

Impact of Data Mining in Business Intelligence

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Abstract - This paper is to highlight various features of Data Mining in Business growth. Extracting the data which allows analyzing on customer pattern gave an opportunity in Business growth. Data Mining and Business Intelligence work together to process and analyze on data to understand customers, market condition and many other discovered materials. In this study, it is recommended for the business to use data mining for higher profits and business growth.

Index Terms - Data, Mining, Business, Customers.

INTRODUCTION

Businesses that utilize data mining are able to have a competitive advantage over business. It provides better understanding of their customers, improved customer acquisition, good oversight of business operations, improved customer acquisition, and new business opportunities. Different industries will have different benefits from their data analytics. Some industries are looking for the best ways to get new customers, others are looking for new marketing techniques, and others are working to improve their systems. The data mining process is what gives businesses the opportunities and understanding for how to make their decisions, analyze their information, and move forward.

DATA MINING IN BUSINESS SECTOR

The data mining provides more techniques which can be used to extract customer pattern and help the business in understanding the customer preferences and satisfaction.

Classification: This data mining technique is more complex using attributes of data to move them into discernable categories, helping you draw further conclusions. Supermarket data mining may use classification to group the types of groceries customers are buying like meat, bakery items, etc. These

classifications help the store learn even more about customers, outputs, etc.

Clustering: This technique is very similar to classification, chunking data together based on their similarities. Cluster groups are less structured than classification groups making it a more simple option for data mining. In the supermarket example a simple cluster group could be food and non-food items instead of the specific classes.

Association rules: Association in data mining is all about tracking patterns, specifically based on linked variables. In the supermarket example, this may mean that many customers who buy a specific item may also buy a second, related item. This is how stores may know how to group certain food items together, or in online shopping they may show “people also bought this” section.

Regression analysis: Regression is used to plan and model, identifying the likelihood of a specific variable. The supermarket may be able to project price points based on availability, consumer demand, and their competition. Regression helps data mining by identifying the relationship between variables in a set.

Anomaly/outlier detection: For many data mining cases, just seeing the overarching pattern might not be all you need. Data needs to be able to identify and understand the outliers in your data as well. For example, in the supermarket if most of the shoppers are female, but one week in February is mostly men, you’ll want to investigate that outlier and understand what is behind it.

These data mining techniques are the key for businesses to be able to understand the information they have and better their practices.

APPLICATIONS OF DATA MINING IN BUSINESS SECTOR

Retails

The transaction information which are done by the consumer is stored in data warehouses & never accessed again for cleaning or research purpose in past 20 years but with the help of data mining this data can be useful to predict potential sales and make it easier for business owners to monitor purchases by their customers (Maksood & Achuthan , 2016). Walmart which is one of the biggest retails in USA, failed to in e-commerce and marketing online so it began using digital interfaces to obtain the customers information and link them with their personal accounts, also they will try to find some information about consumer in online, these data where based in a new data mining technique to find consumer behavior. Consumer behavior can predict their next purchase, when they will visit the store, disease prediction, comparison with global consumption strategies & other biological effects. The digitized world where we log a record into a database every move we take, & the precise manipulation of these records is the reason why Walmart achieves great success (Maksood & Achuthan , 2016). Target is another popular retail in USA, implements data mining to predict pregnancy in their customers based on their previous purchase and when they found she will be pregnant they sent her a promotion for baby stuff (Maksood & Achuthan, 2016).

Insurance

In many business activities, data mining is used, such as carrying out complex classifications & correlations, gathering new clients when referring to current ones, developing & choosing policies. The technique which can be used are: (Mishra, Hazra, Tarannum & Kumar, 2016).

Detection of fraud: It is possible to examine the variables that indicate a high possibility of an allegation or a fraud taking place and its numerous trends. (Mishra, Hazra, Tarannum & Kumar, 2016).

Consumer retention & segmentation: Identify packages and promotions that could improve customer satisfaction and include each new customer in suitable categories (Mishra, Hazra, Tarannum & Kumar, 2016).

Telecommunication

Telecommunication has now evolved from local & long-distance voice communication to modern pager, fax, email, & mobile phone strategies. They are now

incorporated with numerous networking systems such as the Telephone, networks, & computers. The data mining which can be used are: (Mishra, Hazra, Tarannum & Kumar, 2016).

Cluster analysis: In the telecommunications sector, fraudulent activities face a significant danger. Network efficiency is influenced by these events. Clustering can help to identify these deceptive trends & increase the efficacy of the different contact services. (Mishra, Hazra, Tarannum & Kumar, 2016).

Banking

The banking system contains a lot of data where data mining can be used to help the bank make a better decision making. In their decision-making, banks who implement data mining strategies tremendously profit & hold an advantage on those that don't. Some of the fields where decision can improve banks are risk management, detection of fraud, marketing, identify money laundering & customer relationship management (Raj, 2015).

