Effectiveness of Data mining in Banking Industry: An empirical study

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Abstract: Data mining is becoming important area for many corporate firms including banking industry. It is a process of analyzing the data from numerous perspective and finally summarize it into meaningful information, so data mining assist the bankers to take concrete decision. This paper is an attempt to analyse the data mining technique and its useful application in banking industry like marketing and retail management, CRM, risk management and fraud detection.

Keywords: Data mining, Knowledge Discovery in database, customer relationship management, banking.

I. INTRODUCTION

The innovation of Technology improves the working of banking industry and the services provided by them. This is the gift of technology that banks enables sophisticated product development, better market infrastructure, etc. Internet has emerged as important medium for delivery of banking product and services since the early nineties each Indian bank has done some improvement on technology front by use of telemarketing, ATM, internet banking, mobile banking. These technology driven approach reach to maximum number of customer at low possible cost in efficient manner. The beauty of these banking innovation is possible only through the effective use of technology which has positive effect on growth and development [15].

Banking industry became highly competitive now a days. To be able to survive and grow in changing market environment and banks are going to adopt latest and updated technologies, it is also viewed as a tool of cost reduction and effective communication with clients and institution concern with banking transaction.

With the advancement of computer technology and wide application of database, the banks gathered a huge amount of data which is stored in different form but identifying valuable information or knowledge for taking a concrete decision becomes very difficult. At this point of time a new concept of data mining came in existence which makes the ability to recognize the true value of data and decision making process became easier.

Data mining is very helpful in better standing of huge volume of data collected by CRM software system. In recent years many industries particularly banks as well as financial institution have recognized the true importance of information they have on their customer [5][6]. It is data mining which minimize the purchasing cost, identifying the most effective and efficient promotion and provide an effective solutions to numerous other organizations need. As is evident data mining solution have plenty of applications across industries.

Data mining offers organizations a new way of doing business. It opens new horizons and avenues for understanding business and serve their customer in more better way. Now a days data mining is becoming used by several progressive industries apart from banking and finance telecommunication insurance services, retail management [1]. There are other possible applications of data mining include sales forecasting, database marketing, behaviour pattern analysis etc. In order to maintain the pace of business, and keep abreast of industry dynamics. It is important to apply the data mining techniques in profitable manner.

II. KNOWLEDGE DISCOVERY DATABASE & DATA MINING:

Knowledge discovery in database (KDD):
Knowledge discovery in databases often called data mining. A number of data mining techniques used in KDD process and the result obtained. It influenced the business activities of banks [2][12].
A widely accepted model process:
1. Define the goal of the process
2. Data selection
3. Data preparation
4. Choosing the data mining task
5. Choosing the data mining algorithm
6. Interpreting data mining result
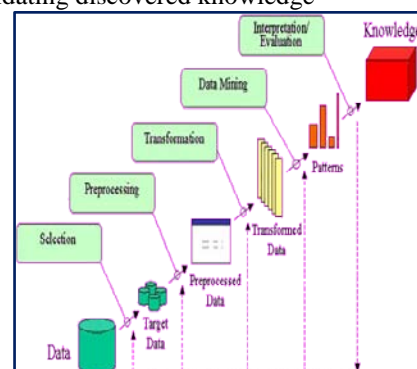7. Consolidating discovered knowledge

Figure 1: Process of KDD

Data mining:

In recent year data mining is widely used in business decision making in these areas such as production management, market analysis, engineering design etc.

Data mining refers to extracting knowledge from large set of data whatever may be the nature of data [11]. The data may be web data, multimedia, text data etc. It is the set of pattern used to find new or unexpected pattern in data using information contained in data warehouse data mining usually provide answer to questions about an organization that a decision maker has previously not thought to ask. Such as in targeted marketing which product should be promoted to a particular set of potential customer [7][8].
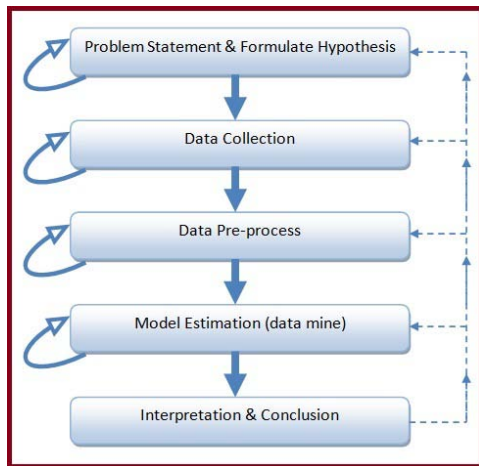
Figure 2: Data mining process

In CRM, what is the change that a certain set of customer will leave for a competitor.

In biomedical services, what is the appropriate diagnosis for a particular patient.

In fraud detection pattern analysis, how to trace out fraudulent users in telecom industry.

Data mining is always synonymous as analytical intelligence. These kind of questions can be answered quickly if the information hidden among the huge set of data in the database can be located and utilised.

Apart from these banking industries realises the need of data mining which can help these to compete in the market.

Now a days leading banks started using data mining in order to know customer segmentation, marketing credit scoring, fraud detection, fraudulent transaction etc.

Undoubting it is data mining which offered banking industries a new way to doing business, data mining provide them a better understanding of business and above all how to serve the customer in profitable manner and increase the effectiveness of firm in the long run.

Data mining gives final treatment to data from the vast set of volume of data collected by CRM practises.

