CHAPTER 4

REVIEW OF LITERATURE

4.1 Introduction:

A review of literature is the state of the art of scholarly article, with the methodological contribution to a particular topic with substantial findings supported by the theory. Review of literature is a search and appraisal or assessment of the literature which are available in selected topic area. A literature review surveys, integrates, synthesises and critically evaluates the information by identifying the gaps in the current chosen topic. It shows the readers about familiarity and the depth knowledge of the subject. It manifests the learning and the starting point of new ideas.

The advancement of relaying of information in the best way is to communicate and trade with the aptitude to expand the extent of choice for investors. From the time immemorial, anticipating good stock return is a vital financial subject that has pulled in scientists' attention. It encompasses a presumption that basic data freely available in the time before has some prescient connections to the future stock returns (Enke & Thawornwong, 2005).

In this section the recent literature in the area of predicting the stock market for a short term say about a week with twitter tweets to gauge stock market price. The primary contribution of this study is to give specialists with a review of recent advancements in stock index prediction. As a noun “predictability” refers totalling in advance or forecasting about something that is going to happen. As far as the stock market is concerned, it refers to foretelling of movements from the twitter tweets, Face book, Google+ etc. Researchers, Academicians, industry experts for ages are trying to predict stock movements. Stock Market is a real time highly volume complex one. But at the same time, it poses a challenge too to decipher its vibrant functions. On the other hand, it enticed investors by the prospects of
making a fat money shortly by fore thinking with the ability to correctly predict the price and set the trend of stock market.

Bachlier (1900) was the first to talk about the random characteristic of stock price Ben following working 1934 & Kendall 1953. The term Efficient Market Hypothesis was coined by Fama E (1965) which contributed a notable study and provided answer to Random Walk Theory. From then on, the number of studies trying to study the efficiency of stock markets was on the rise, and every study contributed in a significant way to understand the behaviour and predictability of markets. This chapter focuses on those research studies in the field of market efficiency by tracing out the empirical evidences for and against it by deeply following the developed and emerging markets. Along with this Research work includes the data mining and data warehousing approaches to stock prices and deducing the inferences.

It is really very difficult not to imagine a stock market as an individual. It has moods and sentiments which change from euphoric to irritable within a fraction of second. It can behave impulsive one day and observe changes immediately. However, can psychology truly help us to perceive the intended meaning the financial markets? Does it furnish us active participation in stock choosing strategies? Surprisingly, Behavioural Finance theorists say that it can. Behavioural Finance states that the investors are not sensible and reasonable as conventional theory indicates. For the investors who are driven by sentiments and moods behavioural finance suggest some descriptions and explanations. The knee jerk reaction which is a part of stock market is the cause of moods and sentiments in the market. The financial anomalies of yester years are witness for it.

4.2 Concepts relating to Investors Behaviour:

In the Conventional Theory of Finance, the most rudimentary assumptions are the investors and the participants of stock markets are mostly rational and wealth maximises. However,
there are many occasions where emotions, sentiments and psychology too plays a major role in decision making which directly make the person to behave unpredictable and irrational. Behavioural Finance gives answer to for why people make irrational financial decisions. Modern Finance attempts to find the explanations to the action of “Economic Man” (Homo Economicus). Any individual follows the principles of Rational Choice Theory. The hypothetical construct of rational choice theory has been extensively used in formation of economic theories and models though over the past years behavioural scientists and psychologists have found that individual person breaches the norms of Bayesian Learning. Expected utility theory and rational expectation theory which creates question marks on their validity as decision making theory (De Bondt, 1998). The initial work undertaken by Allais Paradoxes (1953) depicted that market as well as individual investors do not a follow and act neatly. Kahneman and Tversky (1979), Machina (1982) and other researchers have worked on how people behave under uncertainty and their finding shows that human being is not always rational. Furthermore, Herbert Simon (1991) added the significance of constrained rationality with regards to the restricted ability of human to adjust optimally to complex environments.

4.2.1 Anchoring:

Ideas and opinions ought to be on the basis of appropriate and actual facts in order to view substantial. Be that as it may, this isn't generally so. The idea of anchoring draws on the inclination to connect or "anchor" our contemplations to a reference point – despite the fact that it may have no rational relevance to the current choice. For example, purchasing a diamond ring for engagement where people are dealing with concepts that are new and novel.

In a 1974 paper entitled "Judgment under Uncertainty: Heuristics and Biases".
Kahneman and Tversky (1974) organised an activity to study about a wheel containing the numbers 1 through 100 was spun. Then, subjects were asked whether the percentage of U.N. membership accounted for by African countries was higher or lower than the number on the wheel. later, the subjects were asked to give a genuine gauge or estimate. Tversky and Kahneman found that the apparently random anchoring value of the number on which the wheel arrived had a pronounced effect on the answer that the subjects gave. For example, when the wheel landed on 10, the normal gauge quoted by the subjects was 25%, while when the wheel arrived on 60, the normal gauge was 45%. As one can see, it should be obvious the random number had an anchoring impact regarding the subjects’ reactions, pulling their evaluations nearer to the number they were simply demonstrated- despite the fact that the number had absolutely no relationship at all to the inquiry.

