IBM Telecommunications Data Warehouse
General Information Manual

IBM

Content

The Telecomunications Data Warehouse

The IBM® Telecommunication Data Warehouse (TDW) is a comprehensive set of business models that represent best practice in Telecommunication Services. The TDW provides an information architecture blueprint with detailed business content that can be applied to many different types of initiatives on an enterprise-wide basis or a specific project scope. The TDW contains an enterprise-wide ontology which is used to precisely define the meaning of the many concepts that make up the Communication Service Provider's core information and its business environment.

The Telecomunications Market

A strategic imperative for Service Providers today is managing the relentless change being driven across the business by technology advancement and convergence, deregulation and increased value chain complexity (e.g., ever increasing competition, Interconnected Next Generation Networks, Service Level Optimization, Syndicated Content and Billing, Process Assurance, etc..) The Information Technology required to support Service Providers is growing in complexity and cost with the business models. Service Providers must respond to external market forces while at the same transforming their legacy business models becoming more agile, dynamic and transparent. Specifically, data management in such an environment where Operation Support Systems (OSS) and Business Support Systems (BSS) source systems and the requirements and scope of the lines of business and functions are continuously evolving is extremely challenging.

The lack of standard business definitions is continuing to inhibit business transformation in Telecommunications:

- Service Providers would like to respond in real-time to market demand and threats by integrating touch points in order to improve cross-sell/up-sell uptake, increase account penetration and improve customer value contribution. But high data latency and their lack of common customer identifiers across lines of business and regions limit opportunity detection and expose them to data privacy and non-solicitation compliance risks.
- Service Providers would like to accelerate Product Lifecycle Management, reducing time-to-market and time-to-bid for new product offerings and custom solutions. But, their of lack reusable product components degrades their bidding, order entry, provisioning and billing processes.
- Service Providers would like to optimize the parallel cost and capital base re-engineering, consolidating and in some cases outsourcing legacy OSS/BSS processes. But divergent data standards across lines of business, regions and functions inhibit such cost optimizations.
- Service Providers face increasing process assurance requirements especially related to financial reporting and revenue tracking. But inconsistent KPI reporting and the lack of a chain of custody for financial detail and other performance data makes complete compliance difficult if not impossible.
- Service Providers would like to reposition in the value net to optimize their risk/profit balance. But they have not reached sufficient agreements with their interconnect and roaming partners as well as the supply and distribution chain (i.e., content, service and equipment providers, MVNOs and value-added resellers) regarding data standards.

Making better decisions faster can be the sole difference between surviving and thriving in an increasingly competitive communications marketplace. Service Providers rely on data warehouses, Business Intelligence (BI) and related data management solutions to make the decisions required to support and transform their business models. In the end, volatility in the business environment is driving upgrades in the OSS/BSS and continuous evolution of information requirements. These changes will in turn affect any data management solution. Therefore, realizing benefits from business transformations in telecommunications can be very challenging without enterprise data standards.

Clients are increasingly turning to data management solutions based on the TDW industry standard data model and solution templates. These model templates enable Service Providers to exploit the potential of non-standard information locked in legacy systems or summarized and distributed in data marts reducing project schedules, cost and risk. For example, data model and Analytical Requirements have been shown to reduce development effort by as much as 50%.

Uses of the IBM Telecomunications Data Warehouse

- Common Customer View. Integrating customer identifiers, organizational structures and account hierarchies across lines of business and functions.
- Product Lifecycle Management. Integrating product management and performance measurement across lines of business and functions.
- Campaign Performance Management. Improving program planning and tracking of sales and marketing activities and performance metrics across channels and touch points.
- Analytical Customer Relationship Management. Integrating Customer Segmentation, Data Mining, Online Analytical Processing (OLAP) and Campaign Management in Closed-loop CRM.
- OSS/BSS Re-engineering. Standardizing legacy data for migration to Next Generation Operational Support Systems (NGOSS) (e.g., billing consolidation).
- Data Warehouse and Data Mart Consolidation. Re-engineering legacy data warehouse and BI infrastructure consolidating data repositories and analytical reporting requirements
- Other Data Management Solutions. Establishing data architectures for Enterprise Application Integration (EAI), Service Oriented Architectures (SOA) and other near real-time data analysis (e.g., operational data stores for fraud management).

Data Integration and BI Self Service

The TDW is designed with data integration and change management at their core. Service providers who implement data models biased towards their existing OSS/BSS source systems and BI requirements typically fail to integrate the data and make query development much more difficult for IT as well as business end users.

TDW enables Service Providers to create BI self-service models that clearly separate the responsibility for data integration from the responsibility for business analytics. TDW enables IT departments to take the lead in maintaining the integration of volatile source data with the TDWM. This enables the Lines of Business to focus on defining analytical requirements, priorities and designs using Telecomunication Analytical Requirementss.

Re-engineering

TDW also offers an iterative, project-by-project approach for re-engineering an existing data warehouse or other OSS/BSS applications based on cost/benefit analysis that assures a phased procession of low-risk, high-return projects well aligned with business priorities.

Business Advantages of the TDW

The data warehouse designed with TDW will enable organizations to not only respond positively to the pressures they face but actually translate these pressures into business advantage. There are several areas of business advantage which can be leveraged by the construction of a TDW-based data warehouse:

Profit Improvement	Gained from increasing the velocity, rationing and targeting of marketing programs and incentives to customer segments with proven contribution potential
Customer Intelligence	Gained from understanding subscriber value across lifecycles and product lines. Improved response to customer needs using proactive and reactive programs focused on building and retaining a valuable subscriber base.
Operational Efficiencies and Risk Mitigation	Gained from improvements in process assurance and the minimization of operational risks (e.g., credit management)
Profit	Gained from transaction / service costing, pricing / costing rules, actual charges and discounts, historical activity and price performance etc.
Competitive Advantage	Gained from better understanding the customer's total telecommunications wallet and identifying and reacting to usage defection across the service and content value-net

Building a Data Warehouse

If the benefits of business transformation through improved data management are to be achieved, a comprehensive specification of the organization's data and analytical requirements is required. In fact, the data and solutions models should be independent of the volatile OSS/BSS data architecture and current analytical reporting requirements. Designing and implementing such data and solution models can be a complex process and many organizations may not have the appropriate skills available in-house. The best practice solution is to leverage the data and solution model templates from 3rd parties reducing project risk, cost and time-to-implementation.

The TDW enables Service Providers to build data warehouse solutions to suit their specific needs. TDW includes all of the key components required for a data warehousing solution.

TDW comprises a flexible and scalable data warehouse infrastructure, enabling Service Providers to build both comprehensive enterprise data warehouses as well as departmental data marts through rapid, phased development. TDW unleashes data management solutions with high business value by enabling Service Providers to initially focus on business areas offering the greatest returns and technical feasibility. This approach assures that parallel (or subsequent) projects will be aligned with a single, proven data architecture.

TDW Solution Architecture

Data warehousing and Business Intelligence solutions have two basic assumptions: 1) that line of business and functional users have a set of analytical reporting requirements to fulfill and 2) that a set of data is available to draw the information from.

These two assumptions represent two divergent approaches to define project scope. The first is a "top-down" business-oriented approach, while the second is a "bottom-up" data driven approach. Best Practice is to employ a combined approach and a gap analysis to determine the final project scope as well as 1) instances where there is no data to satisfy specific business requirements and 2) instances where there are no identified business use cases for certain data sets in the source systems.

TDW Solution Architecture
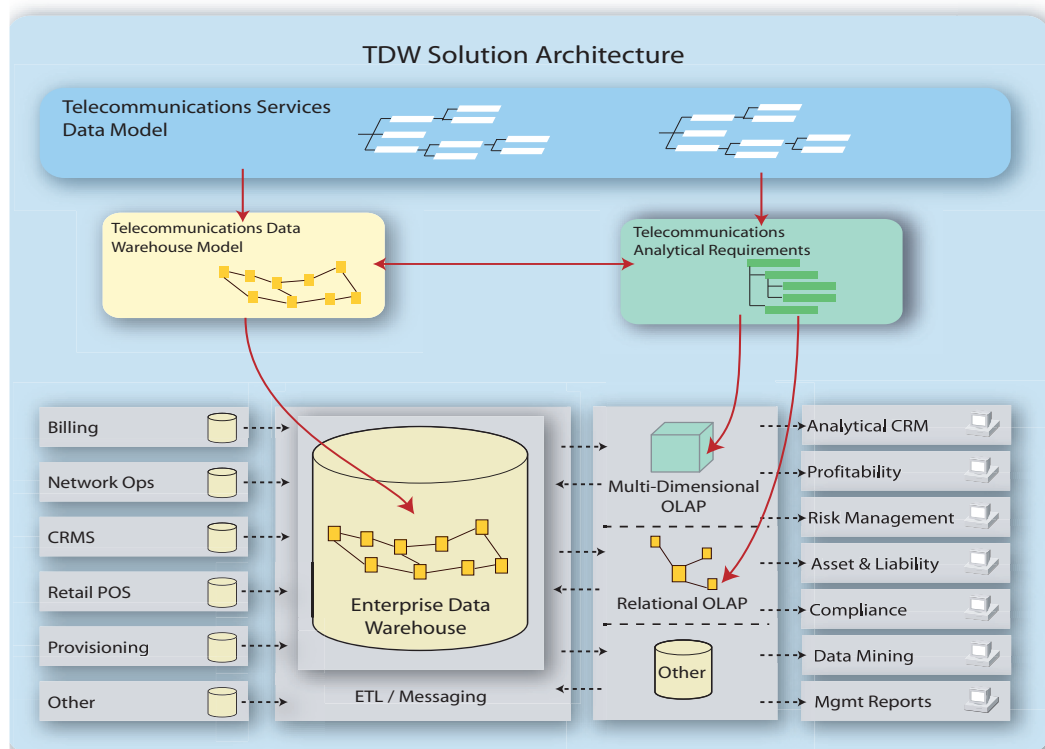
TDW Components

The TDW is composed of 3 components which assist with analytical BI: The Telecommunications Data Warehouse Model (TDWM), the Telecommunications Services Data Model (TSDM) and the Telecomunication Analytical Requirements.

