

Why Knowing About Your Customers Helps Your Business

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Introduction

Customer-based marketing is an exploding business activity of the 1990's, and is replacing the traditional mass marketing approach. Database marketing is a relatively new area of quantitative work related to data mining. In its purest form, database marketing is an activity that exploits a data warehouse or data mart that contains customer information. Companies that want to gain a competitive edge in today's global marketplace are implementing database marketing applications to develop focused marketing campaigns for their products. Database Marketing is an activity that a corporation can employ that will actually make more money for the organization.

This purpose of this paper is define the topic of Data Mining and describe why this emerging technology is being incorporated by more organizations. A typical application flow will be provided to help identify the requirements of a successful implementation of a Data Mining strategy. Finally, this paper will summarize the advantages, issues, and challenges of implementing a Data Mining strategy and describe how the SAS System is an ideal solution for this type of processing.

Data Warehousing

The new challenge facing organizations today is to employ data warehousing techniques that extract and summarize data from operational systems and external data sources, in order to transform the raw data into a usable data warehouse for decision support. Once a company's raw data has been cleansed, the opportunity exists to exploit the data warehouse through data mining activities. Marketing departments are typically among the first business units in an organization to drive a data warehousing strategy because of the initial benefits gained in building a customer-based data warehouse containing information on their customer's buying patterns. These types of data warehouses provide the ability to consolidate customer records, identify duplicate data, standardize mailing addresses, and map inconsistent data values to corporate standards. The cornerstone of a successful data mining strategy is the establishment of a solid data warehousing architecture. Extracting and transforming the corporate data ensures that the data for use by the database marketing applications is robust and clean. After all, the results of any data mining or database marketing activity is only as good as the data. A data warehouse or data mart is also critical for incorporating additional data besides customer data, like geo-demographic data or outside mailing lists.

An example of a typical database marketing application is a Marketing Customer Information File, or MCIF. The MCIF may contain all the information known about customers throughout their relationship with the company. This may require bringing together files from a number of different business units through the use of a technique commonly known as householding, which involves associating members of the same household together. Identifying which customers are actually members of the same household can be a complicated process. One technique is to conduct householding based on names and addresses. There are some keys to make that easier such as social security number and telephone number, in addition to the street address.

Data Mining

Data mining can be defined several different ways. Corporations are searching for ways to find value in large databases. This definition comes from a business perspective and tends to be a natural extension of decision support concepts, through the application of basic principles to more detailed levels of data. In many ways data mining is simply the exploitation of a data warehouse or data mart.

Most customers in industry segments like insurance, banking, retail, health care, telecommunications, and catalogers build data warehouses that contain customers information. The ability of a business to turn operational and transaction data into meaningful information to reach business objectives like accurate identification of buying trends, precise definition of market segments, and the optimization of promotional programs is within the scope of data mining. This list of business applications of data mining serve to highlight that it is not limited to one type of industry or function, but can be invaluable to virtually all

organizations. Data that is “mined” for purposes like the examples above are utilized by organizations to increase revenue, decrease costs, and enhance their competitive position. Examples of where data mining is used include database marketing, frequent shopper programs, and insurance claims analysis. Database marketing allows businesses to better target candidates for outreach efforts. Frequent shopper programs provide an understanding of a customer’s buying patterns by tracking those patterns. This addresses the need for better customer service. By understanding a customer’s buying patterns, a company can develop promotional or reward incentives that appeal to a specific type of shopper. Insurance claims analysis allows reviewing of insurance claims in order to understand factors that reduce the amount of time to service or pay a claim. The common theme with these examples is to better understand the customer so a company can develop more effective sales and marketing campaigns, targeted marketing and product strategies. A data warehouse provides the richest supply of mining material. that will support mass customization.

Database Marketing: What Is It ?

Database marketing (DBM) is an information-driven marketing process that enables marketers to develop, test, implement, measure, and appropriately modify customized marketing programs and strategies.¹ The SAS System offers the only complete solution for database marketing on the market today. Goals of database marketing include the ability to:

- Store all customer purchase and promotional activities
- Code, score, and rank customers based on purchase likelihood
- Create targeted lists of specific customer segments
- Determine a profile of best customers for prospecting
- Provide a means to measure and test marketing efforts
- Increase customer lifetime value through marketing efficiency

Clearly DBM is one of a limited number of software activities that can actually make more money for an organization. Most DBM activities follow a logical application flow of data warehousing, data mining or analysis, and data presentation. A closer look at each of these areas reveals some of the considerations for a successful implementation.

Relevancy of database marketing activities

An effective database marketing strategy can empower the management of organizations by facilitating market development, identifying marketing opportunities and finding target markets. In addition, ad hoc queries performed against a MDDB (multi-dimensional database) can provide quick feedback to marketing questions. Test and rollout marketing plans can be produced. The exploitation of a data warehouse or data mart can utilize both internal and external data. An effective database marketing implementation includes accommodating multiple levels of users: knowledge builders who are involved in coding and customizing various segments and also administer queries, knowledge users who required transparent access to information, and production systems for mailing selections.

The reduced cost of data storage also contributes to hardware environment factors that are conducive to implementing database marketing programs. The increased speed of desktop processors also makes this technology more feasible. In addition, corporations are not realizing a decline in detailed data. In fact, there is more detailed data available on customers and prospects than ever before. Couple this with a need to create and maintain a competitive advantage and the rationale for database marketing is apparent. Finally, as corporations evolve, there is a persistent need for new products and specialized services.

Application Flow

Most DBM applications follow a similar flow.

¹ David Shepard Associates, *The New Direct Marketing: How to Implement a Profit-Driven Database Marketing Strategy*, 1995.

