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DATA MINING TREND IN PAST, CURRENT AND FUTURE

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Abstract: The data mining patterns over past, display What more future. Data mining techniques are important for all the field of daily life in all fields of the life like valuable thing. This is important because we mining the data from the mountain of the data. There are different data for different purpose, but our target is to hit the valuable data for the purpose of research and scientific use as well as daily life. Here we are describing the different trends in data mining for different field because now a day's all fields are wide in it. Every field has different subjects for data mining. For example, in medical field, education field, business field, research field, multimedia, field, data mining for financial analysis, data mining for telecom industry. Information what's more data or learning need A critical part around mankind's exercises. Information mining will be those learning funding procedures Eventually Tom's perusing examining the extensive volumes of information starting with Different perspectives Furthermore summarizing it under suitable data. Because of the vitality from claiming extracting knowledge/information from the substantial information repositories, data mining need turn into a key part clinched alongside Different fields about mankind's an aggregation including business, education, Medical, exploratory and so on. This paper examines those Different upgrades in the field from claiming data mining starting with a secret word of the display Furthermore investigates what's to come patterns.

Keywords; Data mining; trends; fields; finance; Data stream; Concept drift; Data preprocessing;

1. INTRODUCTION

The data warehouse is the collection of data from the different database, it is the ocean of data. The data mining is the need for the classification & prediction to finding the best result or improving performance in an existing system or software. Data mining is done on the data warehouse. The data warehouse is the collection of different databases. The mining process is called knowledge discovery in database (KDD) process. Its knowledge discovery. We use data and information is the processed form of data that is useful for the all but when we processed the information that is called the knowledge. To gain this knowledge we use different techniques. In data mining there are many software that is used for analysis of data that are called analytical tools these tools are used to minimize the cost and reduce the time and these are beneficial in different ways for the users of the data mining field. In this paper, we are presenting the different data mining types in current trends.

2. HISTORICAL TRENDS OF DATA MINING

Data mining is useful in several disciplines, which includes, database management systems (DBMS), Statistics, Artificial Intelligence (AI), and Machine Learning (ML). The era of data mining applications was conceived in the year 1980 primarily by research-driven tools focused on single tasks. The early day's data mining trends are as under.

2.1 Data Trends

The initial days, data mining algorithms work best for numerical data gathered from a single database, and several data mining techniques have developed for flat files, traditional and relational databases where the information is stored in tabular. Later on, with the confluence of Statistical and Machine Learning techniques, several algorithms evolved to mine the non numerical data and relational databases.

2.2 Computing Trends

The field of data mining has been greatly influenced by the development of fourth generation programming languages and several related computing techniques. In, early days of data mining most of the algorithms employed only statistical proficiencies. Later on they evolved with several computing techniques like AI, ML and Pattern Reorganization. Several data mining techniques (Induction, Compression and Approximation) and algorithms developed to mine the heavy masses of heterogeneous data stored in the data warehouses.

3. CURRENT TRENDS

The field of data mining has been growing due to its tremendous success in terms of broad-ranging application accomplishments and scientific progress, understanding. Several data mining applications have been successfully enforced in diverse areas like health care, finance, retail, telecommunication, fraud detection and risk analysis etc. The ever increasing complexities in several fields and improvements in technology have posed new challenges to data mining; the several challenges include different data formats, data from disparate locations, advances in computation and networking resources, research and scientific fields, ever growing business challenges etc. Advancements in data mining with several consolidations and implications of methods and techniques have molded the present data mining applications to handle the several challenges, the current trends of data mining applications are:

3.1 Mining the Heterogeneous data

The following table depicts several currently employed data mining techniques and algorithms to mine the several data formats in different application areas.

The several data mining areas are explained after the table1.

Table 1: Current Data Mining areas and techniques to mine the several Data formats

Data mining Type	Application Areas	Data Formats	Data mining Techniques/Algorithms
Hypermedia Data mining	Internet and Intranet Applications.	Hyper Text Data	Classification and Clustering Techniques
Ubiquitous data Mining	Applications of Mobile Phones, PDA, Digital Cam, Etc.	Ubiquitous Data Traditional data mining techniques drawn from the Statistics and Machine Learning	Traditional data mining techniques drawn from the Statistics and Machine Learning
Multimedia data Mining	Audio/Video Applications	Multimedia Data	Rule based decision tree classification algorithms
Spatial Data Mining	Network, Remote Sensing and GIS applications.	Spatial Data	Spatial Clustering Techniques, Spatial OLAP
Time series Data mining	Business and Financial applications.	Time series Data	Rule Induction algorithms

3.2 Research and Scientific Computing Trends

The explosion in the amount data from many scientific disciplines, such as astronomy, remote sensing, Bioinformatics, combinatorial chemistry, medical imagery, and experimental physics is moving to several data mining techniques, to find out useful information. The Direct-kernel based techniques a potential data mining tool for prognostic modeling, feature selection and visualization in scientific computing.

3.3 Business Trends

Today's business must be more profitable, react quicker and offer high quality services that ever before. With these types of expectations and constraints, data mining becomes a central technology in enabling customer's transactions more accurately. Data mining techniques of classification, regression, and cluster analysis are used for in current business courses. Most of the current business data mining applications utilize the classification and prediction techniques for supporting business decisions. In business environment data mining has evolved to Decision Support Systems (DSS) and very lately it has grown to Business Intelligence (BI) systems.

