

Telecommunications Customer Relationship Management

Logical E/R Model

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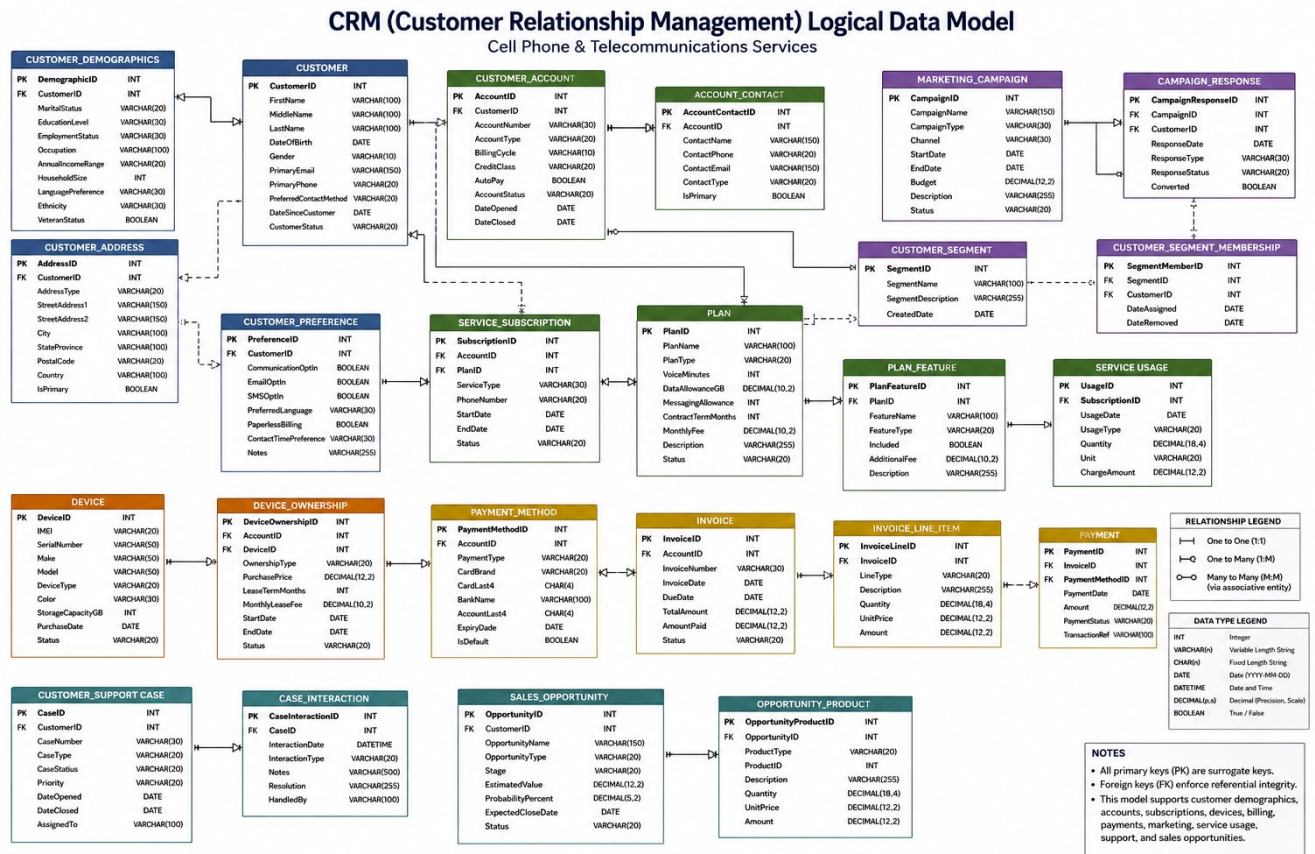


Figure 1.1 – Logical Data Model

CRM Logical Model Data Dictionary

Below is a data dictionary for the logical data model, specifically, the attribute data types are identified.

