NOVACOM TELECOMMUNICATIONS

Business Data Requirements & Definitions

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1. Business Glossary

This section defines key terminology used across NOVACOM's data warehouse and business operations. These terms ensure consistent understanding across teams including billing, customer service, network operations, and analytics.

ARPU (Average Revenue Per User)

A key performance indicator calculated as total revenue divided by the number of active subscribers during a given period. ARPU helps measure the revenue-generating capability of the customer base. Calculated monthly and annually. Linked to CRM_CUSTOMERS and BIL_INVOICES tables.

Churn Rate (Customer Attrition Rate)

The percentage of customers who discontinue service during a specific time period. Calculated as (Customers Lost / Total Customers at Start of Period) × 100. A critical metric for business health. High churn rates indicate customer satisfaction issues. Derived from CRM_CUSTOMERS.STATUS and PRV_SERVICE_ASSIGNMENTS.END_DATE fields.

MRR (Monthly Recurring Revenue)

The predictable revenue stream generated from active service subscriptions each month. Excludes one-time charges and usage-based fees. Calculated by summing PRV_SERVICES.MONTHLY_COST for all active PRV_SERVICE_ASSIGNMENTS. Foundation for financial forecasting and valuation.

Service Assignment (Customer Service Allocation)

The provisioning of a specific telecommunications service to a customer for a defined period. Tracked in PRV_SERVICE_ASSIGNMENTS table. Each assignment links a customer (CRM_CUSTOMERS) to a service offering (PRV_SERVICES) with start date, end date, and provisioning status.

Provisioning (Service Activation Process)

The technical process of configuring and activating network services for a customer. Includes equipment setup, network configuration, and service enablement. Status tracked through PRV_SERVICE_ASSIGNMENTS.PROVISIONING_STATUS field with values: Pending, Provisioned, Failed.

Network Uptime (Service Availability Percentage)

The percentage of time that network services are operational and available to customers. Calculated as ((Total Time - Outage Time) / Total Time) × 100. Measured from NWK_OUTAGES data. Critical for SLA compliance and customer satisfaction.

Customer Segment (Market Classification)

High-level categorization of customers into distinct groups based on business model and service needs. Values include Business (B2B enterprise customers) and Consumer (B2C residential customers). Stored in CRM_CUSTOMERS.CUSTOMER_SEGMENT. Drives pricing strategies and service offerings.

Customer Tier (Service Level Classification)

A ranking system that classifies customers based on value, loyalty, or service level. Common tiers: Gold (premium customers with highest value), Silver (mid-tier customers), Bronze (standard customers). Stored in CRM_CUSTOMERS.CUSTOMER_TIER. Influences support priority and promotional offerings.

Invoice Line Item (Billed Service Component)

An individual charge entry on a customer invoice representing a specific product, service, or fee. Each line item includes quantity, unit price, discounts, and taxes. Stored in BIL_INVOICE_ITEMS. Multiple line items aggregate to form the total invoice amount.

MAC Address (Media Access Control Address)

A unique hardware identifier assigned to network equipment for device identification and tracking. Format: six groups of two hexadecimal digits (e.g., 00:1B:44:11:3A:B7). Stored in NWK_EQUIPMENT.MAC_ADDRESS. Essential for network management and equipment inventory.

SLA (Service Level Agreement)

A contractual commitment defining expected service quality metrics including uptime guarantees, response times, and resolution timeframes. Typical telecom SLA: 99.9% uptime (43 minutes downtime/month). Violations may trigger service credits. Measured against NWK_OUTAGES and SUP_TICKETS data.

CLV (Customer Lifetime Value)

The predicted total revenue a customer will generate throughout their relationship with NOVACOM. Calculated as (Average Monthly Revenue × Average Customer Lifespan in Months) - Customer Acquisition Cost. Key metric for marketing ROI and customer retention investment decisions.

2. Business Rules & Data Quality Constraints

These rules define validation logic, business constraints, and data quality requirements that must be enforced across NOVACOM's systems. All rules are mandatory unless marked optional.

Invoice Integrity Rule [VALIDATION]

Every invoice (BIL_INVOICES) must have at least one associated line item (BIL_INVOICE_ITEMS). An invoice cannot exist without billing details. Validate: COUNT(BIL_INVOICE_ITEMS WHERE INVOICE_ID = X) >= 1 for each BIL_INVOICES record. System should reject invoice creation if no line items are present.

