Data Mining Techniques and Modelling for Financial Analysis

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Abstract

Data mining methods are used to identify the needs of the customers and this also helps the companies to stay competitive in the global market. Effective data mining process allows the firms to stay in the running in the competitive world by looking into the strength of the company. Data mining process has the capability of analysing financial stability and that in turn helps the companies implicate suitable policy and strategy to achieve competitive advantages. There are several types of data mining process that helps the companies to analysis their needs and allows the companies to evaluate finances. Different the types have their own approaches and advantages and helps companies to assess their finances to make concrete decision. The study has been carried out with the help of suitable methods to secure the success of the study. Qualitative methods, inductive approach and cross-sectional research design has been utilised to accomplish the study. From the assessment it is evident that despite of the advantages there are some issues that has been faced by the companies is mainly due to the large size of the data and lack of expertise of the higher authority.

Keywords

Companies, finances, Data mining, decision.

INTRODUCTION

Data mining techniques are utilised to establish credit scoring models to help organisations to take decisions of rejecting or accepting customer's credit. In other words, Data mining technique is used to extract inheritance patterns and anticipate future trends and behaviours in the financial marketplace. Advanced statistical, artificial intelligence mathematical techniques are typically needed in case of mining large data, especially high frequency financial data. Predictive model of data mining works is a composition of regression, classification, time series analysis and anticipation [1]. In other words, the predictive model is also known as statistical regression. It can be stated that data mining is major sentiment analysis. Price optimization, database marketing, credit risk management, fraud detection, healthcare system and medical diagnostic, risk evaluation are some of the examples of names that fall under this analysis. One of the main advantages of this process is that it helps the organisation to make informed decisions with the help of valid and reliable information.

In the present day, this process has become important for the companies as this helps the forms to shape their finance. The major benefit of this data mining process is that it allows the companies to identify patterns and interrelation in large data sets from various sources. The major goal of assessing financial analysis is to evaluate the stability of an organisation. A financial analysis allows higher officials of the companies to identify stability of the form in terms of profitability and business growth. Data mining helps businesses to effectively evaluate their financial stability and identify core areas that need to be transformed in order to stay in the running in the competitive marketplace [2]. As a consequence companies become more effective in terms of profitability and revenue generation. On the other hand, it is essential for the companies to evaluate their efficiency as this allows the companies to maintain their competitiveness and at the same time this allows the forms to make more profitable businesses.

Data mining allows firms to assess the efficiency of the companies and this eventually results in more seamless business operations. On the other hand, a comprehensive and advanced data modelling allows the companies to create a simplified and seamless logical database that is capable of mitigating repetition, minimises storage requirements and helps companies to recover speedily [3]. One of the key advantages of this process is that this helps the companies to reduce their excess cost in business operations and this also allows companies to detect any issues and errors in the system. This also helps the companies to improve their database performance and it is cost effective and allows colonies to save their valuable time.

Data mining and modelling; helps the companies to improve tire business processes by undergoing financial modelling. Financial modelling can be explained as a procedure of creating a synopsis of a firm's expenses and profit in a form of spreadsheet and that is further used to analyse the impact of future events or any decision [4]. In other words, financial modelling is used to anticipate the valuation of the company or this also helps the companies to compare the business with their peers in the marketplace. This process is also utilised in strategic planning in order to test several perspectives or scenarios, evaluate the estimated cost of a new project.

MATERIALS AND METHODS

This study has been carried out with the assistance of suitable methods and tools that have allowed to effectively and seamlessly accomplishing the entire study. With their help of qualitative research methods the overall study has been carried out in the right direction. The main reason behind the selection of this method is that this is less time taking, and at the same time this helps to accomplish the research in a moist effective and budget-friendly way. Secondary qualitative data has been used in this study in order to effectively fulfil the demand of the subject matter. It has been ensured that all the data related to data mining and modelling and its impacts on the financial analysis has been collected from authentic and reliable sources.

