A Study on Data Mining in Banking Application

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Abstract— Banking segments collect giant amount of data, it collect customer information, transaction details, risk profiles, credit card details, limit and security details, investment acquiescence and Anti Money Laundering (AML) related information, employment finance data. This information includes acknowledgment, default information, savings and unlawful financing. Patterns and knowledge can be mined from this huge dimensions of data that in revolve can be used for this decision making process. It provides an overview of data mining techniques and procedures. It also specifies how these techniques can be used in banking areas to make the decision making process easier and useful.

Key words: Data Mining, Banking segment, Fraud recognition, Risk management, Customer Correlation management

I. INTRODUCTION

Data Mining is the process of extracting potentially sensible, attractive and formerly unidentified patterns from a huge volume of data. It theatre an important part in result direction. It is also called as Knowledge discovery. The same is correspondingly considerable in other areas including sales/ marketing, proceeds services, sports, health care and insurance etc. Data mining is gaining popularity in research fields due to its inexhaustible applications and accession to mine the data in a congruous manner. Data mining software is one of a number of methodical tools for analyzing data. Precisely, data mining is the process of discovery correlations or patterns between dozens of fields in large relational databases. There are variety of areas in which data mining can be used in financial sectors ,such as customer segmentation and productivity, high threat loan applicants, predicting payment, marketing, credit testing, position investments, deceptive transactions, optimizing accumulation portfolios, cash management and forecasting operations, most gainful Credit Card Customers and Cross retail. There are varieties of accounts you have to take to borrow money and it's essential to know your options. The new production banks with new banking equipment and their approaches in the direction of their business required other established banks to support or distribute more spotlight on new technologies. To develop the financial presentation and customer relationship, financial organizations started using web and other electronic channels to process applications for various products, which reduces time and cost. Electronic and computerized softwares have entirely changed the basic concepts of banking business and way the business operations are being carried out.

A. Data Mining Architecture

Data Mining's structural design is produced of many elements namely Data Mining obtains / Pattern estimation / Data Warehouse server/User Interface and Knowledge Base.

1) Knowledge Base

Centralized Knowledge Base is used to collect the information and to estimate the pattern.

2) Data Mining Engine

A critical element of data mining system and consists of efficient elements that achieve a variety of tasks namely clustering, classification, prediction, association and correlation analysis, characterization.

3) Pattern Evaluation Module:

The element performs exciting measures and communicates with the data mining mechanism component to find out interesting pattern.

4) User Interface:

User interface component interact between user and data exploring system [7]. It allows the subscriber to do communication with the system by explaining his enquiry and concurrently by identifying information in order to help in search and to carry out investigative data mining based on the transitional data mining results.

II. APPLICATIONS OF DATA MINING

A. Sales/ marketing:

Data mining is the method of extracting unidentified patterns from database which help in preparing, organizing, overseeing and initiating new market in a cost efficient way. It gives information related to item sets that are purchased collectively, their progression and when they were bought. This information helps production support and to make it most gainful [4].

B. Banking / finance:

There are various fields in which data mining can be used like in financial and banking segment for credit investigation, deceptive transactions, customer segmentation and productivity, optimizing stocks portfolios, predicting payment, ranking savings, marketing, high risk loan applicants, cash management and forecasting operations and most money-making credit card customers and cross exchange.

C. Health Care and Insurance:

Insurance industry expansion is entirely depends on the capability of transforming data into information concerning customers, competitors and its market [5]. The insurance industries have implemented the Data Mining productively and have achieved incredible aggressive advantages.

D. Retail Industry:

Retail industry accumulate huge amount of data associated to sales and customer history of shopping. Retail data

mining helps in analyzing client performance, client patterns of shopping and trends which increases the quality of client service, develop things expenditure ratios, design more efficient goods transportations and circulation policies.

E. Telecommunications industry

Telecommunication industries usually produce and accumulate large amount of high quality data, having a very huge customer base, and work in speedily changing and highly aggressive location. Telecommunication companies use data mining to improve their marketing efforts to perceive deception and to betterment of their telecommunication networks.

F. Higher Education:

Data mining can be efficiently used to address students and former student's challenges. Data mining facilitate organizations to use their current exposure capabilities to discover and appreciate secreted patterns in huge databases. These patterns are then built into data mining models and used to calculate individual behaviour accurately.

G. Instruction Detection:

Instructions are the set of activities that threatens the accessibility and reliability of a network resource. Network instruction finding has been measured to be one of the most capable methods for protective complex and dynamic disturbance behaviours.

III. APPLICATIONS OF DATA MINING IN BANKING SECTOR:

There are variety of areas in which data mining can be used in financial sectors like customer segmentation and productivity, credit investigation, predicting expense default, marketing, deceptive communication, ranking savings, optimizing accumulation portfolios, cash organization and forecasting operations, high menace loan applicants, most gainful Credit Card Customers and fractious Selling[1]. Banking industry has been utilizing the data mining equipment efficiently as follows.

