

## THE ROLE OF DATA MINING TECHNIQUES IN RELATIONSHIP MARKETING

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*Relationship marketing involves a displacement of the organizations' attention from customer acquisition and the execution of mere transactions to the retention of profitable customers and the tacit understanding of each party's needs. The activity of going from mass marketing to one-to-one marketing is associated to a series of dimensions based on concepts such as trust, commitment, loyalty, fidelity and retention. The challenges facing many companies is to be able to create and maintain a business relying on customer relationship, and the Data Mining techniques can significantly ease this process. This paper concretely emphasizes the objectives to reach in order to "perform long-term collaborating exchanges" and the main Data Mining techniques providing solutions to execute them.*

*Keywords: relationship marketing, fidelity, retention, Data Mining techniques*

### **Concepts characteristic to relationship marketing**

Relationship marketing has become the key of the mechanism by means of which the organization focuses on maintaining and developing current customer relations. Although acquiring new customers has remained one of the most important issues, organizations grant more and more value to ongoing interaction with the consumers. Relationship marketing involves a displacement of the organizations' attention from acquiring new customers and performing mere transactions to maintaining the profitable customers and the tacit understanding of each party's needs according to specialist G. Day "the performance of collaborating exchanges". If, within the exchange, the product and price are deemed essential when it comes to transactional marketing, and if attention is moved to the needs of both parties, both those of the consumers and those of the organization, then the exchange is deemed to be relational.

#### *Increase of the collaboration relation intentisty*

Source: Adapted after G. Day (2000)

Going from mass marketing to one-to-one marketing is associated with a series of dimensions based on concepts such as: trust, commitment (both affective and rational, fidelity, loyalty and retention. The essence of relationship marketing consists in earning competitive advantages for the company practicing it due to consumer retention for a longer period within the circle of permanent customers, by maintaining and/or increasing their level of satisfaction as to the provided performance<sup>442</sup>. In economic terms, the retention stage is the most profitable, since the highest value level of the relation is experienced.

#### **Trust**

Both with respect to theoreticians and with respect to practitioners, trust is one of the crucial factors leading to the set up, maintenance and development of a long-term relationship between the organization and the consumers. The experience of a perceived higher value leads to a climate of trust which reduces significantly the effect of uncertainty, representing thus the basis of a solid relationship.

#### **Affective and rational commitment**

The literature of relationship marketing knows another possible factor leading to customer loyalty: commitment. Most researchers in the marketing field define commitment as the desire to continue, maintain the relationship between the parties without considering the offer of the competition. The field literature indicates two distinct dimensions of commitment: affective and rational. *The affective commitment* is an emotional factor developing through a degree of reciprocity or personal involvement, which results in a high degree of trust and commitment<sup>443</sup>,

442 Henning-Thurau, Hansen, 2000, pag. 3-27.

443 Garbarino și Johnson 1999; Morgan și Hunt 1994.

and the *rational commitment* is the cooler and more calculated dependence, with economic reasons, on the benefits of products due to the lack of alternatives or cost modification.<sup>444</sup>

### ***Fidelity***

Customers' fidelity contains the set of measures taken by the organization with the purpose of positively orienting the behavior of current and potential customers in order to obtain stability and progress in the customer relations. The loyal customer is the one who resorts frequently to the products and/or services of an organization.

### ***Loyalty and retention***

A unitary vision of specialists is that consumer retention leads to loyalty. Loyalty may have various forms only due to the idea that certain customers are more valuable than others. Loyalty clearly focuses on establishing a permanent dialogue with active customers. The aim is to build a mutually profitable long-term relationship. Thereby, we pursue operational goals like increasing usage, up-selling and repurchase rates.<sup>445</sup>

The duration, consistency and interdependence level between consumers and the organization may vary. The significant difference between a faithful and loyal customer is that the latter (the loyal customer) not only comes back frequently within the organization and resorts most of the times to its products and services, but also actively recommends the organization products, developing a positive word-of-mouth communication.

The challenge for any organization adopting relationship marketing consists in:

- the identification and familiarization with the own customers;
- the satisfaction and retention of existing customers.