Cell Phone and Telecommunications Services

Typically, this type of model will support customer purchases of cell phones and related contracts and deals.

1. CUSTOMER

Stores the core customer identity record.

Column	Data Type	Key	Description
CustomerID	INT	PK	Unique customer identifier.
FirstName	VARCHAR(100)		Customer first name.
MiddleName	VARCHAR(100)		Customer middle name or initial.
LastName	VARCHAR(100)		Customer last name.
DateOfBirth	DATE		Customer date of birth.
Gender	VARCHAR(10)		Customer gender, if collected.
PrimaryEmail	VARCHAR(150)		Primary customer email address.
PrimaryPhone	VARCHAR(20)		Primary customer phone number.
PreferredContactMethod	VARCHAR(20)		Preferred communication method.
DateSinceCustomer	DATE		Date customer relationship began.
CustomerStatus	VARCHAR(20)		Active, inactive, prospect, closed, etc.

Suggested Indexes

Index Name	Columns	Purpose
IX_Customer_LastName_FirstName	LastName, FirstName	Supports customer lookup by name.
IX_Customer_PrimaryEmail	PrimaryEmail	Supports lookup by email.
IX_Customer_PrimaryPhone	PrimaryPhone	Supports lookup by phone number.
IX_Customer_Status	CustomerStatus	Supports filtering active, inactive, or prospect customers.

2. CUSTOMER_DEMOGRAPHICS

Stores customer demographic characteristics used for marketing segmentation.

Column	Data Type	Key	Description
DemographicID	INT	PK	Unique demographic record identifier.
CustomerID	INT	FK	Related customer.
MaritalStatus	VARCHAR(20)		Marital status.
EducationLevel	VARCHAR(30)		Highest education level.
EmploymentStatus	VARCHAR(30)		Employment status.
Occupation	VARCHAR(100)		Customer occupation.
AnnualIncomeRange	VARCHAR(20)		Income range category.
HouseholdSize	INT		Number of people in household.
LanguagePreference	VARCHAR(30)		Preferred language.
Ethnicity	VARCHAR(30)		Optional demographic value, if legally permitted.
VeteranStatus	BOOLEAN		Indicates veteran status.

Suggested Indexes

Index Name	Columns	Purpose
IX_CustomerDemographics_CustomerID	CustomerID	Supports joins to Customer.
IX_CustomerDemographics_Income	AnnualIncomeRange	Supports marketing segmentation.
IX_CustomerDemographics_Language	LanguagePreference	Supports language-based campaigns.
IX_CustomerDemographics_Occupation	Occupation	Supports occupational segmentation.

3. CUSTOMER_ADDRESS

Stores billing, shipping, mailing, and service addresses.

Column	Data Type	Key	Description
AddressID	INT	PK	Unique address identifier.
CustomerID	INT	FK	Related customer.
AddressType	VARCHAR(20)		Billing, shipping, service, or mailing.
StreetAddress1	VARCHAR(150)		Primary street address.
StreetAddress2	VARCHAR(150)		Secondary address line.

Column	Data Type	Key	Description
City	VARCHAR(100)		City.
StateProvince	VARCHAR(100)		State or province.
PostalCode	VARCHAR(20)		Postal or ZIP code.
Country	VARCHAR(100)		Country.
IsPrimary	BOOLEAN		Indicates primary address.

Suggested Indexes

Index Name	Columns	Purpose
IX_CustomerAddress_CustomerID	CustomerID	Supports joins to Customer.
IX_CustomerAddress_PostalCode	PostalCode	Supports geographic segmentation.
IX_CustomerAddress_City_State	City, StateProvince	Supports regional marketing queries.
IX_CustomerAddress_Type	AddressType	Supports billing/shipping/service address lookup.

4. CUSTOMER_PREFERENCE

Stores customer communication and billing preferences.