4.2.2. Mental Accounting:

Individual’s behaviour with reference to assignment of activities to a particular account is commonly called as Mental Accounts. Invariably all people just connect the dots of activities to be taken with amount of income with the expenses. Each and Every person by and large, prepares this income and expenditure chart implicitly most of the times in their mind itself. Normally individuals divide their wealth and income into financial activities and economical activities. If he wins through lottery and again he will put it to lottery.

As per the rational expectation hypothesis money is fungible that means Re.1 is exactly equals to any Re.1 but the finding of the experiment done by Kahneman and Tversky (1984) shows that Individuals do not consider money is fungible.

Scenario 1. Suppose you have paid $10 for ticket of theatre to see a play but after reaching at theatre you have noticed that the ticket have been lost. Would you pay another $10 to see play? Yes or No?
Scenario 2. Suppose you are on the way to see a play but you have not purchase a ticket of
theatre in advance. On arriving at the theatre, you have come to know that you have lost $10
cash in that case would you buy a ticket to see a play? Yes or No?

Kahneman and Tversky (1984) in their study documented that 46 percent of the people
were interested to buy another ticket of theatre after losing the ticket previously bought by
them but after losing the cash 88 percent of the people were ready to buy another ticket. In
both scenarios the total cost to see a play is $20 but the behaviour of individual was different.

4.2.3. Overconfidence:

Every individual by and large believes that they have superior ability and instinct in
comparison with others. This concept is called “ I know many things” or “I know
everything”. The overconfidence leads to mistake in the decision making. Over confidence
one such attitude which is prevalent in stock market too. This makes the investors to regret
later. In real life also, we practice it in most of our regular work.

Barber and Odean (2002) analyse the trading behaviour of over 1600 individuals that
switch to telephonic based trading to online trading during the 1990s. telephone based
buying and selling of shares to internet-based trading during the 1990. This pre-sets situation
where individuals have greater access to information and lower transaction cost. After
making such switch the result show individuals trade much more frequently.

Batchelor and Dua, (1990 and 1992) conducted a survey in forecasting methods. It was
found that most forecasters put much weight on judgment with formal econometric
modelling. Forecasting practising a balance of modelling and judgement were more perfect
than small number model-only and judgement-only forecaster. However, it was not
explored how the judgment was practised. Later it was found that individuals forecasters
continuously tend to adopt pessimistic and optimistic view of the economy after 2 years. In
1992 it showed that forecasters were conservative and make a new revision in prediction macro-economic factors such as growth, unemployment, inflation and interest rates for a fixed target year.

Yates Franklin J (1990) in his work 'judgement and decision making' again said the positive and negative mindset affect the judgement and it mainly due to overconfidence. The retail and individuals believe that they have right and extraordinary ability in valuing the equity share price against the reality. Nevertheless to say, they hardly make mistake or error in predicting which is in line with evidence they become extremely over confident when the public information is in tandem with private information, but at the same time it does not drop along with the contradicting public information. The empirical research on psychology says that people pat their own back on their past success and transfer the blame on external factors for failure earlier victory and pass on the blame to some other factors or else call it as destiny. (Langer and Roth, 1975; Miller and Ross, 1975; Taylor and Brown, 1988; Kent Daniel et al, 1998).

Barber and Odean (2001) have quoted the instances that overconfidence generated excessive trading, but such kind of behaviour is more seen in males than in females. Since male feel that they trade more and know more which leads to such bad experience later.

Fischhoff, Slovic, and Lichtenstein, (1982) added and concluded that “the most pervasive finding in research is that the people are over confident with general knowledge items of moderate and extreme difficulty” and that “over confidence is most extreme with task of great difficulty”.

According to Greenwald (1980) every individual with others and notice themselves more positively than they are recognised by other people. He also said “ stock that are cheap are ugly stocks” It was again reiterated by Svenson, 1981; Cooper et al., 1988; Taylor and
Brown, 1988). Alpert and Raiifa (1982) gave a detail experiment about how the subject should assess the probability of distribution for uncertain quantities and later used one method to calculate and estimate direct fractile estimate. In fact, it is said that individuals overweight their own prediction in comparisons with that of others and undermine their chances of committing mistakes.

4.2.4. Home Biases:

According to the conventional theory individual should keep a large chunk of domestic assets that is quite equivalent to their country’s share of world market capitalization (Sharpe, 1964; Lintner 1965). Many research exhibits that investors are keen on “Home bias” while making decision of portfolio investment. Investors prefer to invest in their home country rather than investing in other countries though the portfolio remains undiversified.