These processes involve a detailed understanding of the consumption needs and the expectations customers have from the organization products and/or services. The best approach of such needs is an essential factor for the creation and ongoing improvement of mutual, durable and profitable relations for both parties, both for the organization and for the consumer. Due to Data Mining techniques the best approach of needs becomes doable.

### **Data Mining techniques – a marketing approach**

Data Mining is simply a process and a serious tool that help to analyze information already collected to use it to support decisions.

In marketing, Data Mining techniques favor the understanding of the consumer behavior leading to the best decisions. Valuable models can be identified supporting marketers in the identification of the consumers' needs, the customization of products and communication adapted to their needs. In other words, by introducing the data analysis process, Data Mining, the organization can understand much better the customers' buying and consumption behavior. The models identified by a Data Mining method can be transformed into knowledge, only after appropriate validation; then, the knowledge can be subsequently used to fundament economic decisions.

The Data Mining concept is the discovery of models of useful information and/or knowledge in a large amount of data. The basis of professional data storage, finding and use mechanisms is data collection, without which their advanced analysis would be practically impossible. The evolution of information technology made it possible that at present users have direct access to sophisticated databases, which facilitates the making of correct and due time decisions, thus favoring the strengthening of customer relations.

### ***Stages of the Data Mining process***

The Data Mining process is done in 3 essential stages:

Prior to the beginning of the analysis process, within a software, an essential stage is to define the issue to be solved. The lack of accuracy within the process will lead to a waste of time and even of financial resources.

***Stage 1:*** Initial exploration: a succession of steps is made within this stage:

data cleaning: the process to remove useless and inconsistent data;

While performing an e-mail marketing campaign, inexistent e-mail addresses can be detected (by means of the e-mail received from the organization with the message "this address doesn't exist") or addresses of consumers who are no longer interested in the company products. It is very important to remove these e-mail addresses and the database be permanently cleaned.

-data integration: the activity to efficiently combine the data coming from various sources and their storage in a central system for analysis.

-data selection: the extraction of data relevant for the analysis from the available data warehouses (databases, data warehouses, WWW etc.);

-data transformation: placing data in unit formats corresponding to the analysis with a view to discovering knowledge.

Data transformation mainly concerns data description, data encoding, the units of measure and data format. Data description and visualization is a key component of this stage (statistic description, correlations, graphs etc).

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444 Anderson and Weitz 1992; Dwyer, Schurr and Oh 1987; Heide and John 1992.

445 Data Management in Analytical Customer Relationship Management- Dirk Arndt, Wendy Gersten, 12 The European Conference on machine learning.

**Stage 2:** Creating the model and its validation:

Extracting data models by applying results on data after the previous methods, generically called Data Mining techniques; this process is essential to discover useful knowledge within databases.

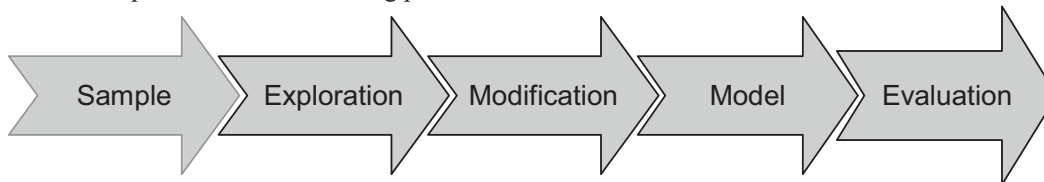
A model can be seen as a “transparent”, coherent, intelligible structure or can be seen as a “black box”, structures and rules based on which forecasts are made which are difficult to understand in full. The model validation involves its assessment on a distinct set of independent data.

**Stage 3.** Providing knowledge to the user

The data mining process interacts with the user through the database meant to him/her from among the data models discovered, those important to the user representing in fact new knowledge which is stored in the knowledge base in order to be presented.