The first step is to create a marketing database or data warehouse. As mentioned in the previous section on data warehousing, data types include internal and external data. Internally or directly supplied data is comprised of four fundamental pieces: the customers (customer file), when they bought (invoice file), what they bought (product or inventory file), and how they bought (promotions, offers, etc.). Externally supplied data is anything that comes from outside your organization like automobile registration information.

Some key issues to consider when building the warehouse are business needs and corresponding functional warehouse requirements. This list of functionality should reflect *what it is that you want the database to help you do.*² A DBM data warehouse plan is usually developed by one group of marketing personnel defining the business needs and a second group of IT professionals developing the functional requirements. The functional requirements are IT's translations of those business needs into a specific plan for accomplishing needs. This list of functional requirements will include the following³:

- A listing and detailed description of each of the individual business files to be brought into the database process
- A statement and description of the data to be retained from individual files
- A plan describing how the records from individual files will be linked together
- A plan for consolidating individual customers into households
- A plan defining how the warehouse will be updated
- A definition of what new values will be created during the update process
- A description of how the warehouse will be accessed
- A statement of how quickly warehouse queries need to be answered
- Descriptions of operations included in the business needs analysis such as these:
 - Response analysis
 - Profiling
 - Scoring
 - Selecting names for promotions
 - Tracking promotion results
 - Reporting and business geographics

One of the most critical issues to clearly define when designing a DBM warehouse is to determine the various kinds of queries the warehouse must be able to answer. The more specificity that is provided up front by the business unit using the DBM warehouse, the better. There are two main types of queries that a DBM warehouse should satisfy: 1) queries that can be answered directly and fully and 2) complex queries that go beyond traditional two-dimensional row and column data analysis.

The first type of query is available through Query Window functionality of the SAS System. The second type of query is now available through new enhancements to the online analytical processing (OLAP) applications with the Orlando release. The goal of OLAP, sometimes known as multidimensional data analysis, is to provide fast, flexible data summarizations, analyses, and reporting capabilities with the ability to view trends over time.⁴ For example, the query 'how many hammers did our company sell last month' does not require the pulling and summarization of different data dimensions such as different time periods, regions, and products unlike the query 'how many Hard/Hittingbrand hammers did we sell last month in the Southeast and the Northwest, compared to the same month last year'. The new multidimensional class within the Orlando release provides for the presummarization of large amounts of data with subsequent organization in the matrix-like structure of the multidimensional database (MDDb). This capability is considered an extension of the SAS System's data warehouse strategy because it allows select data elements to be further summarized in a special format to provide faster access for OLAP-style applications. Once a detailed plan for creating the DBM warehouse is complete, attention can then be turned to considering the types of data mining and data analysis tasks that can be accomplished.

² Shepard, The New Direct Marketing, Chapter 5, "What Do You Want the Database to Do ?"

³ *ibid.*

⁴ SAS Communications, 1st Quarter, 1996, "Serving Up OLAP".

Data Mining Tasks

Data mining is a process of finding useful information in your data. Specific data analysis techniques like segmentation release the power of the data you have collected. Key principles of segmentation are as follows⁵:

- Once a customer has purchased a product or service, he or she is likely to purchase again from the same source, assuming the customer has had a good experience with the original purchase. A focus is given to repeat sales to the same customers.
- Understanding the value of customers allows the marketers to maximize their business by responding to customers' needs and wants. A corporation's most valuable customers usually represent a large percentage of its revenue (the 80/20 rule). By learning more about these best customers' needs and wants, the marketer can meet the customers' purchase requirements and at the same time maximize profits.
- All customers do not purchase the same product for the same reason.

In addition to segmentation techniques, the right historical data and statistical tools enable you to predict how a prospect or customer will behave both in the near future and over the long term with a reasonable degree of accuracy. The outline below details quantitative tasks that are pertinent to DBM. All the listed tasks are available or are under development in conjunction with the Orlando release of the SAS System:

- 1) Summary statistics
Confidence intervals, Tests for significance
- 2) Response analysis
Ordinary regression, Logistic regression
Discriminant analysis, Tree-based models, Neural networks
- 3) Segmentation analysis
Factor analysis, Cluster analysis

The implementation of a successful DBM strategy is not an easy task for organizations. Many factors exist today that are identifiable barriers to implementation. Even so, organizations will move to adopt DBM technology because of the new for a competitive advantage in the marketplace. For example, companies will increasingly identify the need for marketing organizations to be able to measure the effectiveness of their programs. Technology drivers like price/performance, client/server, increasing volumes of detailed data, data warehousing, and OLAP will add pressure to adopt DBM strategies within organizations. The emphasis will be placed on the company providing superior service at every point of interaction with the customer. At the same time, customers are likely to judge companies by a perceived value of interaction. Companies that achieve a perception of high value by their customers will be rewarded with higher rates of customer retention and an extension of their relationships with these same customers.

From a technology standpoint, a robust data warehousing architecture is necessary to provide access to a consistent picture of the customer relationship. The warehouse must provide a cross-product, multi-channel, enterprise-wide view of the customer. The role of IT departments is to build the systems and the infrastructure to capture, store, manage, and access the customer information. A better bridge to other business units like marketing departments is required to convey the results of quantitative work to non-technical users. The role of a marketing department is to create new strategies for managing and leveraging the use of customer information. Gradually there must be a resolution of the cultural differences between marketing and IT for a DBM implementation to achieve success.

⁵ Rob Jackson and Paul Wang, Strategic Database Marketing, Chapter 10, "Statistical Techniques: Segmentation—A Key to Understanding Your Customers, p. 159.