Column	Data Type	Key	Description
PreferenceID	INT	PK	Unique preference identifier.
CustomerID	INT	FK	Related customer.
CommunicationOptIn	BOOLEAN		General communication permission.
EmailOptIn	BOOLEAN		Email marketing permission.
SMSOptIn	BOOLEAN		SMS marketing permission.
PreferredLanguage	VARCHAR(30)		Preferred language.
PaperlessBilling	BOOLEAN		Indicates paperless billing preference.
ContactTimePreference	VARCHAR(30)		Preferred contact time.
Notes	VARCHAR(255)		Additional preference notes.

Suggested Indexes

Index Name	Columns	Purpose
IX_CustomerPreference_CustomerID	CustomerID	Supports joins to Customer.
IX_CustomerPreference_EmailOptIn	EmailOptIn	Supports email campaign eligibility.
IX_CustomerPreference_SMSOptIn	SMSOptIn	Supports SMS campaign eligibility.

Index Name	Columns	Purpose
IX_CustomerPreference_Language	PreferredLanguage	Supports language-specific communication.

5. CUSTOMER_ACCOUNT

Stores account-level billing and service information.

Column	Data Type	Key	Description
AccountID	INT	PK	Unique account identifier.
CustomerID	INT	FK	Customer who owns the account.
AccountNumber	VARCHAR(30)		Business-facing account number.
AccountType	VARCHAR(20)		Individual, family, business, etc.
BillingCycle	VARCHAR(10)		Billing cycle or cycle day.
CreditClass	VARCHAR(20)		Internal credit classification.
AutoPay	BOOLEAN		Indicates whether autopay is enabled.
AccountStatus	VARCHAR(20)		Active, suspended, closed, delinquent, etc.
DateOpened	DATE		Date account was opened.
DateClosed	DATE		Date account was closed.

Suggested Indexes

Index Name	Columns	Purpose
IX_CustomerAccount_CustomerID	CustomerID	Supports joins to Customer.
UX_CustomerAccount_AccountNumber	AccountNumber	Enforces fast account lookup.
IX_CustomerAccount_Status	AccountStatus	Supports account status reporting.
IX_CustomerAccount_DateOpened	DateOpened	Supports account growth reporting.

6. ACCOUNT_CONTACT

Stores authorized contacts for an account.

Column	Data Type	Key	Description
AccountContactID	INT	PK	Unique account contact identifier.
AccountID	INT	FK	Related customer account.
ContactName	VARCHAR(150)		Contact person name.
ContactPhone	VARCHAR(20)		Contact phone number.
ContactEmail	VARCHAR(150)		Contact email address.

Column	Data Type	Key	Description
ContactType	VARCHAR(20)		Authorized, billing, emergency, etc.
IsPrimary	BOOLEAN		Indicates primary account contact.

Suggested Indexes

Index Name	Columns	Purpose
IX_AccountContact_AccountID	AccountID	Supports joins to Customer Account.
IX_AccountContact_Email	ContactEmail	Supports contact lookup by email.
IX_AccountContact_Phone	ContactPhone	Supports contact lookup by phone.

7. SERVICE_SUBSCRIPTION

Stores subscribed services for each account.

Column	Data Type	Key	Description
SubscriptionID	INT	PK	Unique subscription identifier.
AccountID	INT	FK	Related account.
PlanID	INT	FK	Related plan.
ServiceType	VARCHAR(30)		Voice, data, messaging, web, bundle, etc.
PhoneNumber	VARCHAR(20)		Assigned phone number, if applicable.
StartDate	DATE		Subscription start date.
EndDate	DATE		Subscription end date.
Status	VARCHAR(20)		Active, suspended, cancelled, pending, etc.

Suggested Indexes

Index Name	Columns	Purpose
IX_ServiceSubscription_AccountID	AccountID	Supports account subscription lookup.
IX_ServiceSubscription_PlanID	PlanID	Supports plan usage analysis.
IX_ServiceSubscription_PhoneNumber	PhoneNumber	Supports lookup by phone number.
IX_ServiceSubscription_Status	Status	Supports active/cancelled subscription filtering.
IX_ServiceSubscription_StartDate	StartDate	Supports subscription trend reporting.

