING SYSTEM DATABASE SCHEMA



A comprehensive overview of the
database structure supporting
train booking, scheduling and
feedback in Kenya.
by Peer group 5

OVERVIEW OF THE DATABASE SCHEMA

DESIGNED TO MANAGE A TRAIN BOOKING SYSTEM IN KENYA

01



The database schema is specifically structured to facilitate the operations of a train booking system across Kenya, ensuring that all aspects of the booking process are efficiently handled.

INCLUDES RELATIONSHIPS AND CONSTRAINTS

03



Relationships between entities, such as User-Booking and Train-Route connections, are clearly defined within the schema. Constraints ensure data integrity and prevent errors during booking transactions.

ENCOMPASSES NECESSARY ENTITIES

02



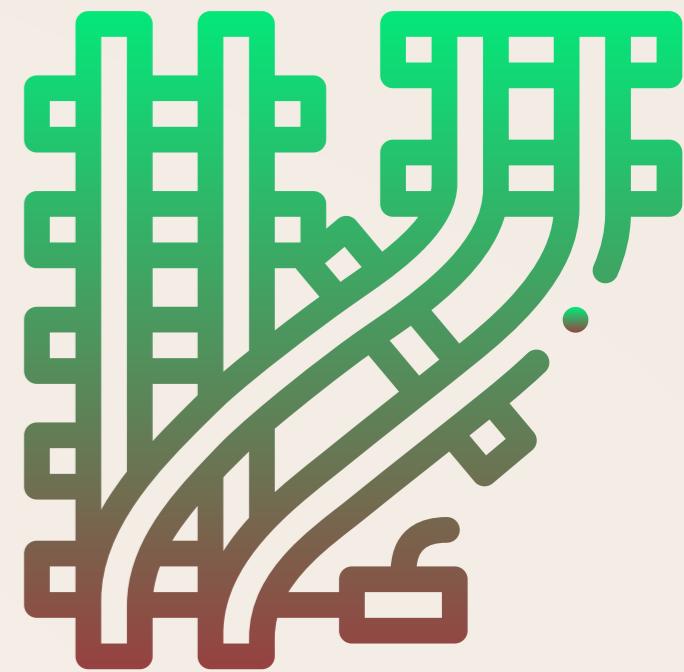
The schema includes critical entities such as User, Train, Route and Booking, which are essential for maintaining a functional and user-friendly booking environment

PROVIDES SOLUTIONS FOR BOOKING, SCHEDULING, AND FEEDBACK COLLECTION

04



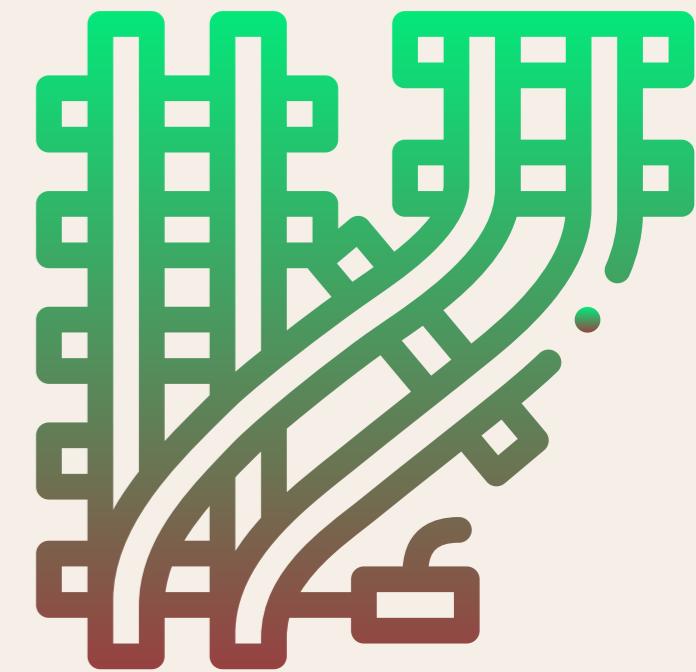
The schema not only supports the booking process but also includes functionalities for scheduling train services and collecting user feedback, which is vital for continuous improvement.