**Stage 4.** Dissemination. Once created, a model must be able to be used whenever necessary on other data as well.

In the field literature, there is a variety of models of the Data Mining process, focused on the integration of methodology in an organization; i.e. how data can be turned into knowledge, how the most important stakeholders can be advantaged and to what extent knowledge dissemination can be made in a form which is easily convertible into resources. One of these models belongs to Institutul SAS. Within the SEMMA model, accent falls on the technical aspects of the Data Mining process:



Source: [www.statsoft.com](http://www.statsoft.com) – Short course in Data Mining

The Data Mining techniques have led to the effective and profitable use of data coming from customers. In relationship marketing, objectives such as owning a competitive advantage, knowing the customers’ consumption needs, effective and ongoing communication with the current and potential customers can only be reached after the following stages: creating the “customer” database, classifying customers on criteria, filtering them, setting customers on hierarchies, selecting them depending on the level of interest, classifying them depending on the buying frequency, the preferred products, identifying the customer important data, completely visualization of the interaction between the organization and the customer, understanding the customers’ individual needs, communicating in a few minutes with all the customers in the database, obtaining valuable feedback a.s.o.

The role of Data Mining techniques in creating and maintaining customer relations In order to know its customers better, a company must have a very large database so as the relations with its customers be controlled over time and the important data can allow access at any time to authorized users.

Depending on the type of the expected result, the Data Mining techniques are grouped into several categories. One of the most frequently used classification groups techniques into: supervised learning techniques and unsupervised learning techniques. *Supervised techniques* have a predictive function through the behavior of the answer variable and not only an explanatory function. In the case of *unsupervised techniques*, it is assumed that in explaining the phenomenon, all variables have the same significance, since no distinction is initially specified among them.

In the context in which customers become more and more sophisticated and demanding and the interpersonal relations in the field of marketing acquire a gradually high importance, the Data Mining techniques can be used for the planning, coordination and monitoring of segmentation, customer communication campaigns in order to become more customized and relevant, of fidelity programs, intentions which lead to consumer retention and the settlement of long-term relations profitable for both parties, the consumers and the company. The advantages of using the information technology is mostly shaped in two types of results: cost reduction and sales/profit increase.

Usually, the data resulting from cleaning and integration processes are stored in *data warehouses*, which ensure useful information for the company. The Data Mining techniques bring intelligence to such data, allowing the stored information to be turned into “useful samples”, the design of new action rules, the application of new ideas and, last but not least, forecasts on the future of the company-customer relation. By using the techniques a series of questions can be answered with a significant importance for a relationship basis stable over time. Among these we can mention:

- Which is the target market?
- Which are the consumers likely to remain faithful and which are not?
- Which are the reasons making consumers answer favorably to a certain offer?
- Which are the future products or services that will be desired by customers?
- Where should a new branch be opened?
- Which is the accepted communication technique?

Data Mining can be used by any organization aiming to discover patterns or the existence of relations between owned data, anything that can be obtained from such owned data that could help a good exploitation of the business. Data Mining is a very powerful tool for various objectives, among which are the following:

### ***Segmentation***

It is the process to identify consumer groups aiming for the same benefit package from a product, each group with unitary and homogeneous needs. An important aspect of the database is that it does not represent the homogeneity feature, and a common message sent by all customers in the warehouses cannot be effective.

One of the most effective Data Mining techniques used for an effective segmentation is Cluster Analysis, aiming at grouping the cases (observations) into clusters (groups, categories) It can be used to sort out data (customers, companies, cities or other attributes) into homogeneous groups based on common features called clusters.

Cluster analysis can also be used for the understanding of the consumer behavior. By identifying homogeneous buyer groups, the buying behavior of each group can be observed separately, and the respondents are groups based on the importance they grant to a criterion for the selection of a product.

### ***Fidelity***

In the commerce field, prosperity comes only to those who know how to attract new customers and also keep the old ones and make them buy as many products as possible.<sup>446</sup> Through the effective customer management, very important data can be obtained on them and, as a result, various products and/or services with the same features as those preferred by them but unused before can be provided. Thus, knowing the preferences of the current customers, they will buy even more if their fidelity is rewarded.

