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TO STUDY DATA MINING AND IT'S APPLICATIONS IN MARKET ANALYSIS.

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Abstract

Data mining is the process extracting and using only productive data from the huge data. Market analysis is the process of analysing the market as per the latest trends and thus preparing the roadmap as per those trends. Thus in market analysis the importance of correct data is crucial. In market analysis the data is spreading its roots very rapidly , thus to choose proper and correct application of data mining as per the requirement of the marketing organisation is important. In this study the first priority is given to the requirements of market analysis and then the study suggests the applications of data mining. Any marketing organisation has to analyse the trends of the market and then create its planning. Thus for that planning the most important entity is collection of meaningful and productive data. Therefore to collect this data the use of only the specific meaningful data mining application becomes important. In this study the need of data of data mining is specified with simplicity. Also the general marketing sectors where the data mining is done is mentioned concisely. The study shows some most important applications of data mining in market analysis which eventually will help the market analysts to choose appropriate application as per their need. Also this study will be valuable asset for the researchers in market analysis. In this article some applications of data mining are shown for the understanding of marketing organisations. The comparisons between applications will help marketing firms to choose a right way to do market analysis.

Index Terms: Data mining, Marketing analysis, Clustering, Segmentation, Prediction, Affinity group, Decision tree, Classification,

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1. INTRODUCTION

Data Mining is the most widely used technique to extract the meaningful information from the bulk of data. Data mining is now a days giving a flexibility of efficient data usage in an effective manner as the huge amount of data is taking birth .

This huge amount of data is meaningless until it is converted into useful information. As the sources of data are increasing it becomes necessary to analyse these huge amount of sources and extract the useful information and abstract the unnecessary data or information.[1][2][3]

In today's modern era of IT the data mining in market analysis

playing a crucial role. As the market analysis is a key entity for sustainable growth of any old or emerging organisation the effective data mining becomes important. [1][2][3]

1.1 Need of Data Mining in Market Analysis

There are numerous amount of data present for the market analysis thus the important and worthy data should be colander from bulk amount of data. The scope of the the different organisations may differ but there need doesn't differ thus at times the single application becomes useful for different organisations in the industry. Data mining in market analysis helps to know, compare, integrate, differentiate and share the needy data and information as per the latest trends considering the on-going entities. With the help of data mining the

organisation can find latest trends to attract customers towards its products or offerings. Also organisations can evaluate the customer's requirements for customer satisfaction which eventually help the organisation to maintain goodwill.

1.2 Marketing sectors where the Data mining takes place.

There are many marketing sectors who are now a days using data mining techniques. Following are some sectors where the data mining is taking place :

- Online shopping sites
- Healthcare Sector
- Share Market (eg. Stock analysis)
- Educational institutes(eg. E-learning)
- Real Estate Sector
- Banking Sector
- Entertainment Sector
- Supermarkets
- Traveling Sector, and many more.

Thus data mining is spreading its roots in almost every marketing sector for that purpose proper knowledge of best possible application of data mining becomes important.

2.   Market Analysis Requirements.

Following are the various entities where the task of marketing analysis should takes place.

- Requirement identification of customers
- Determining latest trends of marketing
- Finding similarities between customers
- Improving the quality of service/product
- Payment Methods
- Advertisements of service/products
- Control on production
- Maintaining the security and detecting the frauds[4]

2.1 Requirement identification of customers :

Data mining might well be the best asset for knowing the requirements of the customers. The fact that customer satisfaction and goodwill is key for wellbeing of any marketing organisation thus the effective data mining becomes important as per the change in time, trends and technology. Requirement identification also involves the comparative analysis between different types of customers in society.[4]

2.2 Determining latest trends of marketing :

Data mining helps the marketing firm to compare its services and other offerings with the services of rival firm thus allowing the organisation to improve the quality in services as per the latest trends. Data mining is necessary for setting the new trends in marketing.[4]

2.3   Finding similarities between customers :

Data mining gives the flexibility of determining the purchasing pattern of various customers. Data mining enables marketing analysts to analyse the buying pattern of different customers taking the facts like place, financial condition into account to do calculative comparisons to find similarities between the different customers in society.[4]

