

Database Design

Telecommunication Database Management System

Abstract :

Creating and maintaining a centralized database which would be used to store a huge amount of data across service providers and would store Customer data and the services they have subscribed to. The analysis of this data would help user with a consolidated view of bills for these services and would provide a better insight of the expenditure for these services for previous months.

Entities:

Our project deals with generating bills for all the telecommunication services used by the customer. We have identified the following entity types. An identifier is also suggested for each entity, together with selected important attributes:

- **CUSTOMER**

Customer is the general representation for all the telecommunication users. Customer_ID is the primary key for this entity and the entity contains additional information such as CustomerName, PhoneNumber, Email, Address and DateOfBirth.

- **SERVICE_PROVIDER**

Service_Provider is the general representation for all the provider providing different types of telecommunication services . SP_ID is the primary key and it also has other information about the ServiceProvider such as SP_Name and also the service type information such as Has_Wifi, Has_TV, Has_Mobile . ContactNo of the service provider is also included.

- **REGISTRATIONINFO**

RegistrationInfo stores the relationship between Customer and ServiceProvider. Registration_ID is the primary key for this entity, and it contains two foreign keys namely, Customer_ID and SP_ID, which are the primary keys in the Customer and ServiceProvider entities respectively. It also has an attribute Registration_Date, to maintain the date customer subscribed to the particular service provider.

- **PLAN**

Plan gives details of various telecommunication plans provided by the ServiceProvider. Plan_ID is the primary key for this entity. It also includes details of the plan which would be required to bill the customer as per his selected plan. The details included are PlanType, PlanPrice, Cycle, PlanName, PlanDesc. Also this entity includes a foreign key SP_ID to link plans to its ServiceProviders. Plan, here, acts as a supertype, and has three subtypes – WIFI, TV, Mobile. These sub-types are identified from the PlanType attribute. The supertype-subtype relation is complete specialization, i.e. Plan has to belong to one of the subtypes.

- **WIFI**

This entity acts as a subtype to PLAN entity. This entity contains attributes more specific to Wifi such as ExtraCharges as per speed and usage. WPlanID is the Primary key of WIFI entity and it includes other Wifi plan related information such as Usage, Speed, ExtraCharges.

- **TV**

This entity acts as a subtype to PLAN entity. TPlanID is the primary key of the TV entity and other information in TV includes PlanName, TV_Services.

- **MOBILE**

This entity acts as a subtype to PLAN entity. Mobile includes the mobile plan details which would assist in billing the customers as per the telecommunication plan they are using. MPlanID is the primary key and other details included are DataSpeed, Calling and SMS.

- **ASSET**

Every Service Provider would have some assets mapped to it. Asset entity provides us with information related to the assets owned by the service providers along with the quantity of these assets. Asset contains primary key Asset_ID and also other details about the asset such as AssetName, AssetDesc, AssetModel, AssetSerial, AssetPrice, Quantity. All the details are not null except AssetDesc as it can be null. It also has a foreign key associated with it - SP_ID to identify the service provider owning the assets.

- **ORDER**

ORDER maps the customer with the Asset entity which provides the asset details ordered by a customer which is internally linked to the service provider the customer has subscribed with. OrderID is the primary key. ORDER also contains other details such as OrderDesc and OrderDate and OrderAmount. It references two foreign keys, CustomerID from the customer entity and AssetID from the Asset entity.

- **CUSTOMER_PLAN**

Customer_Plan includes the details which would assist to generate the billing information for a customer depending on the plan the customer selects. It provides start and end date of the customer plan to understand the cycle to be applied. CustomerPlanID is the primary key and it also includes StartDate, EndDate, and Duration. This entity references foreign keys from two other entities - CustomerID from Customer entity and PlanID from the Plan entity.

- **BILLING_INFO**

Billing_Info stores the data for every customer based on the subscribed plan at a monthly basis. TransactionID attribute is the primary key for this entity. Billing_Info contains two foreign keys i.e. CustomerPlanID and OrderID. OrderID attribute can be NULL, as OrderID would only be considered if the customer has bought any assets. BillingInfo also has details such as Duration, Month, TotalAmount, YearlyEstimate which would help in the bill generation for a customer as per the customer's telecommunication plan.

Entity Relationship Diagram