According to Huberman and Sengmuller (2004) and Driscoll et al. (1995) home bias is the outcome of individual’s perception towards their own country stock which is less risky than diversified portfolio. Gehrig (1993) and Brennan and Cao (1997) have elucidated the reason of home bias because of information asymmetries. Though in this internet era all news are available to the public in no time, people feel the information relating to the domestic stock is readily available than international securities. The other reason of home bias consists of (Adler and Dumas, 1983; Cooper and Kaplanies, 1994; Black, 1974; Stulz, 1981; Kang and Stulz, 1997, Brennan and Cao, 1997; Coval and Moskowitz, 1999; Huberman, 2000; Chan et al. 2005; Ivkovic and Weisbenner, 2005; Kalev et al. 2008; Van Nieuwerburgh and Veldkamp, 2009; Beugelsdijk and Frijns, 2010; Philips et al. 2012; Cooper et al. 2013; Fedenia et al. 2013) high transaction cost of international investments, regulatory constraints, exchange rate risk, different accounting standards and corporate culture and even language barrier.
Demarzo et al. (2004) have given their suggestion that difference of opinion in goods markets may result in investors holding under diversified portfolio. There exists a strong evidence that investors are more optimistic about their familiar national stock market and this optimism led to an increased investment (Strong and Xu, 2003; Kilka and Weber, 2000; Vanpée and De Moor, 2013; Levy and Levy, 2014). According to Graham et al. (2005), an individual’s competence level can be the cause of home bias. Those who are more aware about the benefit and risk resulting from diversification they prefer to make international investment otherwise do not. Karlsson and Norden (2007) found that those who work under the public sector are more prone to home bias.

4.2.5. Regret:

Behavioural Economics or Behavioural Finance evinces those individual investors investment decision is basically influenced by fear for wrong decision. According to Kahneman and Tversky (1979) ‘Prospect Theory’ the amount of pain a person feels for the degree of loss due to mistake is umpteen times more than the amount of happiness gained by making profit through the right decision which gives the same percentage of return.

Robert J Shiller (1999) has endorsed the psychological feeling of regret because of wrong decision in equity market. In his literature he identified some behaviour principles which the outcome of psychology, sociology and anthropology. These behaviour principle may be after all the behavioural aspects such as over and under reaction, gambling behave and perceived irrelevance of history thinking, quasi magical thinking etc along with global culture.

Odean (1998) and Statman (1985) have also documented that individual investor in most of the time sells the winner stock and hold on the looser stock till the purchase price is reached. By doing so, they can minimize the feeling of regret as a result of poor decision. However, individual investor measures their purchase decision based on accrued return and on the basis
of realized return. So, holding on the looser stock helps them to minimize the feeling of regret due to mistake. This kind of behaviour helps them to have positive self-appraisal as the feeling of loss is delayed. The empirical research shows that the feeling of regret is affecting one’s decision.

Shefrin, H (2002), described even the expert investors who has experience and highly savvy do commit mistakes because of over confidence and emotion cloud. In selection of stock, with greed and fear investors go for it. But beyond it Shefrin argues that financial practitioners, investors commit costly human error beyond all corporate financial strategy etc. There are so many costly mistakes committed are witness to it. According to Shefrin the financial community ignores the psychology of investing at its own peril.

4.2.6. Risk Attitude:

Kahneman and Tversky (1979) have experimented with several classes of choice problem in which preferences systematically violate the norm of expected utility theory. As per the rational expectation hypothesis an individual is risk averse and that person prefers certainty to uncertainty.

If a person is given two options:

Option 1: Receive $700 for sure or

Option 2: Win $1000 with probability of 70% and 30% chances of not winning anything.

In the above case both the options have same expected return of $700 even though most of the people prefer option 1 which shows risk aversion attitude of individual person. Individuals avoid risk and will bear it when they compensated for the same.

Kahneman and Tversky (1979) further tested risk attitude of individual person in loss making situation.
Suppose individual investor has two options:

Option 1: Loss of $700 for sure or

Option 2: Loss of $1000 with a probability of 70% and 30% chances of lose nothing.

Again, in the above case both the options have the same expected return and Option 2 is more uncertain even though most of the people prefer the option 2. The above experiment reveals that so called rational individual person shows inconsistent attitude towards risk. Individual person becomes risk averse in profit making situation and risk seeker in loss making situation.

4.2.7. Herd behaviour:

Herd behaviour depicts about individual behaviour in a group act in a collective manner without any centralized direction. Investors do have this animal mentality or herd mentality. The investor does not behave rationally many times as greed and fear is always there as a integral character evidence in him.

