Case Study for Telecommunications

TDW Reference Implementation

David Cope
EDW Architect – Asia Pacific
“…to enable Customer Relationship Management (CRM) across the client organization and reduce operating costs. The Solution becomes an integral component to the formation of the customer knowledge database to support CRM front office applications and business intelligence functions. The ultimate goal is to form a closed loop integrated environment between operational and analytical CRM to facilitate customer relationship management..”
Project Structure

- Project Sponsor: Chief Operating Officer
- Key User Community: Customer Base Analytics Group

Project covers the following divisions:

- Sales & Marketing
- International & Wholesale
- Finance
- Product Development
- Information Technology
Why TDW and IBM?

- Several vendors and associated products were evaluated
  - Teradata, Microsoft, Oracle and IBM
  - TDW offered the highest degree of flexibility and scalability
  - Complete solution with capability to expand with business

- TDW provided a strong fit to the organization, with over 90% of the business and data requirements being met out-of-the-box

- Open technology approach – looking for an open scalable solution rather than a proprietary architecture / technology

- IBM services had a proven ability in data warehouse implementation, and it was believed that the success of the project lay heavily on a robust and sound industry model, together with the delivery team’s proven ability to implement
TDWM embraces different views of the business to support various analysis requirements

Example – how a single user view can be interpreted in TDWM:

- Service Instance-1; Product-1; Plan-1
- Service Instance-2; Product-2; Plan-1
- Service Instance-2; Product-2; Plan-2
- Prospect Customer
- Involved Party-1; Account-1; Customer
- Churned Customer
- Involved Party-1; Account-2; Customer
- Acquisition
- Cross-sell Product-2
- Migrate Price Plan-1 to Price Plan-2
- Win-Back
- Time
Project Objectives and Phasing

Project Objectives

- Implement a Data Warehouse Infrastructure to deliver business intelligence capabilities and Closed Loop CRM Capabilities
- Establish a customer knowledge environment, addressing the existing business & technical issues through an integrated and reliable platform (Cost, Security, Integrity, Access, Tools, etc.)
- A fully secured environment that safeguards assets.

Implementation Phasing

- Phase 1 – Integrated Data Warehouse Infrastructure
- Phase 2 – Business Intelligence Applications
  - Phase 2A – Campaign Management Solution
  - Phase 2B – Data Mining Solution
Implementation Phases

**Phase 1**
Established the core Data Warehouse using the Telecom Data Warehouse Model (TDWM) to immediately support flexible, ad hoc query analytical capabilities within the environment.

**Phase 2**
Deployed a new Campaign Management System and integrated Data Mining environment with the Data Warehouse Infrastructure to support their campaign operations and analytics.

Logical

Physical

Provisioning, billing and OSS/BSS apps.

Data Warehouse Database

Campaign Management and Data Mining Apps

Static & Ad-hoc Reporting

BSTs
Business Requirement Analysis

- Adopting the Telecommunications Data Warehouse **Business Solution Templates (BST)** to guide the investigation and scope the requirements

**Sales and Marketing**
- Campaign Analysis
- Cross Sell Analysis
- Customer Acquisition Analysis
- Data Package Sales Analysis
- Number Portability Analysis
- Retail Transaction Analysis
- Sales Channel Analysis

**Churn Management**
- Contract Renewal Analysis
- Customer Churn Analysis
- NLD/IDD Defection Analysis

**Operations and Finance**
- Customer Billing Analysis
- Financial Management Analysis
- Income Analysis

**Product Lifecycle Management**
- Product Profitability Analysis
- Postpaid Revenue Analysis
- Prepaid Revenue Analysis

**Usage Profiling**
- Content Usage Analysis
- E-Commerce Analysis
- Inbound Roamer Usage Analysis
- Outbound Roaming Analysis
- Pre-rated CDR Analysis
- SMS/MMS Usage Analysis
- Wireless Data Usage Analysis
- Wireless Voice Usage Analysis
- Wireline Data Usage Analysis
- Wireline Voice Usage Analysis

**CRM & Segmentation**
- Commercial Customer Financial Analysis
- Customer Arrangement Analysis
- Customer Lifetime Value Analysis
- Customer Profitability Analysis
- Individual Customer Financial Analysis
- Customer Complaints Analysis
- Wallet Share Analysis

