

# Assessment of Consumer Perception for Selecting Sports Brands Through Text Mining and Netnography



Vishu Singhvi, Prateek Srivastava

**Abstract:** Sports Apparels are pretty common amongst the young generation people since it provides people with greater flexibility, comfort and ease of use. Looking at the sell trend and bulk purchase of Sports Apparels and Sportswear by people, bigger companies like adidas, Nike, Puma, Reebok and Fila started spreading their business in Asia, specifically in India. With the course of time, a large number of customers have increased who not only are shopping online but also posting their reviews or comments on e-commerce sites, social media platforms, blogs, forums etc. The study assesses three brand analysis factors or parameters i.e. brand name, price and style on five sports brands which includes adidas, Nike, Puma, Reebok and Fila. On the basis of consumer's online textual data, positive or negative reviews and comments, were segregated with respect to three mentioned brand analysis parameters of each sports brand. The Research was carried out on five sports brands and the final assessment was done accordingly for the three brands analysis parameters namely Brand Name, Price and Style. The research did the assessment of mentioned three factors that is Brand Name, Price and Style forming the consumer perception regarding selecting sports brands through Netnography and Text Mining.

**Keywords :** Netnography, Text Mining, Brand Name, Price, Style, Sports Brands.

## I. INTRODUCTION

Sports Apparels are very much common amongst the young generation people since it provides people with greater flexibility, comfort and ease of use. This prompted bigger multi-national companies of big sports brands like Nike, Adidas, Puma, Reebok and Fila to increase their business and growth options in Asia and specifically in India. Sports brands apparels have essentially become an inevitable part of any sports person at any level.

The seven factors of brand loyalty and customer's satisfaction are brand name, price, product quality, promotion, style, service quality and the environment of the store. Brand name is pretty much related to the term brand loyalty. For increasing the customer satisfaction in order to make a particular customer loyal regarding a specific brand, various marketing team take initiatives of coming up with new programs and orientations.

Majority of the Sportswear Industry companies improvise themselves in various fields to increase the trust factor among their existing customers. Sportswear companies consider Brand Loyalty and Brand Name as a key factor to retain and sustain their customers for a longer duration of time. In marketing, brand loyalty, brand name, customer satisfaction, quality of a product etc. factors are the terms that makes the clients or the customers to repurchase the product again. There are many customers who not buy products online but also post their comments, reviews on various social media platforms, e-commerce about various aspects of the product they bought. Customers put their positive and negative feedbacks, give ratings and accordingly express their views which in turn help other people to bug or not to buy that particular product again. If a product's quality and service is good then majority of the customers put positive feedback and if it's of bad quality, then customers put the negative feedback about the product. As a result, the online sale of a product increases or decreases depending on the majority of the positive or negative review or comments from customers about the product. This clearly shows that the repurchase of a product depends on quality of product, trust and service [8]. In the current market world, there are a lot of duplicate items available but most of the customers prefer the original branded products having brand names. These particular brand name's images and their product quality tend to attract various customers to repurchase the product and therefore reducing the product switching behavior based on prices [7].

In last 10 years, consumer behavior regarding buying a product specifically Sports Brand product has been under great notice by various Analytical techniques. It has been observed in various researches that when customers want some information about a particular product, they depend and rely on some basic aspects and key factors that make them purchase the product and accordingly review or comment on them. The current study of consumer perception and behavior in Sports helps to understand the customer requirements directly or indirectly.

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A better understanding of customers and their requirements can help to develop services and products that meet the basic needs of a consumer. Also, it will help in developing, designing and implementing the marketing plan of actions to retain current consumers and at the same time attract new ones.

The paper has four sections in which the first section will display the background literature review, second shows the methodology, third section shows the result with analysis and finally comes the discussion and conclusion part.