Raafat, Chater and Frith (2009) described this approach by considering the two key issues of thoughts or behaviour between individuals and the patterns of connections between them. Ideologies and behaviour differ from people to people and the relationship between them. They revealed that whatever herding behaviour of individuals just integrates the theoretical with practical applicability to many concepts which includes neuroscience to economics. Herd behaviour is a hardwired human attribute with the tendency for individual mimic the action whether it is rational or irrational. The philosophers Soren Kierkegaard and Friedrich Nietzsche were pioneers in giving the definition about, what they told to as "the crowd" (Kierkegaard) and "herd morality" and the "herd instinct" (Nietzsche) in human society. In academia, though so many researchers have taken place but initially it was carried out by Nobel laureates Vernon L. Smith, Amos Tversky, Daniel Kahneman, and Robert Shiller.
found out herding in the group unreasonable thinking among the investors. Hey and Morone (2004) dissected in a clear way and developed a model of herd behaviour in a market context. Their work is identified with no less than two imperative strands of writing. The first of these strands is that on herd behaviour in a non-market context. The original references are Banerjee (1992) and Bikhchandani, Hirshleifer and Welch (1992), both of which showed that herd behaviour may come out from private information not publicly shared.

4.2.8. Gambling and fallacy:

Presuppositions, predictions and assumptions about onset events if it is misunderstood, the other name for it is gambler’s fallacy. The gambler’s fallacy, also otherwise called as the Monte Carlo fallacy or the fallacy of the maturity of chances. There are situations where what is being observed is truly random (i.e., independent trials of a random process), this assumptions and predictions, even though not right, it make a plea to the human mind, is false. This fallacy can crop up in many practical circumstances, but is most strongly connected with gambling, where such mistakes are common among players.

From the above key points in the behavioural finance one can conclude that Behavioural finance reflects the attitudes embedded in the investment system. Investors or behaviourist may argue in such a way that because of inefficient market and mispriced securities they behave irrationally, and they do not want to miss the opportunities of making money. Investors to investors are also worst enemies. Trying to out-guess the market many times does not pay off also. So, for implementing a strategy which is really a profitable, one must avoid the common investing mistakes.

4.3 Investment Perceptions about Stock Market

Investors have different perception about investment more to say about stock markets. Now-a-days most of the investors, invest in stock market after many people warning them not to
burn their fingers. But scenario has changed people become financially literate. Since they have wide range of Investment Avenue available to them they choose what is best suitable to him. They decide about the combination of portfolio. That is the reasons who are willing to take a less risk invest in mutual funds, slowly in a debt instruments and to stock market. As far as the investment in the stock market is concerned, the investors invest to earn quick. “quick rich” principle is the prime motto of them. Secondly, they want their investment to grow fast. The main objective of investment is return. In a year a person invest about 20% of their income into savings and investment. Apart from these they invest in stock market to get capital gain, tax benefit etc. Now in the later part of the study the researcher had written the different authors perception about investments and the priority of it. The different authors perceptions and attitudes discussed vividly one by one.

**Barry, Christopher B et al** (1998) studied on capital markets in emerging nations become an essential asset class and discovered that these developing markets are usually connected with high returns, high volatility, and diversification benefits for investors in developing market. They have encountered with abnormal state of volatility, but they also have consistently provided diversification benefits when combined with developed market portfolios.

**Bensman, Miriam** (1997) witnesses that market do not trade on information which is available to the public news and behave rationally. It moves in irrational impulses. This irrationality only explains the movement anomalies, out performance value and moments stock in the stock moments. He also explained these reasons mentioned above have impacted the ‘January effect’. Additionally, behavioural theorists always criticise that understanding the emotions, moods and sentiments, with cognitive influences the decisions of individual decision. This may lead in the emotions of consistent profit also.
Mackenzie, Craig (1997) explained that the behaviour of investors is based on ‘endowment effect’ and ‘loss aversion’. He made a number claims about the indifferent motives of people for their behaviour which is rational.

Zvi Bodie et al., (1997) showed form a very unique survey which contains the information of total assets holding of the investors especially the inside and outside of them retire account. It revealed that Individual asset allocation mainly depend upon expert’s opinion and the recommendations prescribed by them with some practical economic indicators. It is being told the market behaves erratically because of irrational behaviour of investors.

David, Alexander. (1997) studied the average relative profitability of different firms in the economy bounces unpredictably. What is more proposed that investors continuously update their beliefs with respect to high and low productivity organisation by watching the total return on each organisation, which comprises of the average productivity plus noise.

Arvind K Jain (1997) in his study focuses on 36 professional South Asian (Indian) families in a metropolitan city in Canada so as to compile the thought process for financial behaviour. Hindus worldview tells that Indians look wealth procurement as important for the natural progression of a person’s life and consume long period of time as far as investment is concerned. The study characterises the importance of understanding the socio-cultural context of decisions that may appear to be purely economic decisions at first place.

Chan, Louis K. C et al., (1996) examined whether the predictability of future returns from past returns is because of to the markets under response to information. The outcomes recommend a market that responds slowly to new information.