III. DATA MINING TECHNIQUES

There are various data mining techniques & algorithms developed and proposed to solve the problem related to business other issues.

A. Association: It is one of the popular techniques of data mining association and correlation is used to find frequent item set findings among huge data set. This kind of finding

help business to make certain decision such as cross marketing behaviour analysis (cons.), pricing selling etc. basically this is a techniques to finding a pattern where one event is concerned to other [2].

B. Clustering: It is one of the best known technique of data mining. It makes meaningful cluster of items that have similar attributes using automatic technique that is why clustering can be send a s identification of similar or homogenous group of items. This is the technique of combining the transitions with similar behaviour into one group [2].

C. Prediction: It is a well known technique of data mining as the name suggest it discovers the relationship between a dependent and independent variable.

Regression analysis is used for prediction model as it established the relationship between one or more variables.

In data mining technique independent variable attributes are already known and response variable is likening to be predict.

This technique of data mining is very helpful and beneficial in finding the pattern from which one can make a reasonable or logical prediction.

D. Classification: In order to protect from fraud and avoiding risk of credit classification method is best suited. In fact it is a technique of data mining which employs a set of pre-classified examples to develop a model of excellence that segment the population of records at large [9].

This method of data mining technique frequently employs decision tree or neural network based classification algorithm. In classification process learning is involve, in fact in learning training data are analyzed by classification algorithm.

In classification accuracy of data is very important basically in classification method test data are used to predict the accuracy of classification. If the accuracy is acceptable then the value can be apply to new data set.
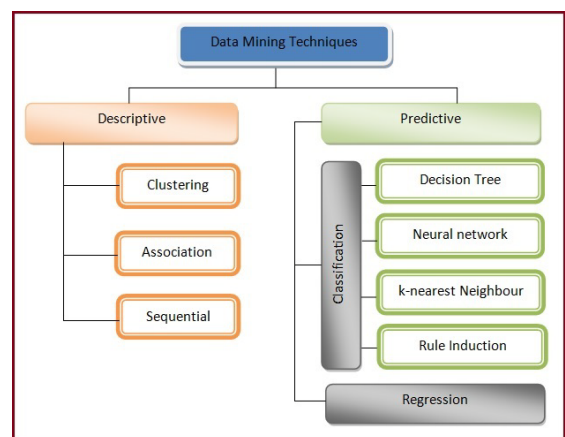
Figure 3: Data mining techniques

IV. APPLICATION OF DATA MINING IN BANKING INDUSTRY

A. Marketing:

Cross selling is a concept of marketing where data mining can be extensively used. with the help of data mining a service provider makes it attractive for a customer to buy

additional products and services with the same bank, as much the bank offer variety of financial products and services more likening the bank is to retain those customer [4].

B. Risk Management:

Data mining is used to reduce the risk of banks in issuing credit card, loan etc by analysing those customer who are likening to default on their accounts.

Credit scoring is one of the most widely used tool developed. It is valuable to the lenders in banking and finance services where taking decision about the lenders.

This tools is used by several industries including banks and financial institution, retail, insurance, telecommunication etc. In order to predict, action, behaviours and outcomes [13].

C. Retail Management:

The retail sector also realises the importance of data mining. Retailers are also collecting huge set of data throughout the year in order to gain important information and concrete decision making for the concern business data mining technique capable to provide information on product sales trends, customer buying behaviour, delivering performance, seasonal variables and similar predictive decision. Retailer can study customer past purchasing behaviour history in order to know what kind of promotions and incentives to potential customers [3][10].

D. Portfolio Management:

The use of modern risk theory is within the premises of portfolio theory, considered an important part of portfolio management. With the applications of data mining techniques investors are able to allocate capital across trading activities in order to maximize the possibilities of profit or minimize the risk.

Data mining technique make the dream come true extensive scenario analysis capabilities concerning expected assets price or return on the risk involve numerous scenario results evaluation in considering real market study. The true analysis of profit and loss allow users to access an asset class, counterpart, region etc. can be standardized against common international benchmarks.

E. Investment Banking:

Most of the banks (private/public) offers investment services to their clients. Investment is very profitable for the clients as well as for banks, in fact it is an act of investing money into an asset or item for profit or income [14].

There are variety of investment (financial) instruments available in the market. Data mining techniques are applied to choose the best investment as per the clients profile. Data mining techniques like neural networks, linear regression can be applied to predict prices for stocks. Data mining also applied in time series analysis for financial applications.

V. CONCLUSION

Data mining is a process of extracting knowledge from existing data. In banking industry the importance of data mining is vital as it in general to discover useful information form historical data enable to take concrete decisions. The banking industry uses data mining tools in various

application area like marketing, risk management, fraud detection etc.

The detected pattern is helpful in banking system to forecast future trend that is helpful in decision making process.

Data mining techniques are widely used for targeting potential set of customers, retention, provide segmentation based products, fraud detection and risk management.

In order to gain completive advantage more and more banks are investing data mining tools and they believe in building a data mining environment for their decision making process will definitely obtain huge benefit and get a sharper edge in future.

In nutshell, data mining used as a tool in banking and finance in order to discover meaningful information from the previous data and operational data to enable sound decision making. It is an interdisciplinary domain constitute of statistics, information science, machine learning etc. It involves various steps like data selection, data integration, data transformation, data mining, pattern evaluation etc.

VI. REFERENCES

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