IBM

Bank of Montreal becomes master of its destiny with IBM scoring tool.

Overview

- **Application**
  Data scoring for predicting customer behavior, profitability, revenue growth and more

- **Business Benefits**
  Faster and more effective targeted customer analysis and resource allocation

- **Software**
  IBM DB2® Universal Database™ Enterprise-Extended Edition for AIX®; IBM DB2 Intelligent Miner™ for Data; IBM DB2 Intelligent Miner Scoring

- **Hardware**
  IBM RS/6000® SP™

Dr. Jan Mrazek and Doug Welch of the Bank of Montreal accept the 2001 Best Practices in Data Warehousing Award on behalf of the bank at this year's TDWI Conference in Anaheim, California.

What if you could predict when certain customers were ready to take their business down the street to your competitor? And, anticipating these defections, you could present these customers with promotions so well targeted that they decided to stay? Not without a crystal ball, you're thinking. Or, in the case of innovative companies like Bank of Montreal, not without sophisticated business intelligence technology.

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– Dr. Jan Mrazek, Senior Manager, Business Intelligence Solutions, Bank of Montreal

Headquartered in Toronto, Ontario, Bank of Montreal is one of North America's ten largest banks, managing $238 billion (U.S.$158 billion) in assets. As Canada's first bank, founded in 1817, Bank of Montreal has made a practice of staying two steps ahead of its competitors. For example, its mbanx is the first North American-wide virtual banking unit, and its Veev service is the first wireless banking and investment service in Canada to provide stock trading and other functions from Web-enabled cell phones.

Now, Bank of Montreal continues its progressive tradition by incorporating IBM DB2 Intelligent Miner Scoring into its business intelligence and data warehousing environment. Developed with IBM business intelligence software, the eight-terabyte data warehouse, together with its business intelligence applications, provides bank analysts, managers and executives online

Institute of Learning of the Bank of Montreal.

access to quantitative business performance information. They can learn, for example, the behaviors and profitability of the bank's 10 million corporate and retail customers, as well as the performance of the bank's 32 lines of business and numerous subsidiaries. They can also gain valuable insights into revenue growth, lost business and risk.

By adding DB2 Intelligent Miner Scoring to the mix, the bank can apply an automated scoring process to its predictive models to segment, classify or rank the information in its customer databases—enabling it to gauge propensity for certain behaviors. And the bank can do so without having to rely on painstakingly tedious, manual methods. Explains Dr. Jan Mrazek, the bank's senior manager of business intelligence solutions, "We were looking for a way to score potentially hundreds of predictive models every year and have the results automatically fed back into our data warehouse for

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broader use. We found the answer to our needs in DB2 Intelligent Miner Scoring, a technical breakthrough that marks a fundamental change in the knowledge discovery process."

Groundbreaking scoring technology from IBM

Continuing its pattern of leadership, Bank of Montreal is one of the first large institutions to implement DB2 Intelligent Miner Scoring. Says Mrazek, "We consider advanced technologies important tools in helping us excel in customer service by anticipating our customers' preferences in a timely manner through knowledge discovery. IBM business intelligence solutions consistently come through in meeting our evolving data analysis needs."