8. PLAN

Stores subscription plan definitions.

Column	Data Type	Key	Description
PlanID	INT	PK	Unique plan identifier.
PlanName	VARCHAR(100)		Plan name.
PlanType	VARCHAR(20)		Prepaid, postpaid, family, business, promotional, etc.
VoiceMinutes	INT		Included voice minutes.
DataAllowanceGB	DECIMAL(10,2)		Included data allowance.
MessagingAllowance	INT		Included messages.
ContractTermMonths	INT		Contract length in months.
MonthlyFee	DECIMAL(10,2)		Monthly recurring charge.
Description	VARCHAR(255)		Plan description.
Status	VARCHAR(20)		Active, retired, promotional, etc.

Suggested Indexes

Index Name	Columns	Purpose
IX_Plan_PlanName	PlanName	Supports plan lookup.
IX_Plan_PlanType	PlanType	Supports plan category filtering.
IX_Plan_Status	Status	Supports active plan filtering.
IX_Plan_MonthlyFee	MonthlyFee	Supports price-based plan analysis.

9. PLAN_FEATURE

Stores features associated with each plan.

Column	Data Type	Key	Description
PlanFeatureID	INT	PK	Unique plan feature identifier.
PlanID	INT	FK	Related plan.
FeatureName	VARCHAR(100)		Feature name.
FeatureType	VARCHAR(20)		Included, add-on, premium, optional, etc.
Included	BOOLEAN		Indicates whether feature is included.
AdditionalFee	DECIMAL(10,2)		Additional monthly or one-time fee.
Description	VARCHAR(255)		Feature description.

Suggested Indexes

Index Name	Columns	Purpose
IX_PlanFeature_PlanID	PlanID	Supports joins to Plan.
IX_PlanFeature_FeatureName	FeatureName	Supports feature lookup.
IX_PlanFeature_FeatureType	FeatureType	Supports add-on and included-feature analysis.

10. SERVICE_USAGE

Stores service usage records.

Column	Data Type	Key	Description
UsageID	INT	PK	Unique usage record identifier.
SubscriptionID	INT	FK	Related subscription.
UsageDate	DATE		Date usage occurred.
UsageType	VARCHAR(20)		Voice, data, SMS, web, roaming, etc.
Quantity	DECIMAL(18,4)		Amount consumed.
Unit	VARCHAR(20)		Minutes, MB, GB, messages, sessions, etc.
ChargeAmount	DECIMAL(12,2)		Charge associated with usage.

Suggested Indexes

Index Name	Columns	Purpose
IX_ServiceUsage_SubscriptionID	SubscriptionID	Supports usage lookup by subscription.
IX_ServiceUsage_UsageDate	UsageDate	Supports date-based usage reporting.
IX_ServiceUsage_Subscription_Date	SubscriptionID, UsageDate	Supports customer usage history.
IX_ServiceUsage_UsageType	UsageType	Supports usage category analysis.

11. DEVICE

Stores device master records.

Column	Data Type	Key	Description
DeviceID	INT	PK	Unique device identifier.

Column	Data Type	Key	Description
IMEI	VARCHAR(20)		Mobile equipment identity number.
SerialNumber	VARCHAR(50)		Device serial number.
Make	VARCHAR(50)		Manufacturer.
Model	VARCHAR(50)		Model name or number.
DeviceType	VARCHAR(20)		Phone, tablet, hotspot, etc.
Color	VARCHAR(30)		Device color.
StorageCapacityGB	INT		Storage capacity.
PurchaseDate	DATE		Device purchase date.
Status	VARCHAR(20)		Active, retired, lost, stolen, returned, etc.

Suggested Indexes

Index Name	Columns	Purpose
UX_Device_IMEI	IMEI	Enforces fast lookup by IMEI.
IX_Device_SerialNumber	SerialNumber	Supports lookup by serial number.
IX_Device_Make_Model	Make, Model	Supports device inventory analysis.
IX_Device_Status	Status	Supports active/lost/retired device reporting.

