Customer Relationship Management using Data Mining

Namdeo Badhe¹ Jinal Doshi² Divya Sharma³ Divya Upadhyay ⁴

¹, ², ³, ⁴ Department of Information Technology Engineering
Thakur College of Engineering and Technology

Abstract—Data Mining is motivated by most important area of research. Data Mining consists of evaluation of very large volume of data which leads to more consumption of time, so to reduce this efficient Data Mining algorithms are needed to be implemented so that the computational time as well as the efficiency increases.[3] CRM (Customer Relationship Management) describes the relationship between the different users and the product they buy or sell. This again involves very large amount of data and record keeping. The existing methodology of Data Mining used in the CRM systems are Apriori algorithms, which finds the frequent item sets and thus finding the relationship between them. But this too has various shortcomings such as excess time consumption which can be ruled out by the implementation of the Improved Apriori algorithm where portioning of the database is done.[1] The proposed system will have a CRM system where with the use of Improved Apriori algorithm the searching and the scanning time of the item sets can be reduced tremendously giving accurate and efficient output.[2]

General Terms: Business, Organization, Data, Shopping, Account, User, Algorithm, Customer, Admin

Keywords: CRM, Improved Apriori, Apriori, Association, Data Mining, Database

I. INTRODUCTION

In the proposed system, we have a Online Shopping Website which includes information about different electronic products. Analyzing all this products manually leads to wastage of time, thus in order to save time and efficiency we have implemented Improved Apriori algorithm, leading to which the accuracy also increases.[1]

In CRM system we have database of various users divided on basis of the overall transactions by the particular customer, namely loyalty customers and normal customers. The system thus studies the customer behavior and accordingly provides the customer with
Better service.[5]

The main objective of this project is to maintain a good relationship with the customers and customer Retention by providing better services and also increasing the revenue for the organization.[1]

In this project we have developed a commercial electronic products website where the user can register themselves, buy and sell products which they desire. Also the users will be provided with the recommended products and discounts based on the loyalty of the customer. Reports will be generated at the admin side where the evaluation of the sales of different products can be evaluated and different strategies can be made for organizational profits.[3]

II. PROBLEM DEFINITION

The basic Apriori algorithm requires multiple passes over the database. For disk resident database, this requires reading the database completely for each pass resulting in a large number of disk I/Os. In these algorithms, the effort spent in performing just the I/O may be considerable for large databases. Apart from poor response times, this approach also places a huge burden on the I/O subsystem adversely affecting other users of the system. The problem can even be worse in a client-server environment.[1]

It overcomes the above problems the proposed system focuses on the portioning method to improve the performance of finding the association rules in the transaction databases. [2]

The proposed system uses the Partitioning and Apriori algorithm (Improved Apriori Algorithm) to build a system which helps directors of shops/stores is to have detailed view about his business. The soft gains an acceptable result when runs over a quite large databases.[3]

The proposed system considers supermarket database and applies improved Apriori algorithm based on partitioning.

The proposed system consists of the following steps:
1) To evaluate the importance of finding association rules and specifies the main cost of the process finding them.
2) To present, illustrate and analyze the strength and weakness of some algorithms using partitioning approach.

To build up a system to manage a small soft, find interesting rules related to customer routines. This system uses Improved Apriori algorithm that provides good efficiency [2]

III. DEVELOPMENT IDEA

The goal of our system is to evaluate, predict and improve customer’s performance. The main objective of this project is to design and implement a prototype of a large scale internet service. The system will also help students as well as companies to improve their placement process.[2]

The key stakeholders of this system are:
1. Customer
2. Manager
3. Administration
4. Development Team

A. Functional Requirements

1) Customer:
The customer would log in into the site with his credentials. Then the page would be directed to his own account. The customer’s portfolios would be displayed.

2) Manager:
The Manager manages all the activities by the customers and report the same to the administrator.

3) Administrator:
The administrator will be responsible to maintain the system. Administrator will update a Customers records. Administrator will be responsible to report errors
forward. Administrator will be responsible to add/delete/edit customers information.

4) Development Team:
The development team will be responsible for checking any bugs in the system. Also, the development team will report System critical error and provide patches for the system. Development team will be responsible for adding new functionalities to the system.

B. Non Functional Requirements:

1. 24 X 7 availability.
2. Better component design to get better performance at peak time.
3. Secure access of confidential data (user’s details).
4. Flexible service based architecture will be highly desirable for future extension.

IV. RESULTS

Our system being time efficient by the use of the improved Apriori algorithm provides better services to the customer, thus making customer retention for longer period of time.[3]

This system gives regular analyzes on the basis of the sales of the product in form of bar graphs and pie charts so that the admin can prepare quick and reliable strategies for better profits.[2]
V. DISCUSSION

We have proposed a system to analyze the customer relationship management database and accordingly recommend it with the help of trading experts. To increase user friendliness we have used simpler software for developing it. The GUI is also kept simpler so as to improve the user involvement while doing transaction with the end site. With the help of data mining we can predict the future requirements of a customer.[4]

Finding large item sets – find out sets of items, which have frequently appeared together higher than given number – is a very important part in the process of finding association rule. It works with large amount of data so the problem of optimizing the process and reducing data scanning, will influence the effect of this step in particular and influences all the process in general a lot. The more data that could be ignored, more the running time will be saved. While database expands day after day, and become colossal we try to make the size of transaction which is needed to scan in iteration smaller and fit our work in limited resources. [1]

To evaluate the importance of finding association rules and specify the main cost of the process finding them, it also illustrates and analyze the strength and weakness of some algorithms using partitioning and Improved Apriori approach [3].

VI. FUTURE SCOPE

The proposed system can be implemented and launched at the broader scale for commercial purposes. Also more algorithms such as FPtree, Kmeans, Naïve Bayesian etc can be implemented so that the better prediction can be made which is followed by better sales [2].

Proper implementation of this system can used in gaining more profits for the administrator and also by customer retention. [3]

ACKNOWLEDGMENTS

We would like to express my deep gratitude to DR. B.K Mishra, Principal, Thakur College of Engineering and Technology, Mumbai for extending the opportunity for major project and providing all the necessary resources for this purpose.

We express heartfelt thanks to Mr. Namdeo Badhe for his wonderful support for preparing the project and for giving us an opportunity to do our project on “Data Mining on Customer Relationship Management System”.

We are grateful to Mr. Vinayak Bharadi, Head of Department (Information Technology), Thakur College of Engineering and Technology, Mumbai and all the faculty members for conducting the project and their encouragement and co operation has been a source of great inspiration.

Also we would like to thank Thakur College of Engineering and Technology for providing me all the facilities for timely completion of the project.

REFERENCES