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Dexia Bank uses data mining to create a model for cross-selling and upselling

Dexia Bank is part of the Dexia Group, which operates in Belgium, Luxembourg, France, Germany, Austria, Spain, the United Kingdom, Portugal, Switzerland, Sweden, Italy and the United States. Dexia Group's three main activities cover three areas: the funding of public utilities and financial services to the public sector and major corporate customers, general commercial banking services, and private banking and administrative and financial wealth management. In a recent data mining project, Dexia Bank set out to determine what products its customers are likely to purchase.



"A successful data mining project in a powerful SAS data mining environment is an ideal way to realize a return on our investment in a data warehouse."

Geert Van den Berge

Data Miner, Dexia Bank

Benchmarking

The objective of Dexia Bank's first large-scale data mining project, which ran between March and September 2001, was to select 5 target products from the bank's range of around 100 bank products and search for the most appropriate target public for each of these 5 products among the bank's existing customers. Thus the project had to produce a list of products and a score per customer to rank the likelihood of each specific product being bought by that target public.

The corporate data warehouse provided the information in three categories: personal data, whether each customer had already bought any of those specific products, and business indicators for each product, such as characteristic values (e.g. for a mortgage loan, this would include the term, monthly repayment, etc). While these data from the data warehouse were verified and selected, they were still raw data and not mineable, i.e. not readily interpretable by business people.

So why did Dexia Bank choose SAS for its data mining? "The choice was not a foregone conclusion," said Geert Van den Berge, Data Miner and project leader at Dexia Bank. "Dexia Bank had already built up a certain amount of

experience with SAS by using it for other purposes, so that was definitely an advantage," he conceded.

"We were also aware that SAS Enterprise Miner was being used very successfully in other banks and that they were very satisfied with it, which was another strong argument, but we still wanted to make our choice based on the results of exhaustive benchmarking. One of our top criteria was the potential for communicating results to all the parties concerned in a uniform way, so that we can be certain that everyone is working with one version of the truth. A second criterion was assessment, i.e. the ability to compare the performance of different models in a single graphic. By assessing the results gained from each stage of the process, you can determine how to model new questions raised by the previous results, and thus return to the exploration phase for additional refinement of the data. Moreover, the SEMMA data mining methodology used by SAS is the most natural approach, and the SAS data mining solution addresses the entire data mining process."

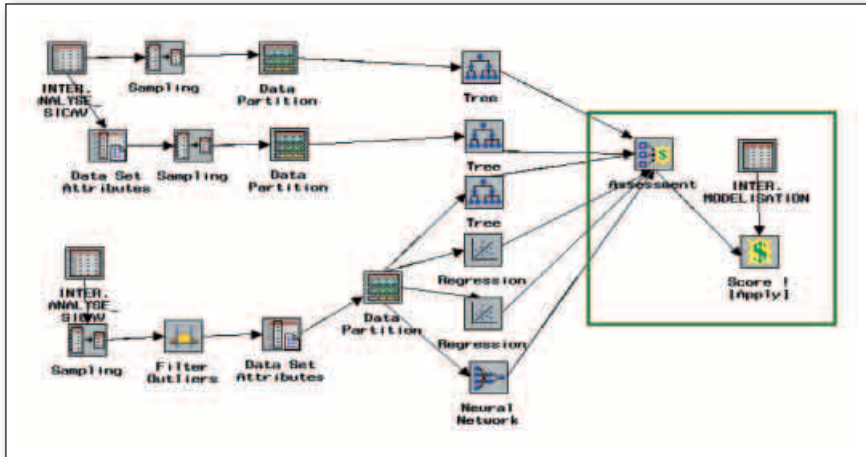
SEMMA data mining methodology

SAS Enterprise Miner's "Sample, Explore, Modify, Model, Assess" (SEMMA) approach provides users with

The Power to Know.™

The challenge

For marketing purposes (cross-selling and upselling), Dexia Bank needed to select five target products from its full range of existing products and to define the target audience among its 2.8 million customers for each of the selected target products.



Scoring 'Business Test' persons

a logical, organized framework for conducting data mining. Beginning with a statistically representative sample of the data, this methodology makes it easy to apply exploratory statistical and visualization techniques, select and transform the most significant predictive variables, model the variables to predict outcomes, and confirm a model's accuracy.

"However, we reversed the first two stages," said Geert Van den Berge. "We started by exploring the population first, then did the sampling afterwards, since the exploration of the population in terms of useful parameters first had to give us a better insight into the population studied."

Geert Van den Berge also underlined the power of SAS data mining tools and the teamwork necessary to conduct such a project successfully. "SAS offered us so many powerful functionalities that non-specialist users were able to draw false conclusions. Although the point-and-click graphical user interface of SAS Enterprise Miner is very user-friendly, a certain amount of statistical and data mining knowledge remains essential. There is also a definite need for teamwork throughout the entire

project - with marketing people for the business knowledge, with people who are very familiar with the contents of the corporate data warehouse, and with hardware specialists, because a project like ours needs large amounts of disk space and processing power."

Lessons learned

The sample needed to construct predictive models comprised 370,000 people, 75% of whom were used for modeling, and 25% for a business test. Why this split? "The business people inside Dexia Bank were a little skeptical about our approach, so they wanted to verify our results via a business test," replied Geert Van den Berge.

Association rules were used to select the 5 target products, i.e. you could say that a customer already using product X, Y and Z was likely to be interested in a specific target product. Mineable data were obtained by calculating useful business indicators per customer and per product. Assessment, scoring, and finally extrapolation followed the construction of predictive models to the 2.8 million user group through iteration.

Apart from the need for close cooperation between all the parties involved,

Geert Van den Berge concludes that other lessons were learned with this first data mining project at Dexia Bank. "You must have a precise, carefully-evaluated definition of the expected deliverables, good data preparation is essential to enable experimentation in SAS Enterprise Miner, the hardware configuration must be fine-tuned, and the results must be interpreted in a uniform way by all the parties involved.

"A successful data mining project such as this is an excellent way to realize a high return on our data warehouse investment," concluded Geert Van den Berge.

The solution

Using first a sample, followed by the complete corporate data warehouse containing monthly refreshed data on 2.8 million customers, Dexia Bank set up a data mining project with SAS Enterprise Miner. Raw data were transformed into mineable data, a scoring model was developed and, finally, a customer's degree of maturity to buy a target product was determined.



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