Analyzing Customer Engagement Using Twitter Analytics: A Case of Uber Car-Hailing Services

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Abstract. Nowadays, most of the organizations and businesses develop online services, which add value in their business and even increase their customer base. Social Media has changed the dynamics of digital marketing. Social media gives power to customers to post, share, and review content. Customers can directly interact with other customers and companies. In this paper, we will analysis huge user-generated content which can be used by organizations for their customer engagement strategies. The purpose of this study is to derive insights using Twitter Analytics on Twitter data to understand how businesses use Twitter for customer engagement strategies. Data collected from Twitter. The present paper uses descriptive and content analysis techniques for analyzing the tweets. The analysis will help in identifying the gaps in the priorities of the stakeholders. With the right customer engagement strategies, companies can make benefits.

Keywords: Twitter Analytics · Customer engagement · Sharing economy

1 Introduction

The concept of Customer engagement has gained attention in recent years by both practitioners and academics [21]. Organizations today need to build an emotional connection with their customers for performing better. This business communication between the brand and its customers referred to as customer engagement [5]. The outcome is a customer base with more brand loyalty and awareness and hence better revenues for the company. Companies today use various methods like personalized discounts, feedback collection, social campaigns, which could be either offline or online. However, with the major shift towards technology, companies have now extensively started using social media for engaging with their customers, for Example, blogs, microblogging sites, Video sites, social sites [22].

The competition among the players and the service providers on online services are rising. Companies always need to come up with new ideas, features, and discounts, etc. They also need to pay special attention to their customer service, as being an online

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platform, they receive instant criticisms or gratifications. Social media platforms widely used for expressing such emotions by users. In the long run, customer loyalty can contribute by continuous engagement and providing differentiated service.

Twitter has gained immense popularity and is being used in all fields like political campaigns, marketing purposes, branding, public sensitization, etc. [16]. Twitter is being used by users and service providers extensively for discussions and opinions. So, it very important to analyze, visualize, and summarize the Twitter conversations for finding the new insights in respective of customer engagement [16, 23]. The reason why marketers should concern about Twitter conversations because tweets from customers and service providers can influence the sentiments of customers towards their brands. Keeping this in mind, the purpose of this study is to explore the Customer engagement behavior of Uber in India and the users of this service, in the Twitter platform. Uber, a US-based company, is one of the leaders in sharing economy in the global market [18]. As a business that runs from a digital platform, Uber follows many customer engagement methods. We aim to understand the strategy that Uber applies to ensure customer loyalty and hassle-free customer service. So, we attempt to address the following research objectives (RO) based on Uber as a case study using Twitter data.

RO1: Using social media analytics to learn about customer engagement of businesses.
RO2: Examine customer engagement behavior of Uber in India using Twitter data.

In this paper, Sect. 2 describes literature. Section 3 is talking about methodology and findings. Section 4 describes managerial implications, and in the end, Sect. 5 gives limitations and future work.

2 Literature Review

Social media users generate a massive amount of user data. Social media term means online portals and websites where people can share information, interest, and even can give opinions [8]. Social media and engagement connected as social media engagement mean communication or interaction. There are several studies on social media and engagement [9–12]. Armstrong and Hagel [13] highlighted that engagement through social media for marketers can be beneficial. Even now, it becomes a new business communication way where marketers and customers can get engaged in conversations [14]. Existing literature shows many insights about engagement on social media [3–6]. It is also relieved that on social media customer engagement is easier. Boyd et al. [14] studied retweet behavior and tried to connect with customer engagement. Harrigan et al. [15] highlight customer engagement in respective of tourism brands based on social media. Ibrahim et al. [16] collected data from Twitter and studied to determine how different types of engagement with customers affect customer sentiments. Social media conversations also affect brand value of businesses. Ahujaa and Shakeel [1] talk about customer engagement for this purpose; they used word clouds and further did

sentiment analysis for Jet Airways. There are few studies, which uses social media data for customer engagement [24, 27]. Twitter has been used as a social media platform for customer engagement [2, 7].

