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DATAMINING: THE ACTION FOR CUSTOMER RELATIONSHIP MANAGEMENT (CRM): A REVIEW

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ABSTRACT

Most marketers understand the value of collecting customer data, but also realize the challenges of leveraging this knowledge to create intelligent, proactive pathways back to the customer. Data mining - technologies and techniques for recognizing and tracking patterns within data - helps businesses sift through layers of seemingly unrelated data for meaningful relationships, where they can anticipate, rather than simply react to, customer needs. In this paper we provide a business and technological overview of data mining and outlines how, along with sound business processes and complementary technologies, data mining can reinforce and redefine customer relationships. We are seeing today widespread and explosive use of database technology to manage large volumes of business data. The use of database systems in supporting applications that employ query based report generation continues to be the main traditional use of this technology. However, the size and volume of data being managed raises new and interesting issues. Can we utilize methods wherein the data can help businesses achieve competitive advantage, can the data be used to model underlying business processes and can we gain insights from the data to help improve business processes. These are some of the issues which we address in this paper.

KEY WORDS

Business Process, Customer Activity, Campaign Management, Data Mining, Data base Marketing and CRM.

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INTRODUCTION¹

Data mining is a relatively unique process. In most standard database operations, nearly all of the results presented to the user are something that they knew existed in the database already. A report showing the breakdown of sales by product line and region is straightforward for the user to understand because they intuitively know that this kind of information already exists in the database. If the company sells different products in different regions of the county, there is no problem translating a display of this

information into a relevant understanding of the business process.

THE PROCESS

When every satisfied customer is a potential advertisement and every disappointed customer is a potential hard to brand reputation, the boundary between marketing and CRM will fade.

How does someone actually use the output of a data mining analysis? The simplest way is to leave the output (the "model") in the form of a black box. If they take the black box and score a database, they can get a list of customers to target (send them a catalog, increase their credit limit, etc.). There's not much for the user to do other than sit back and watch the envelopes go out. This can be a very effective approach. Mailing costs can often be reduced by an order of magnitude without significantly reducing the response rate. But it does require that the user trusts the system, and that's where things get complicated.

Two popular types of applications that leverage companies' investments in data warehousing are data mining and campaign management software. Data mining enables companies to identify trends within the data warehouse (such as "families with teenagers are likely to have two phone lines," in the case of a telephone company's data). Campaign management software enables them to leverage these trends via highly targeted and automated direct marketing campaigns (such as a telemarketing campaign intended to sell second phone lines to families with teenagers).

A. Success Stories²

Data mining and campaign management have been successfully deployed by hundreds of Fortune 1000 companies around the world, with impressive results. But recent advances in technology have enabled companies to couple these technologies more tightly, with the following benefits: increased speed with which they can plan and execute marketing campaigns; increased accuracy and response rates of campaigns; and higher overall marketing return on investment.

B. Data Mining based CRM

Data mining automates the detection of patterns in a database and helps marketing professionals improve

their understanding of customer behavior, and then predict behavior. For example, a pattern might indicate that married males with children are twice as likely to drive a particular sports car as married males with no children. A marketing manager for an auto manufacturer might find this somewhat surprising pattern quite valuable.

The data mining process results in the creation of a model. A model embodies the discovered patterns and can be used to make predictions for records for which the true behavior is unknown. These predictions, usually called scores, are numerical values that are assigned to each record in the database and indicate the likelihood that the customer will exhibit a particular behavior. These numerical values are used to select the most appropriate prospects for a targeted marketing campaign.

Campaign management and data mining, when closely integrated, are potent tools. Campaign management software enables companies to deliver to customers and prospects timely, pertinent, and coordinated offers, and also manages and monitors customer communications across all channels. In addition, it automates and integrates the planning, execution, assessment and refinement of possibly tens to hundreds of highly segmented campaigns running monthly, weekly, daily or intermittently.

Unfortunately, for most companies today, the use of data mining models within campaign management is a manual, time-intensive process. When a marketer wants to run a campaign based on model scores, he or she has to call a modeler (usually a statistician) to have a model run against a database so that a score file can be created. The marketer then has to solicit the help of an IT staffer to merge the scores with the marketing database. This disjointed process is fraught with problems and errors and can take weeks. Often, by the time the models are integrated with the database, either the models are outdated or the campaign opportunity has passed.

The solution is the tight integration of data mining and campaign management technologies. Under this scenario, marketers can invoke statistical models from within the campaign management application, score customer segments on the fly, and quickly

create campaigns targeted to customer segments offering the greatest potential.

