Social Media Challenge: Sentiment Analysis in Maruti Suzuki India Ltd.

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Abstract— **The growth of social media platforms and its users has shown a stupendous growth since 2005. According to a survey done by Social Media Examiner with social media marketers, 83% of the respondents agreed that social media is the need of the hour for organization because customers use it for giving their opinion about the product/service the organization offers. It's a proven fact that social media distributes information much faster than traditional word-of-mouth. Thus, it's more important than ever for organisations to monitor what is being said about their product/service across all social media networks. Social media monitoring requires gaining insight for the positive, negative or neutral opinion given by the users or in other words gaining insight for sentiment analysis. On the basis of sentiment analysis, organisations can identify the opportunities, implement novel strategies, adjust campaigns duly and improve their brand image leveraging the power of social media. This study focuses on the challenges faced by India's leading automobile company, Maruti Suzuki India Ltd. during the process of sentiment analysis.**

Keywords- Sentiment Analysis, Social Media, monitoring, Maruti Suzuki India Ltd.

Social media is the media that is published, created and shared by individuals on the internet, such as blogs, images, video and more [1], as well as online tools and platforms that allow internet users to collaborate on content, share insights and experiences, and connect for business or pleasure [2]. Social media has shown stupendous growth in just few years since its birth and has established itself as the media of choice all across the world. Contrary to the one-way production and transfer of news, information, and entertainment from main media outlets via the mass media, social media allows anybody to become a producer of such content, and deliver it through interactive communication. It can be said that social media is an open media for interactive communication led by common people. Social media can be called a strategy and an outlet for broadcasting, while social networking is a tool and a utility for connecting with others. Organisations have come to realize that social media is an essential marketing tool, though not to be used as the only marketing tool. Social media is no longer a trend for marketers: It is a reality [3]. Social media is an inevitable channel for customer support [4]. Customers get a forum wherein they can freely express their views and opinion about a product/service. The views and opinions of people effect the purchasing decision/opinion formation of others who go through their text. More than 75% of the users confirm that customer's reviews have a significant influence on their purchase and they are willing to pay more for a product with better customer review. In other words, customers trust the opinion of someone on social media more than the traditional promotional messages. Social media operates like a giant word-of-mouth machine, catalyzing and accelerating the so-called viral distribution of information [5]. Thus, the task of finding the opinion of people becomes paramount to help building organisation's reputation and brand image. While a single negative opinion/comment from the consumer can damage an organizational reputation, a positive opinion and amplification of that opinion can help in boosting sales and improving the brand image. There is a tsunami of `sentiments' available on social media platforms like Facebook, twitter, blogs and other forums. These snippets of text are nothing but gold mine for organisations that want to monitor their reputation and brand image and get timely feedback about their product/service. Using sentiment analysis, an organization can develop marketing strategy responding to the negative sentiments so as to positively affect the customer's perception and in case of positive comment, engage the customer in a manner to foster brand loyalty. However, there are several challenges an organization has to face and keep in mind while conducting the sentiment analysis. This study would focus on the challenges faced and overcome by India's leading automobile company, Maruti Suzuki India Ltd. (MSIL) during sentiment analysis process.

I. OBJECTIVES OF THE STUDY

The present study seeks to achieve the following objectives:

1. To study the challenges faced by Maruti Suzuki India Ltd. while conducting sentiment analysis

II. LITERATURE REVIEW

Sentiment analysis seeks to measure the tone, opinion or sentiments conveyed by internet users towards a product/service. It is becoming a buzzword these days.