The sharing economy has changed the way of consuming goods and services [25]. Kumar et al. [26] give insights for service enablers, i.e., how resources and focus between service providers and customers can be balanced. Most of the current literature addresses, what are the motives of a consumer to participate in collaborative services tangibly [25]. Based on the literature, we find out that there is no study in sharing economy domain where customer engagement measured on Twitter data conversations.

3 Methodology and Findings

3.1 Data Collection

The collection of tweets from Twitter was done using R programming and using TwitteR package. Tweets having #Uber_India, #uberindia and @mentions of Uber_India, UberINSupport, Uber_Support collected over three months from October 2017 to December 2017. The tweets collected were then segregated into two categories. First is tweets by users in which the tweets collected from the same handles. The tweets having @mentions of Uber but not posted by Uber were separated and were taken to be tweeted by the customers. Second is Tweets by Uber. The tweets which had been tweeted by the Uber company handles were chosen to be tweets by Uber. Post removing duplicates, we had 46,618 tweets by Uber and 41,135 tweets by the users.

3.2 Data Preprocessing

The data preprocessing involved steps like removing URLs, @usernames, numbers and punctuations and common English stop words like the, are, is, Uber, etc. Stemming of the document and stripping the white spaces have done [19]. The "tm" package in R programming was used to achieve this. The result was a set of tweets with only the words that have relevance and can contribute to the analysis.

3.3 Data Analysis

The analysis was done separately for both types of categories of tweets, i.e., the tweets by the users and the tweets by the Uber as the objective was to understand the customer engagement of Uber, the activities and reactions of the users to the service provided by Uber. For this purpose, Descriptive analytics of the tweets done in the form of the word cloud and content analysis [20].

Tweets by Users: The purpose of analyzing the tweets by users is to understand their essential requirements and their satisfaction from the services of Uber.

Word Cloud: As a part of the analysis, the most common words used by the users found out in the form of a word cloud (Fig. 1). The size of the word is proportional to its usage. It shows that words like "driver," "help," "app," "charge" dominate the picture. Some other words which stand out are "issue," "cancel," "refund," "support" etc. which seem to portray an image of users facing issues with the service and looking out for help. The critical topics of discussion are related to payment, security, ride, bookings, and customer service, which tells that users generally use Twitter to post the issues or they may have faced and looked for support and resolution from the company.

Sentiment Analysis: Sentiment analysis would help us to understand the dominating sentiments of the users towards Uber in their tweets.

Fig. 1. (a) Word Cloud for user tweets (b) Word Cloud for Uber tweets customer replies

Figure 2 shows the sentiment analysis of the tweets by the users. It shows that the highest percentage is for trust, followed by anticipation and sadness. Users were looking for a trust factor while availing any services. About the sentiments, even though the positive sentiment is slightly more than negative, there is still a large percentage which falls under negative sentiment which cannot be ignored.

Topic Modeling: Topic modeling discovers abstract "topics" in a set of documents which are in the form of a cluster of words. For this purpose, we have used the Latent Dirichlet Allocation (LDA) model [17]. For this study, 50 such topics of 15 words each found. From the word cloud, we could understand that the users gave priority to customer service. However, to further understand the most common reasons for their issues or the topics of discussion among them, these topics were manually classified under three categories i.e. customer service, information sharing, and criticism.