Telecommunications Services Data Model

The TSDM is an enterprise Industry Model. It is a customizable hierarchy of business terms and definitions that provides a direct link between analytical requirements, data concepts and a Service Provider's OSS/BSS environment. The content and usage of the TSDM are described in detail in the Telecommunications Services Data Model section.

Telecommunications Data Warehouse Model

The TDWM provides a highly normalized and generic, enterprise entity relationship diagram (i.e., ERD) for a variety of Telecommunications data management solutions. Comprising over 800 entities and 3000 attributes it forms the blueprint for implementing a data warehouse. The TDWM supports rapid, phased implementation of data management solutions with a well defined, proven data model. The content and customization of the TDWM are described in detail in the Telecommunications Data Warehouse Model section.
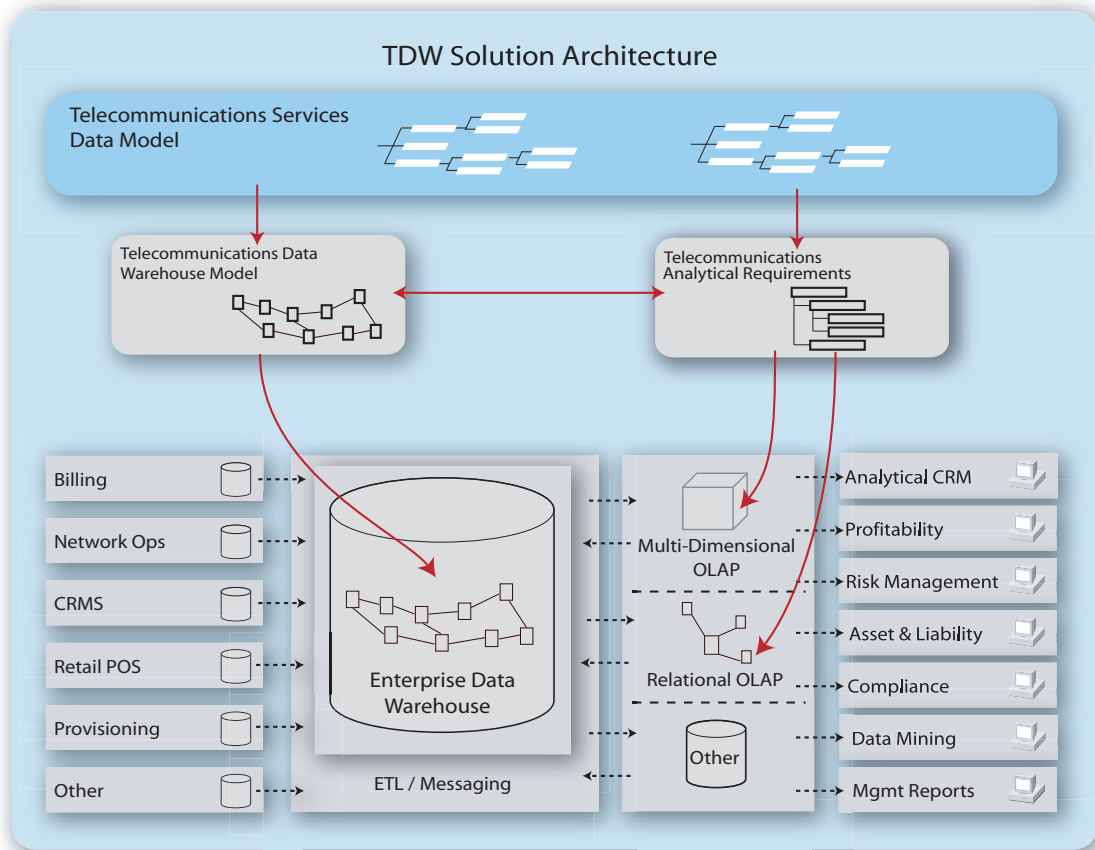
Telecommunications Analytical Requirements

The Analytical Requirements consist of about 75 best practice business scorecards grouped by reporting area. Analytical Requirements provide immediate benefits to a Business Intelligence initiative in two ways. First, they provide a proven means for gathering business requirements through customizing a range of predefined OLAP models. Second, once customized, the modified Analytical Requirements then provide design templates for the physical generation of MOLAP cubes and ROLAP reports. Telecommunication Analytical Requirements enable business users to more efficiently manage the scope and design of a data warehousing development or re-engineering project. The content and usage of Analytical Requirements are described in detail in the Telecommunications Analytical Requirements section

TDW Customization

- Use the Analytical Requirements to interview the lines of business and gather business requirements. This provides a "top-down" project scope based on overlapping business requirements. (i.e., many requirements refer to the same set of measures and dimensions).
- Use the TSDM to profile candidate source systems in order to define the data scope.
- Perform a gap analysis between the data scope and business scope to determine overall feasibility and the reduced project scope. Then instead of data modeling, we customize the TDWM System of Record and summary tables based on the reduced project scope. This is the initial guide for ETL design.
- Use the customized Telecomunication Analytical Requirements to design MOLAP cubes and dependent ROLAP reports.
- The ETL programmers will continue to refine the TDWM System of Record model during ETL design and testing by adding additional subtypes and attributes. The highly normalized nature of the TDWM allows for this type of parallel ETL development without breaking other ETL processes and BI applications under development.

IBM Telecommunications Services Data Model

TDW Solution Architecture

Telecommunications Services Data Model

Telecommunications Data Warehouse Model

Telecommunications Analytical Requirements

Billing
Network Ops
CRMS
Retail POS
Provisioning
Other

Enterprise Data Warehouse

ETL / Messaging

Multi-Dimensional OLAP

Relational OLAP

Other

Analytical CRM
Profitability
Risk Management
Asset & Liability
Compliance
Data Mining
Mgmt Reports

What is the Telecommunications Services Data Model?

The Telecommunications Services Data Model (TSDM) is a classification model designed specifically for the Telecommunications industry, containing thousands of carefully constructed business definitions reflecting many person-years of analysis. It provides an enterprise-wide view of generic information concepts in Telecommunications.

The TSDM has been developed to provide a Service Provider with a "jump start" in its model development process and assist in maximizing the value of information. The TSDM is a generic model, defining data that is common between Service Providers. The information reflected in the model is independent of organizational structure and has been validated by multiple Service Providers.

The TSDM is a business model that:
- Provides a vehicle for merging requirements of existing models
- Is designed for stability, flexibility and reusability
- Is designed to incorporate classification, inheritance

Using this model, the information management team can be pro-active in supporting a Service Provider's response to the dramatic changes that are driving the Telecommunications industry.

The TSDM represents at least 80% of the information captured by the OSS/BSS applications that support a Service Provider's core business. The TSDM is not simply a bland listing of data types and definitions. The structure of the model is designed to address some of the key issues facing Service Providers in the current environment of deregulation, competition and accelerating technological change.

The TSDM is structured in a hierarchical, 'top to bottom' structure with multiple layers of business content models containing industry standard business definitions. Each layer of the structure contains a model that provides more detailed view based on the previous layer.

Issues the TSDM Addresses

Improved customer care

The TSDM reflects the complex inter-relationships that exist between customers and between customers and the Service Provider. It distinguishes between the natures of the customers themselves and the relationship the customer has with the Service Provider. The TSDM is therefore a pivotal component in the Service Provider's response to changing market dynamics. It enables the business to refine its approach to the management of customer relationships while providing information systems staff with a blueprint for integrated customer care systems.

Rapid development of new products

The TSDM recognizes that products should be rapidly assembled from reusable components. It maintains the distinction between sales and marketing products templates offered, technical product instances provisioned and the views of product required for financial reports. Further, it recognizes the complex ways in which a product may be acquired by a customer and then operated in the field. By clarifying the distinction between a technical, marketing and financial products, the TSDM enables the Service Provider to plan and manage the increasingly complex relationships between product offered, the resources required to enable those products and product usage that materially affects the financial standing of the business

Complex relationships with competitors

The TSDM recognizes that competitors are also customers and, on occasion, strategic partners. It allows for these changing roles and the policies, regulations and agreements that impact these roles.

Integration of business and engineering

The TSDM does not differentiate data by source system. The model reflects a fully integrated view of data accessible by all segments of the business. The model focuses on providing the Service Provider with a means of understanding the different facets of each business challenge, and how those facets can then be combined into a solution. It cuts through the confusion of OSS/BSS applications and provides the path to co-ordination across lines of business and functional areas.

TSDM Benefits

The TSDM has been developed with the assistance of Telecommunication professionals. The structure, especially that of the business model, has been designed to facilitate the understanding and navigation of the model by those who may have had minimal exposure to data modeling. At the same time, the structure and rigor of the TSDM satisfies the needs of Business Analysts. Consequently, the TSDM provides a communication bridge between the data warehousing project team and OSS/ BSS technical staff as well as Line of Business and Functional users.