Invoice Total Calculation Rule [BUSINESS_LOGIC]

The TOTAL_AMOUNT on BIL_INVOICES must equal the sum of all LINE_TOTAL values from associated BIL_INVOICE_ITEMS before applying invoice-level discounts and taxes. Formula: TOTAL_AMOUNT = SUM(LINE_TOTAL) - DISCOUNT_AMOUNT + TAX_AMOUNT. Discrepancies indicate data corruption or calculation errors.

Payment Amount Constraint [CONSTRAINT]

A payment (BIL_PAYMENTS.AMOUNT) cannot exceed the remaining balance on its associated invoice. Validation: SUM(payments.AMOUNT) <= invoice.TOTAL_AMOUNT for each INVOICE_ID. Overpayments must be rejected or applied as account credit. Prevents financial discrepancies.

Discount Rate Boundary Rule [DATA_QUALITY]

All discount rates in BIL_INVOICE_ITEMS.DISCOUNT_RATE must be stored as decimal fractions between 0.0 and 1.0 inclusive. For example, a 15% discount = 0.15. Values outside [0, 1] are invalid. Validation: DISCOUNT_RATE >= 0 AND DISCOUNT_RATE <= 1.

Tax Rate Validation Rule [DATA_QUALITY]

Tax rates (BIL_INVOICE_ITEMS.TAX_RATE) must fall within acceptable bounds: 0.0 to 0.5 (0-50%). Standard rates: 0.05 (5%), 0.10 (10%), 0.20 (20%). Rates above 50% likely indicate data entry errors or incorrect decimal conversion. Validate: TAX_RATE >= 0 AND TAX_RATE <= 0.5.

Active Service Assignment Rule [BUSINESS_LOGIC]

A service assignment (PRV_SERVICE_ASSIGNMENTS) can only be created for customers with STATUS = 'Active' in CRM_CUSTOMERS table. Inactive customers cannot receive new services. Additionally, the service (PRV_SERVICES) must have ACTIVE_FLAG = true. Validate both conditions before assignment creation.

Service Assignment Date Logic [VALIDATION]

For any service assignment, START_DATE must precede END_DATE when END_DATE is not null. Active assignments have NULL END_DATE. Validation: END_DATE IS NULL OR END_DATE > START_DATE. Historical data integrity requires proper date ordering for billing and reporting accuracy.

Network Outage Duration Rule [BUSINESS_LOGIC]

All resolved outages (NWK_OUTAGES) must have END_TIME greater than START_TIME. The duration in minutes is calculated as TIMESTAMPDIFF(MINUTE, START_TIME, END_TIME). Negative or zero durations indicate data errors. Validation: END_TIME IS NULL OR END_TIME > START_TIME.

SLA Violation Threshold [BUSINESS_LOGIC]

Critical priority support tickets (SUP_TICKETS.PRIORITY = 'High') must be resolved within 4 hours of creation. Calculate: TIMESTAMPDIFF(HOUR, CREATED_AT, RESOLUTION_DATE) <= 4. Violations trigger automated escalation to management and may result in service credits to affected customers.

Customer Contact Uniqueness [DATA_QUALITY]

Each customer (CRM_CUSTOMERS) must have exactly one primary contact method marked with IS_PRIMARY = true in CRM_CONTACTS. Validation: COUNT(CRM_CONTACTS WHERE CUSTOMER_ID = X AND IS_PRIMARY = true) = 1. Multiple primary contacts or zero primary contacts violate data integrity.

Equipment Assignment Constraint [CONSTRAINT]

Network equipment (NWK_EQUIPMENT) can only be assigned to service assignments (PRV_SERVICE_ASSIGNMENTS) where PROVISIONING_STATUS = 'Provisioned'. Equipment cannot be allocated to pending or failed assignments. Validate: ASSIGNMENT_ID exists in PRV_SERVICE_ASSIGNMENTS with PROVISIONING_STATUS = 'Provisioned'.

3. Key Performance Indicators (KPIs) & Metrics

NOVACOM tracks the following metrics to measure business performance, operational efficiency, and customer satisfaction. Metrics are calculated daily, weekly, or monthly depending on business needs.

Monthly Recurring Revenue (MRR) [KPI]

Total predictable monthly revenue from active service subscriptions.

Formula: SUM(PRV_SERVICES.MONTHLY_COST) for all PRV_SERVICE_ASSIGNMENTS where STATUS = 'Active' and END_DATE IS NULL

Referenced Entities: PRV_SERVICES, PRV_SERVICE_ASSIGNMENTS

Customer Churn Rate [KPI]

Percentage of customers who canceled service during the month.