A core component of its knowledge discovery strategy, the bank's data warehouse manages information on the monthly profitability of more than 18 million accounts, customer profiles and demographics, product categories and performance, and market segments and regions. The warehouse, called Customer Knowledge DataBase (CKDB), was developed with IBM DB2 Universal Database Enterprise-Extended Edition for AIX and resides on a ten-node, massively parallel processing IBM RS/6000 SP server.
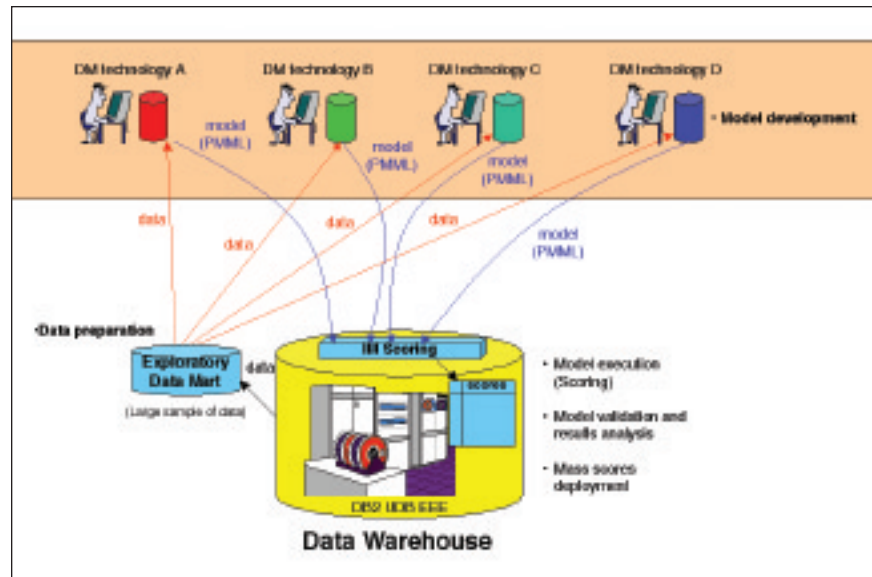
Knowledge Discovery Process with integrated IM Scoring.

Using off-the-shelf data modeling tools, the bank extracts data from CKDB and generates predictive models that uncover insights into:

- *The likelihood that a customer will be interested in a certain financial product or particular channel of communication*
- *The probability that a customer will switch to another bank*
- *Customer credit risk*
- *Full customer relationship potential*
- *Customer response to targeted marketing campaigns.*

Bank of Montreal organized data from its data warehouse into several data marts, each serving a different department or mission within the organization. By addressing these

data marts through standard Web browsers, users leverage IBM DB2 Intelligent Miner for Data to mine these data sources for analytical insights. Off-the-shelf multidimensional analysis tools provide additional business intelligence power. The data warehouse has been generating $53 million annually, enabling the company to achieve a 100 percent return on its investment in just six months.

Business intelligence comes full circle

By integrating with the bank's knowledge discovery tools, DB2 Intelligent Miner Scoring has shaved off much time that bank analysts and data warehouse specialists previously spent executing data models, virtually reducing several weeks of effort to minutes. Analysts

for different lines of business once handled data transformation and modeling on their own, using stand-alone systems and disparate technologies. With the exception of simple rule-based models, they couldn't promote models directly to the data warehouse. Instead, they had to extract data for all customers from the data warehouse to their inadequate stand-alone systems, execute models there and load the resulting scores back to the data warehouse. Adding analysis of actual customer behaviors to the mix was something they could only dream about.

DB2 Intelligent Miner Scoring enables groups of analysts to leverage various data mining software that they're used to working with by taking models built with these technologies and executing them in highly efficient ways on massively parallel databases. The Bank of Montreal extracts a large sample of data from its data warehouse and loads it into an exploratory data mart with more than 2,000 derived variables. Analysts are using this data mart for building new predictive and other models. These models are then translated into Predictive Modeling Markup Language (PMML), an open standard for defining mining models.

Afterward, the models are passed to DB2 Intelligent Miner Scoring, which executes the models against the data warehouse, resulting in scores

being assigned to each processed record in the database. These scores are saved in the data warehouse and used in a number of front-end applications, as well as decision making and comparative analysis against data related to actual customer behaviors and responses.

"With DB2 Intelligent Miner Scoring, our analysts can deploy data mining in our applications with a simple SQL call," says Mrazek. "By bringing our knowledge discovery strategy full circle, DB2 Intelligent Miner Scoring enables us to continually refine our data models to enhance the quality of our analysis."

IBM makes predicting the future a little easier
By speeding its execution of data models and obtaining more timely scoring results, Bank of Montreal hopes to gain an advantage by predicting the future better than its competitors can.

"Businesses are going to have to build models for smaller and smaller customer segments, review their models more frequently and develop more sophisticated models to achieve higher levels of accuracy," says Mrazek. "We embrace DB2 Intelligent Miner Scoring as a tool extending the analytical powers of DB2 to enable information-rich companies like ours to make more informed decisions faster and, thus wield more control over where our business goes."