Here is how it works

Step 1: Creating the Model

A modeler creates a predictive model using the data mining application. He or she then exports the model to a campaign management application, possibly by simply by dragging and dropping the data from one application to the other. This process of exporting a model tells the campaign management software that the model exists and is available for later use.

Step 2: Dynamically scoring the data³

Once a model has been put into the campaign management system, marketers can then reference the model's score just as they would reference any other piece of data. Records can be selected based on the score, in conjunction with other characteristics in the data. When the campaign is run, the records in the database are scored dynamically using the model. The ever increasing challenges of business environment in the recent past has taught the practitioners of data mining and customer relationship management (CRM) much about delivering high-return and efficient results. Many service sector organizations including banks are now using data mining techniques to analyze the performance of service/customer relationships.

The scope of data mining in business is enormous and thus the organizations including banks are applying data mining techniques to gain competitive advantages in their business. They are maintaining customer data in data warehouses and apply data mining software to uncover trends in the customer behaviour and understand their true business value. The organizations need an evaluation model to select the right data mining tools so as to avoid wrong decision. However, from the survey of literature, it is found that there is a gap in research in the design of an evaluation model for data mining software.

In view of the importance of the subject and the existing gaps in research, this paper proposes a model for evaluating the data mining software with special reference to one of the leading banks in India, which have successfully implemented the data mining for CRM systems. It is now a cliché that in the days of the corner market, shopkeepers had no

trouble understanding their customers and responding quickly to their needs. The shopkeepers would simply keep track of all of their customers in their heads, and would know what to do when a customer walked into the store. But today's shopkeepers face a much more complex situation. More customers, more products, more competitors, and less time to react means that understanding your customers is now much harder to do.

A Number of Forces are working Together to Increase the Complexity of Customer Relationships⁴

Compressed marketing cycle times

The attention span of a customer has decreased dramatically and loyalty is a thing of the past. A successful company needs to reinforce the value it provides to its customers on a continuous basis. In addition, the time between a new desire and when you must meet that desire is also shrinking. If you don't react quickly enough, the customer will find someone who will.

Increased marketing costs

Everything costs more. Printing, postage, special offers (and if you don't provide the special offer, your competitors will).

Streams of new product offerings

Customers want things that meet their exact needs, not things that sort-of fit. This means that the number of products and the number of ways they are offered have risen significantly.

Niche competitors

Your best customers also look good to your competitors. They will focus on small, profitable segments of your market and try to keep the best for themselves.

Successful companies need to react to each and every one of these demands in a timely fashion. The market will not wait for your response, and customers that you have today could vanish tomorrow. Interacting with your customers is also

not as simple as it has been in the past. Customers and prospective customers want to interact on their terms, meaning that you need to look at multiple criteria when evaluating how to proceed. Companies will need to automate⁵:

- ❖ The Right Offer
- ❖ To the Right Person
- ❖ At the Right Time
- ❖ Through the Right Channel

DATA MINING TO IMPACT A BUSINESS

It needs to have relevance to the underlying business process. Data mining is part of a much larger series of steps that takes place between a company and its customers. The way in which data mining impacts a business depends on the business process, not the data mining process. Take product marketing as an example. A marketing manager's job is to understand their market. With this understanding comes the ability to interact with customers in this market, using a number of channels. This involves a number of areas, including direct marketing, print advertising, telemarketing, and radio/television advertising, among others.

The issue that must be addressed is that the results of data mining are different from other data-driven business processes. In most standard interactions with customer data, nearly all of the results presented to the user are things that they knew existed in the database already. A report showing the breakdown of sales by product line and region is straightforward for the user to understand because they intuitively know that this kind of information already exists in the database. If the company sells different products in different regions of the county, there is no problem translating a display of this information into a relevant understanding of the business process.

Customer relationship management (CRM) is a process that manages the interactions between a company and its customers⁶. The primary users of CRM software applications are database marketers who are looking to automate the process to customers.

To be successful, database marketers must first identify market segments containing customers or

prospects with high-profit potential. They then build and execute campaigns that favorably impact the behavior of these individuals.

The first task, identifying market segments, requires significant data about prospective customers and their buying behaviors. It is said that, the more data the better. In practice, however, massive data stores often impede marketers, who struggle to sift through the minutiae to find the nuggets of valuable information.

The closer data mining and campaign management

If these two work in cohesion the better the business results will be. Today, campaign management software uses the scores generated by the data mining model to sharpen the focus of targeted customers or prospects, thereby increasing response rates and campaign effectiveness. Ideally, marketers who build campaigns should be able to apply any model logged in the campaign management system to a defined target segment.

Figure No.1.1, which shows a "gains chart," suggests some benefits available through data mining. The diagonal line illustrates the number of responses expected from a randomly selected target audience. Under this scenario, the number of responses grows linearly with the target size.

