

# Revenue Generation from Recommendation System Using Sentimental Analysis

Tabish Farooq, Mohammad Shabaz

**Abstract:** Rapid-tidily when we are talking about sentimental analysis, one only thought about that the terminology concerned only with the opinion or emotions of human. But they never thought that using this terminology one can even make a business model and generate revenue. There are many big as well as small industries, organizations that use sentimental analysis to grow and inclined their business to heights. Some of those organizations include delta airlines, amazon, flipcart etc. The concern is how to create that business model that can be easily accessible to everyone. In this paper we extract the amazon transactional data from January 2019 to March 2019 and evaluate the difference in prices from vendor's price to the corrected marked price. We find that a large difference which leads to extortionate for the customer. Using sentimental analysis we can target large audience, as the size of customer increases then the market price of the item/product decreases.

**Index Terms:** Text mining, Opinion mining, Revenue generation, Recommendation systems

## I. INTRODUCTION

Due to advent or enormous use of internet, data has been increased heavily. By this data people can know about their surroundings. The age of internet has changed the way in which people express their views, emotions, opinions and sentiments. Millions of people are connected together by using social media sites such as twitter, facebook, google plus, hike instagram etc and share their views about their life and other things. Many devices such as laptops and smart phones make the way easy to access the internet. By using these devices a customer can review the items or things and provides the functionality that rates these items. Now a day's people prefer online shopping to purchase the goods and pay the bills through online. Sometimes a user can comment the items from a list of datasets. By these comments a company owner takes necessary steps to tackle the problem. We use text mining to analyze the subjective information. It is not easy to analyze or extract the data generally from a given datasets. To extract useful information we use sentimental analysis. The analysis technique based on sentiments of people is related to emotions, reviews, opinions. By using sentiment analysis, we can determine the rating of a particular item either good or bad. Sentiment analysis gives positive, negative and neutral sentiments according to the ratings. By using these analysis techniques we generate revenue from

**Revised Manuscript Received on April 06, 2019.**

**Tabish Farooq**, Computer Science Engineering, Universal Institute of Engineering & Technology, Mohali, India.

**Mohammad Shabaz**, Computer Science Engineering, Universal Institute of Engineering & Technology, Mohali, India.

recommendation systems using sentimental analysis. Revenue generation is the total amount of monies collected during the period of a specified time. When we analyze the total profit from revenue, then the total amount is considered. Generally, the department store industry consists of retail establishments that sell many kinds of products such as clothing, cosmetics etc through decentralized points of sale throughout the store. Global department stores revenue is estimated to reach \$839 billion by 2018. U.S. department store industry generates approximately \$170 billion in revenue per year. It represents 3.6% of sales in the U.S. retail industry. Further the delta airlines annual revenue in 2017 is \$41,244 and it increases in 2018 by \$44,438. So using sentimental analysis we can generate increased amounts of revenue. Using sentimental analysis we can create a business model and generate revenue. These business models works around the efficiency of their recommendations. An accurate understanding of revenue generation also affects how a company is run. Revenue is also referred as sales. Sentiment analysis is broadly applicable to customer materials such as survey responses and ratings and health care materials. Sentiment analysis also looks for emotional states such as anger, sad, happy etc. For a point of recommender system, sentiment analysis provides the basic techniques for evaluating the item reviews. A recommendation system predicts the ratings that a user can give to an item. For example amazon uses the recommendation systems to suggest their products to customers. Facebook use it to provide or recommend people which page they like and follow. Recommendation systems sort the item from a given dataset based on people's choices or ratings and provides that item in the top of the list whose ratings or reviews are high.

## II. LITERATURE SURVEY AND RELATED WORK

T.karnan and G.Seenuvasan [1]: Proposed a system that uses the sentimental analysis for analyzing E-Shopping websites. The paper uses random learning algorithms which consider various feedbacks in which sentiments are classified. Sentiments are expressed either negative or positive. Moreover this paper uses pre-processing of information to analyze the fake reviews in the web site. These fake reviews should be measured by identified the MAC address of the user along with review item patterns. If the system detects fake review it will inform the admin to eliminate that review from that particular system.

Mohammad Shabaz and Ashok Kumar [2]: This paper describes an adaptable approach known as AS analysis. There are many varieties of approaches for extracting sentiments or opinions but these approaches do not



provide the accurate extraction result. This analysis is used to minimize the problem of negative and positive word correlation. In this analysis author describes a formula for finding the sentimental data. This sentimental data ranges from negative to positive values. By using AS analysis, the result so obtained is accurate near about.