Sentiment analysis is being considered as one of the major trends for the nearest future [6]. However, sentiment analysis is not to be taken as a recent phenomenon linked to the expansion of modern technologies. Origin of sentiment analysis is rooted in the area of psychology, anthropology and sociology. Emotions or sentiments are nothing but feelings generated through conscious and unconscious brain processing. On the basis of mental processing, positive, negative or neutral evaluation is manifested and exhibited through verbal or non-verbal response. These responses are nothing but sentiments that have an important role to play in marketing of products or services. Much before the advent of internet and the www service, people's attitude and decisions were influenced by the friends and relatives around them [7], [8]. A study by Forrester Research in 2010 found that social network users tend to ask others opinions more than ordinary internet users. Among them, 30 percent said they follow others recommendations when buying a product while 50 percent shared their opinion on products or services that caught their interest to their friends. A similar study done in April 2010 by ROI Research, commissioned by Performics, revealed that at least once a week, 33% of active Twitter users share opinions about companies or products while 32% make recommendations and 30% ask for them. In 2008, Pew Internet and American Life Project Report that was focused on online shopping behavior identified that more than 80% of US internet users have previously done online research about a product or service. More than 75% of online-hooked customers confirm that reviews have a significant influence on their purchase and they are willing to pay more for a product with better customer reviews. In addition to that, 1/3rd of users post an online review or rating regarding a product or service, thus, becoming an influencer themselves. [9]. Therefore, consumer's or customer's sentiments are to be monitored and analysed because it shapes purchasing behavior.

Several studies have established links between emotions and strong brands [10], [11]; emotions and consumption; and emotions on product evaluations [12]. Sentiment analysis can be defined from two perspectives: functional and operational. The functional aspect focuses on the outcome of polar classification i.e. positive or negative. Sentiment analysis is a process that categorises a body of textual information to determine feelings, attitude and emotions towards a particular issue or object [13]. The second aspect of sentiment analysis focuses on the operations of the technique as a sub-field of computational linguistic. Sentiment analysis is automated subjectivity analysis similar to opinion mining and appraisal extraction which does the extraction and classification of text with machine language and algorithms [14]. A detailed and comprehensive review on effective computing and computer technology for emotion and expression recognition was presented by researcher Pang and Lee [15]. Computing technology brings about measurability and objectivity to the sentiments generated on the social media platforms. Extracting emotions from natural language processing and algorithms is becoming popular amongst researchers and practitioners. More than 7000 research articles have been written in the area of sentiment analysis in recent years. Several startup organisations are developing system solutions and many major statistical

packages like SAP & SPSS now include dedicated sentiment analysis modules [16].

There are two approaches to conduct sentiment analysis: Lexicon-based and machine learning methods [17]. Lexicon based approach uses a dictionary of words to recognize the sentiment orientation i.e positive, negative or neutral. The dictionaries are manually or automatically created. Then each word in the document is compared with the word cited in the dictionary, rated with sentiment polarity score and its polarity score is added to the total polarity score of the document [18]. In the second approach i.e. machine learning methods; a classifier is trained to distinguish between text elements with positive and negative sentiments. The classifier use not only unigrams or bigrams, but also longer parts of the text. There are several algorithms used to perform the sentiment analysis like: Naïve Bayes, Maximum Entropy or Support Vector Machines [19]. Some researchers have proposed hybrid approaches utilizing both approaches i.e. the lexicon-based and machine learning together so as to create the training set for supervised learning [20].

The power of sentiment analysis resides in combining software evaluation with human interpretation. Human analysis is important in providing a robust picture of the trend, its causes and whether or not action is required. The current software tools interpret sentiments correctly only between 75 and 80 percent of the time. With the amount of time invested in coding and training a computer to correctly interpret human communication; getting a result that may be only 80% correct is an area of concern. Otherwise also, certain messages in social media may contain sarcasm, humour, slang or colloquial terms. Such terms can only be interpreted by human beings and not machines.

Thus, sentiment analysis can be used as a predictor of buzz on social media platforms by organisations to design marketing strategies and campaigns around their products or services. Media professionals can then use sentiment analysis tools to understand the opinions and assess the collective trend and mind of the market.

III RESEARCH METHODOLOGY

A.   *Rationale of the Study:*

After extensive literature review it was found that sentiment analysis to track market trends is the need of the hour. However, there are several challenges an organization has to face while using the hybrid approach of sentiment analysis. This study was conducted to study what type of challenges Maruti Suzuki India Ltd. faces during its sentiment analysis process.

B.   *Research Methodology:*

Research is a systematic inquiry to describe, explain, predict and control the observed phenomenon and it helps to take informed decisions.

Research involves following interrelated steps to bring about a novel finding. The title of this study is `Social Media

Challenge: Sentiment Analysis Process in Maruti Suzuki India Ltd.'. The title of the research itself introduces the dimensions of the interrelated steps. Keeping in mind the title of the project, as a researcher, it was crucial to understand the theoretical framework of sentiment analysis. All other steps such as stating the objective, choosing the orientation to qualitative research and research tool, sample collection technique are all related to the title and are also interrelated and not independent.