### II. BACKGROUND

Advertisement is one of the most common, popular and costly way of branding a particular Product. The more and a big the advertisement, big will be the cost which will be associated to it. Researchers tried to find an alternative option other than advertisement since it has a cost factor associated to it. Brand Extension is the term and an alternative option of advertising which can achieve the effectivity and efficiency similar as of Advertisement [2]. Moreover, it is assumed that Brand Extension can become a suitable means for introduction of any product without being advertised. In short, this can help a particular product entering into the market with lower cost associated with it.

In recent times, buying capacity and power of customers using online communities has increased gradually. Brand Loyalty i.e. the Brand Name has been one among the important factors for understanding a consumer's behavior and its perception [1],[4],[6],[9],[11]. Depending on the products and services provided to the consumers, the loyal consumers tend to buy and repurchase the same product again and again. The Loyal Consumers don't go for other options with respect to other Brands and thus Brand Loyalty can act as a parameter for measurement for repurchase of Product and service of a particular Brand product [5].

While many consumers are pretty much brand specific, there are huge number of consumers which switch their product Brands depending on how much satisfied they are after using a particular product. There are approximately 65% of such consumers are present which switch their brands depending on satisfaction level and the services provided by the service provider of the brand [12],[13].

In the current market world, there are many companies and service providers which struggle to give good services and develop long term relation with their customers. Due to this, a lot of companies fails in retaining their old customers resulting in no brand loyalty by a particular consumer. With the increasing demand and needs from the consumers, now a days only good service is not enough as an attractive measure by the companies to be compete in the challenging situation [3],[10],[14].

In the year 2007, Cengiz & Yayala researchers did their analysis and research on effect of marketing mix depending on positive word of mouth communication. The complete study focusses on positive word and mouth and how companies should consider effective marketing mix so that it can impact the products sale. If the positive word of mouth spreads, it represents an excellent service by the company and vice versa. One more study of "Factors influencing purchase

of Apparels and Footwear from organized retail outlet" shows a number of factors which consumers feel important were price, variety, style, quality, appeal, brand name and referral group.

Ko, Kim & Hoon,2008 also tried comparing the consumer's behavior for Sports Brands in countries like China and Korea. With the increase in price of product of a brand, a negative representation and demarcation was observed on the purchase of the product in China. Now a days, as online market and e commerce are at a boom in India, the sports wears and other apparels are bought at a massive level and many of the customers write reviews about their product. This helps in the collection of data of various brands from various e commerce and social media platforms[16].

One more study which was done in a similar field and was reviewed in the paper was of "The external factors that influences Taiwanese students shoe purchase intention". This particular study takes six factors into consideration which includes brand, price, style, promotion, comfort and durability. The particular research study showed that the consumers pretty much considered comfort and style as important factors while purchasing and using the product. Also, the research study concluded that style and comfort factors were majorly responsible for influencing the purchase of a shoe by the Taiwanese college students [15].

Youn, Song & MacLachlan in the year 2008 examined consumer's preference for a particular brand and price range changes as the experience increases in sports of various categories[17].

One more article which was evaluated during the research period was "Service quality as a mediator of the relationship between marketing mix and consumer loyalty". Marketing mix, Quality of the service and customer loyalty were the three factors studied in the article. After various analytics, results of the article showed that there was an important connection between customer loyalty and marketing mix. This in turn showed an optimistic connection between service quality and customer loyalty[18].

In year 2010, a study by Saha, Dey, & Bhattacharya titled "Factors affecting consumer buying behavior of shoes in Kolkata" focusses on the factors that influence the buying behavior of the people of Kolkata. The major factor came out as a result of the study were product, promotion, its price and finally the place[20].

A product's quality and durability placed a vital role and thus were considered as the most important factors in affecting consumers buying behavior. There were review being done on articles related to Mature customer selection if Apparel and footwear brands in the departmental stores. The result of such studies showed that the reduction in the price and sale specially make the majority of mature consumers to buy specific brands products.

Krishna in the year 2012 concentrated on the behavior of young generation buying methods towards sports brand categories. The final goal of a buyer is to buy a product of superior quality, more in quantity but low or affordable in price.

