Enterprise Data Architecture

PART-1: MODELING

11.09.2022

Ritika Motwani (RM6383)
Sneha Singh (N11049579)-ss15639

Overview

Enterprise Data Architecture is a discipline designed to simplify, streamline, standardize, and enhance the accessibility of your organization's data. A successful enterprise data architecture plan should cover the policies, procedures, standards, on how data is collected and stored in addition to how data is managed, processed, and used throughout the organization.

Most larger organizations are currently dealing with an extremely fragmented data landscape, with substantial redundancy. In many cases, this landscape has evolved for a variety of reasons, such as rapid growth, limitations with legacy technology, and the lack of investment in managing your organization's data assets.

The result is disparate systems with data being stored and managed in silos throughout the organization and an environment that eventually becomes so complicated that no one individual in the organization can understand how it works together. Some organizations start out believing that technology can solve the challenge and that applications such as CRM or ERP systems will solve everything.

For this given project, we have been provided a Claims-Policy-Customer Management System. This part deals with the modeling of the given EDA using creation of Entity-Relationship Diagram to support the system design. We have used "draw.io" to attain the given ERD.

EDA Modeling Questions

Analyzing generated Entity-Relationship Diagram

The given system can be viewed overall as a system implementing a Claims-Policy-Customer Management System. The complete system can be majorly divided into the following sections:

A: CUSTOMER DETAILS:

- This region comprises basic Customer details namely Name (FirstName, LastName, MiddleInitial, Suffix), their DOB, Salutation and Gender. The eMail address and SSN_TIN with SSN type is stored to uniquely identify and contact the customer. The system holds the start date, end date and the preferred languages of the customer with their LegacyID, withholding code and Private Medical Record fields having both a Yes and a No value.
- Every customer is assigned an Alias whose information is similar to the one derived from the main customer and has Alias values for Name, Suffix, DOB, Salutation, eMail Address, Gender, and SSN_TIN with type.
- The address of the customer is stored as a composite value having two lines of address, the city, state, zip, annual start and end dates and the PMR_Z fields.
- An image is associated with each customer having a unique Document ID, the image type, its location and the date when it was received.
- Every relation as a dependent for the customer has their details saved with what relation they hold to the customer and from which start date to end date.

B: CLAIM DETAILS:

- This region consists of claim information with a unique ClaimNumber, the date of claim, the settlement date and the wellness eligibility date.
- The claims have an image associated with them having a unique document ID, the document class, image type, date when it was received and the date it was processed into the system.
- For accessing the claims, the customer acts as a claimant/ participant with their details derived from the customer details section and has an image mapped to them with document ID, the file location, the date of receiving and the pending date.
- There exists a section to keep notes for specific claims.
- Each of the claims are generated via a Coverage Request generated by the Claimant thus creating a Claims Event.
- Whenever a Claims Event is triggered, the Financial Institution comes into action having details like name, address, city, state, zip and phone number.

C: INVOICE DETAILS:

- The billing invoices are generated for the Claims event having a unique Invoice Number, Paid date, due date and run date with banking details mapped from the

banking section and this is corresponded to the Customer requesting the claim or bill.

- The invoice holds the following details namely invoice line number, detail ID, a flag marking if conversion is pending or not, check for if paid ahead, the premium subtotal and the activity record to ensure the history of the invoice can be traced.
- Once done, the invoice is marked for remittance with a remittance date, the frequency, chosen payment method and the date of payment. This is monitored by the Billings department.
- For a given customer, the invoices are grouped and redirected to the Billing and accounts department.

D: ACCOUNTS SECTION:

- The account details are managed by recording the name in two lines, address, city, state, zip, taxID number, the number of employees, what date corresponds to the employee strength, the activity status with date, group number, legacy flex ID, the established date, plan year start and end dates, subsequent year start date, the industry details, check for dual company, check for complex account, the standard industry code, annualized premium, and counts in place for no outstanding invoices, no months inactive, last invoice - paid date, due date, generated date, next invoice generated date, last service call date, last bill count, phone, disability offering start date, web address, special handling code, check for multi-location, PEO, transit one flag, HSA, HRA, data confidence level, total policy count, and other details.
- The account relation details are maintained having a relationship type and date.
- An admin role is assigned with description and has an account admin having the details of name, suffix, address, city, state, zip, phone, fax number, gender and email.
- Every account has an account member mapping to the customer relations having a start date, end date, FSA contribution amount and Customer bank account department number.
- Each account is assigned a Legacy Alias having an alias source, a unique Alias ID, name, address, city, state, zip, phone, email address and fax.
- The account is associated with a contract through a company having a company code, name and legacy company number.
- The accounts have unique account products having a start and end date.
- Now, the billings are handled by the Billing Account having a name, address, city, state, zip, group number, tax ID number, online billing flag, activity status tih date,

web address, payroll processor check, phone, account type with date, special handling codes, change files check, enrollment files check, debit card check, FTP site, next visit date and other information.

- Every Billing account has an admin with a name, address, suffix, city, state, zip, phone, faze, gender and email address.
- The eligibility check for each billing account is maintained via a description, start and end date.

E: PRODUCTS SECTION:

- The products are designated a line of business with description. These are assigned a series name with a renewal qualifier rate and a corresponding rate tier.
- The Product Series have a set of guidelines with a name and description which must be followed.
- Every Product has a Product plan associated with it having a plan name, ratebook location code, a plan code, description, benefit and annualized premium. This is maintained by a government agency.
- The Product plans have a product rider with a rider name, description and extended product plan details. These have their own set of Product plan guidelines with a name, description and other parameters for uniquely mapping the guidelines to the corresponding product plan.