12. DEVICE_OWNERSHIP

Connects accounts to devices.

Column	Data Type	Key	Description
DeviceOwnershipID	INT	PK	Unique ownership record identifier.
AccountID	INT	FK	Related account.
DeviceID	INT	FK	Related device.
OwnershipType	VARCHAR(20)		Owned, leased, financed, company-provided, etc.
PurchasePrice	DECIMAL(12,2)		Purchase price.
LeaseTermMonths	INT		Lease term in months.
MonthlyLeaseFee	DECIMAL(10,2)		Monthly lease or finance amount.
StartDate	DATE		Ownership or lease start date.
EndDate	DATE		Ownership or lease end date.
Status	VARCHAR(20)		Active, closed, returned, defaulted, etc.

Suggested Indexes

Index Name	Columns	Purpose
IX_DeviceOwnership_AccountID	AccountID	Supports account-device lookup.
IX_DeviceOwnership_DeviceID	DeviceID	Supports device ownership history.
IX_DeviceOwnership_Status	Status	Supports active lease/ownership filtering.
IX_DeviceOwnership_StartDate	StartDate	Supports device lifecycle reporting.

13. PAYMENT_METHOD

Stores customer payment methods.

Column	Data Type	Key	Description
PaymentMethodID	INT	PK	Unique payment method identifier.
AccountID	INT	FK	Related account.
PaymentType	VARCHAR(20)		Credit card, debit card, ACH, autopay, etc.
CardBrand	VARCHAR(20)		Card brand.
CardLast4	CHAR(4)		Last four digits of payment card.
BankName	VARCHAR(100)		Bank name.
AccountLast4	CHAR(4)		Last four digits of bank account.
ExpiryDate	DATE		Card expiration date.
IsDefault	BOOLEAN		Indicates default payment method.

Suggested Indexes

Index Name	Columns	Purpose
IX_PaymentMethod_AccountID	AccountID	Supports account payment lookup.
IX_PaymentMethod_Type	PaymentType	Supports payment method analysis.
IX_PaymentMethod_Default	AccountID, IsDefault	Supports default payment method lookup.

14. INVOICE

Stores customer account invoices.

Column	Data Type	Key	Description
InvoiceID	INT	PK	Unique invoice identifier.
AccountID	INT	FK	Related account.
InvoiceNumber	VARCHAR(30)		Business-facing invoice number.
InvoiceDate	DATE		Invoice issue date.

Column	Data Type	Key	Description
DueDate	DATE		Payment due date.
TotalAmount	DECIMAL(12,2)		Total invoice amount.
AmountPaid	DECIMAL(12,2)		Amount paid.
Status	VARCHAR(20)		Paid, unpaid, partial, past due, cancelled, etc.

Suggested Indexes

Index Name	Columns	Purpose
IX_Invoice_AccountID	AccountID	Supports account invoice history.
UX_Invoice_InvoiceNumber	InvoiceNumber	Supports invoice lookup.
IX_Invoice_InvoiceDate	InvoiceDate	Supports billing-period reporting.
IX_Invoice_DueDate_Status	DueDate, Status	Supports collections and past-due reporting.

15. INVOICE_LINE_ITEM

Stores detailed invoice charges.

Column	Data Type	Key	Description
InvoiceLineID	INT	PK	Unique invoice line identifier.
InvoiceID	INT	FK	Related invoice.
LineType	VARCHAR(20)		Plan, usage, device, tax, fee, credit, adjustment, etc.
Description	VARCHAR(255)		Charge description.
Quantity	DECIMAL(18,4)		Quantity billed.
UnitPrice	DECIMAL(12,2)		Unit price.
Amount	DECIMAL(12,2)		Total line amount.