Bolster et al., (1995) construct a different model which was useful for defining the investors characters with certain conditions suitable for certain investments. This version processes the choice of securities with lower importance subjective without giving up the broker’s
ability to customise the portfolio according to the requirements of the investors. Behavioural finance, an investigation of the markets that makes use of psychology, is tossing all more light on why individuals buy or sell particular stocks or do not buy stocks at all. Burr, Barry (1997) investigated the propensities of investors to make mistaken analyses or have biases are at the core of behavioural finance.

Shaw, Leslie (1995) considered the normal responses to the principal agent relationship natural in the investment industry structure and recommends that sponsors and managers should be the joint issue solvers making decisions for their joint benefit. In stock prices the prices climb up and down beyond what is suggested by connection between stock prices and dividends. One can find fashions and fads. Shiller, Robert J (1990) witnesses that the speculative prices on observed volatility and the pattern of feedback of price to dividends/earnings is indicative of simple feedback models of investor behaviour.

Nagy, Robert A et al., (1994) studied various economic variables in connection with the demographic variables. The study exhibits that individual equity investors with major holdings in Fortune 500 firms take their stock purchase decisions on classical wealth maximization criteria combined with diverse other variables. In variably these invest not depend upon the single integrated approach.

Narasimhan Jegadeesh (1993) contended that techniques of buying stocks that have done well before and selling those that have done ineffectively, create positive returns more than 3-12-month holding periods. There is a comparative example of returns around profit declarations of past gainers and losers.

Abarbanell (1992) examined security analysis, by testing whether it over reacts or under reacts before price earnings information. And whether these movements could explain what
is documented early in stock price movement anomalies, with respect to over reactions and under reactions.

**McInish, Thomas** (1991) study showed that propensity to seek novelty and newness in investing by avoiding risky situation varies between investors who presently own or do not own each of a variety of such assets on using data for more than 500 investors.

**Neumark, David et al.,** (1991) through his model explains that the asymmetry and temporal variations in cross-market relationships are same over the same period with rational investor behaviour in stock markets with nonzero transaction costs and share price volatility as the time varies. Experts’ earnings forecasted that there exist a positive and disheartening and saddening correctness in the market. These lacunae are generally attributed to some important characteristics such as incompetent knowledge, incompetence and/or misrepresentation.

**Olsen, Robert A** (1996) had written that the human desire for alike mindedness leads to animal or herding behaviour among earning predictors. However, this herd behaviour results in the decrease of the distribution in a wide range prediction and an increase in the average of the distribution of experts’ prediction. Along with these it creates positive predisposition and mistake in published earnings estimates. Investors do commit mistakes which bring about declined scattering for reduced risk and positive bias for high returns. Positive predisposition and mistake in distributed profit gauges. Financial specialists do commit errors which bring about diminished scattering for decreased hazard and positive inclination for significant yields.

**Rosen, Barry N** (1991) yet an important dimension towards greater corporate social responsibility of the on-going trend is the development of individual investors and institutional investors invest in those companies that support social noble causes. The study
finds that the younger investors are better educated and socially responsible too in comparison with usual investors. The young investors value social responsibility, but at the same time, they are not ready to give up financial returns to achieve it.

Schijndel, et al (1987) justified in making an attempt that the investors will move into shares only when the relating production limit level of those organisations rate of return is increased, which brings about investor portfolio comprises of those organisations where the organisations with capital sizes contained within a restricted scope of levels.

Choudhry, Taufiq. (1987) examined volatility, risk premium, and the persistence of volatility in six emerging stock markets before and after the 1987 stock market crash. Results indicate changes in the ARCH parameter, risk premium, and persistence of volatility before and after the 1987 crash. But these prominent changes are not uniform and rely upon the individual markets. Factors other than the 1987 crash may also be responsible for the changes.

4.4 Behavioural Portfolios:

Though the investors understand the principle of portfolio diversification, they do not follow it as prescribed by Harry Morkowitz theory. According to Hersh Shefrin and Meir Statman, the psychological tendencies of investors prod them to build their portfolios as a pyramid of assets as shown in Figure – 9

The salient features of the pyramid of behavioural portfolio are as follows:
Investors have numerous goals in their life. It starts with mainly safety, income and growth.

Each layer in the pyramid represents assets meant to meet a particular goal. Investors have separate mental accounts for each investment goal and they are willing to assume different levels of risk for each goal. The asset allocation of an investor’s portfolio is determined by the amount/ money assigned to each asset class by the mental account. Investors end up with a variety of minimum as they overlook among mental accounts and among the investment assets. Diversification stems from investor goal diversification, it not from purposeful asset diversification as recommended by Markowitz’s portfolio theory. This directly means investors do not have efficient portfolio. In other words, they can get higher expected returns for the level of risk they are taking.