C.   Research Approach

Next step to be followed is to develop approaches to the research problem. In this study, exploratory research is adopted. Since one doesn't know the real problem while doing research, exploratory research helps to identify and explore the different dimensions of the problem so that a better understanding of the research framework can be developed. The exploratory research procedure is unstructured and highly flexible which helps the research to dwell deep into the issues and identify the problem. Recently sentiment analysis has established itself as an important tool to elucidate the opinions of the customers/consumers regarding an organisations product or service. When the research objective is to develop an understanding of some phenomena in great detail and in much depth, qualitative research can be applied. It helps to learn how a phenomenon occurs in its natural settings and thus, to understand the challenges faced during the sentiment analysis process, qualitative research was adopted for the study.

There are different techniques to perform Qualitative research. For this study phenomenological approach to research was adopted. Phenomenology represents a philosophical approach to studying human experiences based on the idea that human experience itself is inherently subjective and determined by the context in which people live. This approach is highly unstructured and provides every opportunity for gaining new insights.

In this study therefore, conversational interview tools were used to assess the problem. The questions were unstructured and indirect. The respondents were asked to share their experiences about the sentiment analysis process followed in the organization i.e. MSIL. The researchers also referred to the official social media sites to assess the content and understand the application of sentiment analysis and interpretation several comments/ideas posted on varied official social media platforms.

D.   Data Collection Tools

The data was collected using conversation tool. The researcher had a series of discussion with the social media team which comprised a Deputy General Manager, and 2 Media Managers. The approach was flexible and unstructured. The objective of the interview was to encourage respondents to share their experience of sentiment analysis process being followed in MSIL. Data was also collected from the official social media sites of MSIL.

- Sampling: Sampling tool is used to gather important and useful information from the population. Purposive sampling, one of the most common sampling strategies, groups participants according to preselected criteria relevant to a particular research question. Since the research problem was identifying how sentiment analysis is done in Maruti Suzuki India Ltd. and what are the challenges faced, purposive sampling technique was used to collect data from the social media team based at head office of MSIL in Vasant Kunj, New Delhi. The respondents were Media Manager and his team. The Media team manages social media, traditional, digital media of Maruti Suzuki India Ltd.

III.   DATA ANALYSIS AND DISCUSSION

Maruti Suzuki India Ltd. has a very efficient social media team that works round the clock to understand their customer's needs. The team handling media includes one Deputy General Manager and two Media Managers. Social media is collectively handled by media team and 12 Brand Managers. The team takes care of traditional, digital and social media. Traditional medium like magazines, television, movies, webcasting are used for product promotion. Social media tools like facebook, twitter, orkut, LinkedIn, Google Circle are extensively used by MSIL now. The company has clearly understood the role of social media in influencing customer's purchasing decision and fostering brand loyalty. It helps an organization to gain insights from an effective monitoring program while communicating about product design, pre-launching and launching activities. Monitoring is also a critical tool for handling negative comments/publicity;by way of timely monitoring and responding, organisations can ensure positive reputation building.

MSIL has outsourced the brand monitoring and sentiment analysis task to an external agency named `Ignitee Digital Services'. Automated software, `Thoughtbuzz' is used for monitoring multiple times a day and conducting sentiment analysis of what is being said about MSIL's product/services/dealers/company as a whole. The automated software `Thoughtbuzz' presents the analytics to help the Brand Managers gain the customer's perspective The inputs given by automated software are segregated on the basis of service related issues, sales related issues, complements/appreciation & negative comments. The media team including the Brand Managers is then required to identify the trend and take suitable measures.

Presently at MSIL, the media team does not try to identify the influence of the customers in terms of how many retweets they get/ how many Shares or how many comments their Blog posts/Facebook posts attract. The Media Manager said that MSIL can consider monitoring the influence of customer in future keeping in mind the large customer base so as to harness a large communication foot print available. The information generated by `Thoughtbuzz' is immediately analysed by the Brand Managers and post-analysis, information is sent to the Social Media team. The team addresses the issues/grievance immediately and does not wait

for the number of similar comments/complaints to increase in the form of posts on any of the social media tool. The response, which is always vetted by the Brand Managers, is sent through the company's official email id.

