(RESEARCH ARTICLE)

Credit card application handling using data mining technique

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Abstract

During the final two decades, the credit card framework has been broadly utilized as a component to drive the worldwide economy to develop significantly. A credit card supplier has issued millions of credit cards to its clients. Be that as it may, issuing credit cards to off-base clients can be a pivotal calculation of a monetary emergency. The objective of this paper is to mine useful data from the databases and apply data mining algorithms for processing credit card applications based on certain criteria. We have done the credit card application processing through k-clusters and decision trees, thus making the process easy and efficient. The processing takes place by considering the applicant's data in a day and then evaluating them by different data mining algorithms. We have used data classification, query analyzer, k-clustering, decision trees and association rules. Our study shows that by clustering and decision trees the applicants can be classified effectively according to the needed criteria.

Keywords: Data Mining; KDD; Credit Card; K- Clustering; Knowledge discovery in database process; Classification; Query Analyzer; Decision Tree

1. Introduction

Data Mining for Credit Card Application Handling proposes an efficient method for the extraction of useful information and processing the credit card applicants based on data mining algorithms. Processing credit card applicants has been a focused topic in recent data mining research. Many credit card applications need to be processed in a single day.

Therefore, an effective method for extracting useful patterns is required. KDD is the step-by-step process in the discovery of hidden knowledge and new rules from the databases.

For application processing, many data mining algorithms are used such as classification, association rules and query analyzers. Here K-clustering and decision trees are used in detail. Data items are grouped according to logical relationships or consumer preferences. Patterns are formed using clusters which are further assessed with the help of decision trees. The patterns formed from these two methods are then helpful in association rules. All the above algorithms abide by the criteria selected by the credit card issuing authority. The data is presented in the graph format, making the processing better.

The objective of this paper is to mine useful data from the databases and apply data mining algorithms for processing credit card applications based on certain criteria.

This paper is organized as follows. In the next section, we discuss about related work of the credit card related paper. Section 3 presents the Methodology of this technique. Section 4 provides discussion of the result of the analysis in the previous section. Section 5 concludes this work.

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1.1. Related work

There have been several works reviewing applications of data mining techniques in the banking sector. In [4] the authors have studied data mining used in various activities in the banking sector, i.e., customer relationship management, fraud detection, marketing and risk management. Unfortunately, this work did not investigate specifically on the credit card process and, therefore, data mining techniques employed in such a process is not obvious. Another review of data mining applications in banking has been presented in [6] in which the concept of knowledge discovery in database process (KDD) was also discussed. However, they didn't emphasize the credit card process. In addition, there are surveying works concerning very specific areas of the credit card process such as fraud detection [8], [13], [14], [5] and credit scoring for customer's application [7]. In order to be more comprehensive review which can be for credit card issuers and researchers in this area, we have investigated research on data mining applications in main activities of the credit card process.

2. Material and methods

The proposed data mining software analyses relationships and patterns in the stored database based on open-ended user queries. Stored data is used to locate data in predetermined groups. The main focus of the project is to reduce the repetitive task and make administrations to maintain the details about a customer who is applied to a credit card. Generates the final report whether the customers who are all eligible to the credit, which keeps track of the customers who are selected.

2.1. Organization of the report

Our project has been organized in the following pattern. During the beginning of the project, first step was to accumulate the background knowledge about data mining. This served as the necessary groundwork for us to work on the application. Subsequently we ventured into the existing techniques used for processing the credit card applications which provided us with various ideas upon which we could improvise, in this phase we studied the K-clustering and decision trees in detail to provide a better result. Our next step was to analyze the software requirement, cost estimation and the project schedule. Next the coding was done using java and SQL server as backend. Finally, we have provided references where we collected information about various aspects of the project. These references will be useful in future improvisation of the project.