A. Customer Service: Customer service, we can divivde into two categories i.e. technical and non-technical (Table 1).

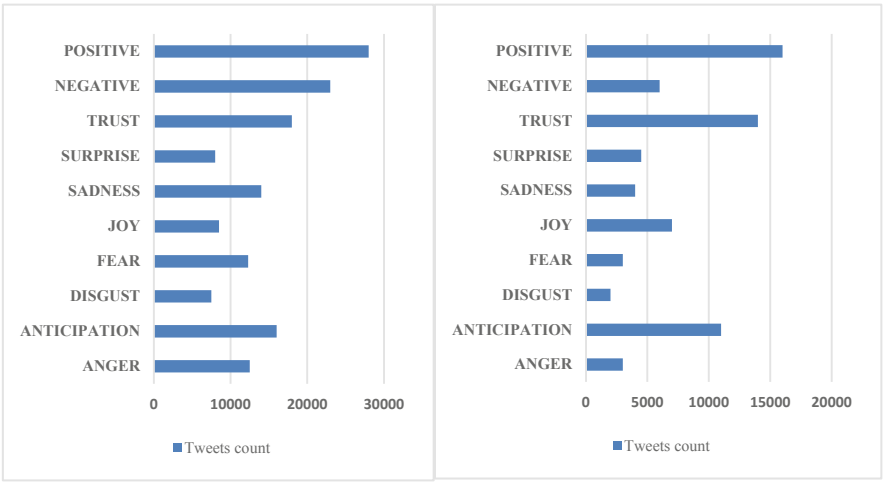


Fig. 2. (a) Sentiment analysis of user tweets (b) Sentiment analysis of Uber tweets

Table 1. Classification of customer services

Category	Attribute	Description
Technical	Application/account related	Tweets that talked about the Uber application and account related issues like login, bookings, etc.
	Payment	Problems related to payment and payment methods like being overcharged, Paytm associated problems, etc.
	Fares and promo	Issues related to the charge and promotion offers given like Fares incorrectly charged, promo code did not work as expected
Non-technical	Safety	About problems or threat of any kind, the passengers must have faced during the journey
	Quality of customer service	Problems with the customer service they receive, which includes the time duration of customer query resolution, experience of the customer in this duration, follow-ups due to the delay, etc.
	Diversifications	Issues with the different services under Uber, for example, Uber Eats, Uber Pool, Uber Auto, etc.

B. News/Information Sharing: Customers share the current trending information about the organization like the change in leadership, organizational expansion, mergers or acquisitions, etc. A loyal customer is interested to know about the brand and expects continuous communication about the organizational strategies.

C. Criticism: Customers directly criticize the services of the company when they face issues with the services in any form. They may sometimes not be as generous with their complaints. Others Mostly dealing with collaborations, feedback received, etc. which are few.

On classification, the results were obtained as shown in Table 2. It observed that a vast majority of tweets (72%) dealt with customer service, be it for technical or non-technical issues. This shows that users use Twitter extensively for seeking issue solution. Among these, a significant chunk of the topics related to the quality of customer service (20%) and issues related to payment (13%) and driver (13%). This reinstates the importance of customer service. Customers look for quicker and a hassle-free solution to their problems. Any issues about the duration taken for customer service, constant reminders from the customer's end, unsatisfactory resolution, etc. reflect poorly on the quality of customer care. Customers are also open with their criticisms (13%) and not as transparent about appreciations.

Tweets by Uber: These are the Tweets posted by Uber. Which, we can divide into three major types. First is Customer Replies. These are the replies to individual customers and looks to either provide a solution to their issue, request for further information to solve the problem or give some information to a user query. Second is retweets. Many of the positive comments by the users and feedbacks are retweeted by Uber and broadcasted to their followers to increase their brand value and marketing. Tweets by customers provide a more significant impact and help in increasing their customer base.

In the end, third is Tweets by Uber for Customer Engagement. These were the tweets by Uber which aims at establishing constant engagement with the customers, be it in terms of providing promos, running a contest, talking about a social cause, etc. Sentiment analysis of all Uber Tweets shown in Fig. 2. On analyzing the tweets, it observed that the percentage of tweets in each of the categories mentioned above found to be as given below in Table 3. Most of the tweets are customer replies, followed by retweets and then tweets by Uber for establishing customer engagement. We analyzed these three categories in detail for more insights into customer enagagement. Which discussed in below subsequent subsections.

A. Customer Replies

Word Cloud: Among the tweets of customer replies, a word cloud was formed to understand the most common words in use. The results have shown in Fig. 1. It saw that words like "Please," "Help," "Sorry" is prominent, which shows that they are amicable and apologetic in their response to the issues. Other words such as "email," "app," "section," "register," etc. show the solutions given for the issues faced by users. The customer replies as expected, mostly dealt with providing customer care services.