In Addition:
* It fully complements the TDWM
* It provides a structured starting point to integrate data and process
* It provides a generic specification of data that helps to reduce redundancy and inconsistency across the enterprise
* It provides common definitions for increasing reuse of data elements
* It accelerates the application development life cycle reducing development costs and project schedules
* It provides a consistent data architecture for modeling new or changed requirements
* It provides a single framework that incorporates both detail data, business rules and analytical requirements
* It focuses the development effort on validating, enhancing and extending data requirements rather than labor-intensive data modeling

The TSDM Nine Data Concepts

Arrangement	Arrangement (AR) represents an agreement, either potential or actual, involving two or more Involved Parties, that provides and affirms the rules and obligations associated with the sale, exchange or provision of goods and services. Subtypes include: • Account Arrangement • Billing Arrangement • Payment Arrangement • Pricing Arrangement • Provisioning Arrangement • Telephony Arrangement • Service Level Agreement • Employment Arrangement

Business Direction Item	Business Direction Item (BD) records an expression of an Involved Party's intent. These directions provide a clear and concise definition of an Involved Party's mission, values, policies and procedures, regulations, goals, strategies, key success factors, assumptions, measures, financial forecasts and business plans. Subtypes include:
	• Assumption
	• Plan
	• Schedule
	• Target
	  • Budget Item
	  • Forecast
	  • Objective

Condition	Condition (CD) describes the specific requirements that pertain to how the business of a Service Provider is conducted and includes information such as prerequisite or qualification criteria and restrictions or limits associated with these requirements. Subtypes include:
	• Rate
	  • Billing Rate
	  • Charging Rate
	  • Exchange Rate
	• Product Rate Plan
	• Period
	• Conditional Numeric Range
	• Condition Temporal Range

Classification	Classification (CL) identifies a value or qualifier that is a member of a category of data. The purpose of the Classification entity is to provide a means by which the Service Provider may categorize information in the warehouse. Subtypes include:
	• Account Type
	• Product Type
	• Event Type
	• Unit of Measure
	• Segment
	  • Involved Party Group
	    • Demographic Segment
	    • Industry Classification

Event	Event (EV) includes communications, accounting and maintenance transactions and posting entries. Customers, employees, business partners and other Involved Parties initiate actions with the Service Provider across the Service Delivery Lifecycle. Subtypes Include:
	• Campaign
	• Product Offering
	• Product Order
	• Work Order
	  • Installation
	• Service Usage
	• Communication
	  • Customer Invoice
	Financial Transaction

Involved Party	Involved Party (IP) identifies any Individual, group of Individuals, Organization, Organization Unit or Employment Position about which the Service Provider wishes to keep information. Subtypes include: • Individual • Organization • Organization Unit • Household • Employment Position

Location	Location (LO) describes a place where something can be found, an address or a bounded area, such as a country or state. Subtypes include:
	
	• Geographic Area
	  • Rate Area
	  • Service Area
	  • Roaming Area
	  • Sales Area
	  • Postcode Area
	• Address
	  • Geographic Point
	  • Electronic Address
	    • Email Address
	    • Web Address
	    • IP Address
	    • Telephonic Address

Product	Product (PD) describes the services, merchandise or facilities that can be offered, sold or purchased by the Service Provider, its competitors and other Involved Parties during the normal course of its business. Product also includes non-telecom goods and services that are of interest to the Service Provider. Subtypes include: • Customer Premises Equipment • Customer Solution • Service Level • Content • Application Service • Value Added Service • Product Mix • Product Group

Resource Item	Resource Item (RI) identifies a logical or physical item of value that is of interest to the Service Provider. Subtypes include:
	
	• Network
	• Network Component
	  • Termination Point
	  • Node
	• Equipment Items
	  • Network Equipment
	  • Access Device
	    • NIC
	    • Telephone Socket

# IBM Telecommunication Data Warehouse Model
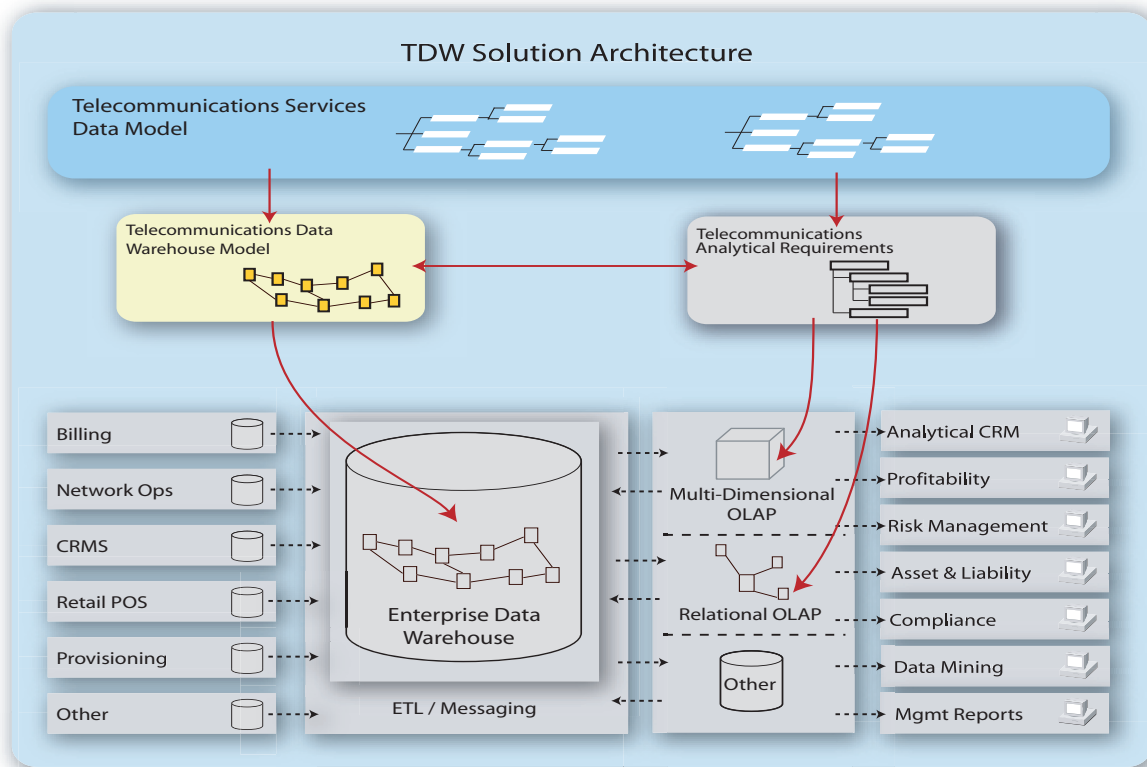
What is the Telecommunications Data Warehouse Model?

It is a logical model consisting of more than 80% of the data structures typically needed by an Service Provider for a data warehouse. This model can be automatically generated into a physical data warehouse database once it has been customized to meet the exact requirements of the Service Provider.

A logical model is a representation of a Service Provider's data or information requirements and is usually represented in an Entity Relationship Diagram (ERD), with business definitions. The data needs are represented without consideration for technology constraints associated with platforms, tools, and software or how the application will be finally implemented. It is generic and flexible in design and facilitates consistent understanding of the meaning of a Service Provider's data.

An example of an ERD from the TDWM is shown:
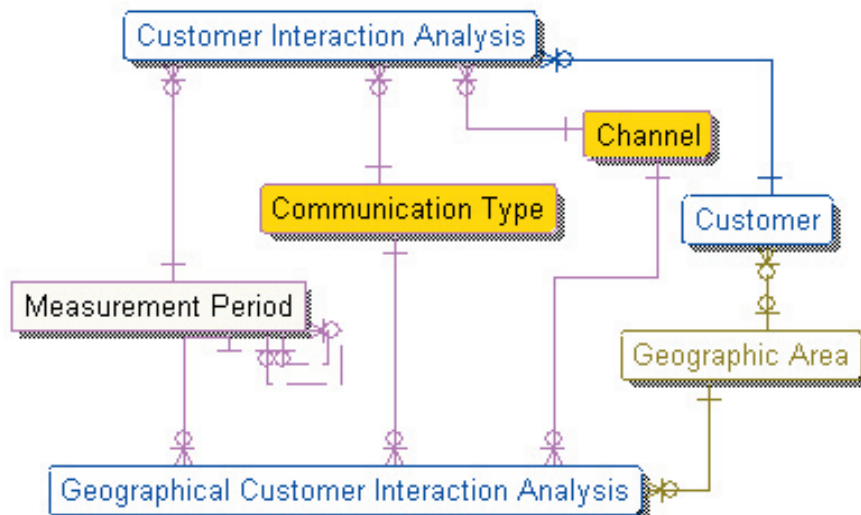
The TDWM features a flexible "System of Record" (the primary data storage area) as well as the summary tables typically needed by Service Providers to aggregate detail data for analytical purposes. The TDWM has been designed to be "one-step" from physical data base generation. Normally, only a portion of the TDWM is generated in the initial project phase. Over time other areas can be incrementally generated as the Service Provider tackles more source systems and/or business areas.

This comprehensive data model is derived from IBM's highly successful Telecommunications Services Data Model (TSDM), which as described previously, and can be used as the basis for supporting a detailed analysis of the business areas of most concern to Service Providers today.

Uses of the TDWM

The TDWM can be used as:

- The blueprint for a design of an enterprise data warehouse. In this case the TDWM will assist in the creation of a flexible and extensible data warehouse platform-specific physical database.
- A neutral reference point for consolidating multiple legacy data warehouses across lines of business or in the case of mergers and acquisitions
- A data structure template for near real-time data management solutions for the to support specific business applications (e.g. CRM).

Benefits of the TDWM

- Enables phased implementation based on prioritized business requirements
- Easy subsequent customization and extension of the data warehouse
- Combines both third normal form and star schema data model designs

Major Groupings in the TDWM

The TDWM has major groupings based on the intended usage of items within a data warehouse environment. These groupings are the System of Record, the Summary Area and the Analysis Area that are now described:

System of Record

This is the component of the data warehouse that acts as the primary storage area for detailed information. Typically this System of Record is populated by Extract, Transform and Load (ETL) processes from operational data in the Change Data Capture Staging Area.Typical components, or entities, of the System of Record are:

Campaign	Campaign identifies a process the Service Provider undertakes in order to accomplish specific business defined objectives. A Campaign is generally addressed to a Segment of the Service Provider's potential and actual customers.
Channel	Channel identifies the different delivery and communications mechanisms through which products and services are made available to a Customer and by which the Service Provider and Customers communicate with each other. A Channel is a role played by either an Involved Party (e.g. Employee, Organization Unit) or a Resource Item (e.g. a Network Segment, a Website). The lowest granularity of Channel required will be a matter of choice for the Service Provider. Some may wish to just identify 'Phone Booths' (one single Resource Item) as a Channel, whereas others will wish to be able to identify each individual Phone Booth (each a Resource Item). A Call Center (an Organization Unit) may be sufficient granularity as a Channel in some cases - others will require recording of each Call Center operative (Employees). Where a given Involved Party or Resource Item instance is capable of both receiving or distributing services, it may be appropriate to associate that instance with two Channels. For example, a Call Center Employment Position may be part of the 'Call Center Receipt' Channel for Service Orders, but part of the 'Call Center Distribution' Channel for Product Campaigns.