4.5 Efficient Market hypothesis.

In the Financial parlance the EMH (Efficient Market Hypothesis) and Random walk theory has instigated a lot of interest and controversial view between resources and financial experts. Several amounts of studies and research work were undertaken from then to till today. There
is developing assortment of both theoretical and empirical literature focuses now on testing the capacity of investor’s sentiment and its implication for financial market and organizations. This written work provides evidences of market anomaly like excessive trading volatility, predictability in returns of stock and investor’s over or under reaction to corporate announcements. Consequently, contemporary research shifted its focus on exploring drivers of their behaviours and its implication for market efficiency. According to traditional equity valuation model the individual is not considered as rational and understands the financial market. The term anomaly is explained as unexpected price behaviour observed in equity market. Likewise, in the capital market the deviation from the prediction of the efficient market theory is known as anomaly. The anomalies which have been documented in previous research may be regarded as deviation from the basic principles of market efficiency. In the stock market the investors expect more returns because of the risk associated with it.

Ashiq Ali et al., (2003) have investigated about the features of shares which has more volatility in return, more transaction costs, book to market value effect, high mispricing in the market which leads to anomaly in the market. These anomalies happen whenever the mispricing happens and any slight change in the economic factors, along with moods and sentiments.

Baker and Wurgler (2000) have explained the inverse relationship between the proportion of new stocks issues and future equity returns over the period 1928–1997. The shares characterized with high return volatility, more transaction costs, and less retail investordifficulty are more influenced by book-to-market (B/M) effect, in line with the market-mispricing clarification for the anomaly.

DeBondt and Thaler (1995) described past gainerssecurities with maximum returns in the past (say to 5 years), which is a “contrarian” effect the unusual returns could be earned by
purchasing out of favour stocks and maintaining stocks in portfolio for long term compared to past losers of stocks with low returns.

Keim and Reinganum (1983) have witnessed "turn-of-the-year effect" where the small firms have earning abnormal profit in comparison to CAPM during the first two weeks of January month in a year. This creates huge selling pressure in small capitalized firm in December month, and again demands for buying position in January month causes them to recover the price.

Banz and Reinganum, (1981) explained about efficiency of the market in the way such that when all the volatility remains undisclosed, it requires an answer for efficient market theory. This effect of Stock Exchange (NYSE) during 1936-1975 which is known as "small-firm effect". During this period many firms were listed in NYSE which was small in the size and capital.

French (1980) has clearly disclosed the fact that the normal earning of the Standard and Poor's (S&P)Index portfolio was continuously negative over weekends during the period of 1953–1977 which is known as "The weekend effect". "Day of the week" effect has been witnessed by few researchers (Cross, 1973; Aggrawal and Rivoli, 1989; Brusa and Liu, 2004; Aboudou Maman Tachiwou 2010). They documented that return of the stock varies as per the day of the week, and the average return on Monday is significantly lower than average return over the next e days of the week. It has been consistently understood that the majority of negative news arriving during the weekends and this negative news are significantly influencing investors. In accordance to it Monday selling pressure is usually higher in comparison to other days of week and returns on stock market becomes negative.

Basu (1977, 1983) vividly exhibited that in comparison to the CAPM, (Capital Asset Pricing Model)companies having high earnings-to-price (E/P) ratio earn positive anomalous returns.
Every investor invests in the market not to lose their money but to get high return out of it, because of the high risk being taken by them. According to financial theories 'more risk more return’

Graham (1995) suggested based on investor's psychology, the price of out of favour stock is irrationally lower due to investors' focus not being on those stock. On the other side, Jegadeesh and Titman (1993) and Lewellen (2002) documented that recent past winners outperform recent past losers (considering sample period of past one year returns), which is known as a “continuation” or “momentum” effect.

Under/over reaction of stock prices to the corporate news has been documented by few researchers (De Bondt and Thaler, 1985, 1987). In the stock market even a weather effect is also examined on stock returns and it was found that stock return goes negative when it is cloudy and positive when it is sunny (Saunders, 1993; Hirschleifer and Shumway, 2003).

4.6 Lacunae of Efficient Market Hypothesis

The undisclosed instability and anomalies which are recorded and evidenced in equity market provokes a question against the base of EMH theory and forcing toward a new paradigm for modern financial theory. In the last few years, financial academicians and experts rather have tried to understand how investor's psychology impacts their financial decisions. This evolution drives to the advent of a new paradigm of financial research.

Early research on stock market prediction was based on random walk theory and the Efficient Market Hypothesis (EMH). According to the EMH stock market prices are largely driven by new information, i.e. news, rather than present and past prices. Since news is unpredictable, stock market prices will follow a random walk pattern and cannot be predicted with more than 50 per cent accuracy. There are two problems with EMH. First, numerous studies show that stock market prices do not follow a random walk and can indeed to some degree be
predicted thereby calling into question EMII's basic assumptions. Second, recent research suggests that news may be unpredictable but that very early indicators can be extracted from online social media (blogs, Twitter feeds, etc) to predict changes in various economic and commercial indicators. This may conceivably also be the case for the stock market. For example, shows how online chat activity predicts book sales. uses assessments of blog sentiment to predict movie sales.

