# **Project Brief: Relational Database Implementation for Customer Management at Orange Telecom**

## **Project Overview**

**Client:** Orange Telecom

**Project Title:** Relational Database Implementation for Customer Management

## **Project Objectives**

1. **Normalization:** Design a relational database schema that adheres to the principles of normalization to eliminate redundancy and improve data integrity.
2. **Data Transformation:** Transform and populate the data from the provided dataset into the normalized schema.
3. **Referential Integrity:** Establish relationships between tables to ensure data consistency.
4. **Documentation:** Provide comprehensive documentation of the database schema, data transformation process, and SQL scripts used.

## **Data Overview**

The dataset provided by Orange Telecom can be accessed from the following source: [Telecom Churn Datasets on Kaggle](https://www.kaggle.com/datasets/mnassrib/telecom-churn-datasets/data). The dataset contains the following columns:

* State
* Account length
* Area code
* International plan
* Voice mail plan
* Number of voicemail messages
* Total day minutes
* Total day calls
* Total day charge
* Total evening minutes
* Total evening calls
* Total evening charge
* Total night minutes
* Total night calls
* Total night charge
* Total international minutes
* Total international calls
* Total international charge
* Customer service calls
* Churn status

## **Database Design Requirements**

1. **Scalability:** The database should be designed to handle a large number of records and support future growth.
2. **Data Integrity:** The schema must enforce data integrity through the use of primary keys, foreign keys, and appropriate data types.
3. **Normalization:** The database should be normalized to at least the third normal form (3NF) to reduce redundancy and ensure data consistency.
4. **Referential Integrity:** Relationships between tables should be clearly defined to maintain referential integrity.
5. **Performance:** The design should consider query performance and include indexes where necessary to optimize data retrieval.
6. **Security:** Implement appropriate security measures to protect sensitive customer information.
7. **Usability:** The database should be user-friendly and support easy querying and reporting.

### **Tables to be Included**

1. **Customer Table:**
   * Stores unique customer-related data such as state, account length, area code, and customer service calls.
2. **Service Plan Table:**
   * Contains details about the customer's service plans, including international plan, voicemail plan, and number of voicemail messages.
3. **Usage Table:**
   * Records detailed usage statistics for customers, such as total day minutes, total evening minutes, total night minutes, total international minutes, and associated charges.
4. **Churn Table:**
   * Tracks the churn status of customers to analyze customer retention and attrition.
5. **Payment Table:**
   * Stores payment details including payment date, amount, and payment method.

### **Key Design Principles**

1. **Primary Keys:**
   * Ensure each table has a unique primary key to identify records.
2. **Foreign Keys:**
   * Define foreign key relationships to link related data across tables, ensuring referential integrity.
3. **Data Types:**
   * Use appropriate data types for each column to ensure data accuracy and efficiency.
4. **Indexes:**
   * Implement indexes on key columns to improve query performance.
5. **Constraints:**
   * Use constraints to enforce data rules, such as NOT NULL and UNIQUE constraints where necessary.

### **Design and Implementation Process**

1. **Requirement Gathering:**
   * Work closely with Orange Telecom to understand the specific data management needs and reporting requirements.
2. **Schema Design:**
   * Design a preliminary database schema based on the requirements and best practices in database design.
3. **Review and Feedback:**
   * Present the schema design to Orange Telecom for review and incorporate feedback to ensure the design meets their needs.
4. **Development:**
   * Develop the database schema using SQL and create tables, indexes, and constraints as per the design.
5. **Data Transformation:**
   * Transform the provided dataset to fit the normalized schema and populate the database tables.
6. **Testing:**
   * Test the database thoroughly to ensure data integrity, performance, and compliance with the requirements.
7. **Documentation:**
   * Document the database schema, data transformation process, and SQL scripts used.
8. **Deployment:**
   * Deploy the database to the production environment and provide necessary training to Orange Telecom staff.

### **Quality Assurance**

**Objective:** Ensure the accuracy and integrity of the data in the new database.

**Tasks:**

* Validate the data transformation and population process.
* Verify referential integrity between tables.
* Perform data quality checks and resolve any discrepancies.

## **Conclusion**

The project aims to successfully transform a flat dataset into a normalized relational database for Orange Telecom. This new database schema will improve data integrity and reduce redundancy, making it easier to manage and query customer data, service plans, usage details, churn status, and payments. The comprehensive documentation will serve as a guide for the project's design, implementation, and data transformation process, ensuring clarity and maintainability