CHAPTER I

INTRODUCTION

1.1 BACK GROUND

It is a proven fact that investing in the stock market fetches more profits in the longer period of time but that is not always the case. Choosing which stock to invest in plays a crucial role in the profit to be obtained. Investing in a stock is nothing but committing our money to a particular company listed in the stock market, with an expectation of getting an optimized profit. A solid investment is not possible without a prior homework on the investor’s part. A proper analyzation is an important step, before agreeing to invest on a particular stock. Randomly chosen stocks for investment can lead to adverse losses.

Many newbie investors today do not have any idea of how the future of the stock will look like. For them, it’s more like a show of hands, invest in any randomly chosen stock, if its price goes up, lucky enough else better luck next time! In reality, it doesn’t work that way. The astrology of predicting the future stock price is one of the most trending and debated topics of all times concerning to various fields which include statistics, finance, trading and computer science, its motivation unquestionably, to forecast the direction of the future stock price, so that they can be bought and then sold at greater profits. The stock’s price depends on many factors such as market forces, the relation between demand and supply etc. If the market demands a particular stock more than what is supplied, the price of the stock goes up; otherwise, the price goes down, i.e., when the supply is more than the demand.

Most of the stock market investors are great believers too! Some believe that it’s an impossible task to predict the stock price while some say; it is completely predictable given a little bit of graphical analysis and a few calculations from the past. While the latter kind of investors are very much right in their beliefs, practically, it’s quite more than that. The sentiments, attitude as well as the expectations of the people who invest in the stock, play an important role in the task of stock price prediction.

Many people use the technical predictors to evaluate the performance of a company through a small time period. Most recently, the online media too has played a crucial role in the behaviour of the stock market. Evidence shows that the news articles published through the online media related to the companies have a greater impact on the future stock price. Even a tiny issue may result in a great impact on the people’s money. Hence, by following the news
articles regarding a particular financial set up over the available online media, the future stock price of that firm may be evaluated. Again, due to exploding number of news articles that are to be digested in less span of time, such a tracking is not feasible if it is to be done manually. The exhilarating field of Computer Science offers the most effective solution to the above problem.

The task of stock price prediction can be accomplished by certain tools like Sentiment Analysis. Sentiment Analysis automatically gives the overall sentiment of the news articles in just some fraction of seconds. With the astonishing popularity of these methods, it makes the developments in the stock market trends visibly clearer and easily understandable, by giving decent yield with little or no effort! The stock market is all about dynamics, hence it is extremely important to accurately forecast further movements of the stock bids.

The three entities that explicitly or implicitly affect decision making with regard to investment in the stock market are, news articles related to the company, financial health of the company and stock price movements of that company after a sequence of events. All of these three key aspects have been taken up in the present work for providing supportive evidence of the correlation between the stock values and news articles, to establish a system that provides the overall financial health of a company and to build a system that would analyse and predict the variations in stock prices over a timeline, based on the sequence of events.

To begin with, here are some statistics. The Bombay Stock Exchange (BSE) was set up in India in 1875 and is situated in Mumbai. Wikipedia shows that Bombay Stock Exchange is ranked as the world’s 10th largest stock market by the capitalization of the market being $1.7 trillion as of 23rd January 2015. The internet made its way to India in the early 90’s, the use of which has increased exponentially over the years. The internet user-base in India stands third largest in the world, with over 243,198,922 users as of 2014. The stock markets introduced internet trading (online-trading) in February 2002 [Source: Wikipedia]. This data clearly shows that the users of the internet surely look for the stock market predictors in the news articles and the historic prices of the company they are interested in.
1.2 MOTIVATION

In October 2008, there was a cyber-attack on ICICI bank, which made its stock value to come down from 634.45 to 493.30 within just 7 days of span. There was a probe which concluded that some people deliberately spread the rumours through SMS and online media but nothing really had happened. The following figures Figure 1.1 and Figure 1.2 show the effect of the number of posts on the online media and stock price fall in that duration.

Figure 1.1: Stock price status of ICICI

Figure 1.2: The bank correlates the data on a timeline
Figure 1.3: News articles published regarding ICICI

(Source:www.livemint.com)

Figure 1.3 shows the news articles published in this regard. It clearly shows that the rumours which were spreading through the online media made an impact on the stock price. A small issue thus proved to impact in a greater way. By tracking the news about a particular financial firm on various online media, the future stock price of that firm may be predicted. But manually going through each and every post/news article and extracting sentiment (which specifies the article is talking positive/negative/neutral about a particular company) is a very tedious and time consuming task. Sentiment analysis, thus, can play an important role here, by automatically extracting the sentiment from these news articles.
1.3 GOAL

The prime goal of this work is to provide a useful insight into decision making system of stock investment. It will be achieved by the implementation of a system that takes the information such as news articles and historic stock prices and their analysis to predict surpassing future stock prices.

1.4 CHALLENGES IN STOCK MARKET PREDICTION MODELS

Challenges for the stock market direction predictor are:

- Randomness
- Violent Fluctuations
- Noise
- Contribution of many factors
- Unlimited number of potential influencers
- Accuracy

![Figure 1.4: Top 5 failed stock market predictions.](image)

The Figure 1.4 shows the incidents in which the stock market direction was an absolute failure.
1.5 THE MAIN OBJECTIVE

The main objective of this thesis is to study the impact made by the sentiments, in the online news articles pertaining to the financial institutions listed in the stock market, on the direction of the stock prices. To investigate the impact of the news articles on the stock price, a different set of text mining techniques can be implemented. Based on this relationship between news articles and stock prices a prediction system model would be designed. The overall scope of this work is to provide the predictive power to the investor in the web environment so that he could take informed decision of whether he can invest in the company in question, and yield high profits.

1.6 THESIS ORGANISATION

The thesis is organized into nine chapters. The first chapter gave an introduction to stock market, its prediction methods and sentiment analysis (since it is the backbone for the study). Chapter 2 gives the review of literature. Chapter 3 covers the problem definition and overall system architecture. The methodology for solving the problem is explained in Chapter 4. Chapter 5 provides evidence of the existence of a correlation between the stock values and sentiments in the news articles. Chapter 6 gives the system that measures the financial health of a company. Chapter 7 provides an empirical study of the impact of events in a company on its stock price. The results and the system evaluation are provided in the Chapter 8 while the summary, conclusions and the future work is summed up in Chapter 9.