Formula: (COUNT(customers with END_DATE in current month) / COUNT(customers active at start of month)) × 100

Referenced Entities: CRM_CUSTOMERS, PRV_SERVICE_ASSIGNMENTS

Average Revenue Per User (ARPU) [PERFORMANCE]

Average monthly revenue generated per active customer.

Formula: Total Monthly Revenue / COUNT(active CRM_CUSTOMERS)

Referenced Entities: BIL_INVOICES, CRM_CUSTOMERS

Network Uptime Percentage [PERFORMANCE]

Percentage of time network services were available (non-outage time).

Formula: ((Total Minutes in Period - SUM(outage duration)) / Total Minutes in Period) × 100

Referenced Entities: NWK_OUTAGES

Customer Acquisition Cost (CAC) [KPI]

Average cost to acquire a new customer through marketing campaigns.

Formula: SUM(MKT_CAMPAIGNS.BUDGET) / COUNT(new customers acquired in period)

Referenced Entities: MKT_CAMPAIGNS, CRM_CUSTOMERS

Average Ticket Resolution Time [PERFORMANCE]

Mean time (in hours) to resolve customer support tickets.

Formula: AVG(TIMESTAMPDIFF(HOUR, CREATED_AT, RESOLUTION_DATE)) for closed SUP_TICKETS

Referenced Entities: SUP_TICKETS

Service Provisioning Success Rate [PERFORMANCE]

Percentage of service assignments successfully provisioned on first attempt.

Formula: (COUNT(PROVISIONING_STATUS = 'Provisioned') / COUNT(all assignments)) × 100

Referenced Entities: PRV_SERVICE_ASSIGNMENTS

Invoice Collection Rate [KPI]

Percentage of invoice amounts successfully collected through payments.

Formula: (SUM(BIL_PAYMENTS.AMOUNT) / SUM(BIL_INVOICES.TOTAL_AMOUNT)) × 100 for given period

Referenced Entities: BIL_INVOICES, BIL_PAYMENTS

Network Utilization Rate [MEASUREMENT]

Percentage of network capacity currently in use based on data consumption.

Formula: (SUM(NWK_USAGE.DATA_CONSUMED) / Total Network Capacity) × 100

Referenced Entities: NWK_USAGE

Customer Lifetime Value (CLV) [KPI]

Predicted total revenue from a customer over their entire relationship with NOVACOM.

Formula: (ARPU × Average Customer Lifespan in Months) - CAC

Referenced Entities: BIL_INVOICES, CRM_CUSTOMERS, MKT_CAMPAIGNS

4. Calculated Fields & Derived Metrics

These calculations derive new data points from existing fields. They are essential for analytics, reporting, and business intelligence. Calculations should be implemented consistently across all systems.

Invoice Line Total [DERIVED_FIELD]

Calculate the total charge for a single invoice line item after quantity, discount, and tax.

Formula: LINE_TOTAL = (UNIT_PRICE × QUANTITY × (1 - DISCOUNT_RATE)) × (1 + TAX_RATE)

Required Fields: BIL_INVOICE_ITEMS.UNIT_PRICE, QUANTITY, DISCOUNT_RATE, TAX_RATE

Business Use: Used for invoice generation and financial reporting.

Invoice Grand Total [AGGREGATION]

Calculate the final amount due on an invoice including all line items, discounts, and taxes.

Formula: GRAND_TOTAL = SUM(BIL_INVOICE_ITEMS.LINE_TOTAL for invoice) - BIL_INVOICES.DISCOUNT_AMOUNT + BIL_INVOICES.TAX_AMOUNT

Required Fields: BIL_INVOICE_ITEMS.LINE_TOTAL, BIL_INVOICES.DISCOUNT_AMOUNT, BIL_INVOICES.TAX_AMOUNT

Business Use: This is the amount the customer must pay. Should match BIL_INVOICES.TOTAL_AMOUNT.

Outstanding Invoice Balance [DERIVED_FIELD]

Calculate the remaining unpaid balance on an invoice after applying all payments.

Formula: OUTSTANDING_BALANCE = BIL_INVOICES.TOTAL_AMOUNT - SUM(BIL_PAYMENTS.AMOUNT WHERE INVOICE_ID = X)

Required Fields: BIL_INVOICES.TOTAL_AMOUNT, BIL_PAYMENTS.AMOUNT

Business Use: Used for accounts receivable tracking and collection processes.

Network Outage Duration (Minutes) [TRANSFORMATION]

Calculate the length of a network outage in minutes from start to end timestamps.

Formula: OUTAGE_DURATION_MINUTES = TIMESTAMPDIFF(MINUTE, START_TIME, END_TIME)

Required Fields: NWK_OUTAGES.START_TIME, NWK_OUTAGES.END_TIME

Business Use: Used for SLA compliance reporting and network reliability metrics.