2.4   Improving the quality of service/product :

There is famous phrase "There is always a scope of improvement" which every marketing organisation knows. Thus for the sustainable growth of firm the efficient data mining becomes valuable asset. For improving the quality of services the marketing analysts must keep an eye on latest inventions and innovations which are supposed to arrive in future and for that purpose mining of important data becomes important.[4]

2.5 Payment Methods :

With the development in technology the new payment methods are getting developed. At times it was found that these new methods are concerned with some major security issues .To overcome this problem extraction of correct and concise data to design security algorithms becomes important. Data mining can also be useful in determining the means through which different customers purchase products which will eventually help the organisation to design some schemes for the customers taking that particular mean of payment into consideration.[4]

2.6 Advertisements of service/ products :

For showing uniqueness in product data mining becomes important as it suggests the different ways to advertise the product on different platforms. Also to show the highlighting specifications of the product the data mining is necessary. In the advertisement industry data mining will help to maintain the uniqueness in each and every advertisement.[4]

2.7 Production Control:

The proper analysis of data mining helps to analyse the market and control the production as it allows differentiating the categories of the customers. Thus if the correct methodologies of data mining are implemented then the data mining will be the valuable asset to the marketing analysts and eventually the marketing firms. [4]

2.8 Maintaining the Security and Fraud Detection:

Data mining is valuable asset for maintaining the security and detecting the frauds as it includes the special algorithms for keeping the data integrity as well as maintenance of data security. Also data mining is important for providing the facility of providing security to various network terminologies.

For bringing the advancements in network security and fraud detection algorithms the extraction of only needy information is important thus data mining becomes crucial term.[4] [5]
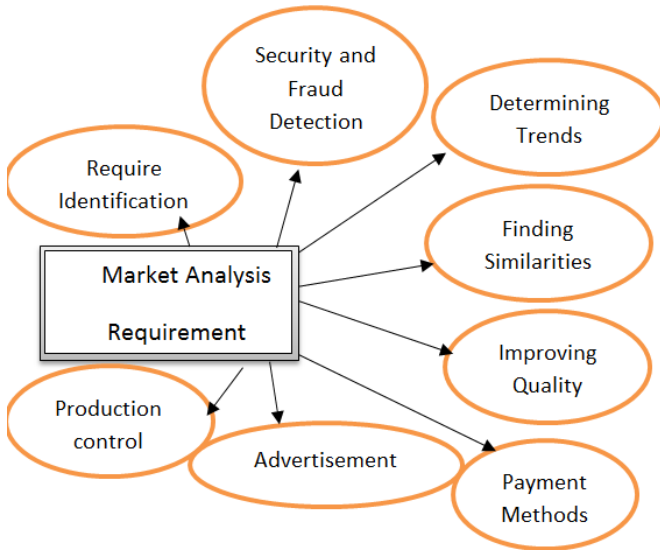

Fig 1. Market Analysis Requirements

3.   Applications of Data Mining Techniques in Market Analysis:

Market analysis is tricky process because the trends of the market changes very fastly but still the traditional data mining techniques are always effective in the process of data mining. Still some innovations in traditional techniques are coming but for those innovations the proper awareness of those traditional techniques to the marketing organisations are important. Following are some commonly used traditional techniques for data mining.

- Decision Tree
- Cluster Analysis
- Estimation
- Classification
- Affinity Grouping
- Prediction
- Segmentation

3.1 Decision Tree:

Decision tree is simply a tree like structure which is often used to divide bulk of records in successive small set of records by applying simple rules of decision in an sequential way. In the decision tree each internal (non leaf) is for a test on an attribute, each branch corresponds to an outcome of the test, and each external (leaf) node denotes a class prediction. The topmost node in a tree is the root node.

