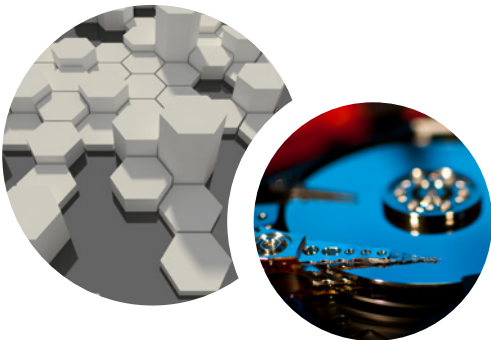**COMARCH** `BI`

DISCOVER KNOWLEDGE FROM DATA

In today's world, one of the greatest challenges for companies is dynamic growth of the amount of data they store and analyse. This situation makes traditional analyses of the ever-growing data collections difficult, sometimes even impossible.

The ceaseless growth of the database volumes is the result of progress in the technologies of information collection and storage. Unfortunately, this progress is not counterbalance by the capacity to analyse the data. The need of analysing large volumes of data is the need for a more extensive knowledge, concealed as patterns, trends or regular cases.

Although for many years this sort of knowledge was acquired through very expensive market research, today we can say with a clear conscience that the enormous potential of collected information is starting to win appreciation. Nevertheless, over 90% of all data stored by companies is still not analysed in the process of making operational decisions. This is a great business challenge for contemporary companies. Gartner published a report where it explicitly said that by 2015, more than 85% of over 500 world's largest concerns will ineffectively analyse their data collections in order to provide competitive edge[1]. Referring to this statement, companies must make

developments towards new technologies based on discovering of knowledge – Data Mining.

Data **mining**

The traditional methods of turning data into knowledge are based on manual analysis and interpretation of data. For instance, in retail, it is common to

90%

That much of the data acquired is not used effectively

analyse the current trends and changes within data merely once per quarter. Then, the specialists provide reports on sales trends and the customers' purchasing preferences. These reports have already become a basis for making future decisions and planning the sales management. In this and many other instances, analysis of enormous data sets is slow, expensive, and very subjective in interpretation. This is why in many fields the manual analyses are becoming less and less practical, and are being replaced with solutions for automatic data mining.

The Gartner company provided the most accurate and

1. „Gartner Reveals Top Predictions for IT Organizations and User for 2012 and Beyond" Gartner 2011

vast definition of data mining, according to which this is "…a process of revealing significant correlations, patterns and trends by mining vast amounts of data stored in repositories and using technologies which identify these patterns, as well as statistical and mathematical techniques."

Companies are increasingly willing to employ the data mining and utilization technologies in order to gain competitive edge, increase their effectiveness and provide more valuable services for the customers. One of the undeniable advantages of data mining is support for sales, revealing of the customers' preferences, analyses of marketing campaigns, or even detection of financial frauds. These are just several of the actual applications of data mining used in today's business.

Sales **stimulation and shopping basket**

Every entrepreneur considers the methods of boosting sales and continuing the market expansion. An overwhelming majority of companies try to compete exclusively In terms of price, which reduces their margin. There is another solution which allows to go around this problem and, at the same time, boost the sales.

If we want to sell more, we must learn as much as possible about our customers, particularly about their needs. When we know their shopping preferences, we can adjust the promotional offer to their current expectations. Analysis of the most likely shopping preferences of the customers allows to satisfy these needs.

Analysis of sales, also known as shopping basket analysis, is one of the methods of data mining and an alternative for this sort of activities. In order to adjust the company's offer to the customers' needs, first of all we must observe their behaviour. We must know such relations as, for instance, the days on which they are the most willing to shop, or sets of products

which they usually buy. Such information will allow us to organize promotional campaigns which would have a high chance of success. We can also use it, for instance, in e-commerce, by suggesting additional goods for purchase, basing on millions of behaviours displayed by other customers whose profile is similar. In both these cases, the resulting knowledge will allow the store managers to improve positioning of key products which are usually purchased together. This is possible thanks to application of models which analyse immense amounts of operations and find mutual patterns, which are impossible to define using the traditional methods.

> *(…) by 2015, more than 85% of over 500 world's largest concerns will ineffectively analyse their data collections in order to provide competitive edge1. Referring to this statement, companies must make developments towards new technologies based on discovering of knowledge – Data Mining.*

Data mining in the sales process also involves forecasting of its future volume. By creating models applicable only to forecasting of future sales volumes for individual products, it is possible to improve planning of the entire process of distribution and replenishing of stock levels.