Service Assignment Duration (Days) [TRANSFORMATION]

Calculate how long a service assignment has been or was active.

Formula: DURATION_DAYS = DATEDIFF(COALESCE(END_DATE, CURRENT_DATE), START_DATE)

Required Fields: PRV_SERVICE_ASSIGNMENTS.START_DATE, PRV_SERVICE_ASSIGNMENTS.END_DATE

Business Use: For active assignments, END_DATE is NULL so current date is used. Used for billing periods.

Customer Account Age (Months) [DERIVED_FIELD]

Calculate the number of months since a customer first joined NOVACOM.

Formula: ACCOUNT_AGE_MONTHS = TIMESTAMPDIFF(MONTH, CRM_CUSTOMERS.START_DATE, CURRENT_DATE)

Required Fields: CRM_CUSTOMERS.START_DATE

Business Use: Used for customer segmentation, loyalty programs, and churn prediction models.

Ticket Resolution Time (Hours) [TRANSFORMATION]

Calculate how long it took to resolve a support ticket from creation to resolution.

Formula: RESOLUTION_TIME_HOURS = TIMESTAMPDIFF(HOUR, CREATED_AT, RESOLUTION_DATE)

Required Fields: SUP_TICKETS.CREATED_AT, SUP_TICKETS.RESOLUTION_DATE

Business Use: NULL if ticket is still open. Used for SLA compliance and support team performance metrics.

Campaign ROI [FORMULA]

Calculate return on investment for a marketing campaign.

Formula: CAMPAIGN_ROI = ((Revenue from Campaign - Campaign Cost) / Campaign Cost) × 100

Required Fields: Revenue calculation uses MKT_CAMPAIGN_TARGETS.CUSTOMER_ID linked to BIL_INVOICES, compared to MKT_CAMPAIGNS.BUDGET

Business Use: Measures marketing effectiveness. Positive ROI indicates profitable campaigns.

Data Usage Cost per GB [DERIVED_FIELD]

Calculate the effective cost per gigabyte of data consumed by a service.

Formula: COST_PER_GB = NWK_USAGE.USAGE_COST / NWK_USAGE.DATA_CONSUMED (where USAGE_UNIT = 'GB')

Required Fields: NWK_USAGE.USAGE_COST, NWK_USAGE.DATA_CONSUMED, NWK_USAGE.USAGE_UNIT

Business Use: Used for pricing analysis and capacity planning. Helps identify cost-effective usage patterns.

Customer Payment Velocity [AGGREGATION]

Calculate average number of days between invoice date and payment date for a customer.

Formula: AVG_PAYMENT_DAYS = AVG(DATEDIFF(BIL_PAYMENTS.PAYMENT_DATE, BIL_INVOICES.INVOICE_DATE)) per customer

Required Fields: BIL_INVOICES.INVOICE_DATE, BIL_PAYMENTS.PAYMENT_DATE, joined by INVOICE_ID

Business Use: Identifies fast-paying vs slow-paying customers. Used for credit risk assessment.

Appendix: Data Model Overview

The NOVACOM data warehouse consists of interconnected subject areas covering Customer Relationship Management (CRM), Billing (BIL), Provisioning (PRV), Network Operations (NWK), Marketing (MKT), and Support (SUP). All definitions, rules, metrics, and calculations in this document reference entities and attributes from the following subject areas:

Subject Area	Tables	Primary Purpose
CRM	CRM_CUSTOMERS, CRM_ACCOUNTS, CRM_CONTACTS, CRM_OPPORTUNITIES	Customer master data, relationships, sales pipeline
Billing	BIL_INVOICES, BIL_INVOICE_ITEMS, BIL_PAYMENTS	Invoice generation, line items, payment tracking
Provisioning	PRV_SERVICES, PRV_SERVICE_ASSIGNMENTS	Service catalog, customer service activation
Network	NWK_EQUIPMENT, NWK_OUTAGES, NWK_USAGE	Equipment tracking, outage management, usage monitoring
Marketing	MKT_CAMPAIGNS, MKT_CAMPAIGN_TARGETS	Campaign management, customer targeting, ROI tracking
Support	SUP_TICKETS, SUP_TICKET_NOTES, SUP_KB_ARTICLES	Customer support ticketing, resolution tracking, knowledge base

Document Control: This document should be updated whenever new business rules, metrics, or definitions are added to the NOVACOM data model. Version history and change requests should be tracked through the data governance process.