Suggested Indexes

Index Name	Columns	Purpose
IX_InvoiceLineItem_InvoiceID	InvoiceID	Supports invoice detail retrieval.
IX_InvoiceLineItem_LineType	LineType	Supports revenue category analysis.
IX_InvoiceLineItem_Invoice_LineType	InvoiceID, LineType	Supports invoice charge breakdowns.

16. PAYMENT

Stores payment transactions.

Column	Data Type	Key	Description
PaymentID	INT	PK	Unique payment identifier.
InvoiceID	INT	FK	Related invoice.
PaymentMethodID	INT	FK	Payment method used.
PaymentDate	DATE		Date payment was made.
Amount	DECIMAL(12,2)		Payment amount.
PaymentStatus	VARCHAR(20)		Approved, declined, pending, failed, reversed, etc.
TransactionRef	VARCHAR(100)		External transaction reference.

Suggested Indexes

Index Name	Columns	Purpose
IX_Payment_InvoiceID	InvoiceID	Supports invoice payment history.
IX_Payment_PaymentMethodID	PaymentMethodID	Supports payment method history.
IX_Payment_PaymentDate	PaymentDate	Supports payment reporting.
IX_Payment_Status	PaymentStatus	Supports failed/declined payment review.
IX_Payment_TransactionRef	TransactionRef	Supports payment reconciliation.

17. MARKETING_CAMPAIGN

Stores marketing campaign definitions.

Column	Data Type	Key	Description
CampaignID	INT	PK	Unique campaign identifier.
CampaignName	VARCHAR(150)		Campaign name.
CampaignType	VARCHAR(30)		Acquisition, retention, upgrade, win-back, etc.
Channel	VARCHAR(30)		Email, SMS, web, call center, social, print, etc.
StartDate	DATE		Campaign start date.
EndDate	DATE		Campaign end date.
Budget	DECIMAL(12,2)		Campaign budget.
Description	VARCHAR(255)		Campaign description.
Status	VARCHAR(20)		Planned, active, completed, cancelled, paused, etc.

Suggested Indexes

Index Name	Columns	Purpose
IX_MarketingCampaign_StartDate	StartDate	Supports campaign timeline reporting.
IX_MarketingCampaign_Status	Status	Supports active campaign filtering.
IX_MarketingCampaign_Channel	Channel	Supports channel performance reporting.
IX_MarketingCampaign_Type	CampaignType	Supports campaign category reporting.

18. CAMPAIGN_RESPONSE

Stores customer responses to marketing campaigns.

Column	Data Type	Key	Description
CampaignResponseID	INT	PK	Unique campaign response identifier.
CampaignID	INT	FK	Related campaign.
CustomerID	INT	FK	Related customer.
ResponseDate	DATE		Date response occurred.
ResponseType	VARCHAR(30)		Open, click, call, visit, inquiry, purchase, opt-out, etc.
ResponseStatus	VARCHAR(20)		New, processed, converted, ignored, etc.
Converted	BOOLEAN		Indicates whether the response converted.

Suggested Indexes

Index Name	Columns	Purpose
IX_CampaignResponse_CampaignID	CampaignID	Supports campaign response analysis.
IX_CampaignResponse_CustomerID	CustomerID	Supports customer marketing history.
IX_CampaignResponse_ResponseDate	ResponseDate	Supports response trend reporting.
IX_CampaignResponse_Campaign_Converted	CampaignID, Converted	Supports conversion reporting.

19. CUSTOMER_SEGMENT

Stores defined customer marketing segments.

Column	Data Type	Key	Description
SegmentID	INT	PK	Unique segment identifier.
SegmentName	VARCHAR(100)		Segment name.

Column	Data Type	Key	Description
SegmentDescription	VARCHAR(255)		Segment definition or description.
CreatedDate	DATE		Date segment was created.

Suggested Indexes

Index Name	Columns	Purpose
IX_CustomerSegment_Name	SegmentName	Supports segment lookup.
IX_CustomerSegment_CreatedDate	CreatedDate	Supports segment creation reporting.

20. CUSTOMER_SEGMENT_MEMBERSHIP

Associates' customers with marketing segments.