Table 2. Classification of user tweets

Types of tweets			Percentage
Customer service	Technical	Application and account related	9%
		Payment	13%
		Promo, Fares	7%
	Non-technical	Safety/security	7%
		Quality of customer service	20%
		Driver	13%
		Diversifications	4%
News/information sharing			9%
Criticism			13%
Others			7%

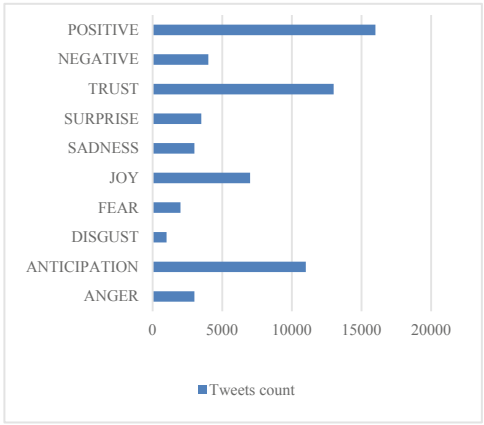
Sentiment Analysis: Further, sentiment analysis was done to understand the polarity of response by Uber. On examining Fig. 3, the fact that sentiment adopted by Uber towards the user is highly positive. The trust factor is very high, while emotions like disgust and fear are the least. These results show that Uber tries to build trust among its customers, knowing that it is of utmost importance to them. The language they use for interaction is also very positive.

Topic Modeling: A topic modeling for the tweets was done, with an output of 15 topics containing ten words each. Each of these topics divided into four types of replies. Viriya et al. [7] used a six type of reply model. However, in our study, we have removed the chit-chat and the positive comment categories as they do not fit in our data. The four types of replies can be explained as below:

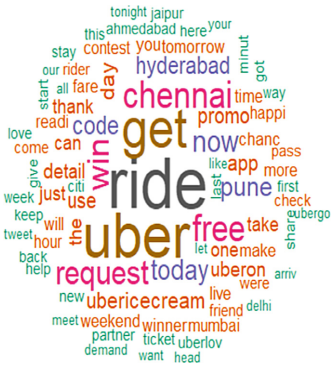
Table 3. Classification of Uber tweets

Categories	% of tweets
Customer replies	81.8
Customer engagement	7.2
Re-tweets	11

i. Information: The purpose of the reply is to provide the users with useful information he/she needs.
ii. Apology: The purpose of the response is to apologize for a mistake. Such reactions are crucial when providing customer support and typically contain apologetic and supportive words, such as 'sorry,' 'apology,' etc.
iii. Question & inquiry: The purpose of the reply is to ask the user a question or request specific information.
iv. Gratitude: The purpose of the reply is to offer gratitude or thank to the user. It was seen that the maximum types of responses were for information (47%), followed by an apology (24%). The other two were less frequent, i.e., gratitude (18%), inquiry and question (12%).



(a)



(b)

Fig. 3. (a) Sentiment analysis for customer replies of Uber (b) Word Cloud for customer engagement of Uber

Since we had seen earlier that maximum tweets by users were related to issues and customer service, the replies by Uber are in sync with that. Most of their responses dealt with providing information to the customer, be it about their issues and how to resolve them or proactive information. Also, a large section of the tweets was for apologizing and empathizing with the customers for their unhappiness and inconvenience they may have faced.

B. Retweets: Uber retweets many positive comments and appreciations they receive from the customers. It acts as online word-of-mouth; hence, customers get more influenced. It acts as a recommendation by the customers and helps in increasing their customer base and building new relationships. It is these retweets that make a tweet go viral in the online media. Therefore this is a great strategy used by businesses to improve their brand presence. Also, retweeting user tweets makes them feel good and post similar compliments in the future. Retweeting again helps in building the brand image. While Uber retweets customer comments, they also frequently request the customers to retweet their tweets to increase their reach. This action is usually a part of a contest or to promote it. This strategy, along with providing information to the existing followers, also helps in generating new customers.

C. Tweets by Uber for Customer Engagement: These tweets are the contents created by Uber for customer engagement. It may be in the form of contests that involve interactions by customers, providing information about the organization or services, talking about collaborations, and social issues.