MSIL has 2000 dealers all across India and more than 1million cars are sold in a year. The company also has a separate division for handling grievances to cater to such a massive customer base. The Dealer Sales interact day-in day-out with the prospective & existing customers. They also get a feedback form and on a daily basis, the feedback is given to the Customer Relations Department (CRD) of MSIL. The company has delegated one Territory Sales Manager (TSM) to one dealer whose role is to monitor the and subsequently give input to the CRD. The CRD then processes information and provides inputs to the Media team & Brand team which then take appropriate action of responding/clarifying on its social media tools.

MSIL allows and encourages customers to become its Brand Advocate and post comments/share experience or even vouch for MSIL cars. As per the media team, such direct recommendations from friends/relatives/peers generate engagement rates some 30 times higher than traditional online advertising does. The social media official sites are utilised by the media team to increase the customer's engagement and brand loyalty.

MSIL has used social media and sentiment analysis proactively to lead its consumers toward long-term purchasing behavioral changes. The media team also solicits consumer input after the purchase; however, sentiment analysis is paramount to engage customers. This ability to gain product-development insights from customers in a relatively inexpensive way is emerging as one of social media's most significant advantages. MSIL has its community forums. The company, through its digital agency collects its customers' views about improving the company's products and services. The media team then aggregates submitted ideas and forwards them to the Product Development team which in turn tries to implement them on the basis of feasibility factor.

Sentiment analysis in social media monitoring can help or hinder Media team's efforts at MSIL – depending on how the team applies the measurements. MSIL's media team looks at both the volume and sentiment as well as trend comparisons to previous weeks for a more accurate judgment than sentiment analysis software results alone. For example if the sentiment is 20% negative for Maruti's Estilo car, it doesn't necessarily mean it's a bad case scenario..it depends on what goes around in the market. If MSIL sees their competitors with a roughly 60% negative sentiment for their middle segment car, while MSIL is at 20% negative, then of course it's an area of concern. MSIL tries to capture sentiment on a trend line to identify sudden positive or negative spikes. On the basis of which, marketing strategies are devised.

The key challenge that MSIL's media team faces is the decision to adopt which of the following technique for sentiment analysis:

- Document-level sentiment analysis
- Sentence-level sentiment analysis;
- Aspect-based sentiment analysis;
- Comparative sentiment analysis;
- Sentiment lexicon acquisition;

Document-Level sentiment analysis: This approach assumes that the document contains an opinion on one main object expressed by the author of the document. There are two main approaches to document level sentiment analysis: supervised learning and unsupervised learning. The supervised approach assumes that there is a finite set of classes into which the document should be classified and training data is available for each class. The simplest case is when there are two classes: positive and negative. Accuracy of 80% is achieved when the document is presented as text with simple text. Unsupervised approaches to document-level sentiment analysis are based on determining the semantic orientation (SO) of specific phrases within the document. If the average SO of these phrases is above some predefined threshold the document is classified as positive and otherwise it is deemed negative.

Sentence-Level Sentiment Analysis: A single document may contain multiple opinions even about the same entities. In order to have an in-depth view of the different opinions expressed in the document about the entities one has to move to the sentence level. It's assumed that we know the identity of the entity discussed in the sentence. It's also assumed there is a single opinion in each sentence. This assumption can be relaxed by splitting the sentence into phrases where each phrase contains just one opinion. Before analyzing the polarity of the sentences one must determine if the sentences are subjective or objective. Only subjective sentences will then be further analyzed. (Some approaches also analyze objective sentences, which are more difficult). The approach works when neighbouring sentences also have the same subjectivity classification. It is advisable to handle different types of sentences by using different strategies.

Aspect-Based Sentiment Analysis: The above two approaches work well when either the whole document or each individual sentence refers to a single entity. However, in many cases people talk about entities that have many aspects (attributes) and they have a different opinion about each of the aspects. This often happens in reviews about products or in discussion forums dedicated to specific product categories (such as cars, cameras, smartphones, and even pharmaceutical drugs). The challenge is focusing on the recognition of all sentiment expression within a given document and the aspects to which they refer and reducing the noise in the noun phrases. Moreover, there may be several aspects that are not mentioned explicitly in the sentences and can be inferred only through the sentiment expressions that mention them implicitly.