Customer	A Customer is a role played by an Involved Party that is considered to be receiving services or products from the Service Provider, or who is a potential recipient of such services or products.
Network Component	Network Component is an Electronic Delivery Device that is a logical grouping of Network Equipment items into the levels at which the Network is managed. A set of Network Components connected together forms a telecommunications network. Network Component represents the logical components of the Network, and are physically implemented by Network Equipment items. Several Network Equipment items may combine to create a single logical Network Component
Segment	Segment is concerned with the various ways in which items are grouped. The current implementation, being Data warehouse oriented, concentrates on Segments of Involved Parties (Market Segments) and Segments of Products (Product Groups). Segment is a structure used to hold these two different concepts in one place in order to reuse common data structures.
Service Usage	Service Usage identifies an Event that involves usage of a telecommunications service; for example, a Facsimile transmission, a local call. The Service Usage encompasses the entire duration of the usage. Service Usage is used to capture any usage by any Involved Party of any Service Provider product or service. As such, it is a key entity for providing analytical data to measure usage, profitability or service quality, for example.
Financial Transaction	Financial Transaction identifies an Event which represents the recording of all levels of business work that change the Service Provider's financial position or information base; for example, the Transaction #456 'Bill Refund' is the result of John Doe's 'Complaint' (Communication #342) to the Service Provider about overcharges on his telephony account (Arrangement #456123), Transaction #321 is the recording of Jane Doe's 'Top-Up' of prepaid credit from an ATM on April 17, 2001. Note that all Financial Transactions, including currently stored and archived, may additionally be summarized in the various Summary entities.

Summary Area

This area contains summaries and aggregations that are commonly used in data warehouses developed for Service Providers. These summary entities may be populated by aggregating in the System of Record or they may be obtained pre-aggregated from operational systems (e.g., G/L account balances). Creating and maintaining such summaries in the data warehouse facilitates a level of reuse that improves query performance, reduces overall system load and improves consistency in analysis. Summary entities are designed to store key metrics (e.g., ARPU) and status indicators (e.g., 'active subscriber) on a periodic basis. Typical components, or entities, of the Summary Area include:

Monitoring Unit Summary	We use Monitoring Unit Summary to append data summarized, aggregated or derived by a data warehouse load process.
Monitoring Unit Balance	We use Monitoring Unit Balance to append summarized, aggregated or derived data loaded as facts from valid operational sources. (e.g., the General Ledger)

|	
Arrangement Summary	The Arrangement Summary is a Monitoring Unit Summary used to store aggregates at the Arrangement level (such as the credits, debits and outstanding balance on billing accounts). Once the summary is calculated at the Arrangement level it is then possible to roll-up these summaries into larger Arrangements Groups based on dimensions such as Involved Party, Organization Unit, Product, Channel, etc.
Campaign Summary	The Campaign Summary is a Monitoring Unit Summary used to track the various internal and external marketing events and segmentations that the Service Provider undertakes in order to promote its Products and other aspects of its business. The Campaign Summary entities enable the Service Provider to monitor the effectiveness of such Campaigns, as well as the cost of each.
Involved Party Summary	Some of the subtypes of Involved Party would typically require periodic summaries. The Involved Party Summary is required for Customer and Organization Unit. The purpose of such summaries is to record key indicators for the relevant item.
Product Summary	It is important for Service Providers to measure the effectiveness of their Products in terms of profitability, usage, etc. The Product Summary entities in this Subject Area provide the mechanisms to do this task.
Segment Summary	A Segment is concerned with the various ways in which items are grouped. Examples include: Involved Party Segments, Market Segments, Product Segments and Network Segments. Segment Summaries are structures used to hold aggregated metrics of different segments

Analysis Area

This is the component of the data warehouse that prepares the data initially stored in the System of Record for subsequent distribution to MOLAP cubes or regional ROLAP data mart. The entities in the Analysis Area consist of fact and dimension tables in Snowflake designs. Typical components, or entities, of the Analysis Area are grouped under the following headings:

- Operations
- Yield Management
- Credit Risk Management
- Customer Segmentation
- Service Quality Management

These are described in more detail in the IBM Telecommunications Analytical Requirements section.
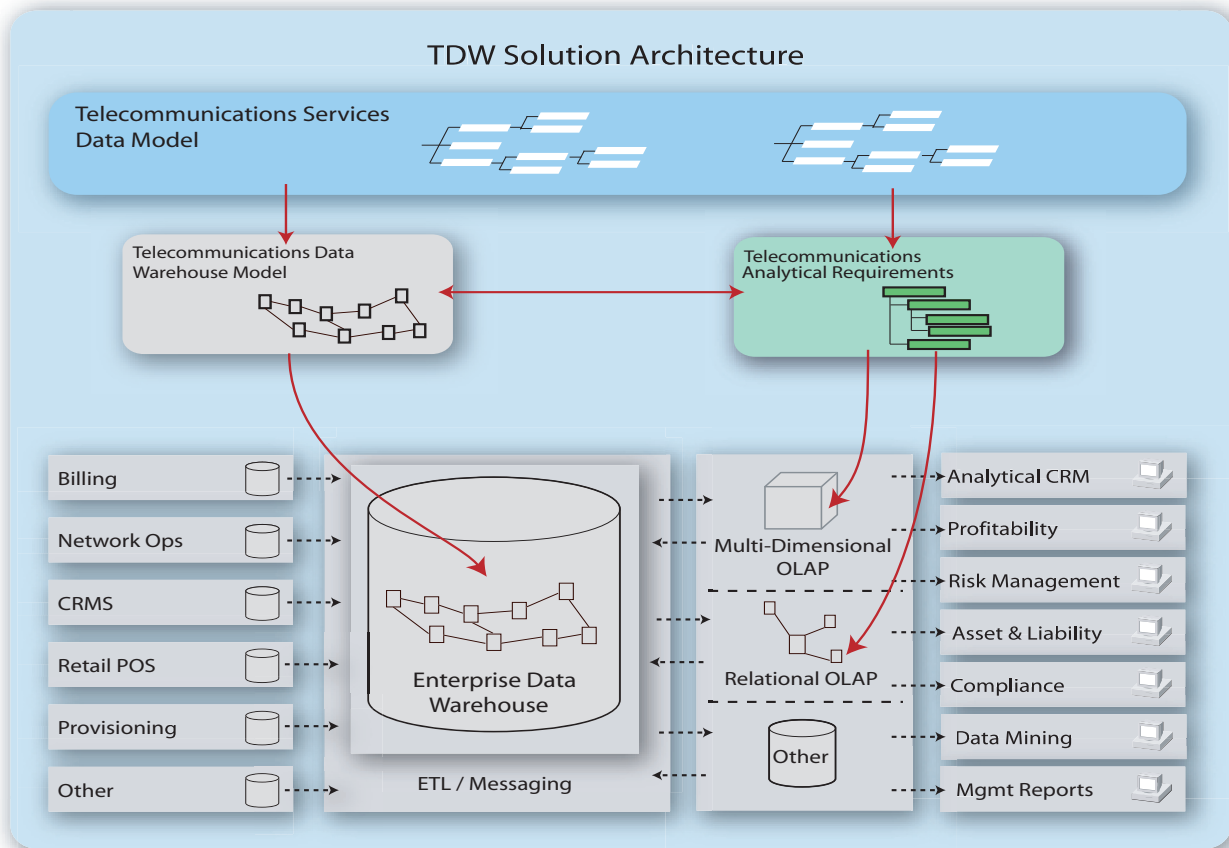
What are the Telecommunications Analytical Requirements?

The IBM Telecommunications Data Warehouse incorporates a set of pre-design Business Intelligence solutions called Telecommunications Analytical Requirements that enables business managers to quickly and easily specify analytical reporting requirements. Each Analytical Requirement consists of a series of measures and dimensions. A measure is an item that business users wish to track, for example: Number of Customers or Profitability. A dimension is something by which users want to sub-divide or sub-categorize measures (e.g., Number of Customers by Customer Segment, Income Contribution by Product).

The Telecommunication Analytical Requirements provide the framework to rapidly define and deliver high value Business Intelligence applications. Business users can easily work with Analytical Requirements to specify their own analytical reporting requirements. Prototype OLAP applications can then be generated automatically based on the customized Analytical Requirements.

Because the Telecommunication Analytical Requirements are mapped to the Telecommunications Data Warehouse Model, the scoping performed by business users will also be reflected in the TDWM, enabling rapid scoping of the data warehouse based on business user requirements.

The following diagram shows an example of the "Product Profitability" Telecommunication Analytical Requirements. This example would generate a prototype data mart for the analysis of Product Profitability. Business users can do period-to-period comparisons of Total Network Costs by Time, Product and Line of Business.