EFFICIENT MANAGEMENT OF TRAIN SCHEDULES

The primary objective is to efficiently manage train schedules to ensure timely arrivals and departures. This involves optimizing routes and coordinating with various stakeholders to minimize delays and enhance service reliability.

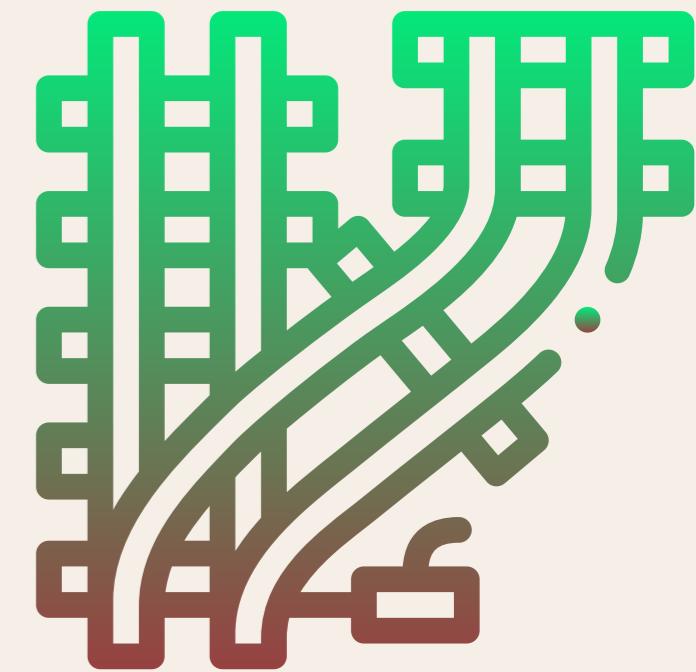




ROUTE OPTIMIZATION AND BOOKINGS

Another critical aspect is the optimization of train routes and the management of bookings. This includes providing users with easy access to booking options and ensuring that routes are strategically planned to meet passenger demand.

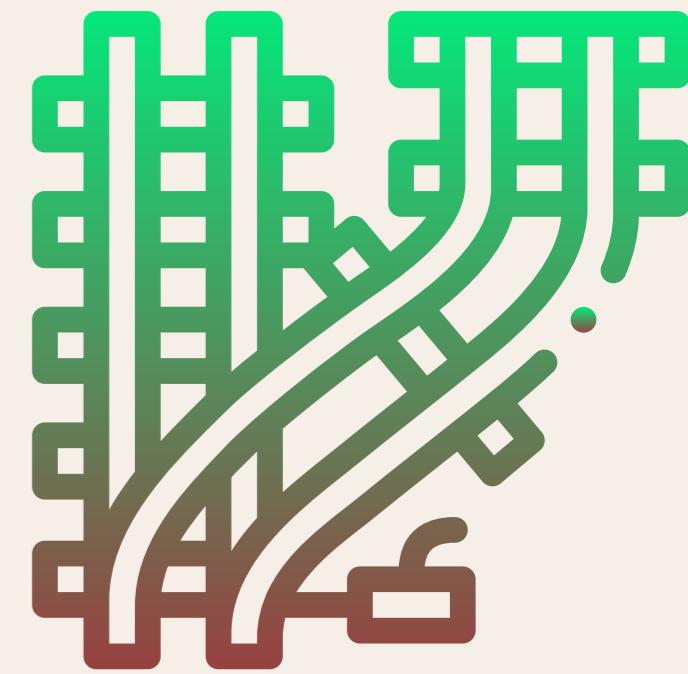




PAYMENT PROCESSING AND USER FEEDBACK

Handling payments efficiently is essential for a smooth user experience. Additionally, collecting and managing user feedback helps improve services and address any concerns promptly. This includes differentiating user roles, such as customers(users) and administrators.

