

# customer sentiment analysis2.pdf

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CUSTOMER REVIEW SENTIMENT ANALYSIS OF INSURANCE SECTOR

AKASH PATEL

Research Proposal



### **Abstract**

The process of identifying customers' feelings after they have bought a company's goods is known as customer review sentiment analysis. The business can collect this data from customer reviews, feedback forms, support tickets, online surveys, etc. Since it's a safe method to identify potential causes of customers' complaints and to strengthen the product features that delight them, every business is interested in conducting customer feedback sentiment analysis. As a result, the company can take action to promptly address the problems, enhance customer satisfaction, lower the rate of customer attrition, modify marketing initiatives, and increase earnings.

In order to gain insight into how consumers feel about various insurance types, this research takes into account customers reviews from online sources for different insurance sectors existing in the market. The results indicate that since 2013, consumer attitudes towards insurance services have become more unfavourable. For each insurance type, the customer feelings are gathered , and it's discovered that overall, customers are moreover feel negatively towards insurance services than positively. Moreover, the findings demonstrate that consumer review sentiments can reliably forecast customer's reviews scores and that for each insurance categories, positive, neutral, and negative customer review sentiments are distinguished by ratings that vary noticeably.

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## 1. Introduction

According to a recent eMarketer report, there will be a significant increase in amount of human beings who are using internet and producing online ratings/reviews over the upcoming years. Ratings and reviews gathered from online platform are a type of customer's generated material those are increasingly used as a source of knowledge by customers when making purchases or using services. According to research, 78% of users believe what other customers have to say. Customer's generated data sentiments offer a particular setting descriptions of the customer's feelings towards the offerings or good. Sentiments can be expressed as positive, neutral/negative statements with various levels of feeling, and they can give businesses valuable insight into how customers feel about their goods and services.

The significance of preserving the feelings expressed in customer online evaluations has been emphasised by numerous researchers. However, they also highlighted how challenging it was to do so. For instance, Liu (2006) found that using human judges to analyse 12,000 movie review comments was "an extremely tedious task." This job is now superior to hand coding in efficiency, less tiresome, and better able to analyse huge amounts of user-generated content thanks to the advancement of text extraction tools. Despite studies showing that text extraction has the drawback of being less precise than judges who are human, the accuracy rates for internet reviews typically hover around 80%.

the use of it in marketing and other fields has resulted from the fact that it is still thought to be helpful at this level of accuracy.

## 2. Background and related research

An increase in Sentiment analysis study interests methods to get the customer's interests and recognise their stances towards products can be attributed to the wealth of user-generated material available online. In this section, A short overview of consumer feedback, sentiment research, and the insurance industry with the aim of using them to extract consumer opinions and emotions towards insurance companies.

### **Sentiment Analysis**

The areas of natural language processing, computational linguistics, and text extraction are where sentiment analysis first emerged. In opinion mining, sentiment analysis is frequently used to detect online perception, affect, and emotional states writing. Finding a writer's attitude towards a particular subject is the primary goal of text sentiment analysis. (Li & Wu, 2010). Sentiment research generally has three key benefits:

- i. In order to make predictions about specific outcomes,
- ii. it transforms large amounts of text that is unorganised into a form, which is useful for building models that aggregate people's opinions.
- iii. Finally, it is helpful for gathering data on people's responses to specific products in order to create campaigns for advertising and marketing.

### **Consumer's rating and reviews**

For those who are interested in learning about other people's encounters with specific goods or services, user ratings and reviews may be helpful. The cognitive load theory asserts that consumers ability to process knowledge is constrained. As a result, they will probably make an effort to make choices with less effort. The availability of consumer reviews has altered how people purchase and facilitated quicker decision-making. With more consumers attempt to balance the demands on their attention and time to reduce the quantity of effort they put into decision-making by reading ratings and reviews in order to learn about the opinions or sentiments before making choices that could ultimately affect businesses sales.

### **The insurance market**

57 insurance companies are there in the India's market; out of which 24 companies are dealing in the life insurance sector, and other 34 companies are providing other insurance services. Life Insurance Corporation (LIC) is the only key player in the public sector providing life insurance. In the non-life insurance industry, there are six public sector insurers. In addition to these, General Insurance Corporation of India is the only national re-insurer. (GIC Re). Agents (individual and corporate), brokers, surveyors, and third-party administrators handling health insurance cases are additional market participants in India.

And it's very difficult to compete in such markets as the competition is high and convincing people for your product is also a difficult part.

According to studies, consumer attitudes will have a big influence on how much money insurance companies make. Nwankwo & Ajemunigbohun (2013) discovered, for instance, that a strong relationship with customers would have a favourable affect on their mindsets and feelings which would influence businesses' profits. Additionally, Huber, Gatzert, and Schmeiser (2015) discovered that customer's interactions insurance service affect their satisfaction and spur those to suggest those services to other clients.