The study concluded on the buying behavior aspects which are pretty much being utilized by the young generation youths [21].

Yoh, Mohr, & Gordon in the year 2012 also investigated on various factors of purchase of athletic footwear over four hundred teens who took part in the investigation study.

The whole study was concentrated on sever important factors of price, style, color, brand name, quality, comfort and any kind of endorsement by any celebrity. The Text mining technique in an application of data mining which is used to discover the useful data from an unstructured phrase or text. The IR technique that is the Information Retrieval technique have used the “bag of words” model for various tasks like ranking, clustering or matching the documents[22].

### III. RESEARCH OBJECTIVE

The major objective of current research is To Do An Assessment of various factors forming consumer perception for selecting sports brands through Netnography and Text Mining. On the basis of Review of Literature and its Analysis, there were number of factors which form consumer perception for selecting Sports brands. Out of all factors forming consumer perception, the current research focusses on three factors which are brand name, price and style.

### IV. METHODOLOGY

The study borrows key elements from both Netnography and Text Mining and adapts them to the aims of this study. Text mining will be utilized using software applications to extract information that helps identify potential types of brand perceptions that may emerge from texts produced by online communities. Netnography will be used by adopting the technique of observing an online community through the texts they produce, some specific research phases, and inductive coding procedures to classify brand associations.

The study will follow the six overlapping steps of Netnography [19] :

1. Research Planning
2. Entrée
3. Data Collection
4. Interpretation
5. Ensuring ethical standards
6. Research representation

Following steps describes the sequential steps of research :

- Identifying the data source for select sports brands on the basis of brand name, market share and well consolidated processes of internationalization.

• **Data Collection :**

Primary Data: The first step would be the identification of the social websites for the collection of data and meta data pertaining to the select sports brands. The next phase would be data collection using tools like : Data Minor, Web Scraper and using Twitter API’s.

Secondary Data: Published articles from online and print journals, magazines, books, newspapers would be collected.

• **Data Processing :**

The process of Data Processing would be done using Tableau tool. Tableau tool is the data representation tool

which is being most prominently used in the IT industry. Tableau is an analytics tool in which researchers can do any kind of analytics, calculations and their representations. The Tableau Public is an Open Source service which can let a person to publish graphs and visuals on the web application side. All the type of visualizations can be shared as well as emailed using social media or other platforms so that researchers can make use of the analytical feature being provided by Tableau tool.

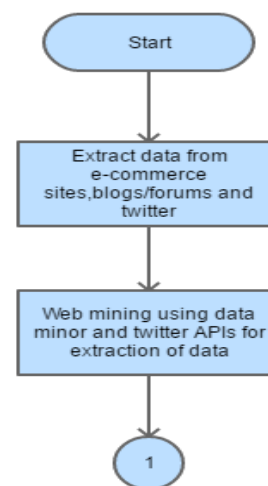
**A. Data Collection**

During the data collection phase, data was collected for the following five Sports Brands : adidas, Puma, Nike, Reebok and Fila. During the research data is collected from random e-commerce sites, social media platform sites, blogs and reviews sites. The major e-commerce platform used for data collection are: www.flipkart.com , www.mouthshut.com, www.amazon.in and www.snadeal.com. Also, twitter APIs were used for the extraction of tweets from twitter and segregation of comments or reviews was done on the three attributes being used in the research i.e. brand name, price and style. Reviews from everywhere were taken into consideration for each sports brands and finally the data model in terms of table 1 to 5 was created.

Tools which used to collect the data during the research are :

1. data scrapper - data minor
2. Twitter API
3. Web scrapper

The Figure 1.1 is showing the flowchart in which data is extracted from the e-commerce sites, blogs, forums and twitters using various mining tools on the basis of five sports brands.