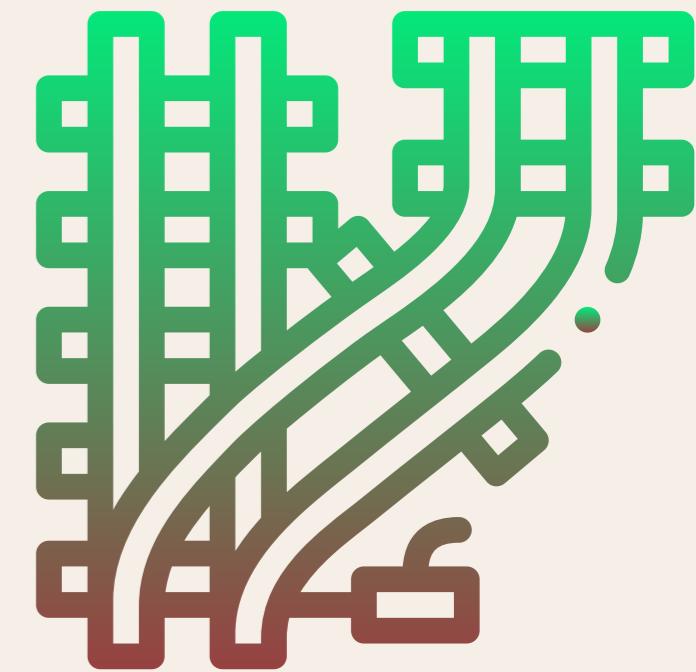




USER ROLE MANAGEMENT

Managing user roles, such as customers and admins, is vital for ensuring that each user has appropriate access and capabilities within the system. This helps maintain security and efficiency in operations.





DATA INTEGRITY AND CONSISTENCY

Ensuring data integrity and consistency is a fundamental goal. This involves implementing relationships and constraints within the database to prevent data anomalies and maintain reliable information across the system.



TABLES AND THEIR ROLES

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User Table

Purpose: Store information about all users i.e. passengers. Key features: Enquires unique emails and secure password storage.



Station Table

Purpose: Represents train stations with unique codes and geographic locations. Key features: Stations are linked to train journeys through routes.



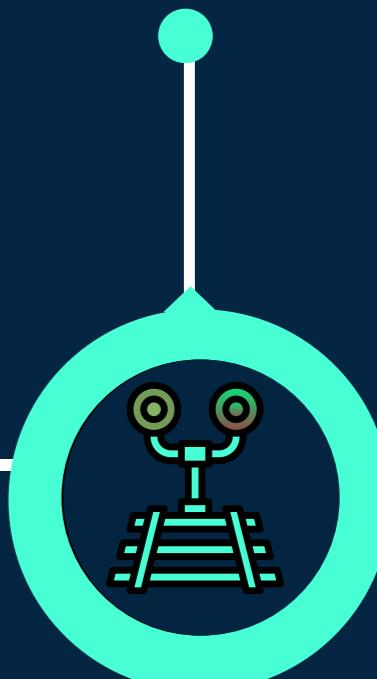
Train table

Purpose: Stores details about trains, including routes and seat availability. Key features: Tracks train types (e.g., Express, Passenger) and links departure and arrival stations.



Admin table

Purpose: Manages the administrative details for train operations. Key features: Includes admin roles like Super Admin or Manager.



START

TABLES AND THEIR ROLES

Booking Table

Purpose: Manages bookings made by users for specific train journeys. Key features: Tracks booking status (e.g., Confirmed, Cancelled) and payment status, associating bookings with users, trains, and stations.



Payment Table

Purpose: Manages payment records for bookings. Key features: Tracks payment methods (e.g., Mobile Money, Credit card) and ensures secure and unique transaction IDs.



Schedule Table

Purpose: Defines schedules for train journeys. Key features: Tracks journey dates and times while managing status (e.g., Scheduled, Delayed).



END

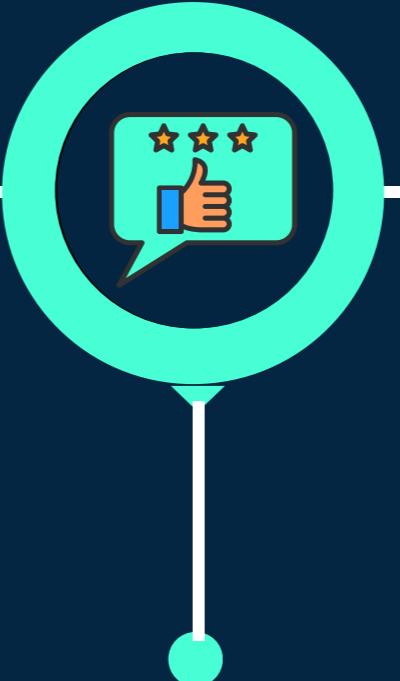
Ticket table

Purpose: Issues tickets for bookings, tracking seat numbers and ticket classes. Key features: Supports different ticket classes (e.g., First Class, Economy) and tracks ticket prices and issuance dates.