Shabeeba T and Aswathi T [3]: Proposed a problem due to data overloading. People get confused about what he choices or buys from a particular website that is based on many other opinions. So, the author uses sentimental analysis to analyze the various data. The paper provides Collaborative filtering (CF). It is an sentimental approach to predict sales of a product. The collaborative filtering can be divided into item-based and user-based collaborative filtering. CF is an approach for measuring item similarity based on common use of items. The main task of collaborative filtering is that it deals with scalability and data scanty. While Matrix factorization is an important approach for low-dimensional matrix decomposition. Matrix factorization has the efficiency to deal with large datasets. It is crucial to mining the valuable information from reviews to understand user's preference.

Dongchen Miao and Fei Lang [4]: Due to advent use of internet and social network sites, the area of recommendation system is becoming an important aspect. Because of the complexity of Chinese language, the existing recommendation systems cannot fulfill the people's sentiments. The author develops a recommender system with the technology based on text/data mining. The paper uses the logistical retrogression to get user's sentimental data. When the division of Chinese word is done, stop the words re-movement. Logistical regression provides the facilities to instruct the classifier and mine the people's opinions from the people reviews.

Achin Jain and et.al [5]: Proposed a literature survey on recommendation system using sentimental analysis. Recommender systems are to be a critical research area. The recommendation system is classified into three main techniques, via; collaborative filtering, context based and content based. The number of population around the world who uses social networking sites and social network services are increased day by day. This increased population describes huge amounts of information over the internet. This increased information led to confusion for the user for making certain decisions. For this confusion recommendation systems are introduced. Recommendation systems are software tools that provide relevant information from huge amounts of data to the user. While designing recommendation contextual information of users is taken into consideration.

D. Mali, M. and et.al [6]: Sentiment analysis has boundless application like predicting market move based on news. Sentiment analysis is a very crucial approach for massive applications. Sentiment analysis also known as opinion mining analyzes people's opinions which are specified in written language. In this paper author use natural language processing technique that allows computers to make sense of human speech. The author deals with information retrieval for providing storage representation and access to items. It uses semi-supervised learning approach in which importance is given to expressive opinion words.

Qi Zhang [7]: Proposed that the supply chain is a network made of entrepreneurs, manufacturers and distributors. Supply chain management has eight different links in which each link is used to reduce cost and minimizes time by

making experienced plan for their supply chain. Supply chain has the great impact on the revenue of a company.

K. Yogeswara Rao and et.al [8]: This paper describes recommendation system from user reviews using sentiment analysis. Author describes relation model known as social sentiment influence. This relation describes how user's friend influences the user in an sentimental approach. Recommendation algorithm is used for developing the formula. This proposed work describes sentiment based rating prediction method in which we have a proneness to extract product opinions from user data. We have also a tendency to gearing the sentiment dictionaries to calculate opinions/sentiments of a particular user.

Amel ziani and et.al [9]: The recommender systems are widely used in today world because of the fast increase of social network sites and social network services. The main aim of recommendation system is to provide a meaningful data from a given dataset. A recommendation system provides suggestions about the item to users. For example, when there are multiple items in a list and a user wants a best item, then the system chooses the best item for the user. This choosing is done due to reviews or ratings of the people's opinions to that particular item. The author presents a tool for analyzing Algerian comments and find out their polarity.

### III. DATASET

We collect the dataset from the amazon transactional data from January 2019 to March 2019. By using these datasets we can generate the maximum price, total price and vendor price. The vendor price is the price of the product in which company sells that particular product. Normally we say that the vendor price is the selling price of the product. In our work vendor price is used for collecting the revenue that is generated by selling the products. The Sample Size contains 6974 items, as shown in Figure 1.

ProductName	CorrectedPrice	ScrapedIndexPrice	BBCorrectedPrice	BBVendorType	BBScrapedPrice
#1 BEST Probiotic Supplei	20.99	20.99	25.02	FBA	-1
#1 BEST Probiotic Supplei	25.02	19.99	25.02	FBA	-1
10 Panel Dip Drug Testin	3.96	3.96	9.97	FBA	4.9
10 Panel Dip Drug Testin	3.96	3.96	9.97	FBA	4.9
10 Panel Dip Drug Testin	3.96	3.96	9.97	FBA	4.9
10 Panel Dip Drug Testin	3.96	3.96	9.97	FBA	4.9
10 Panel Dip Drug Testin	6.5	6.5	9.97	FBA	4.9
10 Panel Dip Drug Testin	7.99	7.99	9.97	FBA	4.9
10 Panel Dip Drug Testin	8.49	8.49	9.97	FBA	4.9
10 Panel Dip Drug Testin	8.99	8.99	9.97	FBA	4.9
10 Panel Dip Drug Testin	9.04	9.04	9.97	FBA	4.9
10 Panel Dip Drug Testin	9.86	4.79	9.97	FBA	4.9
10 Panel Dip Drug Testin	9.97	4.9	9.97	FBA	4.9
10 Panel Dip Drug Testin	9.99	9.99	9.97	FBA	4.9
10 Panel Dip Drug Testin	10	10	9.97	FBA	4.9
10 Panel Dip Drug Testin	14.48	14.48	9.97	FBA	4.9
10 Panel Dip Drug Testin	14.48	14.48	9.97	FBA	4.9
10 Panel Dip Drug Testin	33.54	33.54	9.97	FBA	4.9
10 Panel Dip Drug Testin	35.49	35.49	9.97	FBA	4.9
2wayz FULL METAL BODY	40	40	9.97	O	-1
2wayz FULL METAL BODY	54.94	54.94	9.97	O	-1
3 Pair Motorcycle Riding t	6.79	6.79	6.79	O	6.79
3 Pair Motorcycle Riding t	8.97	8.97	6.79	O	6.79
3 Pair Motorcycle Riding t	12.48	12.48	6.79	O	6.79