4 DATA MINING FUTURE TRENDS

Due to the day to day change in technology the data mining trends are also affected by the change in technology because new techniques are very useful for the data and mining as well as for improving the old results. We are describing some future trends in data mining that are useful for the coming technology.

Referable to the enormous success of several application areas of data mining, the field of data mining has established itself as the major discipline of computer science and has shown interest potential for the future evolutions. Ever increasing technology and future application areas are always present new challenges and opportunities for data mining, the typical future trends of data mining includes:

- Normalization of data mining languages
- Extraction and preprocessing of data
- Complex objects of data
- Computing resources
- Web mining
- Scientific Computing
- Business data

4.1 Standardization of data mining languages:

There are several data mining tools with different syntaxes, hence it is to be standardized for making convenient of the users. Data mining applications have to concentrate more in standardization of interaction languages and flexible user interactions.

4.2 Data Preprocessing:

To identify useful, novel patterns in distributed, large, complex and temporal data, data mining techniques have to evolve in several stages. The present techniques and algorithms of data preprocessing stage are not up to the mark compared with its significance in finding out the novel patterns of data. In future there is a great need of data mining applications with efficient data preprocessing techniques.

4.3 Complex objects of data:

Data mining is going to penetrate in all fields of human life; the presently available data mining techniques are restricted to mine the traditional forms of data only, and in future there is a potentiality for data mining techniques for complex data objects like high dimensional, high speed data streams, sequence, noise in the time series, graph, Multi-instance objects, Multi-represented objects and temporal data.

4.4 Computing Resources:

The contemporary developments in high speed connectivity, parallel, distributed, grid and cloud computing have posed new challenges for data mining. The high speed internet connectivity has posed a great demand for novel and efficient data mining techniques to analyze the massive data which is captured of IP packets at high link speeds in order to detect the Denial of Service (DoS) and other types of attacks.

Distributed data mining applications demand new alternatives in different fields, such as discovery of universal strategy to configure a distributed data mining, data placed in different locations, scheduling, resource management, and transactional systems etc. New data mining techniques and tools are needed to facilitate seamless integration of various resources in grid based environment. Moreover, grid based data mining has to focus seriously to address the data privacy, security and governance. Cloud computing is a great area to be focused by data mining, as the Cloud computing is penetrating more and more in all ranges of business and scientific computing. Data mining techniques and applications are very much needed in cloud computing paradigm.

4.5 Web mining:

The development of World Wide Web and its usage grows, it will continue to generate ever more content, structure, and usage data and the value of Web mining will keep increasing. Research needs to be done in developing the right set of Web metrics, and their measurement procedures, extracting process models from usage data, understanding how different parts of the process model impact various Web metrics of interest, how the process models change in response to various changes that are made-changing stimuli to the user, developing Web mining techniques to improve various other aspects of Web services, techniques to recognize known frauds and intrusion detection.

4.6 Scientific Computing:

In recent years data mining has attracted the research in various scientific computing applications, due to its efficient analysis of data, discovering meaningful new correlations, patterns and trends with the help of various tools and techniques. More research has to be done in mining of scientific data in particular approaches for mining astronomical, biological, chemical, and fluid dynamical data analysis. The ubiquitous use of embedded systems in sensing and actuation environments plays major impending developments in scientific computing will require a new class of techniques capable of dynamic data analysis in faulty, distributed framework. The research in data mining requires more attention in ecological and environmental information analysis to utilize our natural environment and resources. Significant data mining research has to be done in molecular biology problems.

4.7 Business Trends:

Business data mining needs more enhancements in the design of data mining techniques to gain significant advantages in today's competitive global market place (E-Business). The Data mining techniques hold great promises for developing new sets of tools that can be used to provide more privacy for a common man,

5. COMPARATIVE STATEMENT

Table 2 presents the comparative statement of various data mining trends from the past to the future. The table describes the techniques, formats and resources used in different applications in past, current and future and shows with the change in time data mining techniques are improved and used in every area of industries.

Table 2: Data mining Trends comparative statements

Data mining trends	Algorithms/ Techniques employed	Data formats	Computing Resources	Prime areas of Applications
Past	Statistics, Machine Learning Techniques	Numerical data and Structured data stored in traditional databases	Evolution of 4G PL And various related Techniques	Business
Current	Statistics, Machine Learning, Artificial Intelligence, Pattern Reorganization Techniques	Heterogeneous data formats include structured, semi structured and unstructured data	High speed networks, High end storage Devices and Parallel, Distributed computing, etc...	Business, Web, Medical diagnosis, Etc.
Future	Soft Computing techniques like Fuzzy logic, Neural Networks and Genetic Programming	Complex data objects include high dimensional, high speed data streams, sequence, noise in the time series, graph, Multi instance objects, Multi represented objects and temporal data etc...	Multi-agent technologies and Cloud Computing	Business, Web, Medical diagnosis, Scientific and Research analysis fields (bio, remote sensing, etc.), Social networking etc

6. CONCLUSION

In this paper, we try to briefly review the various data mining trends from its inception to the future. This review would be helpful to researchers to focus on the various issues of data mining. We found that Data mining is becoming increasingly common in both the private and public sectors. Industries such as banking, insurance, medicine, and retailing commonly use data mining to reduce costs, enhance research, and increase sales. So, data mining will be more and more useful in future.

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