Feedback table

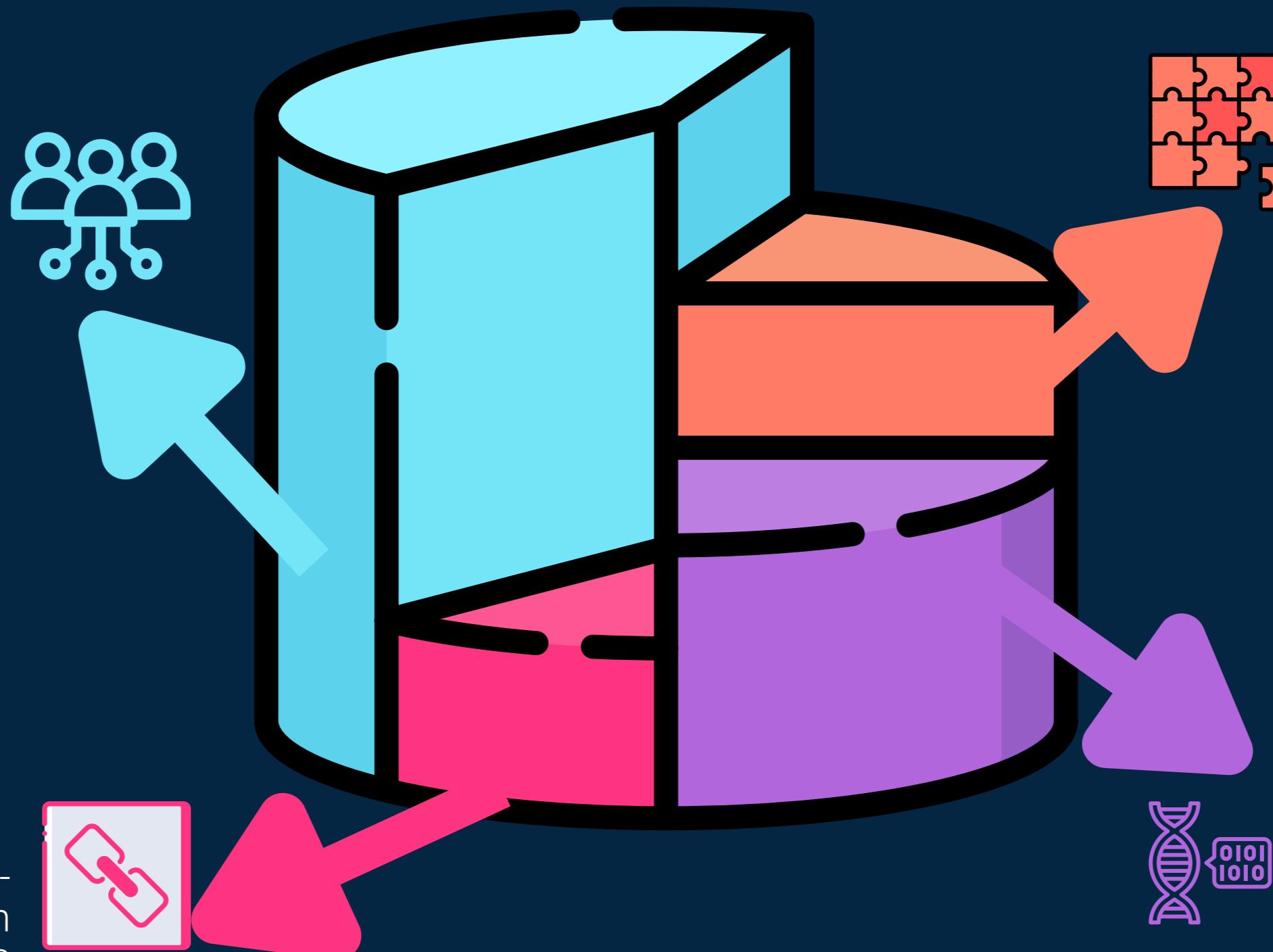
Purpose: Collects feedback from users regarding their train journeys. Key features: Allows rating submissions (1-5 stars) and links feedback to specific bookings and users.