In order to secure the success of the study, inclusion and exclusion criteria has been taken into consideration and all the data has been gathered from the peer-reviewed journals and articles and other sources such as websites and so on. On the other hand, it has also been taken care that no primary data is being used in this study. Apart from that this study has followed all the ethical practices to ensure success of the study. The study has effectively been carried out with the help of cross-sectional research design and inductive approach. The advantages of cross-sectional data research design is that th8is helps researchers to compare different variables simultaneously [5]. Apart from that this also helps the inductive research approach helps the researchers to stay on the right track and helps the researchers to be flexible and generate new theories.

RESULTS

Advantages of data mining in effectively carrying out financial analysis

Data mining is considered as a robust field to execute upgraded data analysis techniques and carry out methods and mechanisms from statistical and machine learning. Business intelligence and upgraded analytics uses the information or data that ultimately generates by this process that comprises analysis of valid and reliable data. Financial analysis of data is essential to evaluate the stability of the company and this also helps to identify the profitability in order to understand the necessity of investment in the business [6]. Data mining method is used to gain inheritance patterns and assume the future trends in the marketplace and attitude in the financial marketplace. There are several advantages of data mining for financial data analysis such as accuracy, effectiveness and so on. It is evident that this process helps the companies to identify their strength and weakness to a great extent and at the same time helps the companies to maintain their competitiveness in the marketplace.

In the present days, the businesses are surrounded with big data that is predicted to grow in the past few years. There are several unique that help the companies to mine data from the large data set. Predictive data mining and descriptive data mining are two major types taught to gather data and identify the pattern in the larger data for the sake of the business expansion. This process helps the organisations to secure their future and at the same time strengthen the existence of the brand in the marketplace. With the help of suitable data mining methods companies make suitable decisions and that in turn allows the companies to stay in the running in a competitive business world. Further, it is true that a data mining model gains data from a data mining structure and afterward evaluates the data with the help of a data mining algorithm [7]. It cannot be denied with the help of data and patterns companies get to know their customers in a better way and this also helps firms to understand their demands of the purchaser.
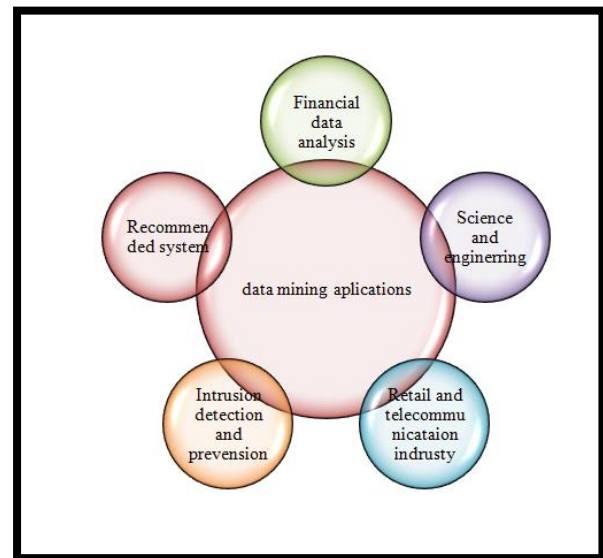
Figure 1: Data mining

It is essential for the firms to evaluate their finances in order to ensure rapid growth with the help of competitive edges. This process helps the investors to make robust decisions about investments and on the other hand, this helps the companies to stay competitive. Financial statement analysis also helps the companies to gain an idea about their financial health and this ultimately leads to effective lending decisions. Evaluation of finance helps the companies make concrete budget plans and therefore this boosts financial stability and this also allows firms to ensure the business strategy utilised by the company is capable of providing strength to the firm [8]. It is important for the companies to set a business plan for the long term support of the company and ensure an uninterrupted business process. In this modern business world it is essential for all the firms from all the actors to look into their efficiency. Financial analysis helps the companies to gain an overview about their efficiency in case of profitability and revenue generation.