Word Cloud: A word cloud created (Fig. 3) and it shows that, apart from the names of the cities in which Uber has its operations, words like “free,” “ride,” “win,” “code,” “contest,” “promo” show relevance. These words suggest that promotion campaigns are widely run to ensure users embrace the service. The reason could be because the customers in India are very price sensitive. Campaigns like “ubericecream” also seem

to have been well promoted. Since we wanted to understand in-depth how Uber engaged with its customers so, further, the tweets divided into three categories, which explained below:

Organizational Content: These directed towards the organization and shares news about organizational growth, plans, and corporate social responsibility, etc. They help to build an image of the brand in the minds of the customers.

Promotional Content: These deal with promotional campaigns to increase their business and provide information related to the products and prices. The aim is that the customers accept the product and use it.

Relational Content: These are information which is of considerable significance to the customer and shows the sensitive side of the organization. The primary objective here is to build a long lasting relationship with the customer by keeping them engaged.

Instead of finding the topics of discussion using topic modeling, the 4598 tweets by Uber were categorized into these three categories manually to get a more realistic picture. It observed that a significant portion of the tweets dedicated to promotional content (86%) followed by relational content (13%) and organizational content (less than 1%). It shows that Uber focuses highly on promotions. They regularly give offers in the form of free rides, rate cuts, credit points, etc. This strategy is essential as the users in India are price sensitive, and there are several players in the market offering competitive prices. Such promotions become crucial for such industries. Lastly, the organizational content, as expected, is low. They share details about the organization and its leadership, but the number deficient. An overall picture from the analysis shown below (Table 4), which gives a comparison of the results obtained using Social Media Analytics of the two perspectives of customer engagement.

4 Discussion and Managerial Implications

Post studying the tweets by users and by Uber, it can be said that users give high importance to the trust factor when availing the services of a cab aggregator. Safety is of utmost importance. The quality of customer service provided by a company is a major factor that determines if a customer would be loyal to them and continue using their services. Uber should keep these in mind in their social engagement strategy. Since customers have shown dissatisfaction for the customer care service provided, Uber should make it their focus area. A discontented customer tends to become a negative influencer which could pose a problem for Uber. Most of the issues arise for payments or driver related issues. These should be made a priority if the target is to reduce the number of problems faced by the customers over time.

The current activity by Uber in social media is mostly in line with the customer requirement as the majority of their tweets are catering to customer service, issue judgement, positive and polite. However, they still need to improve the quality in terms of quicker resolution and better communication. Apart from this, Uber should also post more information about the organization as it would make customers feel more connected. They should seek more feedback from the customers. Uber has excellent promotional and customer engagement programs.

5 Limitations and Future Research

The study was initiated to explore the Customer Relationship Management (CRM) of Uber. However, we faced issues with segregating the tweets into the different stages of CRM – Customer Acquisition, Retention, and Advocacy. A large number of tweets made it difficult to classify them manually. Using topic modeling also did not help resolve this as the topics do not give a clear picture of the content talked. A new way of trying to explore this could be done which would help organizations to reflect upon their existing CRM models. The scope of this study has been limited to India and could be expanded globally. In our study, the drivers have not been taken into consideration enough though they form a large customer segment for Uber. A survey of the drivers could have been done to analyze the relationship of the organization with the drivers. This survey would increase the extent of the study to incorporate all the stakeholders. The scope of this study can be further expanded to study the retweets in-depth, which would help identify the influencers and the correlation between retweets and various stages of CRM.

Table 4. Comparison of the two perspectives

Analysis method	Tweets by users	Tweets by UBER
Word cloud	Words related to issues faced with respect to payments, ride, driver etc. are highlighted	Words that dominate are related to customer issue resolution
Sentiment analysis	Emphasis given to trust and safety Positive sentiment slightly more than negative. However, a large percentage is still negative which shows that a large segment of customers are dissatisfied	Emphasis given to safety and tries to re-install trust in the mind of the customers Highly positive for customer service which shows that Uber maintains a positive behavior in their interaction
Topic modelling	Mostly related to customer issues Top complaints: • Customer service quality • Payments related • Driver related	For customer service most topics were for providing information or apology in one form of the other For customer engagement, highly focused on promotions and campaigns

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