F: CONTRACT DETAILS:

- The contracts have a contract detail record with extended information like the contract number, activity status with date, coverage type, billing method, suspend code, exception code, model premium, auto premium loan, credit card number, expiration date, card type, banking transit number, account type and number, premium payment limit, substandard rate, valuation interest code, supplemental benefit plan, special assembly code, inforce check, pay up date, duration, language, and various PMR flags($, G3, QA, QB, QC, S).
- These contracts have a pay advance having G1 and G2 fields.
- Every contract has an underwriter with an image mapping to it having an id, location and date of reception.
- Each contract has benefits with a policy count contributions.
- The contracts also have a premium with a premium code, annualized premium, process date and application signing date.
- The contract can be majorly classified into 3 parts namely:

- AH POLICY: Having an event for itself with PMR M0, M1, M2, M3, M4 and benefits listed as PMR A_AH and X, and a premium of PMR P_AH.

- LIFE POLICY: Having an event for itself with investment code, declared source code, interest type, principal, interest rate, accrued interest, billing code, paid to date, last activity date, legal name, name change reason, cash value, mortality, and PMR values of D, M1, M4, M5, M6, M7 and benefits listed as PMR A_Life, R and V, and a financial of PMR E_Life and F_Life having a premium of PMR A_Life, B_Life, P_Life and W.

- FLEX AGREEMENT: Having a TransitOne flag.

- The customers are mapped to the contracts via a Benefit for the benefitting party.

- The Contracting Party in role have their roles and description in place mapped to the contract and the customer.

G: ASSOCIATE DETAILS:

- The Associate details stored are Associate name, suffix and tenure date.
- The associates have dependents as relations with a relation type and date, their details and the relation type stop date.
- Each Associate has a DBA with a name, TIN, phone, Consolidated Associate ID, email address, residential address, description, start date and other details.
- The PayAdvance details are stored as name and description.
- There exists a Manager Contract that has a SitCode, issue date, contract type, contract sign date, contract process date, commission code and end date. The Manager contract is having an account associated with a stop date along with other details having an associated role with a role name and description.
- The associate has services like role, last service date and service type. They have a writing number with issue date, status, vested flag, termination date, reinstatement date, no pay rate numerator, no pay rate denominator.
- The Associate DBA has license details with license state, license number, issue date, expiration date. This is issued by a government agency having an agent ID, name, address, city, state, zip, phone, contact name, email address along with a government agency definition.
- The associates have a material name and description.
- The associates have a connection with the account over the relation of prospect having prospect name, address, city, state, zip, phone, contact date and prospect item name and description.
- The associate services have a role and service type.

- The Manager contract has a level name and abbreviation and state coordinators having state operation division name and end date, having a state role and description.
- The Territory Coordinator has an end date with a territory name, with start and end date. These extend to employees having an ID, name and address. Each territory has a contest with a contest name, start date, end date, prize and amount having criteria and threshold.
- The State Coordinators have a state role and description with other details. They have an assistant with a state operation division name. The state code and name with country code, zip code and region zip with name.
- The regional coordinators have a region role and region details and region assistant.
- The district coordinators have a district role with description and assistant having an admin name, phone and email. They have an ASC with a start and end date having a district detail like names, addresses and start and end date.
- The contests have a regional division and a district contest, and an associate contest.
- The Contract Premium has a coordinator position production asset having a production credit split percentage derived from coordinator position production chain.

Milestones

I. Cases - A:

Account (n..n) BillingAccount

As per our ERD, the account maps to the billing account in such a way that if we have two accounts namely Walmart and Columbus can have all three invoices over the disjoint invoice kinds FSA, Life and A&H for both salaried/ hourly employees.

Account (n..n) Account

The account has a many-to-many relationship with itself over the relation of colleagues being from the same company.

Account (n..n) AccountAdmin

An account can have an admin relation in such a way that a given company has separate invoice administrators. Simultaneously, the FSA expert can service multiple accounts.

Account (1..n) AccountMember

There can be an account with multiple members. These employees have a previous employer or maybe doing separate shifts in different companies. This leads to an account having multiple account member mapped to a single value.

AccountAlias

To ensure consolidated information, the account details can have an alias name for easier APB system review.

The creation of aliases allows record maintenance for duplicates and ensures data integrity so that data manipulation can occur on aliases while the original values are retained.

Modeling Concepts

Data modeling helps building databases for production level projects that are reliable, scalable and manageable by employees. They can also be used by different groups of users like the developers, business analysts, decision makers and leadership teams to take critical business decisions. The modeling helps to read through easily on what tables to query and how they're related to different tables.

Transactional databases are optimized for running production systems—everything from websites to banks to retail stores. These databases excel at reading and writing individual rows of data very quickly while maintaining data integrity.

Transactional databases aren't specifically built for analytics, but often become de facto analytic environments because they're already in place as production databases. Because they've been around for decades, they're familiar, accessible, and ubiquitous. They ensure data integrity, low latency and monitoring operational systems.

The database then can be maintained in an operational database environment. An operational data store (ODS) is a central database that provides a snapshot of the latest data from multiple transactional systems for operational reporting. It enables organizations to combine data in its original format from various sources into a single destination to

make it available for business reporting. The snapshots can be changed according to the needs of different sets of users.

The entire data is stored in the data warehouse of a company maintained by different data engineers. A data mart is a subset of a database —usually a data warehouse— where data is stored for a specific business area. That is, a data mart stores concise and specific data sets used for analysis for a specific department or line of business, such as the sales department. The data is stored according to the initial ERD developed by the data engineers and administrators. Different groups of users can access the data they need.