Social Media Analysis for Marketing Improvement

Introduction

Computers are playing an increasingly important role in modern business activities. The application of information systems based on modern computer technology has become a common situation in enterprises today. The purpose of an information system in an organization is to improve its effectiveness and efficiency (Hevner et al. 2004). As a way to conduct organization optimizing, information systems have also evolved with the evolution of computer technology. The emergence and application of new technologies provide new possibilities for enterprises to solve problems, but also put more requirements on information systems.

As a popular concept in recent years, big data has received a lot of attention in enterprises. Social media data is a kind of unstructured big data contains a large amount of information, which can play a significant role in the company's market analysis and business improvement. Also, the opinion from social media platforms can significantly influence user choice(Amado et al. 2018). Combining the business intelligence system and social media analysis can provide decision support for business marketing analysis and production.

Literature Review

For the application of computer technology in enterprises, people have proposed the concept of business intelligence (BI), which points to the skills, techniques, applications and practices used to support decision making in business (Chen 2010). Business intelligence has many widely used applications, such as enterprise resource planning (ERP) systems and customer relationship management (CRM) systems. Through these applications, managers able to “gaining insights from the growing volumes of trans-action, product, inventory, customer, competitor, and industry data” (Chen 2010). These systems and applications provide good support for the operation and decision-making of enterprises. By the improvement of technology, Web analytics, and relevant methods, makes BI no longer limited to the collection and analysis of internal enterprise information but has the ability to collect and analyze user-generated content. This new capability has brought great changes to the business intelligence field, so Business Intelligence with this analytical capability called Business Intelligence 2.0 (Chen 2010). BI 2.0 enhances the ability of enterprises to analyze users, enabling them to collect and analyze unstructured data, especially information from social media. These technological advancements have changed the way companies analyze their markets.

Not only the development of business intelligence, big data technology has also played an important role. The research about cross-domain topics for Big Data and Marketing also increasing (Amado et al., 2018). There are 3 Vs in Big Data management: Volume, Variety, and Velocity, regarded

as the most typical characteristics of big data (Laney 2001), the collection and utilization of big data is a complex task, but it also able to provide extra advantages to the companies (Amado et al., 2016). Social media is one of the most well-known sources of big data, and it has a huge impact on decisions that affect customers (Moro et al., 2016), companies can increase sale and customer satisfaction by doing relative analysis (Chen et al., 2013), which makes social media analysis an important part of market analysis.

Although big data is important, leveraging big data is not easy. Social media data, as a type of unstructured big data, has various forms, possibly text, URL, photos or videos. It is a challenge to analyze sentiment and opinion from a huge volume of unstructured data, people rely on machine learning to such work, Rout et al. get 80.68% using the proposed unsupervised machine learning approach in sentiment prediction (Rout et al., 2018). Netzer et al. conduct Market-Structure surveillance practice by text mining (Netzer et al., 2012). By analyzing unstructured data from social media, marketing departments can make a more accurate market prediction, production departments can also adjust production and inventory conditions based on predict.

Overall, the business intelligence, corroborate with big data technology, provides the companies an effective method to do the marketing research and analysis. Text mining and text analytics have become effective social network analysis methods in recent years, however, the mining of big data still have huge potential, social media analysis deserves more attention, by making fuller use of the information in big data, BI system can provide broader support for marketing and corporate decisions.

Research Question

Big data and business intelligence are current hot topics. Both topics involve many fields, including but not only limit to machine learning, natural language processing, databases, distribution system in the computer science area, and design science and marketing in the field of business management, we will select market analysis and text mining as our topic. In this research, we will focus on the application of text mining, text analytics, sentiment mining, and natural language processing technology in market analysis. We are going to discuss the following issues:

(1) The use of text mining, text analytics, sentiment mining, and natural language processing in market analysis.

(2) The method and analysis process of text mining and text analytics.

(3) An analysis practice about the correlation between marketing share and user opinions in social media platforms.

(4) The use of data visualization to clearly and effectively represent data.

Research Plan

1.Research Dataset

In this project, we plan to use various social media data especially individual online comments as our data source that comes from several main social media platforms, including Twitter, Facebook, YouTube, etc. Most social media sites provide the web-based Application Programming Interface (API) that allows us to easily collect both historical data and real-time data set. In addition, we will also use Gnip, Kaggle, Data.Gov, World Bank Data, and other data set providers to enrich and expand our data sets. Utilizing data sets discussed above will help us to gather comprehensive and high-quality data we need.

2.Method

In general, our analytic approach is to utilize text mining and sentiment mining to analyze individual online content, comments, and reviews to improve sales and customer satisfaction. Our analytic approach is divided into several steps.

First, we will gather a large amount of individual comments and online content from main social media platforms by utilizing Python script and API to search and collect data. We will use different methods for particular social media platforms. For example, we are able to use Twitter REST API to filter specific keywords that we need (Batrinca, B., Treleaven, P.C. 2014). Also, another good example is using the search list method to find out specific content from YouTube. Most social media platforms provide very detailed API tuition that we are able to easily utilize and refer.

Once we get enough data we need, the second step is to analyze the data we gathered. We want to count terms or keywords that represent positive and negative reviews, attitudes, and opinions. To do this, we are able to figure out the customer satisfaction level. We also need to extract opinions from our data since we need to improve targeted products based on individual reviews. We can use the preprocess () function, as an example, to capture specific text on Twitter (Batrinca, B., Treleaven, P.C. 2014).

The last step is data visualization that we will visualize the data we got into the comparison world clod or bar chart in order to clearly and effectively represent our data.

3. Evaluation

In order to determine the data accuracy and ensure its practical utility, we will compare our data with the sales and market performance of the target products. For instance, if we data shows that the product earns more positive comments and has a good reputation from individual reviews, but the product sales are not good, we may notice that our data is at issue.

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