**Fig. 1.1. Flowchart showing the data collection and processing steps**

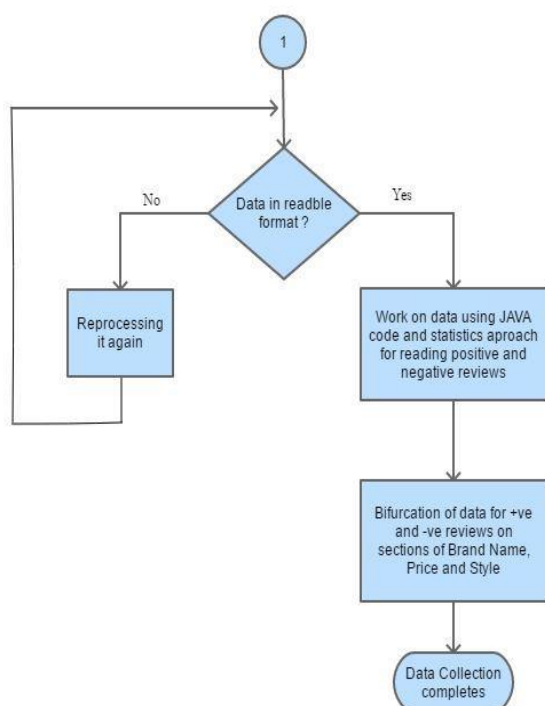
**B. Data Processing**

Once the data collection was done, the collected data is processed through a sequence of steps to convert it into a readable format. Using the JAVA programs, the non -readable data, extra spaces, redundant data and special characters are removed from the files containing raw data.



# Assessment of Consumer Perception for Selecting Sports Brands Through Text Mining and Netnography

As soon as the file becomes readable, again another JAVA program and statistics approach is being used in the research to segregate the comments/reviews as positive or negative comments/reviews. On the basis of reading the comments, each and every comment is divided into positive and negative comment with respected to the three brand analysis parameters of brand name, price and style. Finally, the processed data which is collected is stored in the MySQL database with column as positive (+) and negative (-) for each consumer perception factor of Brand Name, Price and Style. This means there will be one column each of positive and negative comment for Brand Name parameter and similarly for Price and Style parameter. Fig 1.2 shows the segment of the flowchart which does the data processing and displays various steps involved in the process.



**Fig 1.2. Flowchart showing the data collection and processing steps**

## C. Data Representation

In the data representation section, the data which got collected in section A and further processed during section B, the same data is being used for Data Representation. Data collected in the MySQL database is shown in the table 1 to 5 for brand analysis parameters Brand, Price and Style. Tableau tool is being used for the data representation which is being most prominently used in the IT industry. Instead of buying the whole enterprise edition of Tableau tool, Tableau Public is available in the market which is an Open Source service that lets users to publish graphs and various visuals on the website. All the type of visualizations ranging from Graphs, Pie Charts, Line Charts, data tables etc. can be shared as well as emailed using social media or other platforms. This helps researchers to make use of the analytical features being provided by Tableau Public tool. The representation of the data is done in the percentage format after the summation of the each parameter data positive or negative total comments percentage. The data is

transformed into percentage format to make the base as same for all the parameters. Graphs from 1 to 5 represents the tabular data are shown for each Sports Brands with each of their brand analysis parameter in percentage format on the X-Axis.

## D. Tables and Graphs

The tables 1 to 5 contains the processed data comments from each of the sample collected from various e commerce sites, twitter APIs, blogs and forums. Graph 1 to 5 represents the graphical representation of the tabular data contained in table 1 to 5 in percentage format for each brand.