### **3. Research Questions (If any)**

How can insurance companies make profits using customer review sentiment analysis?

Is customer review sentiment analysis more important for a insurance company to track their customers?

### **4. Aim and Objectives**

Sentiment analysis in the insurance industry is becoming a powerful instrument for businesses in a variety of ways. The unstructured data that insurance firms have available is vast.

Following an appropriate sentiment analytics process may assist insurers in identifying opportunities for up-selling and cross-selling as well as improving policyholder retention.

For businesses of all sizes, sentiment analytics have already become a key component of consumer feedback strategies. Sentiment analytics in insurance combines deep-text analytics, machine learning, and natural language processing to reveal the subtleties hidden within messages.



### **Objectives of sentiment analysis**

#### **i. Detecting Fraud**

According to reports, deception costs insurers millions of dollars every year. These are expected to account for 5 to 10% of all compensation payments made by insurers in a given year, at the very least. These are allegations that went unnoticed. Predictive analytics and other tools, however, can support the same detection. Insurance companies will be able to monitor and evaluate insurance settlement and claim patterns with the aid of a sentimental analysis dataset.

Making decisions more quickly based on important parameters or key performance metrics will be made possible. As a result, false claims will be stopped, and the insurer's profits will increase.

#### **ii. Customer Understanding**

will be useful in categorising and identifying client interactions based on factors such as the services/products being offered, the marketing platforms or channels that are used, the operations in place, and so on.

Sentiment analysis aids insurers in comprehending the perspectives of their clients.

Above all else, it promotes superior customer comprehension. Data from social media will make it easier to pinpoint particular features of any method, product, or service.

When this analysis is applied to social media comments, it aids in clearly defining market trends and consumer views of businesses while also allowing prompt alerts on any reputation-related problems.

#### **iii. Managing Claims**

Another logical application for such datasets is the study of complaints and claims. On the premise of the service, product, and other factors, complaints may be automatically categorised and identified.

This makes it possible to send them along to the proper agents or departments in order to guarantee prompt action on the matter.

### **Making connections to the actual world**

Sentiment analysis in insurance lowers costs, fights against false claims, aids in understanding patterns, trends, and customer preferences, as well as reducing burden and speeding up customer service.

In addition, social media sentiment analysis improves client retention, brand building, and referrals while simultaneously increasing employee and customer satisfaction levels.

Additionally, it makes a significant contribution to cutting secondary costs.

Insurance firms can continue utilising unstructured data by using sentiment analytics to find opportunities to increase revenue and identify customer/industry trends.

## **5. Research Methodology**

### **Sentiment Mining**

Depending on the issue under consideration, there are various kinds of sentiment analysis techniques. For instance, feature-based sentiment analysis was used by Archak et al. (2011) to identify sentiments associated with product characteristics. In this research, we examined consumer sentiment and the relationship between sentiment and ratings using sentiment analysis at the document level.

The polarity and the feelings need to be examined to be displayed in these reviews in order to evaluate the reviews sentiments. Based on the words used in these reviews for each insurance category, review polarities (positive, neutral, and negative) need to be extracted using an opinion lexicon as a dictionary. Every "positive" term in a review will be given a polarity of one (e.g., helpful, good, etc.), every "neutral" word, a polarity of zero, and every "negative" word will be given a polarity of one. Words that aren't pertinent (like numbers, and, the, etc.) will not be included. The frequency of a particular sentiment word was calculated for each evaluation. Each review's mood will be determined by adding the polarities of all the words that will be taken into consideration.

"sentiment library" in R code needs to be used to assign one of six emotions (sorrowness, anger, happiness, dislike, amazed, or scared) to each review based on its

content in order to examine consumers' attitudes and emotions more thoroughly as they will be reflected in reviews of each type of insurance. This collection of algorithms includes the Nave Bayes algorithm, which I used in this study, and other methods for identifying the feelings expressed in text. The Nave Baye's algorithm is a powerful and straightforward a classification tool that applied to a variety of information processing tasks, including image identification and information retrieval (Escudero, Márquez, and Rigau, 2000; Lewis, 1998; Nigam & Ghani, 2000). For sentiment polarity categorisation, naive Bayesian classifiers frequently deliver favourable results. (Cao, Thompson, & Yu, 2013; Pang & Lee, 2008).