Analytical Requirements can be used as the design for MOLAP data mart designs. Once these cubes have been populated from the data warehouse it is then possible to create a range of reports and charts. Here are some examples of the type of reports possible:

Inbound Roamer Billed Volume
Analyzes the volume of billing usage of inbound roamers by day-of-week and time-of-day.
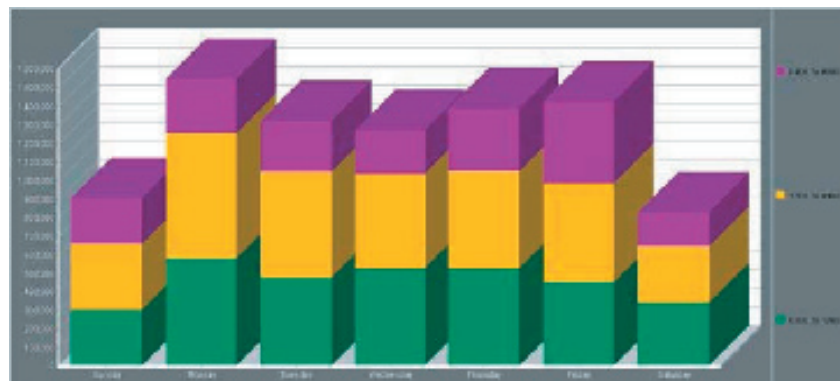
SMS Billed Usage
Analyzes the volume of short message service usage by SMS type (i.e. SMS, I OSMS, ISMS, RSMS) and terminating service provider
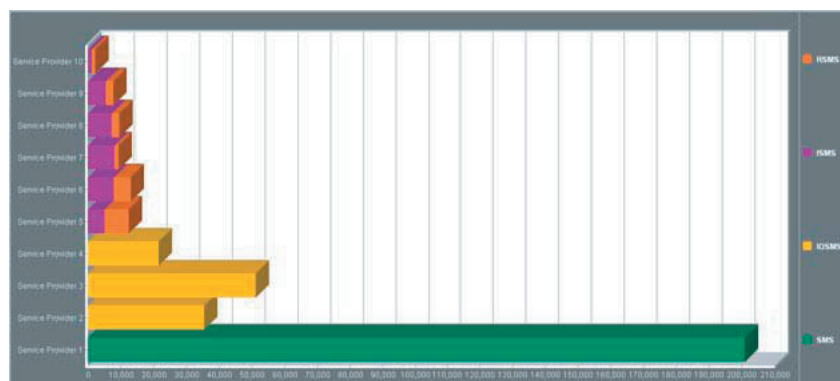
NLD Defection

Analyzes the volume of outbound national long distance calls using a competitor's gateway and terminating service area.
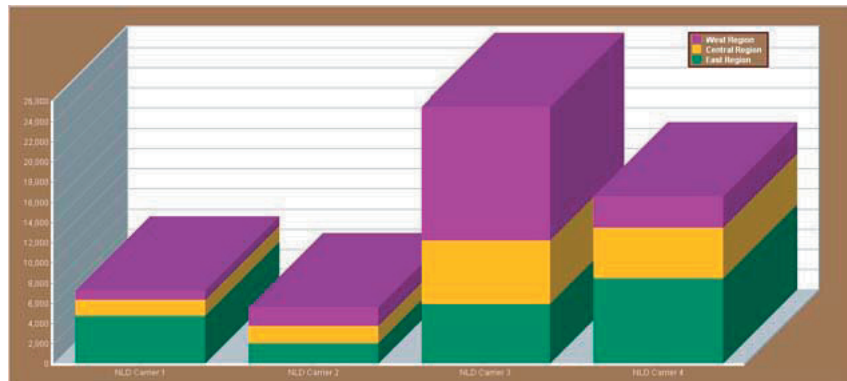
NLD Usage Report

Analyzes the volume of outbound national long distance usage by day-of-week and network ownership.
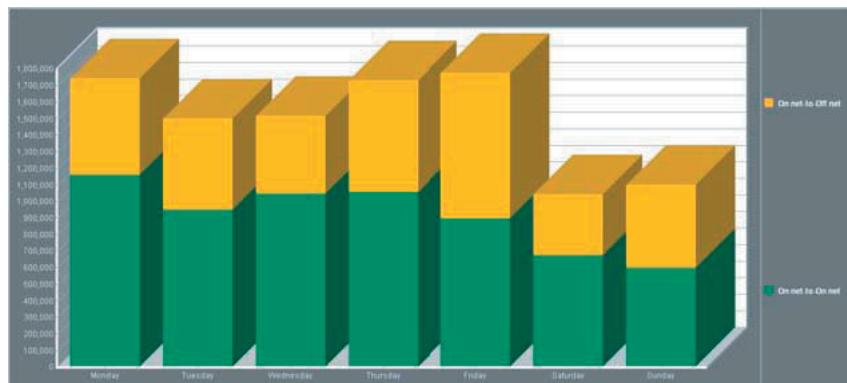
Local Voice Bill-to-Revenue

Analyzes bill-to-revenue for local voice calls by day-of-week and time-of-day

Wireless ARPU

Analyzes the average revenue per user of various wireless revenue segments.
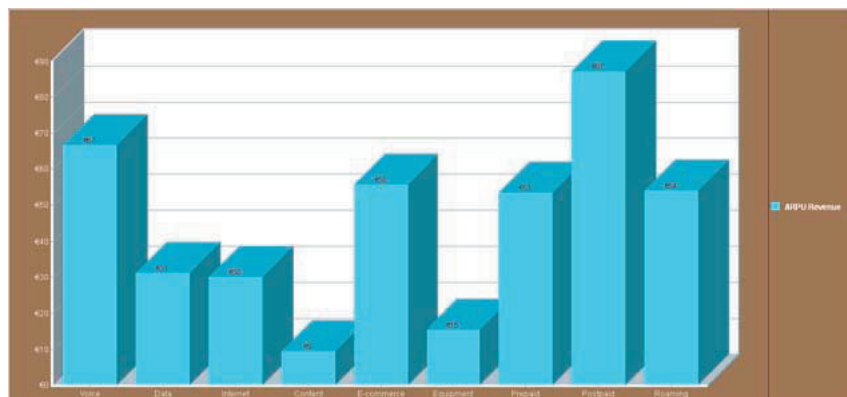
Uses of the Telecommunications Analytical Requirements

Data mart and Data Warehouse Scoping and Design

The information analysis and management reporting aspects of a particular topic are scoped within the dimensions and measures that make up the Analytical Requirements. The scoped Analytical Requirements can then b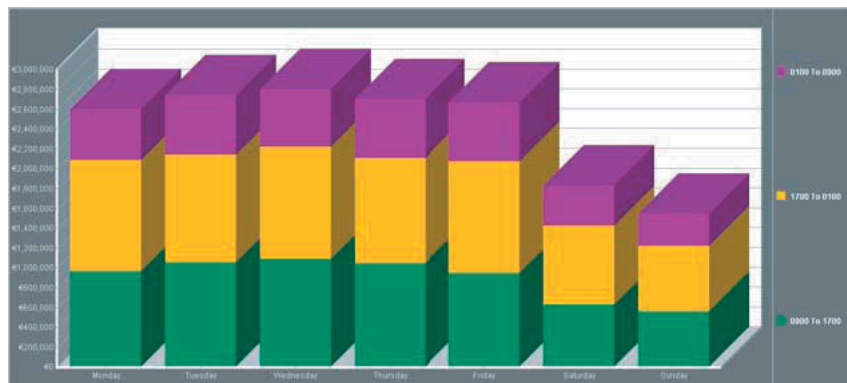e used to specify the design of an appropriate physical data mart structure, and can also identify those areas of the TDWM central warehouse that must be implemented in order that the data marts can be provided with necessary information from the central warehouse.

Benefits of the Analytical Requirements

- Business users can rapidly and effectively control the definition and scoping of a data mart solution
- Provides a consistent structure and reporting for each data mart produced
- Reduce the time and effort required in the analysis phase of a data warehouse implementation
- Reduce the risk by using proven pre-defined templates

Business Coverage

The Six Business Areas

TDW contains 75 Analytical Requirements and over 1000 measures and dimensions. These are arranged into following focus areas.

- Finances
- Profitability
- Relationship Management
- Usage
- Revenue Assurance
- Service Management

Finances

Finance Analytical Requirements focus on the analysis and reporting of the financial standing of a Service Provider including the underlying factors and baselines (e.g. KPIs and segments) that drive revenue and cost.

Balance Sheet Analysis
Cash Flow Analysis
Commercial Customer Financial Analysis
Credit And Collections Analysis
CSR Performance Analysis
Customer Billing Analysis
Customer Delinquency Analysis
Customer Lifetime Value Analysis
Financial Management Analysis
Financial Summary Analysis
Income Analysis
Income Statement Analysis
Individual Credit Risk Profile
Individual Customer Financial Analysis
MVNO Cost Plus Revenue Analysis
MVNO Retail Minus Revenue Analysis
MVNO Service Analysis
Postpaid Revenue Analysis
Prepaid Revenue Analysis
Service Order Processing Analysis
Statement Shareholder Equity Analysis
Stock Availability Analysis

Profitability

The Profitability Analytical Requirements are used to assess the contribution of specific products and channels to the overall profitability of a Service Provider.

Customer Profitability Analysis
Market Basket Analysis
Outlet Location Profitability Analysis
Product Profitability Analysis
Retail Transaction Analysis
Sales Channel Analysis
Advertising Profitability Analysis
Advertising Inventory Management Analysis

Relationship Management

The Relationship Management Analytical Requirements are focused on the analysis and management of the Service Providers channels, processes, programs and campaigns that drive customer acquiaition, value contribution, satisfaction and return.

Campaign Analysis
Contract Renewal Analysis
Cross Sell Analysis
Customer Acquisition Analysis
Customer Arrangement Analysis
Customer Churn Analysis
Customer Complaints Analysis
Customer Interaction Analysis
Data Package Sales Analysis
NLD / IDD Defection Analysis
Number Portability Analysis
Wallet Share Analysis
Customer Profiling-Activity by Time, LO, CNL
Customer Profiling-Survey Response

Usage

The Usage Analytical Requirements are designed to evaluate the usage by the Service Providers' customers of its network components, products,services, content and applications including petterns of usage, subscriptions and transmissions by different access devices, product and service types, providers and channels.

Content Usage Analysis
E-Commerce Analysis
Inbound Roamer Usage Analysis
Outbound Roaming Analysis
Pre-Rated CDR Analysis
Product Usage Analysis
SMS / MMS Usage Analysis
TDW PPV and VOD Usage
Wireless Data Usage Analysis
Wireless Voice Usage Analysis
Wireline Data Usage Analysis
Wireline Voice Usage Analysis
VAS Usage Pattern Analysis

Service Management

Service Management provides the CSP with insight into the following focus areas:

1. Quality of the Customer Experience while using the CSPs service suite and Network Analysis of the CSP's service infrastructure.