KEY RELATIONSHIPS IN A BOOKING SYSTEM

ONE-TO-MANY RELATIONSHIPS

This part represents the many-to-many relationship between routes and stations, showing how multiple routes can include several stations and vice versa.



ONE-TO-ONE RELATIONSHIP

Here, we demonstrate the one-to-one relationship where each booking is associated with one payment record.

ONE-TO-MANY RELATIONSHIPS

This section illustrates the one-to-many relationships, such as a user making multiple bookings, a train having multiple routes, and a booking generating multiple tickets.

ONE-TO-ZERO-TO-ONE RELATIONSHIP

This section illustrates the one-to-zero-to-one relationship, such as a user giving feedback on a booking made. Each booking can have at most one feedback entry. Some bookings may not have any feedback at all.

CONSTRAINTS AND DATA INTEGRITY

Check Constraints

Are applied to enforce logical conditions within the data, such as ensuring that ratings fall within a specified range (e.g, 1-5).

Enum Constraints

Are utilized to standardize the values that can be entered into specific columns, such as status indicators thus maintaining consistency in data.

Unique Constraints

They ensure that certain columns, such as email addresses or ticket numbers, do not contain duplicate values.

Foreign Keys

Are used to establish relationships between tables in a relational database.

Primary Keys

Are crucial for ensuring that each record in a database table can be uniquely identified.

HOW THE SCHEMA WORKS

An Overview of User, Admin, and Database Workflows

USER REGISTRATION AND LOGIN

Users begin by registering on the platform, providing their details to create an account. Once registered, they can log in to access various features and functionalities of the train booking system.

SEARCHING FOR TRAINS

After logging in, users can search for available trains based on their desired journey. They can filter results according to departure times, train types, and ticket prices, ensuring they find the best option that fits their needs.

BOOKING TICKETS

Once users select their preferred train and journey, they can proceed to book tickets. This process involves confirming travel details and selecting seat preferences, making it a seamless experience.

SECURE PAYMENT PROCESSING

Payments are processed securely through encrypted channels, ensuring users' financial information is safe. Multiple payment options are available, catering to various user preferences.

TICKET ISSUANCE

After successful payment, users receive their tickets electronically. These can be saved on mobile devices or printed, providing flexibility and convenience for users.

ADMIN MANAGEMENT OF TRAINS

Admins play a crucial role in managing the platform. They oversee train schedules, routes, and may add or remove trains as necessary to ensure efficiency.

BOOKING OVERSIGHT

Admins monitor all bookings made through the platform. This oversight ensures that any issues can be addressed swiftly, enhancing user satisfaction.

FEEDBACK COLLECTION AND REVIEW

Feedback from users is collected and reviewed by admins. This information is vital for identifying areas of improvement, allowing the service to evolve based on user experiences.

DATABASE SCHEMA CONNECTIVITY

The database schema is designed to connect users, bookings, trains, and payments efficiently. This connectivity facilitates smooth operations and data retrieval.

LINKING FEEDBACK TO JOURNEYS

Feedback is systematically linked to specific journeys, enabling the platform to derive actionable insights from user experiences. This link helps improve services and address common concerns.

WHY THIS SCHEMA WORKS

SCALABILITY

The schema is designed to efficiently support a growing number of users, trains, and bookings, ensuring that as the demand increases, the system can seamlessly accommodate additional traffic without compromising performance. This is crucial for maintaining user satisfaction and operational efficiency over time.



RELIABILITY

By maintaining strong relationships and constraints within the database, the schema ensures data integrity. This reliability is vital for tracking bookings and managing user information accurately, which helps prevent discrepancies and enhances trust in the system.



LOCALIZED REFERENCE

Tailored specifically for Kenya's train system, the schema incorporates popular payment methods such as M-Pesa, catering to the local context. This localized approach enhances user experience by providing familiar payment options, thereby increasing adoption and usage.

FLEXIBILITY

The schema is built with flexibility in mind, allowing for future enhancements such as addition of loyalty programs or dynamic pricing structures. This adaptability ensures that the system can evolve with changing market conditions and user needs, increasing its longevity and relevance.



Thanks!



**Presented by:
by Peer group 5**