In marketing in general, a fidelity card containing points or allowing access to a restricted group is used first of all for the identification of a potential buyer. In Great Britain, there is the highest number of fidelity cards, in Canada there are rewarding cards or point cards and in the USA the most frequently met cards are discount cards, club or prize cards. The appearance of fidelity cards can be explained as follows: customer information analysis. Filling in a form by the customers will significantly help the process of customer familiarization and interrelation, since it contains useful information such as: name, address, education, personal and family monthly income, buying frequency etc.

In Romania, fidelity cards are generally issued by drug stores. SensiBlu was the first to introduce on Romania's pharmaceutical market fidelity cards. At present, it has 700,000 owners. The HelpNet fidelity card is the first card in the pharmaceutical system providing a 5% discount on any product in the network, except for compensated medicine.<sup>447</sup>

Fidelity cards are an important tool used to create a database with detailed information on the company customers (data warehouse), extremely important for the use of Data Mining techniques.

### ***Detecting customers with the tendency to churn***

The Data Mining techniques have a special role in rapidly detecting customers with the tendency to abandon the products/services of a company. The objective is to prevent the migration of existing customers and to detect the customers prone to easily abandoning the company services. The Data Mining solution is to identify the basis of common features of customers about to churn using *Neuronal networks* and *Chronologic series analysis*.

Neuronal networks are dynamic networks, made of a set of artificial neurons, the behavior of which can be characterized by the supervision of states at various time moments. The advantage of this technique consists in the rapidity with which it can provide answers to various problems, offering real time predictions for new instances.

For example, by using Neuronal networks and the Chronologic series analysis, the company France Telecom implemented "Customer Profiling" System (CPS), resulting in the rapid detection of customers with a tendency to churn by comparing certain features of such customers with features of those who have already churned.<sup>448</sup>

In order to set the reasons for which customers manifest a negative attitude to the company products another Data Mining technique can be used, i.e. Factor Analysis. By means of this technique, emphasis is indicated on the interdependence links between the variables with the help of which a certain phenomenon is characterized, by condensing the data volume. The purpose is to discover the factors upon which rely the correlations among several variables. Therefore, the technique may be successfully used to set the reasons which form the basis of the favorable or less favorable attitude of customers to the company products and/or services.

## **Conclusions**

Similar to the complexity of applications, the number of variables to be considered and the primary data volume have gradually increased one year to another, the need of techniques to analyze such data has significantly grown. Therefore, if previously the purpose was to obtain information, nowadays, paradoxically maybe, we have much information; so there appears the need to extract the relevant one.

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446 [www.marketwatch.ro](http://www.marketwatch.ro).

447 [www.sfin.ro](http://www.sfin.ro) - Saptamana financiara.

448 [www.mit.edu](http://www.mit.edu) - PATEL, Nitin, „Data Mining”, Course 15.062, Massachusetts Institute of Technology, MIT OpenCourseWare, Sloan School of Management, 2003.

Data Mining techniques provide the means through which each organization can monitor its customers' buying behavior changes, the modification of the company-consumer relationship and the impact of such changes on other network members. In relationship marketing, the great advantage offered by the use of such techniques is that they allow relationships between the exchange participants (company and consumer) to be able to be monitored, analyzed and developed – a significant factor in setting a long-term relationship.

The challenge facing many companies is to be able to build and maintain a business based on customer relationship. The limits of Data Mining techniques gravitate around this concept since *it takes more than Data Mining to turn a product – focused organization in a customer – centric one*. Therefore, Data Mining is a highly useful tool, but not a “magic wand”, it does not implicitly provide solutions, but it needs authorized guidance.

“Relationship marketing is the mechanism through which the company attention is moved from customer acquisition towards the development and improvement of the relationship with its current customers”<sup>449</sup>, and in order to achieve such goal, a company must:

- know the behavior of its current and potential customers;
- be able to set the buying behavior changes, visualizing the customers' actions in time;
- extract customers' important data;
- learn how to extract knowledge from the information in the customer database;
- act based on this knowledge in order to transform customers into profitable customers.

In conclusion, Data Mining transforms the customers' present and past actions into future actions of the company, bringing a plus of value and efficiency to the strategy for the maintenance of long-term customer relations, turning plans into practice.

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