

A Review: Application of Data Mining Tools in CRM for Selected Banks.

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Abstract -Today ,Banks to survive and grow it becomes critical to manage customers, build and maintain a healthy relationship with customers. **Data Mining in Banks can play a significant role for customer relationship Management.** The areas in which Data mining Tools can be used in the banking industry are customer segmentation, Banking profitability, credit scoring and approval, Predicting payment from Customers, Marketing, detecting fraud transactions, Cash management and forecasting operations, optimising stock portfolios, and ranking investments. Various Data Mining techniques for data modeling are Association, Classification, Clustering, Forecasting, Regression, Sequence discovery Visualization etc. Some examples of some widely used data mining algorithms are Association rule, Decision tree, Genetic algorithm, neural networks, k-means algorithm, and Linear/logistic regression. This paper reviews some Data Mining tools and its application in Banks for Customer Relationship Management.

Keywords: CRM, Data Mining, Data Mining Algorithms, Clustering, Association, k-means, Apriori.

1. INTRODUCTION.

CRM has become integral part of Banks in today's global challenging environment. Operational CRM with the help of analytical CRM provides the business a cutting edge to maintain and enhance relationship with customers. Association rules is meant for determining which things go together (grouping) this also known as dependency modeling. They includes occurrences linked to a single event like identifying patterns that exist within a single set .Clustering is another data mining tool used for segmenting into a number of sub groups or clusters, where each cluster is homogeneous within itself but heterogeneous with the other clusters .Above tools are reviewed in this paper by using k-means and Apriori algorithm.

2. LITERATURE REVIEW.

The identifiable academic literature review of the "Application of data mining techniques in CRM" was published by E.W.T. Ngai et al[1] . It provides an academic database of literature between the period of 2000–2006 covering 24 journals and Nine hundred articles. Findings of this paper indicate that the research area of customer retention received most research attention. Of these, most are related to one-to-one marketing and loyalty programs respectively. On the other hand, classification and association models are the two commonly used models for data mining in CRM. Yong Wang et al[2] expounds the composition and major function of the bank's CRM,

and constructs decision tree to analyze the kind of the bank's customers by applying the ID3 algorithm. This will attain the intellectual need in the CRM interactive process, help the bank understand the behavior of the customers to a fuller extent, and improve the service level of the bank. The paper published by Joseph Vella et al[3] identifies perceived usefulness and perceived ease of use as key elements that are critical in encouraging service providers' intention to use CRM systems. Babita Chopra et al[4] throw light on the underlying technology and the perspective applications of data mining in CRM. She suggests as organization cannot extract valuable information from huge data bases solution lies in the use of Data Mining tools for customer segmentation and profitability, marketing and customer relationship management. Arun Kumar Agariya et al[5] provides a conceptually validated CRM scale catering to Indian banking sector, which can help the managers in implementing the CRM in an effective manner and also can be used as a tool to identify the major areas requiring attention. Mark Lavender[6] suggests by adapting internal process and culture to a customer-centric one that is shared across the group banks can vastly improve the way they manage customer relationships and the returns from one of their greatest assets. Mosad Zineldin[7] findings say that the key ways for building a strong competitive position are through CRM, product/service quality and differentiation. Xiaohua hu[8] paper represents a data mining approach for a retailing bank attrition analysis. The purpose is the identification of rules, trends, patterns and groups that can serve as potential indicators of attrition and identify the potential attriters in advance so the bank can take proactive actions to reduce the attrition rate. Vivek Bhambri [9] suggests Data Mining techniques can be of immense help to the banks and financial institutions for better targeting and acquiring new customers, fraud detection in real time, providing segment based products for better targeting the customers, analysis of the customers' purchase patterns over time for better retention and relationship, detection of emerging trends to take proactive approach in a highly competitive market adding a lot more value to existing products and services and launching of new product and service bundles. Ogwueleka et al[10] concluded that Banks that can realize the potential usefulness of data mining in transforming raw data into valuable information will surely gain strategic advantage and competitive edge over its rivals. V. THANUJA et al[11] referred data

mining as analytical intelligence. He suggested that in building CRM application, Data Modeling is a small yet critical part of the final solution. Chris Rygielski et al [12] look closer at two data mining techniques: Chi-square Automatic Interaction Detection (CHAID) and Neural Networks. Based on those case studies, CHAID and neural Networks are compared and contrasted on the basis of their strengths and weaknesses. He also suggested that Businesses also have a duty to execute their privacy policy so as to establish and maintain good customer relationships. I Kirshna Murthy [13] concluded that for successful knowledge discovery we need the coordination among the disciplines statistics-data mining, computer science and domain knowledge, if this coordination comes into reality then definitely we see wider applications of data mining in almost all the areas of research. Velu C. M [14] buildup a software based intelligent model by using data mining technique Artificial Neural Network (ANN), Genetic Algorithm (GA) and Fuzzy Logic to discover the pattern of the customers, this resulted in classification of the customers and found that 98 % above classification is performed correctly. Ogwueleka [15] predicted that the main applications in data mining involve prediction. Classification is the prediction of a target variable that is categorical in nature and suggested that CRM is essential to banking industry to aid in competing effectively in today's marketplace. XindongWu et al [16] pointed out that k-means can be paired with another algorithm to describe non-convex clusters. He also suggested that the algorithm is quite simple and easy to implement. Experimenting with Apriori-like algorithm is the first thing that data miners try to do. ZHEXUE HUANG [17] derived that Although K-Means has large efficiency in clustering large data sets it only works on numeric data and thus limits its use in many data mining applications because of the involvement of categorical data. Tapas Kanungo et al [18] implemented k-means Algorithm [referred it by Lloyd's algorithm] and analyzed that empirical analysis on synthetic data indicates that the algorithm's running time does improve dramatically as cluster separation increases. M.V.B.T.Santhi et al [19] pointed that in this method the quality of the final clusters rely heavily on the initial centroids, which are selected randomly. Moreover, the k-means algorithm is computationally very expensive also. Dr. T. VELMURUGAN [20] research work concludes that the computational time of k-Means algorithm is less than the k-Medoids algorithm for the chosen application. Hence, the efficiency of k-Means algorithm is better than the k-Medoids algorithm. K.Saravana Kumar et. al [21] concluded that the conventional algorithm of association rules discovery proceeds in two steps. All frequent item sets are found in the first step and the association rules with the confidence at least minimum confident are generated in the second step.

3.CONCLUSION.

As per various reviews, In today's global competition for Banks to survive should adopt a better Customer Relationship Management. Data Mining is backbone for finding unrevealed information about most profitable

customers, Standalone Customers, Customers likely to leave and Customer Relationship Development. There are large no of algorithms but as per Classification and Clustering are concerned K-Means Algorithm is better but in some cases it is expensive. As per various reviews it is concluded that using Association rule for discovering Associations from large databases is one of the tedious tasks in data mining but using Apriori algorithm it can be easily implemented.

4. FUTURE RESEARCH.

The overall objective of this research is to find hidden data sets by adopting various Data mining tools that will be helpful for Managerial Decision Making. In future the results can be expanded for finding more useful information. Also modifying and inventing new algorithms will be a challenge, but important.

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