A. Fraud Detection

Fraud detection is the acknowledgment of symptoms of fraud where no prior distrust or propensity to fraud exists. According to the American tradition dictionary, second college version, fraud is defined as 'a dishonesty intentionally practiced in order to protected unwarranted of illegal gain. Fraud recognition refers to revealing of illegal activities happening in business organizations such as banks, credit card issuing organizations, assurance agencies, mobile companies, stock market [1]. The malevolent users might be the definite customers of the association or might be pretension as a customer (also known as identity theft) towards formative the fraud patterns, online transaction ensure and Offline transaction ensure. Changes in peripheral data files. Data mining acting significant position in the fraud recognition from the business data towards external data ware houses. The regulators define assured rules for specifying the fraud transaction patterns and data mining method can be produced with dissimilar techniques to show the required deceptive patterns as output. Regulatory establishment like financial achievement Task Force

(FATAF), Financial Market decision-making Authority (FINMA), Financial Services ability (FSA), Hong Kong Monitory ability (KKMA), Reserve Bank of India (RBI) set pattern and requests financial organizations to produce several reports on ordinary basis. System can be accessed different data sources and preparing reports based on combinations of data mining techniques like classifying, clustering, segmentation, organization rules, sequencing, degeneration, pattern analysis and resolution trees.

B. Risk Management and Default Detection

Every lending decision a bank takes involves some amount of risk. Quantifying this risk can make the risk management process easier and limit the risk of financial loss to the bank. Knowing customers' capability to repay can greatly enhance a credit manager's decisions. Data mining can also help to identify which customer is going to delay or default a loan repayment [2]. This advanced knowledge can help the bank to take corrective measures to prevent losses. Intended for such forecasting, parameters to consider are turnover trends, balance sheet figures, limited utilization, behavioural patterns and cheque return patterns. Historical default patterns can also help in predicting future defaults when same patterns are discovered. Data mining techniques are functional to enhance the accuracy of credit scores and predict default probabilities [10]. Credit score is a value representing a borrower's creditworthiness. Behavioural scores are obtained from probability models of customer behaviour to forecast their future behaviours in various situations. Data mining can derive this score using the past behaviours of the borrower related to debt repayments by analyzing available credit history.

C. Marketing:

Marketing is one of the mainly used application area for Data Mining by the industry. Retaining customers and finding new customers are getting increasingly complicated because of cut throat competition prevailing in the market these days. Only way to maintain a customer or succeed a new customer is to be positive and know previously what the customer expects and present him what he requirements [3]. This is where data mining can help a great transaction. It also analyze customer data and can establish key indicators to help the bank to be equipped with the knowledge of factors that affected customer's difficulty in the precedent and their needs in the future. This enables the bank to targeted marketing. Chronological patterns can be analyzed to examine changing customer preferences and can move towards customers pro-actively. Data mining techniques can help in analyzing customers according to the customer's attributes, performance, requirements, preferences, value and other factors. Mainly two scoring models are used for this organization purposes, namely credit scoring model and behavioural scoring model [9]. This classification is expensive information for making Customer oriented marketing strategies modify made for the target category and provides different services for each customer category. For example it can establish how customers will respond to a change in concentration rates, which customers will be likely to accept new product offers, what security would require from a particular customer segment for reducing

loan sufferers. Different levels of analysis like RFM (Regency, occurrence and Monitory) analysis, LTV (Life Time Value) of customers attached with K-Means clustering can be working to develop an efficient customer segmentation thereby growing targeted marketing. Data mining can also expose opportunity of cross exchange such as selling home loans to recognition card customers by analyzing relations from the past data. It can also develop a model of existing home loan customers to analyze their profiles to discover comparable customers in other portfolios to find out prospective customers for home loans.

D. Customer Correlation Management

Data Mining can be valuable in all three phases of customer relationship cycle: Customer achievement, Increase Value of the customer and Customer maintenance. Financial organizations particularly banking sector employee's relationship Managers or team of executives to pay proper concentration to their customers. Due to the tight opposition exists in the market customers will always with banks which supply better capability and more protected transaction opportunity [8]. Data Mining techniques can be used to establish the list of customers as per the set of definitions and interest and the organization can offer better conveniences to them customers are shifting from their approach in banking, like certain customers interested only electronic banking while others want banking through the counter. Classifying such customers can simply do using data mining techniques and supply better facilities. Data mining can find out the customers savings one invention having interest in similar to other one, there by promoting the product which benefits the association. Not only can data mining help the banking industry to expand new customers, it can also help to maintain the existing customers with enhanced service. Within the perspective of Customer Relationship Management (CRM), data mining can be seen as a business driven process expected at the discovery and consistent use of profitable knowledge from directorial data. It can be used to fasten the decision making and guide to forecast the effects of decisions[11]. Data Mining can be used to increase the reaction rate of marketing movement. This can be done by segmenting the customers into groups with their needs and description, it can expect how likely an existing customer is to take the business to a competitor. Each of the CRM elements can be supported by dissimilar data mining models which usually include classification, organization, succession discovery, clustering, degeneration, forecasting and visualization.

IV. CONCLUSION

Data Mining is a tool and techniques used to extract significant information from the collected data, enables financial institutions to make better executive process. Data Collections are in the form of maintaining appropriate ware housing based on different databases and other associated sources like files into a suitable data format which becomes the input for data mining development. Based on the paradigm or rules set by the association and regulatory establishment, data mining tool extract the information based on the rule set and throws the output in visual tools,

thereby making end user life easy to make decisions correctly. Banks and Economic organizations started allocating funds and time for implementing data mining tools in the area of decision making by realizing the essential of data mining in their system.

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