Figure 1 shows screenshot of data-set.



#### IV. METHODOLOGY AND IMPLEMENTATION

In order to find out the difference in the prices of products, we have taken amazon transactional data from January 2019 to March 2019. We obtained the results using following steps:

- Step 1: Load the data set in the Cognos Insight tool.
- Step 2: Clean and transform the data as per requirements.
- Step 3: Put the desired attributes and tuple's properly.
- Step 4: Calculate the summary, maximum of the value.
- Step 5: Using column chart to visualize the data.
- Step 6: Finding the difference in prices from vendor price to correct market price.
- Step 7: End the process.

#### V. RESULTS

The results shown in figure 2 describe the maximum price of items from Vendor's (BBScraped) price to corrected price.

	Corrected Price	ScrapedIndex Price	BBCorrected Price	BBScraped Price
Total of ProductName	18,296.65	18,246.09	14,380.23	13,511.97

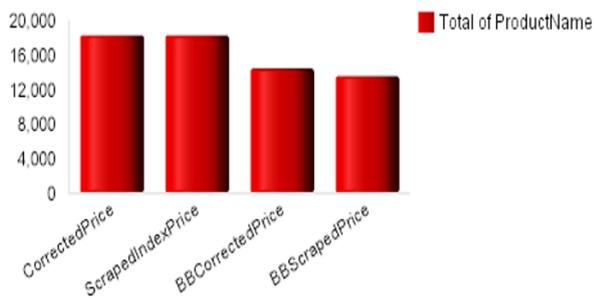


Figure 2 shows maximum price.

The results shown in figure 3 describe the total price of items from Vendor's (BBScraped) price to corrected price.

	CorrectedPrice	ScrapedIndex Price	BBCorrected Price	BBScraped Price
Total of ProductName	387,473.09	382,851.84	319,558.37	253,090.73

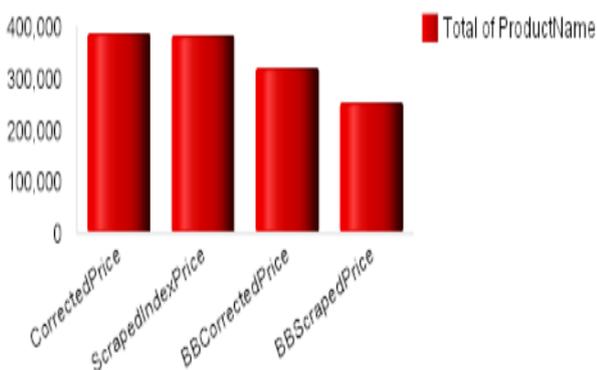


Figure 3 shows total price.

The results shown in figure 4 describe the Vendor's type. It includes FBA (Fulfillment by Amazon), Amazon, Others.

	BBCorrectedPrice			BBScrapedPrice			Count					
	Total of BBVendorType	FBA	O	Amazon	Total of BBVendorType	FBA	O	Amazon	Total of BBVendorType	FBA	O	Amazon
Total of ProductName	319,558.37	21,907.46	30,115.52	267,455.39	253,090.73	17,180.63	18,960.44	216,949.66	6,973	470	715	5,788