2. Analysis of the effectiveness of Customer services provided.

3. Focus into Customer & 3rd Party monetary transactions.

Core Services Usage

Voice Usage Analysis

Broadband Usage Analysis

Online Usage Analysis

Email Usage Analysis

SMS Usage Analysis

MMS Usage Analysis

Core Services Experience

Voice Experience Analysis

Broadband Experience Analysis

Online Experience Analysis

Email Experience Analysis

SMS Experience Analysis

MMS Experience Analysis

Core Services Availability

Voice Availability Analysis

Broadband Availability Analysis

Online Availability Analysis

Email Availability Analysis

SMS Availability Analysis

MMS Availability Analysis

Revenue Assurance

Focus on Revenue Assurance (RA). RA provides an analysis of the relationship between network resources, services, customers, and generated revenue, and enables the CSP to not only detect revenue leakage (e.g. un-billed customers and mis-billed customers), stranded assets, and operational inefficiencies, but also to understand the reasons why these issues occur.

In addition to fraud, reasons for revenue loss (leakage) include network provisioning, mediation and CDR errors, billing and interconnect inconsistencies, loss of data and corrupted files, fragmented support systems, incoherent databases, and manual or ill defined business processes.

The current metrics in this Focus Area define KPIs that provide a common framework to measure three important aspects of revenue assurance: revenue leakage, revenue assurance related process efficiency and data quality.

Revenue Leakage Analysis
Data Quality and Coverage Summary
RA Process Efficiency Analysis

Finances

Balance Sheet Analysis - To analyze the Telco Organization's 10Q and 10K Balance Sheets which report the Telco Organization's total assets, total liabilities, and total shareholders equity at a specific time. The Sarbanes Oxley Act Balance Sheet Analysis template assists Telco Organizations in optimizing report generation with regard to the Securities And Exchange Commissions (SEC) 10Q and 10K regulatory filing requirements.
Typical Measures: Balance Sheet Total Assets, Total Liabilities And Share Capital
Typical Dimensions: Telco Organization Group Reporting Structure, Measurement Currency

Cash Flow Analysis - To analyze a Telco organization's Cash Flow which is the amount of cash a Telco Organization generates and uses during a period, calculated by adding non-cash charges (such as depreciation) to the net income after taxes. The Sarbanes Oxley Act Cash Flow Analysis template assists Telco Organizations in optimizing report generation with regard to the Securities And Exchange Commissions (SEC) 10Q and 10K regulatory filing requirements.
Typical Measures: Net Cash Flow From Investing Activities, Net Increase In Cash And Cash Equivalents
Typical Dimensions: Time Period, Scenario, Telco Organization Group Reporting Structure

Commercial Customer Financial Analysis - To analyze the costs to the Telecommunications Services Provider due to the provision of equipment to Customers at less than the cost to the Telecommunications Services Provider e.g. a discounted mobile handset used as an incentive to activate a new Arrangement, the primary costs of establishing a new customer and the number of times an arrangement has been in a delinquent status
Typical Measures: Adjustments, Customer Discounts, Total Number Of Delinquent Accounts, Total Amount Billed
Typical Dimensions: Billing Cycle, Customer Market Segment, Customer Relationship Age Segment

Credit And Collections Analysis - To determine trends in the efficiency of the Finance section in the collection of overdue payments from Customers.
Typical Measures: Number Of Customers, Total Payment Amount, Average Number Of Billings Past Due
Typical Dimensions: Product, Geographic Area, Potential Exposure Range

CSR Performance Analysis - To analyze how the Telecommunications Services Provider via its Customer Service Representative (CSR) interacts with its customers, and the effectiveness of communications and channels in terms of winning new business.
Typical Measures: Number Of Active Communication Threads, Total Direct Cost Of Communications
Typical Dimensions: Customer, Organization Unit Business Region

Customer Billing Analysis - To analyze customer billing management in the areas of billed ARPU, amount billed, discount, payments rejections.
Typical Measures: Average Account AR Adjustment Amount, Total Number Of Account Arrangements
Typical Dimensions: Billing Cycle, Involved Party Type, Language, Preferred Payment Method

Customer Delinquency Analysis - To analyze Customers who have at least at least one Arrangement that has been deemed delinquent, in terms of the length of time for which the delinquencies have occurred, and the delinquent amounts outstanding.
Typical Measures: Delinquent Amount, Total Delinquency Count, Number Of Days Delinquent
Typical Dimensions: Customer, Arrangement Time To Expiration Segment

Customer Lifetime Value Analysis - To evaluate the total projected earnings of a customer to the Telecommunications Services Provider over the probable lifetime of that customer.

Typical Measures: Customer Lifetime Revenue To Date, Customer Projected Revenue, Customer Churn Rate

Typical Dimensions: Time Period, Arrangement Life Cycle Status Reason

Financial Summary Analysis - To support the Telco Organization in the generation and analysis of the Security And Exchange Commissions (SEC) 10Q and 10K reports which support the Telco Organization with regard to compliance with Sections 302 and 404 of the Sarbanes Oxley Act.

Section 302. Corporate responsibility for financial reports.

Section 404. Management assessment of internal controls.

Typical Measures: Profit Margin Amount, Net Income From Continuing Operations

Typical Dimensions: Organization Unit, Channel Ownership Type

Income Analysis - To evaluate the Income of the Service Provider by Operating Segment, Product, Channel, Market, etc.

Typical Measures: Gross Number Of New Customers, Opening Number Of Access Points

Typical Dimensions: Product Type, Channel

Income Statement Analysis - To analyze a Telco Organization's Income Statement which is a financial report that by summarizing revenues and expenses, and showing the net profit or loss in a specified accounting period it depicts a Telco Organization¦s financial performance due to operations as well as other activities rendering gains or losses. Also known as the profit and loss statement.

Typical Measures: Sales Amount Exclusive of Sales Tax, Income Statement Net Income

Typical Dimensions: Telco Organization Group Reporting Structure, Measurement Currency

Individual Credit Risk Profile - To analyze the subscribers and prospects of the Service Provider to ascertain positive and negative credit risk indicators.

Typical Measures: Average Monthly Income, Average Credit Score, Average Number Of Product Arrangements/Customer

Typical Dimensions: Arrangement Balance Range, Customer Arrears Propensity, Financial Legal Status Type

Individual Customer Financial Analysis - To analyze the costs to the Telecommunications Services Provider regarding the total net amount of non-recurring credits and debits applied to an Account Arrangement for any allowances, charges, discounts, reimbursements or waivers due to special promotions, product or service quality or as a result of accounting or billing errors.

Typical Measures: Arrangement Change In Balance, Number Of Payments Received

Typical Dimensions: Customer Annual Income Segment, Demographic Segment

MVNO Cost Plus Revenue Analysis - To evaluate Mobile Virtual Network Operator (MVNO) revenue from the prespective of both the Mobile Network Operator (MNO) and MVNO for the purpose of revenue optimization, pricing and yield management.

Typical Measures: Total Actual Usage Duration, Average MNO CP Wholesale Revenue Per Usage

Typical Dimensions: Event Type, Customer Market Segment

MVNO Retail Minus Revenue Analysis - To evaluate Mobile Virtual Network Operator (MVNO) revenue from the prespective of both the Mobile Network Operator (MNO) and MVNO for the purpose of revenue optimization, pricing and yield management. This cube uses the Revenue Minus (RM) methodology in evaluating the RM Network Charge Amount.

Typical Measures: Total MVNO RM Income, Average MNO RM Income Per Unit

Typical Dimensions: Customer Market Segment, Peak Time Segment

MVNO Service Analysis - To measure the critical factors involved with the efficiency of service both from the perspective of the MNO, the MVNO and customers of the MVNO.

Typical Measures: Browsing Performance BP, CRM/Back-End Performance CRM/BEP

Typical Dimensions: Complaint Severity, Channel Type

Postpaid Revenue Analysis - To evaluate the Postpaid usage of the Operator's customers of it's products and services including revenue contribution for the purpose of revenue optimization, pricing and yield management.

Typical Measures: Average Revenue Per Account, Total Billed Usage Duration

Typical Dimensions: Brand, Line Of Business SegmentAccess Device Type

Prepaid Revenue Analysis - To evaluate Prepaid voucher sales revenue and entitiled usage of the Operator's pre-paid customers of its products and services for the purpose of revenue optimization, pricing and yield management.

Typical Measures: Bonus Entitlement Amount, Recharge Entitlement Amount

Typical Dimensions: Access Device Type, Customer Market Segment

Service Order Processing Analysis - To measure the critical factors involved with the efficiency of handling requests for services, both from Customers and from within the Telecommunications Services Provider.

Typical Measures: Number Of Service Order Escalations, Number Of Product Arrangements Closed

Typical Dimensions: Product, Arrangement

Statement Shareholder Equity Analysis - To analyze a Telco Organization's Statement Of Shareholders' Equity which includes net profit / loss for period, issuance and repurchase of stock, other gains and losses recognized directly in shareholders equity and the impact of changes in accounting policy and fundamental errors when these are presented as a prior period adjustment. The Sarbanes Oxley Act Statement Of Changes In Shareholders' Equity Analysis template assists Telco Organizations in optimizing report generation with regard to the Securities And Exchange Commissions (SEC) 10Q and 10K regulatory filing requirements.

Typical Measures: Accumulated Other Comprehensive Income Ending, Total Shareholder Equity Ending

Typical Dimensions: Time Period, Scenario

Stock Availability Analysis - To analyze the amount of stock held by the Telco Organization in its various locations and the amount of stock on order in relation to expected sales demand and scheduled replenishment deliveries.