Comparative Sentiment Analysis: In several cases, customers do not provide a direct opinion about one product/service but instead provide comparable opinions. The challenge in this case is to identify the sentences that contain comparative opinions and to extract the preferred entity/ies in each opinion. Moreover, an algorithm is required to identify the preferred entities based on the type of comparative used and the presence of negation.

Sentiment Lexicon Acquisition: The sentiment lexicon is considered as the most crucial resource for most sentiment analysis algorithms. There are three options for acquiring the sentiment lexicon: manual approaches, dictionary-based approaches and corpus-based approaches. In manual approach, people code the lexicon by hand but it's not feasible as each domain requires its own lexicon and is a herculean task. In the dictionary based approach, a set of seed words is expanded by utilizing computer resources. The biggest flaw in this approach is that the acquired lexicon is domain independent and hence does not capture the specific attributes of any specific doman. In the corpus based approach, a set of seed words is expanded by using a large corpus of documents from a single domain

There are many issues in sentiment analysis faced by the media team of MSIL. There is a need for better modeling of compositional sentiment. At the sentence level, this means accurate calculation of the overall sentence sentiment of the sentiment bearing words. The issue of automatic entity resolution is not yet solved. Aspect extraction is also a problem in this case. When the document comprises several entities, it is still a difficult task to identify the text relevant to each entity. All the approaches cited in the study does not have autonomous sentiment analysis system i.e. sarcasm is yet difficult to identify using classification method. Noisy text, (text with spelling, grammatical or semantic mistakes), are still the biggest challenge for the team. Several statements about entities are factual in nature and yet they carry sentiment. Current sentiment analysis approaches overlook such objective statements. The biggest challenge for MSIL's media team is to create algorithms that use context to attach sentiment scores to factual (objective) statements.

Sentiment analysis should be used to remove subjectivity an eliminate biasness. If the technique is integrated appropriately with right human intervention, sentiment analysis can provide novel perspective to brand building.

V. CONCLUSION

This study attempts to examine the process and challenges faced while performing the sentiment analysis process. With the explosion of social networks, any organisation with a consumer-facing product should be thinking about harnessing the power of sentiment analysis. The metrics and data analytics are not the only important aspects; media and public relations professionals must prioritise results on the basis of relative importance, respond immediately when necessary and

deepen the customer engagement. There is a tremendous amount of content and conversation out there in social media platforms about the brand and organisation wants to be able to see and hear all of it. Thus, organisations look for technology-based solutions for help. However, the conversations on the social media ecosystem have subtleties and layers that can be very difficult to interpret using automated solutions. In the absence of human context, one may receive a much skewed view of the conversation therefore; people can help to identify the issues and trends and help to build lasting relationships with customers.

Maruti Suzuki India Ltd. has very effectively managed the social media functions and the sentiment analysis process. MSIL has not simply relied on its automated software `thoughtbuzz' to help interpret the data; its dedicated social media team is on its toes to constantly monitor, respond, amplify and lead the consumer behaviour. MSIL is spending relatively lesser money on conventional advertising and has concluded that social media activity not only boosted sales but also had higher ROIs than traditional marketing did. MSIL has been ranked No.1 in JD Power Customer Service Index (CSI) Study 2010 for the 11th time in a row. It has also received Significant Achievement in Sustainability award in CII-ITC Sustainability Awards 2010 for showing a significant drop in negative comments of customers/customer complaints.

The main challenge in sentiment analysis that MSIL faces is conversion of massive volumes of textual data into meaningful information. If an organization invests millions of rupees in the software with little understanding of how the analytics provided by it can be utilized to influence the consumers to buy organisation's product/ do brand advocacy, it would fail miserably to harness sentiment analysis' true potential. Media professional at MSIL use sentiment analysis tools to analyse opinions on a deeper level in both the traditional and social media platforms. The team acknowledges the fact that sentiment analysis does not replace human insight. It simply provides the Media team with information that helps them to manage social media relationships with their valued customers and help further in implementing innovative strategies adjust campaigns at the right time and improve organisational reputation leveraging the power of sentiment analysis.

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