**Table I: adidas data collection results (w.r.t. 3 brand analyses parameters i.e. brand name, price and style)**

	Brand Name		Price		Style	
	+	-	+	-	+	-
<b>Sample 1 :</b>	67	11	145	26	61	6
<b>Sample 2 :</b>	4	1	5	7	7	7
<b>Sample 3 :</b>	206	43	363	53	163	42
<b>Sample 4 :</b>	340	159	536	268	708	337
<b>Sample 5 :</b>	32	18	76	35	43	24

**Table II: Puma data collection results (w.r.t. 3 brand analyses parameters i.e., brand name, price and style)**

	Brand Name		Price		Style	
	+	-	+	-	+	-
<b>Sample 1 :</b>	66	14	167	53	88	29
<b>Sample 2 :</b>	29	8	73	22	43	14
<b>Sample 3 :</b>	34	7	82	14	38	6
<b>Sample 4 :</b>	12	5	17	6	7	2
<b>Sample 5 :</b>	49	21	234	103	86	40
<b>Sample 6 :</b>	6	2	15	7	8	3
<b>Sample 7 :</b>	3	0	8	2	5	2
<b>Sample 8 :</b>	413	124	915	552	86	35

**Table III: Nike data collection results (w.r.t. 3 brand analyses parameters i.e. brand name, price and style)**

	Brand Name		Price		Style	
	+	-	+	-	+	-
<b>Sample 1 :</b>	28	10	46	19	17	5
<b>Sample 2 :</b>	36	7	307	129	57	26
<b>Sample 3 :</b>	54	12	106	43	84	22
<b>Sample 4 :</b>	289	47	498	159	86	35
<b>Sample 5 :</b>	346	67	753	199	371	129

**Table IV: Reebok data collection results (w.r.t. 3 brand analyses parameters i.e. brand name, price and style)**

	Brand Name		Price		Style	
	+	-	+	-	+	-
Sample 1 :	3	0	5	2	1	1
Sample 2 :	5	3	18	14	7	5
Sample 3 :	3	1	5	2	3	0
Sample 4 :	189	59	564	299	82	34
Sample 5 :	6	1	7	3	6	2

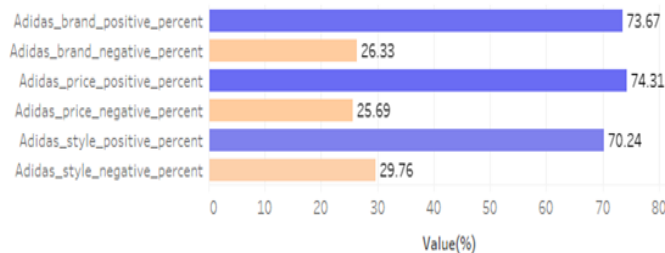
**Table V: Fila data collection results (w.r.t. 3 brand analyses parameters i.e. brand name, price and style)**

	Brand Name		Price		Style	
	+	-	+	-	+	-
Sample 1 :	21	4	84	27	20	7
Sample 2 :	54	0	75	45	30	11
Sample 3 :	12	3	26	13	7	2
Sample 4 :	2	1	3	2	4	2
Sample 5 :	183	62	708	431	265	156

The above 5 tables show the data collection results w.r.t. sports brands adidas, Puma Nike, Reebok and Fila with respect to three brand analyses parameters/factors i.e., Brand Name, Price and Style. The complete Dataset has been accumulated from various social networking, ecommerce platforms, blogs, reviews, post as well as by using search engine technique results. The '+' sign represents Positive Reviews / Comments and '-' sign represents Negative Reviews / Comments.

**adidas Graph :**

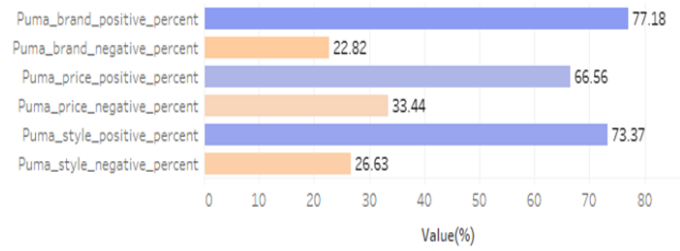
Fig 2.1 shows the data in graphical format for the data in table 1 and converting the table 1 data into percentage format, X-Axis value is in percentage



**Fig 2.1 Bar Graph showing adidas data with respect to positive and negative parameters of brand name, price and style**