Marketing

The bank can analyze the past data, along with the present data to determine the customer behavior of different services and goods in order to achieve more market prospects. The data mining can be used to identify the good and profitable customer (Miyan, 2017).

Risk Management

A certain level of risk is involved in each lending decision a bank makes. Defining this risk will simplify the process of risk management & limit the bank's risk of financial loss. Knowing the ability for the customer to repay can significantly improve the decision of credit management. Data mining can help the bank to identify which customer will repay on time and which will delay this can help the bank to take the right decision to prevent any losses. Data mining can analyze old data to predict some future patterns; also can improve credit rating (value which reflect the credit worthiness of a borrower) & forecast probability of default. Behavioral ratings are collected to predict their possible actions in diverse circumstances using probability models of consumer behavior. Data mining may use the borrower's previous debt reduction habits

to extract this rating by evaluating the credit history available (Mi-yan, 2017; Raj, 2015).

Fraud Detection

Banks lose millions of dollars in fraud annually so detecting a fraud in a transaction can help the bank & reduce the possibility of fraud occurring. One of the areas where fraud detection can be used is credit card product where we can apply data mining to analyze the history of the customer transaction & the risk of new behavior can be estimated to determine if it's a fraud. Customer transaction trends can be found, and warnings can be produced if any detectable anomalies are observed. Another area for fraud detection is in financial statement. These statements can contain overstated income, revenue, & income, so this may contribute to money laundering. To identify money laundering in such programs usually consider customer risk evaluation data, transaction risk measurement data, & activity patterns. Based on their similarity contained in these selected characteristics, transactions can be identified if it's a money laundering (Miyana, 2017; Matthew, Yunusa, Gumel & Abdullahi, 2019).

Social Media

Millions of users are nowadays using the social media. For businesses, any post or tweet on a social media platform can be of useful data in order to analyze the customer patterns & also to keep in touch with their customers. The social media especially important for small business as they are lacking some resource compare to the competitors so with the help of data mining they can analyze social media to maximize the efficiency of the business and keep ahead of competition and consumer expectations. By analyzing social media the businesses will know more about their customer's needs, taste and preference and how to satisfy their customers, so from this knowledge they will be able to target the customer in their advertisement, tailor their product as per the customer preference and satisfy their customers (Balan & Rege, 2017).

Other Applications

Manufacturing- The manufacturers needs to predict the customer preference in order to customize the product that best meet the customer's taste (Bathinda, 2012). Warranties- The manufacturing need to identify

the number of consumers who are willing to claim their warranty and expense of those claims (Bathinda, 2012). Frequent flier incentives- the airline can identify the customer segment who can be offer opportunities to travel more (Bathinda, 2012).

COMPARE TRADITIONAL BUSINESS INTELLIGENCE WITHOUT DATA MINING AND BUSINESS INTELLIGENCE WITH DATA MINING

A research paper conducted a questionnaire comparing BI with and without data mining using 10 performance metrics (Kumar, 2020)

Timely Information (TI)

Ease of Use (EU)

Data Analysis Capability (AC)

Strategic Information (SI)

Future Prediction (FP)

True Enterprise-Wide Decision Support (DSS)

Improved Sales Measurement (IS)

Improved CRM (CRM)

Detecting Early Warning Sign (EWS)

Streamline Business Process (SBP)

RESULTS

In this study, we found out that data mining can improve the business intelligence and enhance the profits of the business, such that the data the business can gain more understanding about the customer pattern and based on these patterns the business companies can react so this will boost the business profits and will decrease the risk when making a decision. Furthermore, because data mining can help business to know their customers, and the market trend, it will dramatically improve the marketing, and the way business do marketing. By gathering the data of the customer in the internet along with data available in the warehouse, data mining can be implemented to analyze data to find a much better understanding of the customers, as a result, business can know the customer history and based on that they can predict the customer next purchase, so this will reduce the level of risk. In addition, data mining is not only helpful for the big business, yet it can also help the small businesses, small business can benefit from data mining to analyze the customer preference for their good using the social media platform. In the

banking sector, data mining can be used to identify money laundering, reduce fraud transaction, and find customer trends.

CONCLUSION AND FUTURE WORK

To conclude the business intelligence, need to implement the data mining techniques as it significantly improves the way business deals with data. The data mining techniques allows the business to get a better understand of their data as it allows business to have much more understand about their customer pattern and this can lead to an improvement in marketing .Furthermore the data mining can be used to analyze both structured and unstructured data, also it helps to identify any fraud within the system and also data mining can analyze the social media data. There are a lot of data mining techniques to be implemented in the business field but it's important to choose the right techniques to get the best result out of your data. Since we have seen some benefits in implementing the data mining to the business intelligent. The future work would be what are the risks in implementing data mining, in order to benefit from the data mining and reduce the risks that might happen from implementing the data mining

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