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ROLE OF DATA MINING IN CRM

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Abstract-

This article presents a framework for identifying appropriate data mining techniques for various CRM activities. This article attempts to integrate customer relationship management and data mining models and proposes a new data mining model for customer relationship management. The new model specifies which types of data mining processes are suitable for which customer relationship management steps / processes. To develop an integrated model, it is important to understand the existing customer relationship management and data mining models. Therefore, the article examines some of the existing customer relationship management and data mining models and finally proposes an integrated data mining model for CRM.

Research Implementation: this research document provides a preliminary understanding of the role of data mining in CRM to retain customers, in addition to that it also highlights how different data mining tools are used to retain their customers with unique ideas and approaches and helps meet market needs for the present and the future.

Originality: this document highlights the different types of use of data mining to retain customers, as well as the importance of data mining and database maintenance to retain existing customers and meet needs.

Keywords: CRM, data mining, customer, data mining techniques, database

Introduction

Although this technology is still relatively new, but companies from all sectors of the industry are investing in it to attract historical data. Data mining techniques in CRM can help your business find and select applicable information which can then be used to get a holistic view of the customer life cycle in four steps: customer identification, customer attraction, customer retention and customer development The more data in the database, the better the models created, "the use of which will result in greater commercial value.

- Data mining generally involves the use of prediction and forecasting and descriptive modeling Key elements .Thanks to these techniques, an organization can manage customer loyalty, select the right prospects and customer segments, define optimal pricing policies and objectively measure and classify suppliers who best meet their needs.

- **Data mining:** Its aim is to find new info information in a large number of data. Data mining is new and useful.
- In many cases, data is stored for later use. Data is saved with a target. For example, a store wants to record what has been purchased. They want to do it to find out how much they should buy, to have enough to sell later. Recording this information generates a lot of data. The data is generally stored in a database. The reason the data is stored is called first use.
- **Customer loyalty:** customer loyalty refers to the ability of an organization or an article to retain customers for a predefined period.

Objective

- To Study the Importance of Data mining in CRM
- To highlight the technique of data mining in CRM.
- To highlight the applications fields of data mining in CRM.

Significance and Importance

In modern times it is very important to identify the importance of Data for enhancement of customer behavior as well as retaining them and because of Technological development has also became an necessary element Besides this the research paper aims to provide the innovative ways to use data mining to enhance customer retention through various ways Just like giving more options according to their taste.

Limitations

The study is based only on secondary data from books, journals, newspaper articles, websites etc. which may work as a limitation of the study.

Review of literature

Much research has been conducted on CRM applications and data mining. However, the benefits of the latest trend in applying data mining to CRM applications must be developed so that multiple organizations can switch to this technique.

- CRM technology includes all the IT technologies used by organizations to build solid and long-term relationships with their customers. In view of this research, **Rigby, Reichheld and Schefter (2002)** have argued that CRM technology is an information technology-based solution designed to support the CRM process.
- **Fang and Lee (2009)** collected 565 valid answers from the distributed questionnaire, then using a two-phase cluster analysis, four distinct segments of the lifestyle of consumers related to food were identified and the segments differ in attitude and behavior in the comparisons of food consumption. Furthermore, segment profiles are obtained by observing the socio-demographic characteristics of the typical members of the segment.
- **Sheu et al. (2009)** helped integrate data mining and experiential marketing to segment online gaming customers. The authors first identified and modified the important influencing factors, then by applying decision tree data mining techniques, they explored the potential relationship between these factors and customer loyalty.

- **Dhanpal et al. (2010)** presented an original methodological approach to assess customer satisfaction by combining a multi-criteria preference breakdown analysis and a rule induction data exploration. The authors indicate that using the characteristics of the client, such as age, marital status, the methodology presented can identify and analyze a special group of clients.
- **Mazumdar (2010)** analyzed the use of data mining techniques, such as the vector quantification-based grouping algorithm for significant segregation of different customers based on their RFM value and the "Association Rules" scanning algorithm based on Apriority to find relationships and models between purchases made by customers in multiple transactions.
- **Musa (2010)** described how to use Microsoft Data Mining plug-ins from Excel as a front-end for Microsoft Cloud Computing and the SQL platform Server 2008 Business Intelligence as a back-end. The content presented has wider applications in areas such as accounting, finance, business in general and marketing. The article provides an understanding of the algorithms and data mining tools to perform analysis of the elementary data, configure and use data mining calculation engines to build, test, compare and evaluate various data mining models and use the mining model to analyze data and predict results for decision support.
- **Romdhane et al. (2010)** describe that data mining is an emerging new discipline that aims to extract knowledge from data using various techniques. Data mining has proven to be useful in cases where transactional data has proven to be a wealth of information on customer buying habits. The development of customer models is therefore an important step for targeted marketing. Therefore, the authors develop a three-step approach to the customer profile. First, the data was added to extract a natural group of customers. Hence, the authors reduced the number of attributes in each group of clients by using information entropy for the importance of an attribute. Finally, modeling based on a neural network is used to create a set of customer profiles with data from the corresponding customer group.

