

# DATA MINING TECHNIQUES FOR CRM

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**Abstract:** *The way in which companies interact with their customers has changed dramatically over the past few years. A customer's containing business is no longer guaranteed. As a result, companies have found that they need to understand their customers better, and to quickly respond to their wants and needs. In addition, the time frame in which these responses need to be made has been shrinking. It is no longer possible to wait until the signs of customer dissatisfaction are obvious before action must be taken. To succeed, companies must be proactive and anticipate what a customer desires. In this paper we are going to discuss the Data Mining techniques used in Customer Relationship Management.*

## 1. INTRODUCTION

Data Mining is the non-trivial extraction of novel, implicit and actionable knowledge from large data sets. It is technology to enable data exploration, data analysis and data visualization of very large databases at a high level of abstraction, without a specific hypothesis in mind. Data Mining is a process that uses a variety of data analysis and modeling techniques to discover patterns and relationships in data that may be used to make accurate predictions. It helps you to select the right prospects on whom to focus, offer the right additional products to your existing customers and identify good customers who may be about to leave you. The result is improved revenue because of a greatly improved ability to each individual contact in the best way.

More than 1,000,000 entries/records/rows  
From 10 to 10,000 fields/attributes/variables  
Gigabytes and terabytes

- Databases are growing at an unprecedented rate
- Decisions must be made rapidly
- Decisions must be made with maximum knowledge

## 2. WHERE IT COMES FROM?

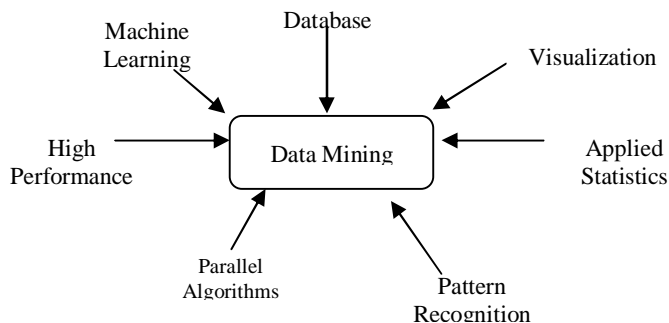


Fig.1 Data Mining in Multi Disciplinary Field

## 3. DATA MINING MOTIVATION

- Changes in the business environment  
Customers becoming more demanding  
Markets are saturated
- Databases now a days are huge

## 4. CUSTOMER RELATIONSHIP MANAGEMENT

Customer Relationship Management (CRM) is the practice of intelligently finding, marketing to, selling to and servicing customers. CRM is a broadly used term that covers concepts used by companies, NGO's and public institutions to manage their relationships with customers and state holders. Technologies that support this business purpose include the capture, storage and analysis of customer, vendor, partner and internal process information.

There are three aspects of CRM, which can be implemented in isolation from each other:

Operational – automation of customer processes that offers support to a company's sales or service representative.

Collaborative - the program communicates to customers without a company's sales or service representative (Self-service)

Analytical – analysis of customer information for multiple purposes.

## 5. TECHNOLOGY CONSIDERATIONS:

The technological requirements of a CRM strategy can be complex and for reaching the basic building blocks include:

A database for customer information operational CRM requires customer agent support software.

Collaborative CRM requires an interactive system, eg. An interactive web site automated phone systems etc.

Analytical CRM requires statistical analysis software as well as software that manages any specific marketing companies.

Each of these can be implemented in a basic manner or in a high-end complex installation.

## 6. DATA MINING IN CRM

Data Mining helps to

- Determine the behavior surrounding a particular life cycle event.
- Find other people in similar life stages and determine which customers are following similar behavior patterns.

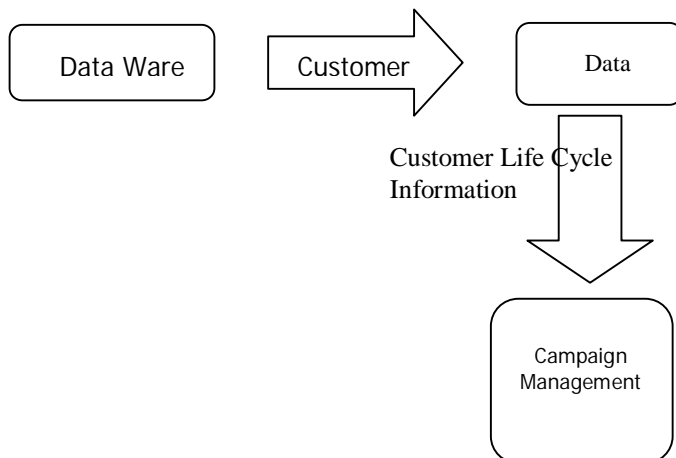


Fig.2 Data Mining in CRM

- Customer life cycle
  - The stages in the relationship between a customer and a business.