The top curve represents the expected response if you allow the model scores to determine the target audience. The target is now likely to include more positive responders than in a random selection of the same size. The shaded area between the curve and the line indicates the quality of the model. The steeper the curve, the better will be the model. Other representations of the model often incorporate expected costs and expected revenues to provide the most important measure of model quality: profitability. A profitability graph such as Figure No.1.2 can help determine the number of prospects to include in a campaign.

In this example, it is easy to see that contacting all customers will result in a net loss. However, selecting a threshold score of approximately 0.8 will maximize profitability.

The future of data mining may very well parallel the history of spell checking. The functionality of database marketing products will increase to integrate with relational database products (no more dumping a RDBMS into a flat file) and with key DSS application environments, it will stress the business problem rather than the technology, and present the process to the user in a friendly manner. Database marketing will start losing some of the hype and begin to provide real value to users. This will make database marketing an important business. The larger RDBMS and data warehouse companies have already expressed an interest in integrating data mining into their database products. In the end, this new market and its business opportunities will drive mainstream database companies to database marketing. Ten years from now there may be only a few independent data mining companies left in existence. The real survivors will likely be the ones with the foresight to develop a strong relationship with the mainstream database industry.

CONCLUSION

Based on the above information, governments and enterprises may infer collective tendencies and demands for scientific researcher in data mining and CRM to formulate appropriate training strategies and policies in the future. This analysis provides a roadmap for future research abstracts technology trends and facilitates knowledge accumulations so that data mining and CRM researchers can save some time since core knowledge will be concentrated in core categories. This implies that the phenomenon "success breeds success" is more common in higher quality publications.

Database marketing software applications will have a tremendous impact on how business is done in the future. Although the core data mining technology is here today, developers need to take what already exists and turn it into something that business users can work with. The successful database marketing applications will combine data mining technology with a thorough understanding of business problems and present the results in a way that the user can understand. At that point the knowledge contained in a database will be understood by people who can turn what is known into what can be done.

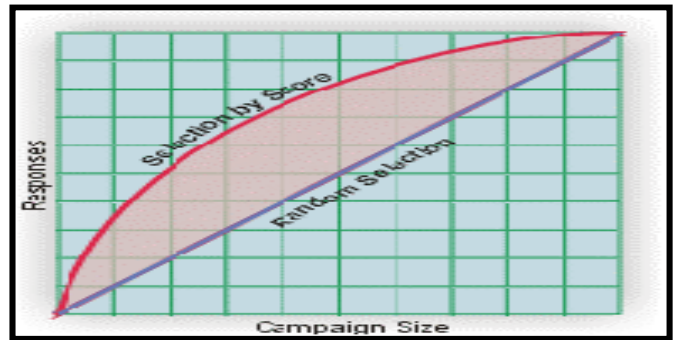


Figure No.1.1: Gain Chart

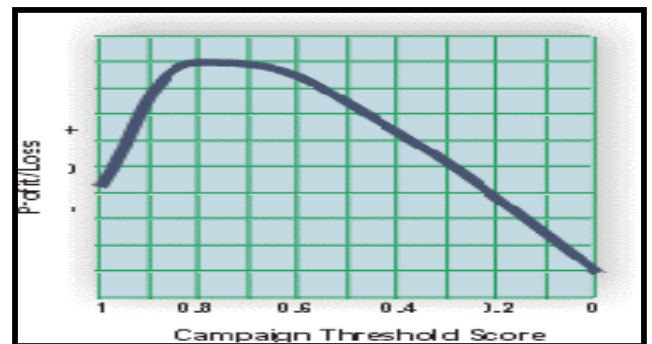


Figure No.1.2: Profitability Chart

According to our observations, data mining application developers will begin spending more time on understandability and interaction instead of tweaking the internals of the algorithm. Those that do will find that their customers are happier and the results generated by their software will be put to good use.

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BIBLIOGRAPHY

1. Hsu-hao- Tsai. Research trends analysis by comparing data mining and customer relationship management through bibliometric methodology, *scientometrics*, 87(3), 2011, 425-450.
2. Sarika Sharma, Goyal D P, Mittal R K. "Evaluation model for data mining software: an empirical investigation of ICICI bank", *Journal of Advances in Management Research*, 4(2), 2007, 63-68.

3. Ngai E W T, Li Xiu, Chau D C K. Application of data mining techniques in customer relationship management: a literature review and classification, *Elsevier*, 48(2), 2008, 453-475.
4. www.hearling.com.
5. www.globaldataconsulting.net.
6. www.geniq.net.