

Applications Of Data Mining Technology in Key Business Areas

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The potential areas of application of data mining techniques are practically without limit. However, the following provides a summary of some key areas.

(a) Banking and Financial Services: A wide variety of data analysis solutions to the financial industry are provided. They range from banking and credit cards to online banking and online equities trading. In the area of Customer Relationship Management (CRM), the following focal applications: *Customer Segmentation, Prospecting and Acquisition, Affinity and Cross Sell, Profitability, Channel Utilization, Retention and Attrition and Risk Analysis*. Through our services, we help our customers understand causes of customer attrition, how to improve customer retention, discover cross product utilization, and how to improve the management of channels such as bank branches, ATMs, etc. The patterns discovered from data mining models can lead to re-shaping the approach of a marketing department. In addition, combining the discovered trends profitability and affinity results, *Right Time Marketing* can be implemented on the basis of *dynamic customer life cycle models*.

| Application | KnowledgeSTUDIO Tool(s) |
|-------------------------|---|
| Customer Segmentation | Cluster analysis |
| Customer acquisition | Logistic regression, decision trees, neural networks, lift charts |
| Affinity and cross sell | Decision trees, neural networks, lift charts |
| Profitability Analysis | Decision trees, neural networks, linear regression, accuracy charts |
| Channel utilization | Decision trees, neural networks |
| Risk Analysis | Decision trees, neural networks, linear regression, accuracy charts |
| Retention | Logistic regression, decision trees, neural networks, lift charts |

Other applications of data mining involve the prediction of account-cycle and customer assets cycle with the bank, tracking special/irregular events (such as large withdrawals, which can signify possible attrition or fraud) and providing the necessary alarm mechanisms.

Retail and Packaged Goods: For the retail sector, in addition to the above solutions related to CRM, data mining techniques offer solutions to basic problems such as inventory control, product affinity, response to promotions, effect of demographics on purchasing preferences, purchase sequence, customer and brand loyalty. Furthermore, other applications cover the areas of logistics and transportation, and sales and price forecasting.

| Application | KnowledgeSTUDIO Tool(s) |
|------------------------|---|
| Inventory Control | Decision trees, Neural networks, linear regression |
| Product affinity | Logistic regression, decision trees, neural networks |
| Response to promotions | Logistic regression, decision trees, neural networks, lift charts |

| | |
|-------------------|---|
| Purchase sequence | Logistic regression, decision trees, neural networks |
| Sales forecasting | Decision trees, neural networks, linear regression, accuracy charts |

Right Time Direct Marketing: In Direct Marketing we focus on *Right Time Marketing* where trend-based information is used to offer the *right product* to the *right customer* at the *right time*. Clustering analysis helps to break the market into meaningful market segments. It can also discover *when* each segment is ready for an offer by discovering the appropriate customer lifecycle models. It can answer typical questions such as "When is the *right time* to sell product X with product Y? Who is ready to buy product X now (based on having product Y or other factors)?" The use of such time-sensitive information allows business users to better succeed in their campaigns by acting at the right time with the right offer.

| Application | KnowledgeSTUDIO Tool(s) |
|---------------------|---|
| Campaign management | Logistic regression, decision trees, neural networks, lift chart |
| Promotion timing | Neural Networks, decision trees |
| Cross-selling | Logistic regression, decision trees, neural networks, lift charts |
| Purchase sequence | Logistic regression, decision trees, neural networks |
| Sales forecasting | Decision trees, neural networks, linear regression, accuracy charts |

Quality Control and Warranty Management: Several data mining techniques can automatically detect the presence of irregularities in the data of manufacturing and assembly operations. This feature helps process control engineers in the early identification of potential problems to, and hence reduces the rate of break-down or malfunctioning. Furthermore, it can help quality engineers to find the source of the problem leading to faster solutions and increased customer satisfaction. Similarly, warranty claims can be analyzed to find common trends and find cost effective solutions to the root of any existing problems as well as discovering any potential fraud.

| Application | KnowledgeSTUDIO Tool(s) |
|-------------------------|---|
| Process/Quality Control | Decision trees, neural networks |
| Fault detection | Neural Networks, decision trees |
| Warranty analysis | Logistic regression, decision trees, neural networks, lift charts |
| Fraud detection | Logistic regression, decision trees, neural networks, lift charts |

Insurance: The most compelling cases for implementing data mining techniques in the insurance industry is in two key applications: *estimation of premiums* and *fraud detection*. Other important applications are credit worthiness, customer lift-time value estimation, cross-selling, customer acquisition and retention and customer segmentation.

| Application | KnowledgeSTUDIO Tool(s) |
|-----------------|--|
| Fraud detection | Logistic regression, Decision trees, neural networks, lift chart |

| | |
|------------------------------------|---|
| Estimation of premium | Neural Networks, decision trees, linear regression, accuracy charts |
| Lift time value estimation | Linear regression, decision trees, neural networks, accuracy charts |
| Customer acquisition and retention | Logistic regression, decision trees, neural networks, lift charts |