Data mining helps companies to successfully and seamlessly conduct financial analysis and ensure business growth in the competitive business world. This process helps companies to identify the market trends and needs of the customers and eventually results in more effective business operations. Whenever companies evaluate their balance

sheet, income statement, and expense statement this leads to more effective and successful business activities. With the help of this process companies incorporate suitable business policies that help the companies to mitigate risk factors. It is crucial for the companies to identify their risk factors beforehand to ensure flawless and uninterrupted business operations and gain competitive advantages [9]. Data mining process boosts the overall process of financial analysis and the success of the entire process. There are several techniques that help the companies to successfully analyse their financials activities and this make sure firms are taking valid decisions and that has the ability to help the company to sustain in the global marketplace.

Types of data mining that is mostly used in firms

There are mainly two types of data mining procedures such as predictive data mining process and descriptive data mining procedures. Both types are also divided into subtypes and all have significant and different approaches in the process. Classification analysis, time series analysis, predictive analysis and regression analysis are the subtypes of predictive data mining. Whereas, cluster analysis, association rules analysis, summarisation analysis and sequence discovery analysis are the names of subtypes of descriptive analysis. Financial data is a critical part of business as financial data comprises large information that eventually helps the organisations to determine a firm's financial performance. Financial data includes the necessary and essential information about the company's liability, resources, equity, cash inflow and out-flow and many more [10]. With the help of suitable data mining process organisations gain valuable information regarding customers' demand and their needs. Classification data mining is commonly utilised in fetching or recovering essentials and relevant data or information related to data & metadata. On the other hand this process is also utilised to categorise various types of data formats in various classes.

Regression analysis is mainly used to identify and evaluate the interrelationship within the variables. It portrays the dependency of one variable on another variable and by doing so companies predict the purpose of the business in forthcoming years. Whereas time serious analysis is a type of data mining, and a time series is considered as a sequence of data points that are commonly recorded at particular time intervals of a certain point. It is evident that the majority of the company creates a large amount of data each and every day, such as sales figures, operational cost, revenue traffic and so on [11]. This process procedure helps the companies to concrete decisions that help the companies in the long run. On the other hand, predictive analysis is utilised to anticipate the relationship that is present within the independent and independent variable. This process is highly used to anticipate profit that has the ability to help the company to provide strength in the future.
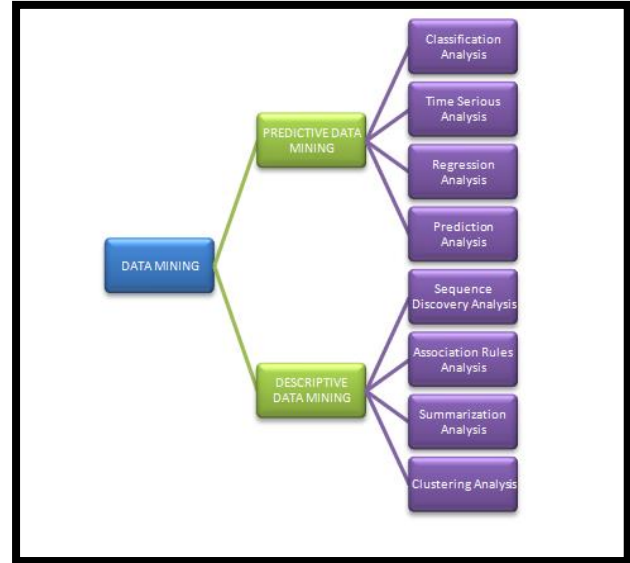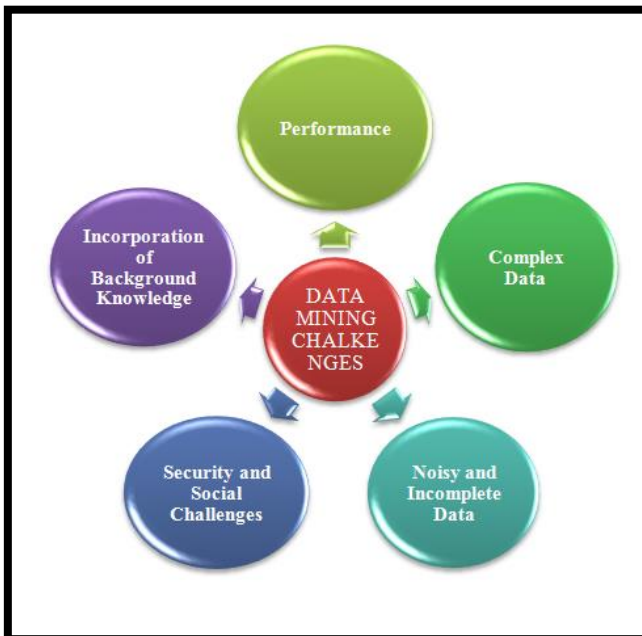