The following Bayes Rule is the fundamental theory for Naive Bayesian text classification:

$$P(A|B)=(P(A|B)*P(A))/P(B)$$

The Baye's method determines the probability of event A given the occurrence of event B. The Nave In text classification, the Baye's method is utilised to determine the likelihood that a review B having a particular word (for example, horrible) is connected to emotion A by examining the frequency of particular terms in the text.

(for example, horrible).

Classifying customer review content based on the feelings gleaned requires the use of the R Wordcloud package from CRAN. (Fellows, 2015). A term document matrix containing the various emotions and the frequency of each word linked with each of these emotions in all the reviews is the process' output. The word cloud (Yarowsky, 1992), a visual representation in terms of regularity of various terms in customer's opinion and their related emotions, needs to be created using this term document matrix. Additionally, regression analysis must be done to determine whether the sentiment of customer reviews can forecast those reviews' ratings.

To determine whether there is a statistically significant difference between the review scores for positive, neutral, and negative sentiments, ANOVA analyses must be performed.

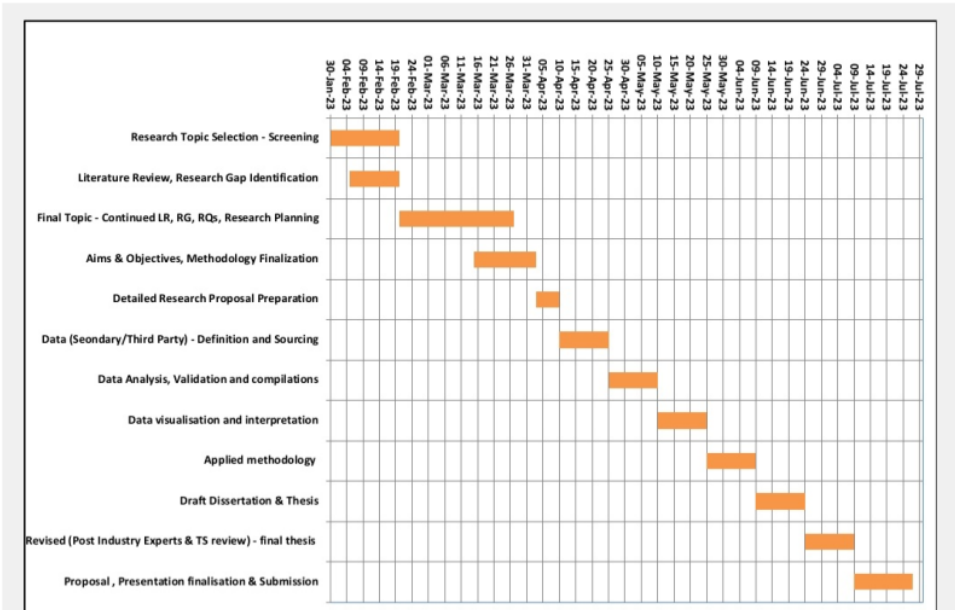
## 6. Expected Outcomes

- i.makes customer support centres less busy
- ii.reduces the time it takes to respond to customers
- iii.aids in the quick identification of fraud and dishonest clients

## 7. Requirements / resources

- i.A PC/Laptop having processor of i5 9th or 10th Gen or more with more than 8gb Ram
- ii.Graphics card-1650 or 1660TI
- iii.With good internet facility (Broadband or wifi is more preferable)
- iv.Data needs to be collected from websites for the reviews analysis
- v.Tools related to vocabulary and error free assignments writings such as Grammarly, Turnitin,etc
- vi.Coding knowledge

8. Research Plan



Input Blue Data					
Task	Start Date	End Date	Duration	Desired Duration	
Research Topic Selection - Screening	30-Jan-23	20-Feb-23	21	21	
Literature Review, Research Gap Identification	05-Feb-23	20-Feb-23	15	15	
Final Topic - Continued LR, RG, RQs, Research Planning	20-Feb-23	27-Mar-23	35	35	
Aims & Objectives, Methodology Finalization	15-Mar-23	03-Apr-23	19	19	
Detailed Research Proposal Preparation	03-Apr-23	10-Apr-23	7	7	
Data (Secondary/Third Party) - Definition and Sourcing	10-Apr-23	25-Apr-23	15	15	
Data Analysis, Validation and compilations	25-Apr-23	10-May-23	15	15	
Data visualisation and interpretation	10-May-23	25-May-23	15	15	
Applied methodology	25-May-23	09-Jun-23	15	15	
Draft Dissertation & Thesis	09-Jun-23	24-Jun-23	15	15	
Revised (Post Industry Experts & TS review) - final thesis	24-Jun-23	09-Jul-23	15	15	
Proposal , Presentation finalisation & Submission	09-Jul-23	27-Jul-23	18	18	

LR - Literature Review, RGs - Research Gaps, Research Questions - RQs

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