According to Malkiel (2003) without accepting above-average risks markets do not allow investors to earn above-average returns. The psychological variable is significantly affecting the securities prices. Consequently, EMH is criticized by many academicians.

Kahneman and Tversky (1979) had given Prospect Theory which is known as one of the most prominent contributions to the theory of decision making under uncertainty and risk. The economic and financial theories have been significantly influenced by the strength and extensiveness of this cognitive psychological research. Individual investors are subject to biases in judgment, dependent on mental frame and use several heuristics may lead to an anomaly in the stock market has been tested within the field of behavioural finance.

As per the earlier research of Kahneman and Riepe (1998) investors rely on fixed and intuition while making financial decisions and they propose some related cognitive biasness and illusion in decision making like overconfident, optimism and overreaction to chance event.

Barberis and Thaler, (2003) in Behavioural finance constructed on the two supports: “limits to arbitrage” and “psychology”. The psychology provides documentation of many abnormalities and the limit to arbitrage as one of main reasons of deviations form rationality of the human being. The limit to arbitrage proposes that rational investor can’t take the benefit of opportunity generated by irrational investors. If irrational investors show deviation
in asset prices from its basic value or intrinsic value by trading on noise, the rational investor
must be able to correct this mispricing through arbitrage. But in the real financial markets, the
arbitrage strategy involves transaction cost, risk or many other difficulties. So, the
inefficiency may exist for a longer period of time.

**Barberis and Thaler**, (2003) described that the behavioural finance is usable at different
level of financial market, for example, on individual investor’s behaviour, on the total market
level, on corporate finance and on the average returns.

**Tversky and Kahneman** (1974) investigated and found that investors assume that the equity
share price change would occur in too narrow range. Secondly, the investor’s perception
about asset’s value is significantly influenced by peer group tips shared from social
media, tips of financial advisors, news in the media or on Internet portals, twitter and news
groups (Robert J Shiller, 1990). Earlier research proves that investors are sensitive to recent
stock market trend or volatility. It indicates that stock price is significantly influenced due to
the moods and sentiments.

The major change which has taken place in the field of financial studies is the enhanced
importance given to individual investors with the inclusion of psychology as important
variable considered for the study. In spite of the existing discussion and deliberation, the
fields of behavioural finance and behavioural finance have been established as sub-
disciplines, further they can be also labelled as sub-fields of finance.

**Frankfurter and McGoun**, (2000) explained Behavioural Finance is wider term of social
science which includes sociology and psychology. It is now most vigorous research
programme and it positions in severe contradiction to the assumption of efficient market
theory, expected utility theory and narrowly described rational behaviour. Behavioural
Finance is experimental in nature and uses research methodology which rarely used in conventional finance and finance literature.

Behavioural Finance is that branch of finance which applies psychology to understand the financial behaviour. It tries to examine why individual investors buy or sell the equity shares based on psychological reason. So, it is not completely replacing the traditional finance, but it plays a complimentary role in understanding the issues which the traditional finance is unable to explain the particular phenomena, for example, (1) what are the factors which influence most the investor’s sentiment in India? (2) Which types of information an individual investors look at when making investment decisions in developing country like India? Behavioural finance mainly focuses on how investors infer and react on information.

As per the Efficient Market Hypothesis (EMH) theory given by Paul Samuelson and Eugene F. Fama in the 1960’s, market prices must reveal all available information. Meir Statman, the main contributor of behavioural finance appeal for considering market efficiency to outperform the markets but his view differs from the assumption of rationality. According to Stateman (1999) market efficiency means rational prices reveal only utilitarian feature, for example, risk is taken into account but not value-expressive features like sentiment.

Of late, predicting the stock market return is gaining more attention may be because of the fact that if the direction of the market is known probably the successful prediction may be useful to investors and it be a better guide too. Through prediction of the stock market the profitability of investing and trading can be determined to a greater extent. If any model is constructed which can consistently predict the trends of the dynamic stock market, which would make the investor as well as the model owner also wealthy. In fact, the predicted trends of the share market will help the regulators of the market in taking correct steps.
One more motivation for research in the same arena is that it contains many theoretical and practical challenges. The most important of these theory is Efficient Market Hypothesis (EMH) by Eugene Fama in the year 1970 on “Efficient Capital Markets.” The hypothesis says that in efficient market, stock market prices will be the mirror of information that is percolated in the market. Above than this it tells about the constituents and any opportunity of earning excess profit is also reflected. So, it is very clear that no system is expected to perform more than the market forecasting and consistently. Therefore, according Pan Heping (2004) creating any market under the assumption of EMH is only possible on speculative, stochastic component not on the changes of fundamental factors.