2.2. KDD process

KDD (knowledge discovery in databases) is the non-trivial extraction of implicit, previously unknown and potentially useful knowledge from data. In principle the KDD process consists of six stages:

- Data selection
- Cleaning

Enrichment

- Coding
- Data mining
- Reporting

The fifth stage is the phase of real discovery. At every stage, the data miner can step back one or more phases; for instance, when in the coding or the data mining phases, the data miner might realize that the cleaning phase is incomplete, or might discover new data and use it to enrich other existing data sets.
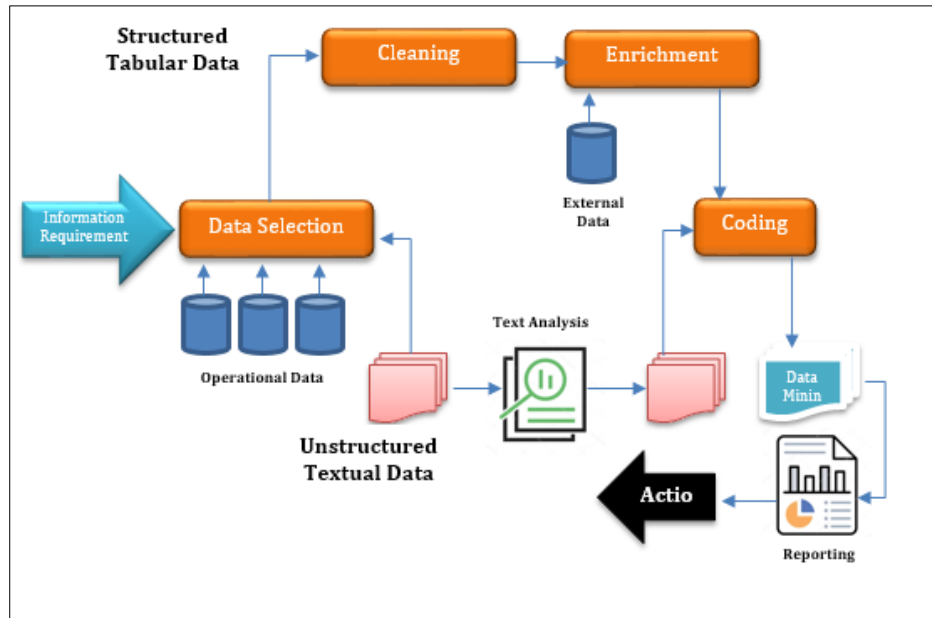
Figure 1 Methodology

3. Results and discussion

The proposed system consists of the following modules.

3.1. Data collection – Existing members

Collect all the needed details of customer who already have an account with the bank and needs to apply for the credit card. Data such as salary, assets etc.

3.2. Data storage

All the collected information from the customers is stored in the database. If new criteria for determining the clusters are needed, the database can be updated. Database contents can be viewed, modified, deleted only by the bank client.

3.3. Credit card application process entries

These entries are for the customers who need a credit card and an account. Credit card detail includes salary, car owned or not, house owned or not etc. Account detail includes name, address, salary etc.

3.4. Credit card application data storage

This module is similar to the second module that is storing all the collected details from the above step.

3.5. Loan application

These entries are collected from the customers who need a loan from the bank. This include account number, amount etc. These entries are also considered in processing the credit card.

3.6. Query analyzer

This module is to extract easily accessible information from the data set using simple query statements. 80 % of the information accessing can be performed in this module.

3.7. Data classification based on criteria

Based on criteria such as salary > 300,000 etc. data are classified accordingly. These classified data are used in processing the credit card.

3.8. Data clusters through K – Clustering

Here records of the same type will be close to each other in the data space, they will be living in each other's neighborhood. Based on this, the basic concept of K-Clustering is "do as your neighbors do". The letter K here stands for number of customers (neighbors) we investigate.

3.9. Data association through decision trees

To predict a certain kind of customer behavior, a suitable attribute which gives us more information is chosen. For this attribute a certain threshold is found and the customers are associated accordingly. Repeat the process until we have to find the correct classification.

3.10. Result analysis

Based on the classification the eligible customers for credit card sanctioning are found out and the prediction is also made.

4. Conclusion and future work

Our work deals with discovery of hidden knowledge, unexpected patterns and new rules from databases. We have done the credit card application processing through k-clusters and decision trees, thus making the process easy and efficient. The processing takes place by considering the applicants data in a day and then evaluating them by different data mining algorithms. We have used data classification, query analyzer, k-clustering, decision trees and association rules. Our study shows that by clustering and decision trees the applicants can be classified effectively according to the needed criteria.

Our performance study shows that different data can be entered and for those data, processing was investigated. Knowledge discovery is the first practical step towards realizing information as a production factor. We have done a step-by-step process in knowledge discovery and classification is best known. Data mining is important for all organizations that utilize large data sets and we have made our work as accessible as possible.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest.

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