Customer Relationship Management

**Case Facts**

CRM was and is used for which customers were solicited, who responded, and what was their response. It doesn’t include just customers, but business customers, citizen, patients, and students to name a few. Since customers are essential to business prosperity then CRM is essential to business prosperity as well.

**Data Warehousing Concepts**

* CRM Overview – the better you know your customers, the better you can maintain long-lasting, valuable relationships with them to maximize the relationship with them over their lifetime
  + Operational and analytical CRM
    - Relies on collection of data at every interaction and the leveraging it though analysis
    - DW is the foundation that supports a 360-degree view of customers
    - Customer data can be leveraged to better identify up-sell and cross-sell opportunities, pinpoint insufficiencies, generate demand, and improve retention
* Customer Dimension Attributes – a well-deployed, well-maintained conformed customer dimension is the cornerstone of sound CRM analysis
  + Name and Address Parsing
    - Liberal designs such as name-1 through name-3 and address-1 through address-6 is not very useful to understanding the customer better
    - Parsing the information to as many parts as possible the information significantly more useful
  + International Name and Address Considerations
    - For English the ASCII is acceptable enough for English speakers and typists
    - Unicode I for international use to cover all translations in America, Europe, Middle East, Africa, India, Asia, and Pacifica
    - Implementing Unicode solutions is done at the foundational level of the system
    - International systems need to be:
      * Universal and consistent
      * Have end-to-end data quality and downstream compatibility
      * Have cultural correctness
      * Have real-time customer response
      * And need to anticipate the need to store electronic names, tokens, and internet addresses
  + Customer-Centric Dates
    - Dates need to be reference as foreign key reference to a date dimension to properly summarize dates as quarters, fiscal periods, etc.
  + Aggregated Facts as Dimension Attributes
    - Facts such as customer who spent the more than a certain dollar amount or how much a customer has bought in a lifetime can be stored as a dimension attribute
    - Store only the most frequently used aggregated facts on the tables and minimize the frequency they need to be updated
  + Segmentation Attributes and Scores
    - These are the most powerful attributes in a customer dimension and include:
      * Gender
      * Ethnicity
      * Age
      * Income
    - A way to score and profile customers is through RFI:
      * Recency
      * Frequency
      * Intensity or Monetary
    - Should not be stored as regular facts and are used in formulating complex queries
  + Counts with Type 2 Dimension Changes
    - Used to track customer dimension changes
  + Outrigger for Low Cardinality Attribute Set
    - Snowflake designs are encouraged to be avoided where low cardinality columns are removed to separate normalized tables
  + Customer Hierarchy Considerations
    - Most challenging aspect of commercial customers is modeling their internal organizational hierarchy
    - Hierarchical relationships can change as customer reorganize themselves internally or involved in acquisitions and divestitures
* Bridge Table for Multivalued Dimensions – can use positional and sparse tables, positional tables require a column for each item gathered and will not be discussed any further
  + Bridge Table for Sparse Attributes
    - Used for whenever the number of variables in open-ended and unpredictable
    - Does not require a column for every piece of information – if an entry has a null then is doesn’t show
  + Bridge Table for Multiple Customer Contacts
    - Used because large commercial customer can have many points of contact
* Complex Customer Behavior
  + Behavior Study Groups for Cohorts
    - Customers who have received a specific test solicitation are considered behavior study groups
    - To create a behavior study group, run a query to capture a specific group of customer durable keys and place them in a table
    - Attached to the table it was queried from by an equijoin to durable key
    - Can be made more powerful by including and occurrence date correlated with the durable key
  + Step Dimension for Sequential Behavior
    - Sequential behavior needs to follow a customer or product through a series of steps
    - Step dimensions are defined in advance and is abstract
  + Timespan Fact Table
    - Used to retrieve the exact status of some customer at some arbitrary point in the past
    - Key modeling is to include date/time stamps for each transaction
  + Tagging Fact Table with Satisfaction Indicators
    - Every customer facing process is a potential source for satisfaction information
    - On-time measure can be additive numeric facts as well as textual attributes in a service level dimension
  + Tagging Fact Tables with Abnormal Scenario Indicators
    - Abnormal scenarios are not modeled nor should they be
    - The way around this is to add a delivery status dimension to the accumulating snapshot fact table and tag it with the order weird for the abnormal scenario
    - This can be joined with a table that has every step of the weird delivery scenario
* Customer Data Integration Approaches
  + Master Data Management Creating a Single Customer Dimension
    - A single customer table that is the best among several available customer data sources
    - Distilled from several operational systems within the organization
    - Involves fuzzy logic, address parsing algorithms, and look up directories
    - Depends on capturing accurate data from source systems and powerful data cleansing/merging tools in the ETL process
  + Partial Conformity of Multiple Customer Dimensions
    - Requires that each customer data source only share one specially administered conformed attribute
  + Avoiding Fact-to-Fact Table Joins
    - DW/BI systems should be built process-by-process no department-by-department on a foundation of conformed dimensions
    - Issue a drill-across technique to query needed tables then join the two answer sets
* Low Latency Reality Check
  + Data quality suffers as data is delivered closer to real time
  + Incorrect information can be obtained if there is not enough latency between the transactions and can throw off the information
  + Lower latency can help with intraday data delivery.

**Summary**

CRM is very important to all organizations. It deals with customers responses to a full spectrum of interactions and responses. Developing a data warehouse for CRM involves task like customer name address parsing, bridging tables, behavior study groups, timespans for transaction times, and data delivery in real time. A properly built DW will inevitably be a great resource to the company if it has been built properly.