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Data Science Application for Sentiment Analysis

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Abstract

Data science is a vast area of computer technology which provides support for decision making process. With the help of data science companies understand reviews of customers by which shows their emotions and driving factors. It helps to especially when you're trying to find patterns, trends or correlations of data. Today data science provides there is always an emotional state connected to their action. Companies invest lot of money in data science to get right information to make right decisions. It increases the capabilities of business. On another side some industries are unaware of value of data science.

Keywords: *Data Science, business, analysis, sentiments, tools.*

1. Introduction:

Data science is a special field that combines various areas such as statistics, mathematics, intelligent data capture techniques, data cleansing, mining and programming to prepare and align big data for intelligent analysis to extract insights and information. Big data encompasses all types of data namely structured semi-structured and unstructured information which can be easily found on the internet.
Big data includes variety of data as follows,

a. Unstructured data: social networks which consists of images, videos etc.
b. Semi-structured: It includes XML files, system log files, text files, etc.
c. Structured data: It include structured data like RDBMS, OLTP, transaction data, and other structured data formats.

Data science is a multidisciplinary field and uses scientific methods, procedure, algorithms, and frameworks to extract the knowledge and hidden insight from a huge amount of data. The extracted data comes in either structured or unstructured format. Data science is a concept used to bring together ideas, data examination,[1] [3]

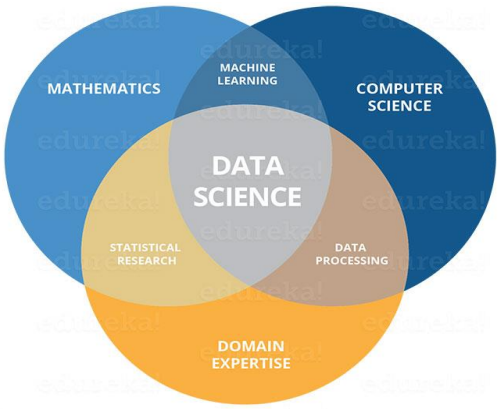

Fig.1 Data Science Multidisciplinary field

2. Role of Data Scientist

Data science technique plays important role for policy or strategy making process in organization as follows:-

- Mitigating risk and fraud - Data scientists develop methodologies using technologies like statistic, network, path, and big data for predictive fraud propensity models and use them to create alerts which ensure timely responses when unusual data is recognized.
- Delivering relevant products - Organizations can find when and where their products sell best; this is one of the advantages of data science. This can helping to provide the right products at the right time and can help companies in development of new products to meet their customers' needs.
- Personalized customer experiences - One of the most buzz worthy aids of data science is the ability to understand the audience of sales and marketing on a very granular level. This knowledge helps an organization in creating the best possible customer experiences. It provides following advantages,

    1. Helps to Make Better Decisions
    2. Help to define and achieve goals
    3. To adopt best practices and focus on issues that matter
    4. Finding new Opportunities
    5. Decision making with quantifiable, data-driven evidence
    6. Identification and refining of target audiences
    7. Recruiting the right talent for the Organization

3. Data Science and Sentiment Analysis

Sentiment analysis is the process of analyzing text data and classifying opinions as negative, positive *or* neutral automatically. The ability of algorithms to analyze text has improved significantly. Advanced artificial intelligence techniques can be an effective tool for doing in-depth research in sentiment analysis. Sentiment analysis is applied at different levels of scope:

- **Document level:** Finds the sentiment of a complete document or paragraph.
- **Sentence level:** Finds the sentiment of a single sentence.

- **Sub-sentence level: Finds** the sentiment of sub-expressions within a sentence.

The applications of sentiment analysis are wide-ranging and powerful. The ability to extract hidden insights from social data is a practice that is being widely adopted by organizations across the world. Changes in sentiment on social media have been shown to correlate with changes in the stock market. In 2012 presidential election the Obama administration used sentiment analysis to measure public opinion for policy announcements and campaign. It can also be a crucial part of your market research and customer service approach. Not only can you see what people think of your own products or services, you can also see what they think about your competitors too. [1]

4. Sentiment Analysis Algorithms

Many methods and algorithms to implement sentiment analysis systems are there, which can be classified as:

- **Rule-based:** These systems perform sentiment analysis based on a set of manually crafted rules.
- **Automatic:** These systems rely on machine learning techniques to learn from data.
- **Hybrid:** These systems combine both rule based and automatic approaches.

5. Sentiment Analysis For Manufacturing Industry

Sentiment analysis can be used for opinion mining. Depending on company type, it is used to analyze product reviews and predict future trends. Companies use sentiment analysis to gather serious feedback on newly released products to find problems. Data is used from any source for accurate decision making and implementation. For companies wishing to gauge consumer sentiment or their view of the firm; this is particularly true. Identifying purchasing decisions can also be done through this. Sentiment analysis is used to gain ironic insight into the details and becomes the reason for otherwise opaque market trends.[2][3]

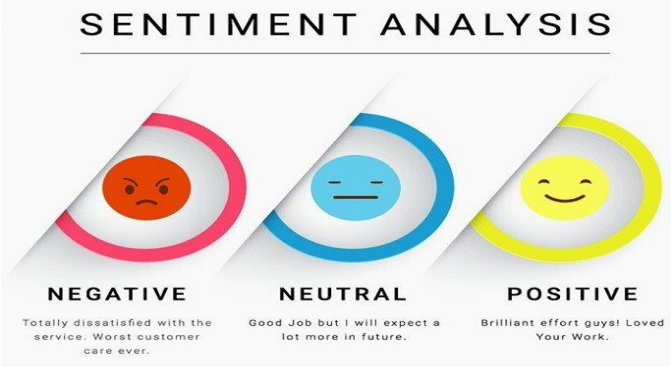

Fig.2 Factors for Sentiment Analysis

6. Future Work

Manufacturing companies launches new brands based on customer's demands. It is an essential task to know opinion of customers about newly launched brand to promote sales and gain margin. Our aim is to design and implement sentiment analysis system for manufacturing companies to analyze sentiment of customers about their products and make proper decisions to make the product successful.

7. Conclusion

Data science is important for organizations. Getting right information at right time is essential for decision making process. For customer sentiment analysis data science provides better support. It effects the growth and development of product by providing a lot of intelligence about customers and campaigns, through techniques like data mining and data analysis. Data science helps products to understand their customers in a much enhanced and empowered manner. Data science is accessible to almost all sectors.

8. References

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