Typical Measures: Number Of Cases On Hand, Number Of Items On Order

Typical Dimensions: Time Period, Product

Profitability

Customer Profitability Analysis - To evaluate the contribution to profit of the customers of the Telecommunications Services Provider.
Typical Measures: Market Sizing Measures Group, Key Performance Indicators
Typical Dimensions: Housing Tenure, Individual Age Segment,

Market Basket Analysis - To analyze the shopping baskets of a Telco Organization based on brand, channel, campaign season, region, store location, product and many other factors.
Typical Measures: Average Number of Customer Visits, Number of Market Baskets With Items On
Typical Dimensions: Campaign Season Type, Individual Dimension Group

Outlet Location Profitability Analysis - To analyze a Telco Organization's store performance based on geographic location, demographics, store format and proximity to competitors.
Typical Measures: Average Floor Space Area, Average Profit Margin Amount
Typical Dimensions: Competitor Proximity, Geographic Area Nature

Product Profitability Analysis - To evaluate the contribution to profit of the various products and services of the Telecommunications Services Provider.
Typical Measures: Total Fee Revenue, Profitability Measures
Typical Dimensions: Organization Size Segment, Business Cost Center Type

Retail Transaction Analysis- To evaluate the Retail Transactions made by the Telecommunications Services Providers' customers of its products and services, including volumes and time periods.
Typical Measures: Total Transaction Amount, Average Time Since Last Transaction
Typical Dimensions: Customer Market Segment, Event Type

Sales Channel Analysis - To identify the contribution to profit of the Telecommunications Services Provider's sales channels, including value-added resellers (VARs), interconnected carriers, virtual network operators and communications services providers, as well as other channel partners.
Typical Measures: Number Of Upgrades Requested. Market Sizing Measures Group
Typical Dimensions: Time Period, Customer Market Segment, Customer Relationship Age Segment

Advertising Profitability Analysis - To identify the contribution to profit of the Telecommunications Services Provider's advertising services.
*Typical Measures: Number Of Ad Viewings, Number Of Customers Responding, Ad Revenue*
Typical Dimensions: Time Period, Customer Target Group, Advertisement Restrictions Types, Advertisement Ownership

Advertising Inventory Management Analysis - To support advertising inventory of the Telecommunications Services Provider.
Typical Measures: Number Of Ad Viewings, Number Of Hours Available, Advertising Time Used
Typical Dimensions: Time Period, Customer Target Group, Advertisement Type, Advertisement Ownership
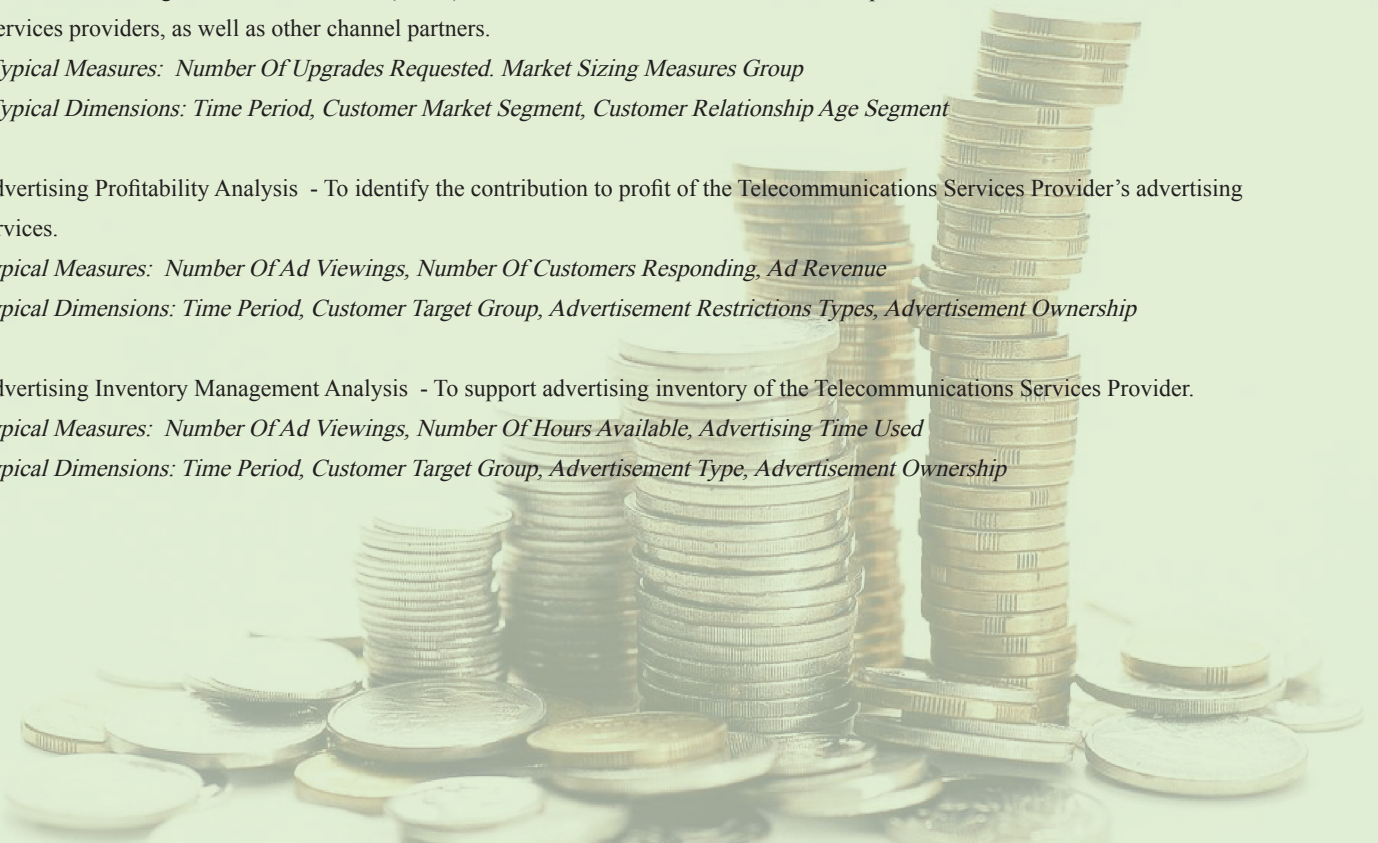
Relationship Management

Campaign Analysis - To analyze and compare the effectiveness of customer and product promotions, marketing drives, and advertising.
Typical Measures: Campaign Deliverable Amount, Total New Revenue From Campaign
Typical Dimensions: Competitive Win Status, Customer Market Segment

Contract Renewal Analysis - To evaluate the extension and renewal of Service Usage Arrangements (i.e., contracts) by the Services Providers' customers.
Typical Measures: Closing Number Of Service Usage Arrangements, Opening Number Of Users
Typical Dimensions: Demographic Segment, Scenario

Cross Sell Analysis - To analyze the characteristics of multi-product usage by customers. Identifying profitable usage trends of a base product suggests complementary product and service bundles.
Typical Measures: Average New Product Arrangement Balance, Number Of New Product Arrangements
Typical Dimensions: Organization Unit Function, Organization Size Segment

Customer Acquisition Analysis - To analyze the types of Customer that are joining the Telecommunications Services Provider, their reasons for doing so and the Channels that are acquiring them with a view to establishing the most cost-effective ways of growing the Telecommunications Services Provider's Customer base.
Typical Measures: Free Credit Amount, Total Acquisition Cost
Typical Dimensions: Organization Unit Business Region, Customer Acquisition Source

Customer Arrangement Analysis - To analyze Account Arrangement Types e.g. end users per account, churn rate, new users.
Typical Measures: Total Closing Number Of Active Account AR, Total Number Of New Customers
Typical Dimensions: Organization Unit Function, Access Device Type

Customer Churn Analysis - To understand the reason and impact of customers ceasing to use the Telecommunications Services Provider's products and services.
Typical Measures: Product Arrangement Churn Rate, Market Sizing Measures Group
Typical Dimensions: Arrangement Life Cycle Status Reason, Time Period

Customer Complaints Analysis - To understand the pattern of complaints and the effectiveness of the resolution process.
Typical Measures: Maximum Inbound Communication Response Time, Customer Complaint Ratio
Typical Dimensions: Processing Involved Party, Product Type

Customer Interaction Analysis - Analysis of how the Service Provider interacts with its customers, and the effectiveness of various Communication Types and Channels in terms of winning new business.
Typical Measures: Average Number Of Communications Per Thread, Mean Time Between Communications
Typical Dimensions: Customer Market Segment, Scenario

Data Package Sales Analysis - To evaluate the peformances of channels and campaigns to sell data packages (e.g., GPRS, ADSL, etc.) to customers of the the Services Providers.
Typical Measures: New Account Arrangement Data ARPU, % New Service Usage Arrangements From CrossSell
Typical Dimensions: Channel, Initial Product

NLD / IDD Defection Analysis - To evaluate the usage of competitor National Long Distance (NLD) and International Direct Dial (IDD) gateways and prefixes by the Services Providers' subscribers including patterns of usage and lost revenue estimates.

Typical Measures: Number Of Calls, Percentage Of Voice Usage Volume Lost

Typical Dimensions: Service Usage Direction, Competing Service Provider

Number Portability Analysis - To evaluate the acquisition and loss of subscribers by the Services Providers due to number portability regulations.

Typical Measures: Port-in Trend, Port-out Trend

Typical Dimensions: Day Of Week, Line Of Business Segment

Wallet Share Analysis - To identify the total communications spend of Customers compared to their utilization of products and services of the Telecommunications Services Provider, with a view to measuring the realized and unrealized revenue and income opportunity.

Typical Measures: Customer Market Share Percentage`, Number Of Households With Products

Typical Dimensions: Organization Unit Business Region, Organization Unit Function

Customer Profiling-Activity by Time, LO, CNL - Customer Profiling-Activity by Time, Location and Channel.

Typical Measures: Number Of Service Usages, ARPU - Average Revenue Per User

Typical Dimensions: Customer Market Segment, Individual Dimension Group

Customer Profiling-Survey Response - Customer Survey Response Analysis.

Typical Measures: Number Of Customers Responding, Response Percentage

Typical Dimensions: Number Of Customers Responding, Response Percentage

Usage

Content Usage Analysis - To evaluate the Content Usage of the Services Providers' customers of its content products (e.g., news, entertainment, stock quotes, etc.)