Findings and Suggestions

Importance of Data mining in CRM

Some of the areas where the application of data mining in CRM can be quite helpful:

- Data mining can help you predict future trends by analyzing past behavior adopted by the people. This is quite helpful in making re-stocking decision as you neither overstock your products nor understock it so that your customer doesn’t have to return empty-handed. In short, it helps you with supply chain and financial management, which are co-related. And thus, you gain control over your internal operations.
- Data mining helps you correctly segment your target audience based on demographics, buying behavior, gender, and other factors. The information can be collected through some sort of market survey, social media platforms, and more. You can then design your marketing campaign and strategy, keeping their tastes and preferences in mind. It will automatically result in increased ROI for your business. It removes inefficiency by removing customers from the list who shows little to no interest in your product, saving you time and money.
- Whenever a competitor offers a lower price, customers jump from one boat to another. If you want to reduce this customer turnover rate, data mining can help. For example, data mining uses a model called “customer cluster”, which uses audience data on social media sites to generate ideas to improve brand service, satisfy customers and increase loyalty. In fact, data mining doesn't always focus on the customer. The contribution of your employees can also give you a great perspective on how to improve their service, get feedback on product development and more. In summary, determining customer value throughout your life not only helps you improve acquisition costs, but also helps you find out why customers are sparing. And by identifying the reasons, strategies can be created to retain customers and build brand loyalty.

Techniques of Data mining in CRM

- **Anomaly detection:** the search for information which does not correspond to the expected behavior or to a projected model is called anomaly detection. The anomalies can provide usable information because they diverge from the average in the dataset.
- **Learning association rules:** discover the relationships between data elements in large databases. With learning association rules, hidden models can be discovered and the information obtained can be used to better understand customers, learn their habits and plan your decisions.
- **Grouping:** identifying similar data sets and understanding both the similarities and differences within the data. Data sets with similar characteristics can be used to increase the conversion rate. For example, if the Buy a group of customer's behavior is similar to that of another group, both can be directed with similar services or products.
- **Classification:** this technique is used to collect information about the data, so that the data sets can be placed in the appropriate categories. For example the classification of the email as either regular email, acceptable email or spam email.
- **Regression:** It is one of the advanced data mining techniques in CRM. The goal is to find the dependence between different data elements and to map which variables are affected by other variables. This technique is used to determine levels of customer contentment and their impact on customer stability

Applications Fields of data mining in CRM

- **Client character analysis:** in addition to address, gender, age, profession, income, education and other basic information about the client, access, such as hobbies, marriage, spouse, health, family environment and other functions, can help businesses to get more detailed information. Understand the customer, observe behavioral patterns and therefore better develop customer strategies to improve the response speed of your campaign. The main idea is to use classification and grouping techniques, to divide customers into different groups with different demands and transaction practices based on their age, gender, income, business behavior, etc. And finally to address the customer's concern, aimed at developing the personalization marketing strategy.
- **Customer loyalty analysis:** customer loyalty analysis consists of the analysis and classification of exclusive customers, stable customers, estimated customers, multiple customers at the request of consumers, etc. Get highly personalized service. Statistically, companies have to pay a much higher cost to get new customers than to keep old customers. The gap is recognized as being more than 6 to 8 times, regardless of the activity on which they focus. In the meantime, according to 80/20 marketing principles, according to which 20% of customers contributed to 80% of sales, it is necessary to adopt more strategies to retain high-consumption customers.
- **Customer acquisition and turnover rate analysis:** company growth and expansion must permanently keep old customers and attract new customers. Through classification, grouping, decision tree and other techniques, it is possible to extract huge customer information, identify potential customers and determine the type of customer that is most likely to lose and the functionality they have. Create a customer unsubscription prediction model to more accurately identify customers who are easily lost. This would help companies planning to take appropriate marketing measures in advance to keep past customers.
- **Page numbering and execution of the head:** thanks to cleaning and centralization, customer feedback is automatically archived in the data warehouse. Therefore, the company can track customer behavior, analyze customer satisfaction, credit rating, etc., to evaluate and optimize the existing strategy, for example by taking different credit terms for different customers. Credit This could maintain customer loyalty and avoid unnecessary risks at the same time. By following the assessment to make sure that customer relationship management is strong to achieve the goals, you also create a good customer relationship.

Conclusion

Data mining as a premise and basis for CRM is no longer limited to the level of customer contact. Rather, it has deepened the behavior and preferences of customers and can anticipate their needs and meet their expectations. Therefore, companies can better understand the customer, understand the value of the customer from a deeper and more complete perspective. The effective use of data mining in CRM can continuously promote an improvement in customer value and expansion of the customer base, guide high-level decision-makers to develop the best marketing strategy, reduce operating costs, increase profits , strengthen customer relationships, improve customer satisfaction, improve product promotions, improve the exchange of information on goods, improve customer loyalty, accelerate business development and allow companies to obtain long-term benefits term.

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