Column	Data Type	Key	Description
SegmentMemberID	INT	PK	Unique segment membership identifier.
SegmentID	INT	FK	Related segment.
CustomerID	INT	FK	Related customer.
DateAssigned	DATE		Date customer joined segment.
DateRemoved	DATE		Date customer left segment.

Suggested Indexes

Index Name	Columns	Purpose
IX_CustomerSegmentMembership_SegmentID	SegmentID	Supports segment membership lookup.
IX_CustomerSegmentMembership_CustomerID	CustomerID	Supports customer segment lookup.
IX_CustomerSegmentMembership_Segment_Customer	SegmentID, CustomerID	Prevents duplicate membership and supports joins.
IX_CustomerSegmentMembership_DateAssigned	DateAssigned	Supports segment growth reporting.

21. CUSTOMER_SUPPORT_CASE

Stores customer service, billing, technical, and device support cases.

Column	Data Type	Key	Description
CaseID	INT	PK	Unique support case identifier.
CustomerID	INT	FK	Related customer.
CaseNumber	VARCHAR(30)		Business-facing case number.
CaseType	VARCHAR(20)		Billing, service, device, technical, complaint, etc.
CaseStatus	VARCHAR(20)		Open, pending, resolved, closed, escalated, etc.
Priority	VARCHAR(20)		Low, medium, high, critical.
DateOpened	DATE		Date case was opened.
DateClosed	DATE		Date case was closed.
AssignedTo	VARCHAR(100)		Assigned employee, agent, or queue.

Suggested Indexes

Index Name	Columns	Purpose
IX_CustomerSupportCase_CustomerID	CustomerID	Supports customer case history.
UX_CustomerSupportCase_CaseNumber	CaseNumber	Supports case lookup.
IX_CustomerSupportCase_Status	CaseStatus	Supports open case reporting.
IX_CustomerSupportCase_Type	CaseType	Supports support category reporting.
IX_CustomerSupportCase_DateOpened	DateOpened	Supports case volume trends.
IX_CustomerSupportCase_AssignedTo	AssignedTo	Supports workload reporting.

22. CASE_INTERACTION

Stores individual interactions related to support cases.

Column	Data Type	Key	Description
CaseInteractionID	INT	PK	Unique case interaction identifier.
CaseID	INT	FK	Related support case.
InteractionDate	DATETIME		Date and time of interaction.
InteractionType	VARCHAR(20)		Call, chat, email, visit, note, etc.
Notes	VARCHAR(500)		Interaction notes.
Resolution	VARCHAR(255)		Resolution details.
HandledBy	VARCHAR(100)		Employee or agent who handled the interaction.

Suggested Indexes

Index Name	Columns	Purpose
IX_CaseInteraction_CaseID	CaseID	Supports case interaction history.

Index Name	Columns	Purpose
IX_CaseInteraction_Date	InteractionDate	Supports interaction timeline reporting.
IX_CaseInteraction_Type	InteractionType	Supports interaction channel analysis.
IX_CaseInteraction_HandledBy	HandledBy	Supports agent activity reporting.

23. SALES_OPPORTUNITY

Stores potential sales, upgrade, renewal, and retention opportunities.

Column	Data Type	Key	Description
OpportunityID	INT	PK	Unique opportunity identifier.
CustomerID	INT	FK	Related customer.
OpportunityName	VARCHAR(150)		Opportunity name.
OpportunityType	VARCHAR(20)		New sale, upgrade, renewal, win-back, cross-sell, etc.
Stage	VARCHAR(20)		Lead, qualify, propose, close, won, lost, etc.
EstimatedValue	DECIMAL(12,2)		Estimated opportunity value.
ProbabilityPercent	DECIMAL(5,2)		Estimated probability of closing.
ExpectedCloseDate	DATE		Expected close date.
Status	VARCHAR(20)		Open, won, lost, cancelled, etc.