Typical Measures: Plan Content Units Limit, Number Of New Content Subscriptions

Typical Dimensions: Charging Rate Type, Hour Of Day

E-Commerce Analysis - To evaluate the electronic shopping behavior of the Services Providers' customers (e.g., news, entertainment, games, gaming and financial services, etc.

Typical Measures: Number Of Users, E-Commerce Users Percentage Of Subscriber Base

Typical Dimensions: Hour Of Day, Network Type

Inbound Roamer Usage Analysis - To evaluate the Inbound Roaming Usage of non-subscribers including patterns of usage of voice, data and content products.

Typical Measures: Roaming ARPU, Average Period Since Last Trip

Typical Dimensions: Customer Market Segment, Portal Website

Outbound Roaming Analysis - To evaluate the Roaming Usage of the Telecommunications Services Providers' customers of its products and services, including patterns of trips and interconnect revenue by different products and channels.

Typical Measures: Net Revenue, Gross Revenue

Typical Dimensions: Brand, Line Of Business Segment

Pre-Rated CDR Analysis - To investigate the types, amounts and origin of traffic being carried on Network Segments, and their contribution to overall network capacity uptake.

Typical Measures: Provisioning Costs, Failure Rate

Typical Dimensions: Service Usage Type, Network Segment

Product Usage Analysis - Product Usage Analysis is the analysis of how different demographic groups are using the Service Provider's Products.

Typical Measures: Minimum Amount Of Daily Usage, Number Of Failed Connections

Typical Dimensions: Product, Customer Market Segment

SMS / MMS Usage Analysis - To evaluate the Wireless Usage of the Services Providers' customers of its SMS and MMS products including patterns of transmission and reception.

Typical Measures: Average Number Of Messages Per Content Unit, Number Of Failed Connections

Typical Dimensions: Customer Market Segment`, Portal Website

TDW PPV and VOD Usage - To evaluate the Pay Per View and Video on Demand Usage of the Services Providers' customers including patterns of sessions, subscriptions and transmissions by set top box type, content type, schedule and channel, etc.

Typical Measures: Number of Revenue Generating Units (RGUs), Total Revenue Per Revenue Generating Unit

Typical Dimensions: Household, Network Channel

Wireless Data Usage Analysis - To evaluate the Wireless Usage of the Services Providers' customers of its data products (e.g., GPRS, WAP, etc.) including patterns of sessions and transmissions.

Typical Measures: Customer Base Data Product Penetration,Voice ARPU

Typical Dimensions: Demographic Segment, Line Of Business Segment

Wireless Voice Usage Analysis - To evaluate the Wireless Usage of the Services Providers' customers of its voice products (e.g., local voice, National Long Distance, International Direct Dial, International Inbound Roaming) including patterns of usage.

Typical Measures: Average Actual Duration Per Data Usage Session

Typical Dimensions: Channel, Demographic Segment

Wireline Data Usage Analysis - To evaluate the Wireline Usage of the Services Providers' customers of its data products (e.g., Leased Lines, ISDN, dialup Internet, xDSL, VOIP, Digital Television) including patterns of sessions and transmissions.

Typical Measures: Customer Base Data Product Penetration, Plan Units Download Limit

Typical Dimensions: Customer Market Segment, Demographic Segment

Wireline Voice Usage Analysis - To evaluate the Wireline Usage of the Services Providers' customers of its voice products (e.g., Local Voice, National Long Distance, International Direct Dial, etc.) including patterns of usage.

Typical Measures: Number Of Failed Connections, Total Voice Usage Billed Volume

Typical Dimensions: Customer Relationship Age Segment, Organization Unit

VAS Usage Pattern Analysis - Value Added Services Usage Pattern Analysis is the analysis of how different customer groups are using the VAS.

Typical Measures: Number Of Service Usages, Number Of Customers Using VAS, VAS ARPU

Typical Dimensions: Geographic Area, VAS Product Type, Customer Market Segment

Revenue Assurance

Revenue Leakage Analysis - Revenue Leakage: These KPIs measure the percentage and the value of revenue leakages of a CSP (percentage of discovered leakage out of the total revenues, etc.)

Typical Measures: Percentage Of Customers Bills Adjusted, Percentage Of Billable CDRs Suspended Or Error

Typical Dimensions: Billing Cycle, Time Period, Geographic Area

Data Quality and Coverage Summary - Data Quality and Coverage: These KPIs measure the quality of data within different CSP systems and the coverage of RA activities (percentage of data validated, percentage of discrepancies in data between systems, etc.).

Typical Measures: Percentage Of Validated Data Records Misaligned, Percentage Of Customers Into Reconcile Process

Typical Dimensions: Time Period

RA Process Efficiency Analysis - RA Process Efficiency: These KPIs measure the efficiency of RA processes within a CSP (revenue recovered, recovery period, etc.)

Typical Measures: Percentage Of Recoverable Revenue, Percentage Of Recovered And Billed CDRs, Average Time To Recover Revenue

Typical Dimensions: Time Period, Billing Cycle, Line Of Business Segment

Service Management

Core Services Usage

Voice Usage Analysis - To evaluate the Voice Usage behavior of subscribers to the CSP.

Typical Measures: Subscriber Base, Average Call Duration, Number Of Attempted Calls

Typical Dimensions: Peak Time Segment, Network Busy Hour, Geographic Area, Access Device Type

Broadband Usage Analysis - To evaluate the Broadband Usage behavior of subscribers to the CSP.

Typical Measures: Duration of Data Service Session, Data Download Volume

Typical Dimensions: Peak Time Segment, Network Busy Hour, Geographic Area, Access Device Type

Online Usage Analysis - To evaluate the Online Usage behavior of subscribers to the CSP.

Typical Measures: Number Of Successful Data Connections, Average Number Of Sites Visited

Typical Dimensions: Peak Time Segment, Network Busy Hour, Geographic Area, Access Device Type

Email Usage Analysis - To evaluate the Email Usage behavior of subscribers to the CSP.

Typical Measures: Average Email Volume Sent, Duration of Data Service Session

Typical Dimensions: Peak Time Segment, Network Busy Hour, Geographic Area, Access Device Type

SMS Usage Analysis - To evaluate the SMS Usage behavior of subscribers to the CSP.

Typical Measures: Average Size Of Message, Average Num Of Successfully Sent Messages

Typical Dimensions: Peak Time Segment, Network Busy Hour, Geographic Area, Access Device Type

MMS Usage Analysis - To evaluate the MMS Usage behavior of subscribers to the CSP.

Typical Measures: Average Size Of Message, Average Num Of Successfully Sent Messages

Typical Dimensions: Peak Time Segment, Network Busy Hour, Geographic Area, Access Device Type

Core Services Experience

Voice Experience Analysis - To evaluate the subscribers experience while using the Voice service of the CSP.

Typical Measures: Number of Dropped Calls, Number of Call Attempts Which Failed, Average Setup Time

Typical Dimensions: Peak Time Segment, Network Busy Hour, Geographic Area, Access Device Type

Broadband Experience Analysis - To evaluate the subscribers experience while using the Broadband service of the CSP.

Typical Measures: Number Of Successful Data Connections, Reliability Of Data Service, Average Data Download Speed

Typical Dimensions: Peak Time Segment, Network Busy Hour, Geographic Area, Access Device Type

Online Experience Analysis - To evaluate the Subscriber experience while using the Online Service of the CSP.

Typical Measures: Page Load Time, Roundtrip Delay, Number Of Dropped Data Sessions

Typical Dimensions: Peak Time Segment, Network Busy Hour, Geographic Area, Access Device Type

Email Experience Analysis - To evaluate the Subscriber experience while using the Email Service of the CSP.
Typical Measures: Average Data Upload Speed, Average Time To Send Email
Typical Dimensions: Peak Time Segment, Network Busy Hour, Geographic Area, Access Device Type

SMS Experience Analysis - To evaluate the Subscriber experience while using the SMS Service of the CSP.
Typical Measures: Average Time Taken To Submit Message, Success Rate Of Messages Sent
Typical Dimensions: Peak Time Segment, Network Busy Hour, Geographic Area, Access Device Type

MMS Experience Analysis - To evaluate the Subscriber experience while using the MMS Service of the CSP.
Typical Measures: Average Time Taken To Submit Message, Success Rate Of Messages Sent
Typical Dimensions: Peak Time Segment, Network Busy Hour, Geographic Area, Access Device Type

Core Services Availability

Voice Availability Analysis - To evaluate the availability of the Voice service from the CSP.
Typical Measures: Service Outage Time - Full Outage, Number of Call Attempts Which Failed
Typical Dimensions: Peak Time Segment, Network Busy Hour, Geographic Area, Access Device Type

Broadband Availability Analysis - To evaluate the availability of the Broadband service from the CSP.
Typical Measures: Mean Time Between Failures (MTBF), Service Outage Time - Partial Outage
Typical Dimensions: Peak Time Segment, Network Busy Hour, Geographic Area, Access Device Type

Online Availability Analysis - To evaluate the availability of the Online service from the CSP.
Typical Measures: Average Data Upload Speed, Roundtrip Delay, Service Outage Time
Typical Dimensions: Peak Time Segment, Network Busy Hour, Geographic Area, Access Device Type

Email Availability Analysis - To evaluate the availability of the Email service from the CSP.
Typical Measures: Reliability Of Data Service, Mean Time Between Failures (MTBF)
Typical Dimensions: Peak Time Segment, Network Busy Hour, Geographic Area, Access Device Type

SMS Availability Analysis - To evaluate the availability of the SMS service from the CSP.
Typical Measures: Average Num Of Successfully Received Messages, Service Outage Time - Full Outage
Typical Dimensions: Peak Time Segment, Network Busy Hour, Geographic Area, Access Device Type

MMS Availability Analysis - To evaluate the availability of the MMS service from the CSP.
Typical Measures: Average Num Of Successfully Received Messages, Service Outage Time - Full Outage
Typical Dimensions: Peak Time Segment, Network Busy Hour, Geographic Area, Access Device Type