**Service Quality Management**
- CSR Performance Analysis
- Service Order Processing Analysis

**Credit Risk Management**
- Credit and Collections Analysis
- Customer Delinquency Analysis
- Individual Credit Risk Profile
Solution Outline - Requirement Definition Approach

- BST’s: JAD Sessions to customise multiple BST’s
- Workshops
- Analysts to review reports for analysis requirements
- Reports
- Determine Measure and Dimension Requirements
- Define Critical Information Elements and assist in the identification of candidate data sources and change data capture specifications
- Top Down: Cross-Reference to Requirements
- Business Requirements Report
- Information Framework
- Develop the framework for a cross-functional Enterprise Information Architecture and specify common (and divergent) definitions of business definitions

Bottom Up
Design Gap Report

Information Framework

Expand into a Subject Area Specific Model

Data Discovery

Determine Measure and Dimension Availability

Match Data Requirements to Data Availability

Conceptual Data Model

Determine Data Elements that cannot be provided together with reasons, recommendations & impacts

Logical Data Model

Cross-Reference to Requirements and map to TDWM LDM

Migration Plan

Define High Level Infrastructure Design

Data Migration Strategy

Determine and evaluate approaches for Data Migration

Infrastructure Design

Customize the TDWM LDM to specific requirements

IBM Software Group

Solution Outline - Requirement Analysis Approach
Requirements: Business and Data

**Business Requirements**
- Support 360° customer base analysis
  - Complete & consistent view of customers
  - Customer Grouping & Segmentation
  - Customer Value Recognition & Measures
  - Customer Profiling & Predictive Modeling
  - Customer Lifecycle Management
  - Customer Contact Management
  - Customer Calling & Usage Patterns
  - Channel Performance
  - Ex-Customer History
  - Billed Revenue and Discount Information
  - Product Hierarchy & Analysis

- Data Integrity Management
  - Accurate, complete, reliable and timely data
  - Data Security
  - Comprehensive Metadata Repository

- Query & Analysis Tools

**Data Requirements**
- Customer Hierarchy
- Customer Profile
- Service Profile
- Usage Pattern
- Spending/Rebate/Payment Pattern
- Customer Behavior
- Customer Contact & Campaign History
- Roamers Profile
- Pre-paid SIM Information
- Revenue/Cost Information
- Prospects
- Product Hierarchy
### Gap Analysis Approach

- **Business Requirement Scope**
- **Business Process Scope** (Data Capture and Definition)
- **Information Discovery Scope**
- **Activity Level Costing**

#### Scoping Assumptions
- No OSS/BSS Changes in Phase 1.
- No Business Process Changes in Phase 1
- No Data Cleansing in Phase 1
  - No End-user Application Development or Re-engineering

#### Example Reasons for Gaps
- Data not Available
- Unstructured Data
- Additional Process Required
- Unclear Business Process
- Unidentified Data Ownership

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**Examples of Assumptions**

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**Examples of Reasons**

- Data not Available
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Gap Analysis Report

Business Process

- Process Data GAPS
- System Process GAPS

Business Requirement

- System Data GAPS

Application System

- Business Impact Measurement
  - Breadth of Impact (Org, BU, Team)
  - Intensity of Impact (Critical, High, Medium, Low)
  - Urgency (<6 Months, < 1 Year, < 2 Years)

Higher Priority

Lower Priority
The DW Solution

- **A TDWM based Enterprise Data Warehouse**
  - The existing Data Marts were re-engineered into the IBM Telecommunications Data Warehouse Model and implemented on DB2 DWE, DB2 OLAP Server, Ascential DataStage, Business Objects and ERwin.

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Business Objects
DB2 OLAP Server

BI Applications
Analysis Structures
Summary Tables
System of Record (3NF)
Change Data Capture (Staging Flat Files)
Legacy OSS, BSS & DSS Data Sources

Business Solutions Templates (BSTs)

Telecommunications Data Warehouse Relational Model (TDWM)

Source Systems and Interface Architecture
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**DB2 DWE**

**Ascential DataStage**
DW – Complete Solution View

- Non-Call Center Touchpoints
  - Interaction with Customers and Prospects through SMS, e-Mail, Direct Mail, etc.