Suggested Indexes

Index Name	Columns	Purpose
IX_SalesOpportunity_CustomerID	CustomerID	Supports customer opportunity history.
IX_SalesOpportunity_Stage	Stage	Supports sales pipeline reporting.
IX_SalesOpportunity_Status	Status	Supports open/won/lost opportunity filtering.
IX_SalesOpportunity_ExpectedCloseDate	ExpectedCloseDate	Supports sales forecasting.
IX_SalesOpportunity_Type	OpportunityType	Supports opportunity category analysis.

24. OPPORTUNITY_PRODUCT

Stores products and services associated with sales opportunities.

Column	Data Type	Key	Description
OpportunityProductID	INT	PK	Unique opportunity product identifier.
OpportunityID	INT	FK	Related sales opportunity.
ProductType	VARCHAR(20)		Plan, device, accessory, service, etc.
ProductID	INT		Identifier of related product, plan, or service.
Description	VARCHAR(255)		Product or service description.
Quantity	DECIMAL(18,4)		Quantity proposed.
UnitPrice	DECIMAL(12,2)		Proposed unit price.
Amount	DECIMAL(12,2)		Extended amount.

Suggested Indexes

Index Name	Columns	Purpose
IX_OpportunityProduct_OpportunityID	OpportunityID	Supports opportunity product detail lookup.
IX_OpportunityProduct_ProductType	ProductType	Supports product category reporting.
IX_OpportunityProduct_ProductID	ProductID	Supports product/service sales analysis.

General Indexing Notes

For a SQL Server implementation, every **primary key** should automatically receive a supporting index. Every **foreign key** should also receive a nonclustered index unless there is a strong reason not to. This model contains many parent-child relationships, so indexing foreign keys will improve joins, reporting queries, deletes, updates, and referential integrity checks.

Recommended general indexing rules:

Rule	Recommendation
Primary keys	Use clustered indexes on surrogate integer primary keys unless another clustering strategy is justified.
Foreign keys	Add nonclustered indexes on all foreign key columns.
Email and phone lookup	Index customer email, customer phone, contact email, and contact phone.
Status columns	Index frequently filtered status columns such as CustomerStatus, AccountStatus, Subscription Status, CaseStatus, and Campaign Status.
Date columns	Index major reporting dates such as InvoiceDate, PaymentDate, UsageDate, DateOpened, StartDate, and ResponseDate.
Large transaction tables	Consider partitioning high-volume tables such as Service_Usage, Invoice, Invoice_Line_Item, Payment, and Campaign_Response by date.
Unique business keys	Consider unique indexes on AccountNumber, InvoiceNumber, CaseNumber, IMEI, and TransactionRef where business rules allow.

High-Value Reporting Indexes

These indexes are especially useful for CRM, billing, customer care, and marketing analysis.

Table	Suggested Index	Business Purpose
Customer	LastName, FirstName	Customer service search.
Customer	PrimaryEmail	Email lookup and deduplication.
Customer_Address	PostalCode	Geographic marketing.
Customer_Demographics	AnnualIncomeRange, HouseholdSize	Demographic segmentation.
Customer_Account	AccountStatus, DateOpened	Account lifecycle reporting.
Service_Subscription	AccountID, Status	Active service lookup.
Service_Usage	SubscriptionID, UsageDate	Usage history reporting.
Invoice	AccountID, InvoiceDate	Billing history.
Payment	InvoiceID, PaymentDate	Payment history.
Marketing_Campaign	Channel, Status	Campaign performance.
Campaign_Response	CampaignID, Converted	Conversion analysis.
Customer_Support_Case	CustomerID, CaseStatus	Customer service history.
Sales_Opportunity	Stage, ExpectedCloseDate	Sales pipeline forecasting.

Summary

This logical CRM model supports a telecommunications business that sells cell phones, subscription plans, web access, messaging services, device leases, and device purchases. The data dictionary defines the logical structure of the model, while the suggested indexes support customer lookup, billing analysis, marketing segmentation, service usage reporting, support case management, and sales opportunity tracking.