**Puma Graph :**

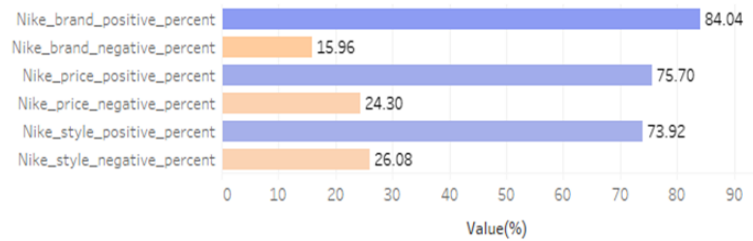
Fig 2.2 shows the data in graphical format for the data in table 2 and converting the table 2 data into percentage format, X-Axis value is in percentage



**Fig 2.2 Bar Graph showing Puma data with respect to positive and negative parameters of brand name, price and style**

**Nike Graph :**

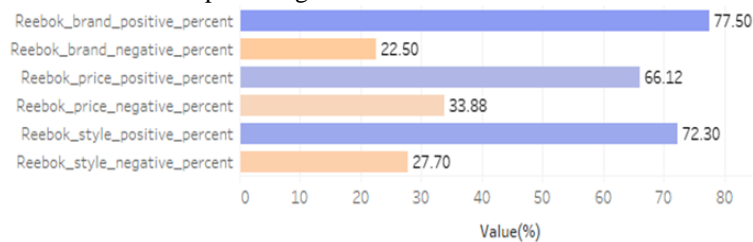
Fig 2.3 shows the data in graphical format for the data in table 3 and converting the table 3 data into percentage format, X-Axis value is in percentage



**Fig 2.3 Bar Graph showing Nike data with respect to positive and negative parameters of brand name, price and style**

**Reebok Graph :**

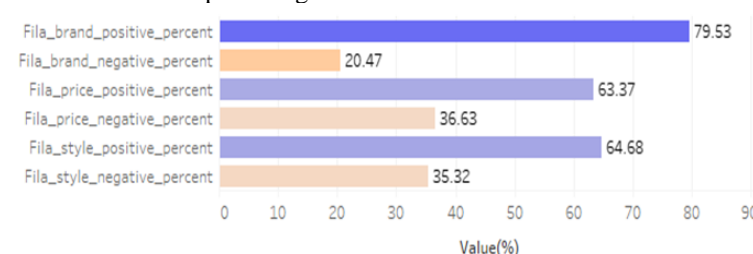
Fig 2.4 shows the data in graphical format for the data in table 4 and converting the table 4 data into percentage format, X-Axis value is in percentage



**Fig 2.4 Bar Graph showing Reebok data with respect to positive and negative parameters of brand name, price and style**

**Fila Graph :**

Fig 2.5 shows the data in graphical format for the data in table 5 and converting the table 5 data into percentage format, X-Axis value is in percentage



**Fig 2.5 Bar Graph showing Fila data with respect to positive and negative parameters of brand name, price and style**

## V. RESULT AND DISCUSSION

The Research study identified the key brand analysis parameters driving the consumer perception for selecting the five Sports Brands which are adidas, Puma, Nike, Reebok and Fila. Also, the paper focusses on the three factors of Brand Name, Price and Style with the help of which consumer comments from various social media and e-commerce platform were divided into positive and negative comments. Depending on the positive and negative comments with respect to three analysis parameters such as Brand Name, Price and Style, data was collected in the tabular format and finally was represented with the help of Tableau business intelligence and analytics tool. The research study used the steps of Netnography and Text Mining methodology to collect the data, process it and finally represented the processed data using BI & A Tableau tool. Overall the research study provided a Text Mining and Netnographic approach to analyze, assess and evaluate the online consumer comments and textual reviews. Thus, this approach provided an insight for business manager, analytics and researchers to use data from customer's online comments and reviews as well as examine the consumer perception for selecting a particular Sports Brand.

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