- Campaign Management Solution
  - Creation, Execution and Retention of Campaigns
  - Customer Contact and Campaign Response Information
  - Campaign Target and Customer Information

- Call Center Solution
  - Interaction with Customers and Prospects by Phone
  - Customer Contact and Campaign Response Information
  - Campaign Target and Customer Information

- Data Mining Solution
  - Customer Segmentation, Scoring and Propensity
  - Customer Profile and Transactional Summaries
  - Scoring, Segmentation and Propensity Results

- Integrated Data Warehouse (IDW)
  - Center of Closed Loop CRM Solution
  - Scoring, Segmentation and Propensity Results
  - Direct Query Access to all Cube, Mart and underlying Warehouse Information
  - Centralized Enterprise Wide Reporting Solution

- Analytical Environment
  - OLAP, Ad-hoc and Static Reporting Solution

- Operational Systems Source Data focused on Customer Profile, Transactional and Interaction Data
  - Billing
  - Call Center
  - ERP
  - VAS
  - MNP
  - ...

- IBM Software Group
Fully Integrated, Closed-Loop, Multi-Channel Solution

Closed-loop Marketing Process

- 360°C Customer Knowledge
- Performance Analysis
- Segmentation/Pre-Analysis
- Program Planning
- Value Proposition Definition
- Creative Development
- Campaign Execution
- Response Management

Multi-channels

- Contact
  - Target Customers
- Campaign Message
  - SMS
  - Outbound Call
  - Email
  - Shop
  - Direct Mail
  - IVRS
  - Web
  - Call Centre

- Response
  - Direct Response
  - Inferred Response
Closed Loop is complete with Campaign and Mining

- Reports on campaign results
- Interaction results fed back into the system
- Channels to contact customers based on the Target customer list

- Effective customer segmentations
- Key drivers for churn model
- Key criteria for acquisition campaign target list selection
- Characteristics of customers with propensity to accept up-sell & cross-sell of varying products under different situations
DW Solution Example
Case Study: Churn Management Application

- **Business Problem - High Pre-pay Churn and IDD Defection**
  - The wireless operator was facing increasing churn rates due to a price war and the introduction of Mobile Number Portability (MNP).
  - The wireless market is saturated with mobile penetration over 100%!
  - Detailed analysis revealed that churning pre-pay subscribers were either “porting-out” or using competitor IDD gateways.
  - Consequently the operator was experiencing high churn rates, reduced market share and impacts to ARPU.

- **Working with IBM the Operator developed BI applications to:**
  - Define and measure pre-pay churn rates
  - Identify the re-sell and/or transfer of pre-pay phones and SIM cards
  - Define and measure IDD defection by pre-pay users
  - Develop retention programs targeted at pre-pay users
Case Study: Churn Management Application

**Critical Success Factors**

- Operator developed a comprehensive Churn Management Strategy including Churn Prediction, Detection and Treatment Programs
- This required stable baselines (e.g. customer segments, propensity models), along with common business definitions across the process (e.g. churned customer)
- Operator implemented the solution through a closed-loop approach to continuously improve churn analytics and subsequent treatment programs
Case Study: Churn Management Application

**Detect**
- OSS/BSS: Customer Account Invoice CDR
- ETL Source Data: Customer, Account, Segments & Scores, Invoice, Usage, Interactions
- EDW

**Anticipate**
- Score & Segment: Churn Scoring & Segmentation
  - Generate: Data Donkeys Business Travelers Weekend Roamers
  - Update Segments & Scores
    - Churn Propensity Credit Risk Rating Uptake Propensity Upgrade Propensity

**Act**
- Load Interactions: Load Leads & Watch list
- Proactive/Reactive Churn Prevention & Win-back
- Churn Programs

**Improve**
- Opening # of Accounts Closing # of Accounts # of Churned Accounts Predicted Churn Score Actual Churn Score Entitlement Balance
Case Study: Churn Management Application

- Significantly reduced churn rates and IDD defection.
- Operator is collecting useful customer data at all Touch Points to produce actionable Business Intelligence.
- Operator remains the most profitable in the market with the highest ARPU and the lowest port-outs.
- Operator is up-selling pre-pay users to lower churn, higher value post-pay ‘premium’ brands.
- Operator is retaining IDD revenue through the managed release of targeted IDD prefixes for market segments.