In the decision tree the record enters in the root node and thus the task of root node is to apply a test to determine which child node the record will encounter next. There are numerous algorithms to choose the appropriate test thus choosing of algorithm as per the need becomes important. This process is repeated until the record reaches upto a leaf node. Decision tree has the flexibility of handling highly multidimensional data. The construction of decision tree classifiers does not require any domain knowledge or parameter setting.[3][6]

3.2 Cluster Analysis:

Clustering is the process of grouping the same kind of data which is more similar to each other than the other groups. This is one of the important technique of data mining and mostly used for statistical data analysis. The clustering is a technique used in many fields, fields like machine learning, pattern recognition, image analysis, information retrieval, etc.[5] [7]

The uses of cluster analysis technique in marketing are described as follows:

Uses:

1) Data reduction:
      This is the process in which the information of a particular product will be reduce such as minimum loss of information occurs.

2) Creation of new chances for new products:
      In this, the company or an organization can predict the potential of new product or the uniqueness of their product in compare with the other similar product.

3) Consideration of customer's thinking in market:
This is use to find the new group of customer having similar class, this is known as segmentation, segmentation in terms of age, money and other characteristics.[5] [7]

3.3 Estimation:

The terminology estimation is often used in marketing analysis but very few have idea about the estimation in marketing analysis using data mining thus for the beneficial marketing analysis the entity estimation is important. The term estimation represents the repeatedly

valued outcomes. One of the important purpose of estimation task is to perform the task of classification, differentiation. To estimate something it is essential to input some data thus the estimated outcome will come. For proper and suitable outcome as per the estimation the usage or design of correct and concise algorithm in necessary.[7]

3.4 Classification:
Classification is the process of analyzing the traits of the newly created objects and assigning it to the one of the predetermined classes. The objects which are supposed to be classified are on normal terms represented by records in a database table or records in a database file. classification is a generalized process of adding a new column with a class code.[7]

3.5 Affinity Grouping:
Affinity grouping determines things which actually can work together. The best example for affinity grouping is the determination of similar kind of the customers with almost similar requirements. Thus affinity grouping is nothing but the arrangement of similar terms or entities for the simple purpose of ease in understanding. The marketing organization has to create groups or classes of different customers so that the organization will be able to understand their needs and thus according to those needs the customers will be get served in a best possible manner.[7]

3.6 Prediction:
Prediction is the process which is very much similar to the classification or estimation of market, but the records are differentiated by considering the future behaviour of customer and the estimated future price of the product. In this process if we have to check that we are going in the right way is to wait and see. The main reason for separating the prediction from the classification or estimation is that, there are some additional issues of temporary relationship between predictors and the customers.[7]

3.7 Segmentation:
Segmentation is nothing but the process of classification of market into the similar types of group of customers. The market segment is formed for showing the actual difference between the each group of customers, hence every segment is addressed with the individual targeted marketing mix.

A market segment is group of customers which is divided according to their needs Thus segmentation allows the marketing organisation to choose its target audiance.[8]
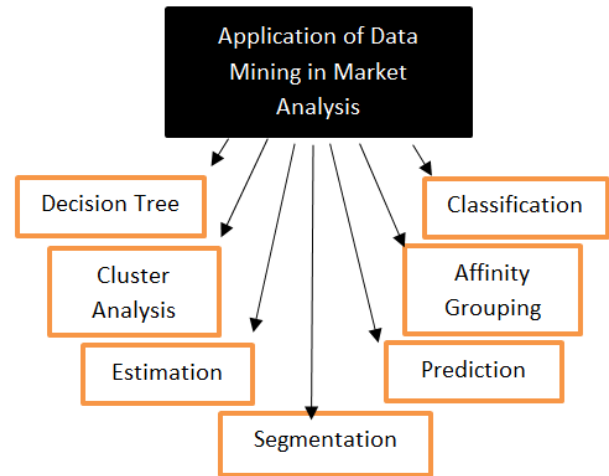

Fig 2. Application of Data Mining Techniques in Market Analysis

4.   CONCLUSION:
Hence in this study the fundamental concepts of data mining as well as the need of data mining are explained precisely. Also the requirements of market analysis are specified effectively. The important applications of data mining i.e Decision tree, Cluster Analysis, Estimation, Segmentation, Prediction, Classification and Affinity Grouping in market analysis are studied efficiently.

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