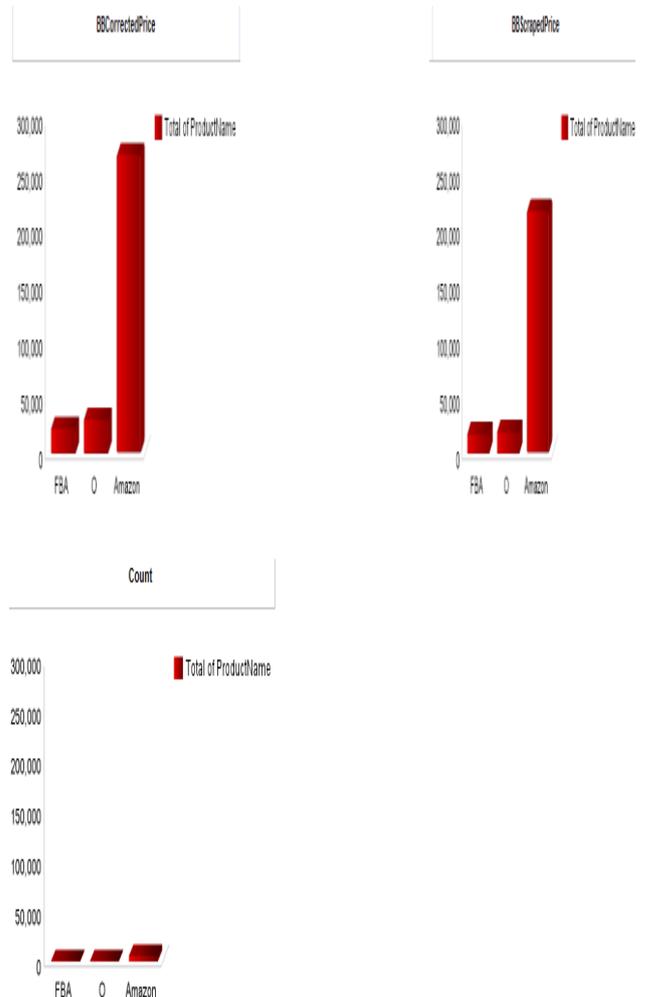


Figure 4 shows Vendor's Type

#### VI. CONCLUSION

The proposed work describes how revenue is generated from recommendation system using sentiment analysis. The main advantage of this framework is to produce a visual organization of revenue data based on sentiments of a user. The techniques through which the sentiments or opinions are analyzed are called as sentiment analysis through. This proposed work uses recommender systems so that a valuable data/information is to be captured from the huge data. In our work, we conclude the difference in prices from vendor price to correct market price of products. We have taken amazon data for obtaining the result. The Sorting operation is done using SA Sorting [10]. This proposed work provides a technique in which we can generate our revenue from sales.



## ACKNOWLEDGMENT

We would like to thank with whole heartedly to Mohd Rafiq, Farooq Ahmed Wani and all others who are either directly or indirectly provide their support and encouragement.

## REFERENCES

1. T. Karnan and G. Seenuvasan, "Sentiment analysis in E-Commerce using recommendation system", international journal of computer science and mobile computing, 2017.
2. Mohammad Shabaz and Ashok Kumar, "AS: a novel sentimental analysis approach", International Journal of Engineering and Technology, Vol. 7(2.27), p.p 46-49, 2018.
3. Shabeeba T and Aswathi T, "Rating prediction using review texts based on sentiment analysis", international journal of innovative research in science, engineering and technology, 2018.
4. Dongchen Miao and Fei Lang, "A recommendation system based on text mining", international conference on cyber-enabled distributed computing and knowledge discovery, 2017.
5. Achin Jain, Vanita Jain and Nidhi Kapoor, "A literature survey on recommendation system based on sentimental analysis", Advanced computational intelligence: An international journal (ACII), vol.3, No.1, 2016.
6. D. Mali, M. Abhyankar, P. Bhavarthi, K. Gaidhar and M. Bangare, "Sentiment analysis of product reviews for E-Commerce recommendation", international journal of management and applied science, ISSN: 2394-7926, 2016.
7. Qi Zhang, "The use of recommender systems in demand management in intelligent supply chain management", The international journal of logistics management, 2018.
8. K. Yogeswara Rao, G.S.N. Murthy and S. Adinarayana, "Product recommendation system from users reviews using sentiment analysis", international journal of computer applications (0975-8887), 2017.
9. Amel Ziani, Nabiha Azizi, Didier Schwab, Monther Aldwairi, Nassira Chekkai, Djamel Zenakhra and Soraya Cheriguene, "Recommender system through sentiment analysis", <https://hal.archives-ouvertes.fr/hal-01683511>, 2018.
10. Mohammad Shabaz and Ashok Kumar, "SA Sorting: A Novel Sorting Technique for Large-Scale Data," Journal of Computer Networks and Communications, vol. 2019, Article ID 3027578, 7 pages, 2019. <https://doi.org/10.1155/2019/3027578>.

## AUTHORS PROFILE



**Tabish Farooq** is a scholar, currently Pursuing M.Tech in Computer Science Engineering from Universal Institute of Engineering & Technology, Lalru, Mohali, Punjab.



**Mohammad Shabaz** has done B.Tech, M.Tech and currently Pursuing Ph.D in Computer Science Engineering from Chandigarh University, Mohali. He is Currently Head of Department in Computer Science Engineering at Universal Institute of Engineering and

Technology (UIET), Lalru. His Publication includes many UGC, Scopus and ESCI.