## 7. KEY STAGES IN THE CUSTOMER LIFE CYCLE

- Prospects: People who are not yet customers, but are in the target market.
- Responders: Prospects who show an interest in a product or service
- Active Customers: People who are currently using the product or service.
- Former Customers may be 'bad' customers who did not pay their bills or who incurred high costs.

## 8. WHAT MARKETERS WANT: INCREASING CUSTOMER REVENUE AND CUSTOMER PROFITABILITY

- Up sell
- Cross sell
- Keeping the customers for a longer period of time.

Solution: Applying Data Mining to CRM

## 9. APPLYING DATA MINING TO CRM

Basic steps of data mining for effective CRM are

1. Define business problem
2. Build marketing database
3. Explore data
4. Prepare data for modeling
5. Build model

Building profitable Customer Relationships

- Evaluate model
- Deploy model and results

### 9.1 Define the business problem

Each CRM application has one or more business objective for which you need to build the appropriate model. Depending on your specific goal, such as increasing the response rate or increasing the value of a response, you build a very different model. An effective statement of the problem includes a way to measure the results of your CRM project.

## 9.2 Build marketing database

This step constitutes the core of the data preparation. Data preparation steps may take 50 to 90 percent of the time and effort for the entire data mining process. If you want good models you must have clean data. The data you need may reside in multiple databases such as the customer database, product database and transaction databases. This means you need to integrate and consolidate the data into a single marketing database and reconcile differences in data values from the various sources.

## 9.3 Explore the data

Before you can build good predictive models, you must understand your data. Start by gathering a variety of numerical summaries (including descriptive statistics such as averages, standard deviations and so forth) and looking at the distribution of the data. You may want to produce cross-tabulations (pivot tables) for multi-dimensional data.

Graphing and visualization tools are a vital aid in data preparation and their importance for effective data analysis cannot be overemphasized.

## 9.4 Preparing Data for Modeling

This is the final data preparation step before building models and the step where the most "art" comes in. There are four main parts to this step:

- First, you want to select the variables on which to build the model. Ideally, you take all the variables you have, feed them to the data-mining tool and let the data mining tool find those that are the best predictors.
- The next step is to construct new predictors derived from the raw data. For example, forecasting credit risk using a debt-to-income ratio.
- Next, you may decide to select a subset or sample of your data on which to build models. If you have a lot of a data, however, using all your data may take too long or require buying a bigger computer than you'd like. Working with a properly selected random sample usually results in no loss of information for most CRM problems.

## 9.5 Build model

The most important thing to remember about model building is that it is an iterative process. You need to explore alternative models to find the one that is most useful in solving your business problem.

### 9.5.1 Evaluate Model

The most overrated metric for evaluating your results is accuracy.

### 9.5.2 Incorporating the results

In building a CRM application, data mining is often a small, albeit critical, part of the final product. For example predictive patterns through data mining may be combined with the knowledge of domain experts and incorporated in a large application used by many different kinds of people. The way data mining is actually built into the application is determined by the nature of your customer interaction.

## 10. Conclusions:

Customer relationship management is essential to compete effectively in today's marketplace. The more effectively you can use information about your customers to meet their needs, the more profitable you will be. Operational CRM needs analytical CRM with predictive data mining models at its core. The route to a successful business requires that you understand your customers and their requirements, and data mining is the essential guide.

## REFERENCES:

1. Davenport T. and Prusak L. (1998) Working Knowledge. How organizations manage what they know. Harvard Business School Press. Boston, M.A.
2. Delmater R. and Handcock M. (2001) Data Mining Explained : A Manager's Guide to Customer-Centric Business Intelligence. Digital Press. Boston, M.A.
3. Luan, J. (2001) Data Mining Applications in Higher Education. A chapter in the upcoming New Directions for Institutional Research. Serban. A., and Luan, J. Editors. Josse-Bass. San Francisco.
4. Arun K Pujari, Data Mining Technique

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