Figure 2: Types of data mining

In the case of data mining, the clustering analysis process is used to create a meaningful object cluster that comprises similar traits. This process is quite different from the classification process as this process gathers objects in class that can be defined with the help of this analysis. On the other hand, summarised analysis is mainly used to store a group or as a set of data in a more compressed manner or in a seamless way [12]. Whereas associated rules analysis is considered as a technique that allows firms to identify some important and interesting interrelation with the variable in a larger data set. Apart from that this process also helps the companies to explore the hidden pattern in a data set and ultimately helps the companies to anticipate the behaviours of the customers. In order to analyse finances of an organisation the firms need to focus on their balance sheet, cash flow and income statement with the help of suitable data mining processes to secure the position on the marketplace.

Issues to implement data mining to analysis finances

Data is essential in the business world and it is essential for the companies to track their data related to the overall performance o9f the company. With the help of data mining process companies gain an overview about their money and the needs of the customers. In Spite of the advantages there are several issues that have been faced by the organisation to utilise the data mining process. Some of the data mining problems are security and social challenges, complex data, performance, data visuality, data privacy, methodology challenges and many more. Effective methods are done by assorted sharing that requires great security [13]. Personal information about the company's finances and other business activities or about clients personal information needs to be protected in order to safely run business in a competitive world. Often companies fail to maintain privacy in data storage and result in faulty programs. On the other hand, it is evident that data is complicated and this includes natural text, spatial data, temporal data, audio & video and so on. The presentation of the data mining ground work solely relies on

productivity of the methods and algorithms that are used in the process.

Often companies face issues related to lack of skills and expertise and impact the overall process negatively. Looking into the skills and the right method is critical for the companies as this secures success in the data mining process. Apart from that sometimes companies fail to maintain privacy in some data that contains personal information about the preferences of the customers. On the other hand, data visualisation is a crucial process in data mining as it is a prime interaction that highlights the output in an effective and respectable manner to the purchasers [14]. The data extracted must pass in a remarkable way by keeping a balance with the plan. Apart from that data mining is a method to gain information from a large data set. This present reality of data is considered as noisy, incomplete, and diverse. It becomes difficult for the companies to regulate large data every day and this leads to severe issues for the companies.

Figure 3: Issues of data mining

Most of the time companies face issues to maintain the data mining approach and at the same time firms face issues with the mining algorithm. Apart from that program failure of error measurement is also an issue that has been facing by the higher authorities of the company. Apart from that, often higher officials fail to maintain security of big data and this results in data misuse or sometimes data can also be solemn due to lack of proper security in data protection [15] It is also evident that in order to make the data mining process seamless companies need to implement right tools and processes to effectively carry out data mining and modelling processes to evaluate finances of the company. Most of the time large data and overloaded data lead to complexity in the overall process this leads to wastage of budget. Not only is the budget excreted with a faulty process but at the same time this results in waste of time and this results in financial loss and the reputation of the company also decreases.

It is true that data mining has covered the ways for a seamless data collection with the help of the suitable methods and tools. In most of the cases this process lacks accuracy to a great extent and this impacts decision making process. A faulty procedure results in inaccurate data and as a consequence this leads to financial loss. It is difficult for the higher authority to identify thrift and this is considered as one of the major issues of utilising the data mining process. Lack of proper expertise and lack of proper security impacts the security of the entire process. Insufficient technical skills and prior knowledge also impacts negatively as this is one of the essential criteria to conduct the process [16]. It is essential for the companies to possess a great control on data collection as large data eventually increases the risk factors and results in system failure.