Customer **segmentation**

Customer segmentation consists in finding who exactly are our perfect customers and how can we distinguish them from the others. Taking into account the specificity of each business and that of the current customers, we can conclude that they are not all the same. More than once, basing on literally several parameters such as the basket value or frequency of

shopping, we can define whether the given customer is the perfect one. It is possible to specify whether acquisition of the given customer means a one-time sale, or if we can count on long-term cooperation. What is the shopping potential of the customer or the scope of services they require.

We can answer the question of what is the shopping history of the given customer and whether cooperation with them could translate into valuable recommendation and acquisition of new customers.

According to numerous experts, segmentation is one of the most important elements of conducting and maintaining business activity. Conducted properly, these actions definitely facilitate understanding of who our customers are and, more importantly, who they are not. For example, if we operate locally, customers from the same city or province will be much more valuable for us. Specifying of such a target group will let us maintain proper relations and strong sales channel among the key customers.

One interesting example of using the customer segmentation occurs in the banking sector. How to find customers who bring the greatest profits? This question can be answered by creating models based on transaction and demographic data, customer's sales profile and the history of their relations with the bank.

Lack of segmentation means primarily a risk of losing the customers or reaching an ineffective target group. Both mean additional costs to be incurred. Instead of falling into the trap of pricing competitiveness, it is worth to focus on one's uniqueness and accuracy of one's offer. Segmentation means lower costs and effective identification of proper customer groups, understanding of their structure and needs. In short – the purpose of segmentation is to answer the question of how important the given customer is for us.

Financial **abuse**

Numerous studies on abuse detectability indicate that the internal audit departments are highly ineffective in that respect – they can detect less than twenty per cent of such cases. Due to an overwhelming number of transactions, it is difficult to extract the interesting knowledge. In order to do so, it is necessary to employ an entire team of analysts, which means a significant cost. Another problem is the effectiveness of the controlling tasks - they fail to provide effective final results.

A simple example of applying the data mining solution is the construction industry. A common practice in the construction market is the issue of unfair selection of subcontractors for the projects, which cause inflated costs of materials and reduced profitability of the project. The complexity of the purchasing process is the reason why the monitoring thereof fails to provide substantial supervision. One level of control is the use of the assumed budget, which also fails to reflect the entire situation in the scope of potential abuse. From this perspective, the prospects of potential lost assets are enormous. So how can one monitor the abuse in a simple manner? The answer is easy – through methods based on analyses of bills, transactions and historical data, which detect potential and actual abuse – that is Data Mining.

A similar application of the methods for detecting financial abuse occurs in the financial sector, primarily in the scope of debit cards, credit risk management and customer relations. Thanks to implementation of appropriate algorithms and integration thereof in the data mining models, it is possible to identify individual cases of abuse, through statistical analysis of all the transitions made by the customers..

Building **customer relations**

A fundamental problem of each enterprise is to specify and then reach the specific target group of custom-

ers. The effectiveness of such activities is highly dependent on well-planned marketing campaign. What is the target group, at whom is the campaign aimed, who are the key customers, what are the chances for a positive reception of the campaign? These are just a few of the questions answered by the data mining solutions. When applied, they enable optimization of the entire marketing process in terms of costs of the campaign, allocation of assets, costs of customer relations, etc.

Corporate managers have long ago realized that the entire business process revolves around the customers and their satisfaction. It follows that the customer relations must become the subject of the highest care.

In marketing campaigns, the data mining solutions are often used to assess the effectiveness of acquiring the given customer and to predict the probability of certain behaviours (one-time purchase, tendency for promotional shopping, etc.). For instance, it is possible to measure the customer's inclination to have a specific credit card or to react to competing products. Moreover, the data mining analyses are often useful for conducting the three fundamental stages of building customer relations:

→ acquisition of the customer
→ development and deepening of the customer relations
→ retention of the customer

Conclusions

In the current realities, the benefits offered by the data mining solutions are becoming increasingly vital for company operation, as they allow the managers to make optimal decisions in a dynamically-changing environment, where the customers' needs and the competitors' actions come to the fore.

The advanced predictive and economic models used to discover patterns on the basis of enormous data sets, as well as AI tools, implemented by Comarch Business Intelligence, allow the contemporary companies to discover hitherto unknown knowledge and to use it in order to achieve even greater benefits.

More about Comarch
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