DISCUSSION

Considering the above arguments it is evident that the data mining and modelling process has the ability to help the forms to assess their finances. By looking into the discussion it is evident that data mining is one of the most crucial procedures that helps the companies to make concrete decisions and ensures greater profitability. Data mining process helps the companies to implicate effective policies to make the business process smooth and effective and this eventually results in greater profitability. On the other hand, this process also helps the companies to analyse their financial activities in order to identify the needs of the business. As a consequence, firms become more active in the global world in terms of business activities. Whenever companies focus on the financial efficiency in terms of revenue generation and profitability these results in seamless business operation and this provides competitive advantages to the company.

Companies evaluate their balance sheet, cash flow and other documents to gain an overview about their business performance and ensure success in the business process. It is essential for the firms to make concrete decisions related to their business that eventually helps the companies to sustain in the competitive business world. With the help of the effective financial analysis investors also gain an idea about the areas that need investments and on the other hand, this prevents money loss. Data mining and modelling are essential procedures that ensure the assessment of the finances is accurate and capable of providing valuable and reliable insight related to the company's business activities. This process helps the companies to identify the needs of the customers and on the other hand this also has the ability to anticipate issues before its occurrence.

Data mining process allows the investors to make concrete decisions before investing their money, and at the same time this prevents financial loss. With the help of data mining process companies secures their existence in the marketplace by identifying their strength and weakness. Data mining process helps the companies to understand patterns and relationships in order to resolve business related issues and

ensure rapid business growth. This process is used by the companies to collect valuable and authentic information about the needs of the customers and at the same time this helps firms to evaluate their financial stability. As a consequence, organisations gain competitive advantages. It is a necessity for the companies to evaluate their financial status to stay competitive. This process also helps the companies to reduce business risk with help of suitable strategy and policy. It is essential for the companies to identify risk before its occurrence to ensure uninterrupted business operation.

Financial analysis helps the companies to make budget plans with the help of strategic implication and as a consequence this helps the companies to maintain their effectiveness on the global marketplace. Apart from that this process also helps the companies to undertake financial strategy and make long term business plans and undertake projects to expand business. There are several processes that help the companies to undergo data mining and evaluate financial stability. Predictive and descriptive both are effective data mining processes that help companies to effectively carry out their business in a competitive world. Despite the advantages of the process, often higher officials face issues to conduct the data mining process. In most of the cases forms face issues due to the increased complexity due to excessively large data. On the other hand, lack of technical knowledge and expertise of the professionals also leads to program failure.

CONCLUSION

In this study all the aspects related to data mining technique and modelling for financial analysis have been successfully discussed. In order to ensure successful completion of the study it has been ensured that all the important aspects related to subject matter have been evaluated critically. By looking into the discussion it is evident that the data mining process helps the companies to make concrete decisions regarding business activity. This process helps forms to identify patterns in the marketplaces and this in turn allows the companies to stay competitive in the marketplace. Data mining process helps the colonies to anticipate future growth and at the same time helps the companies to secure their present market position. There are several types of techniques that help colonies to analyse their finances and secure their competitiveness. With the help of suitable techniques companies evaluate their financial stability in order to make robust decisions related to their businesses to sustain in the global world.

It is true that there are several advantages that this process brings to the table but it cannot be denied that there are some issuers that are associated with this technique and this impacts the form's workflow negatively. One of the greatest issues faced by the colonies related to the usages of data mining process is the lack of skill and expertise of the workers and this impacts the overall process to a great extent. On the other hand, often companies face issues due to the massive size and its complexity as this leads to program failure and gives rise to inaccurate results. Apart from that, forms face issues to provide privacy and security to the gathered data and this eventually results in system failure. These issues made the process more complicated and also increased the chances of program failure and often resulted in faulty anticipation.

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