Another related theory to EMH is the Random Walk Theory, which states that all future prices do not follow any trend or pattern and are random departure from the previous prices. Of late gauging securities exchange return is increasing more consideration, might be a result of the way that if the heading of the market is effectively anticipated the investors might be better guided. The profit of putting and exchanging the share trading system to a vast degree relies upon the consistency. On the off chance that any framework, be created which can reliably anticipate the patterns of the dynamic securities exchange, would make the proprietor of the framework rich. More finished the anticipated patterns of the market will help the controllers of the market in making remedial measures.

According to Pan Heping, (2004), to determine that no framework is required to outflank the market typically and reliably. Subsequently, displaying any market under the presumption of EMH is just conceivable on the theoretical, stochastic part not on the progressions on the adjustments in esteem or other crucial components. Another related hypothesis to EMH is the Random Walk Theory, which expresses that every single future cost doesn’t take after any pattern or design and are irregular takeoff from the past costs.
There has been a considerable measure of open deliberation about the legitimacy of the EMH and irregular walk hypothesis. However, with the approach of computational and insightful back, and behavioural finance, investors have attempted to build up a contrary theory which might be all things considered called as the Inefficient Market Hypothesis (IMH). IMH states that financial markets are in any event not generally proficient, the market isn't generally in random walk, and inefficient aspects exists. (Skillet Heping., 2003). The causes of uniqueness of suspicions of EMH backpedal to craft by Mandelbrot (1960), when he examined the cotton price in New York trade. In his examinations on the cotton price he found that the information did not fit the ordinary dispersion but rather delivered symmetry from the perspective of scaling. The arrangements of changes are independent of scaling; bends of day by day changes and the bends of month to month change coordinated splendidly. Mandelbrot introduced the fractals of the financial markets. Therefore, with advancement in this field of research Pan Heping in 2003 proposed the Swing Market Hypothesis (SMH) which expresses that market is now and then efficient and sometimes is inefficient; and the tends to swing between these two modes irregularly. The hypothesis additionally recommends that the market development can be classified into four s parts: dynamical swings, physical cycles, sudden energies and irregular strolls. (Dish Heping)
4.7 Investor’s Sentiment & stock market

Figure 10

The Process of Social Media Analytics

The innovation process in sentiment analysis started with many ideas. One such innovation is social media through the idea was generated then they invented the social media sights such as Face book, Twitter, Pinterest, etc. Though the data gained and tapped they utilised for any social purpose which is again some big data analytics is done even in stock market.

Shah Saeed Hassan Chowdhury et al., (2013) found out the connection between stock return and sentiment of the stock market. In the emerging market which now days mainly consist of individual investors where the information is not percolated properly and with the professional financial analysts’ services are being rendered, it is not a suspense and surprise that the performance of these markets is majorly affected by sentiments of the retail investors. In Bangladesh stock market it was identified that academicians in the past have used many factors to explain returns, but the connections between factors and return is found to be weak. It was found out that even, stock beta fails to explain the cross-section of expected returns of
the Dhaka Stock Exchange. Under such backdrop, Bangladesh stock market completely from behavioural perspective by introducing behavioural factors in the empirical asset pricing models. Outcome indicates that high sentiment leads to high return followed by negative correction in the next period. Overall, one may conclude that sentiment plays a big role in determining Bangladesh stock market performance.

Karolina Daszyńska-Żygadlo et al., (2014) established a relationship between sentiment indexes and returns for 8 the aggregate market level in eight emerging markets, namely: Brazil, China, India, Mexico, Poland, Republic of South Africa, Russia and Turkey. Based on the scanning media coverage of Thomson Reuters Market Psych Indexes how particular moods and opinion, sentiments and optimism techniques are reflected is being found out and build a relationship between them. They identified a favourable relationship between the investor sentiment index which is otherwise also called as investors optimism index and the increase share market returns in China and Brazil respectively. It was also further found out that the increased returns are very sensitive to fluctuations of moods in investors during negative sentiments or optimism index values in four researched markets were found out viz Brazil, China, India and Mexico.

Bennet et al. (2012) had viewed in his model that Individual investor’s sentiment means attitude and opinion towards investment in stock. It may be affected due to so many factors and it reflects in the market and price of the stock of the company as well as the stock market as a whole.

According to Schgal, Sood and Rajput (2009) investor’s sentiment means ‘understanding of investor’s behaviour that influences stock market activity’ and ‘a quantitative measure to gauge the levels of optimism or pessimism present in the market.’ Stock market prediction is done primarily to earn more in long term and every short term together comprises of long term. But for the return are the moods and emotions playing a vital role.
Dellavigna and Pollet, (2009) have stated that the investors are not very cautious all the time. They are careless too. But when things are happening in the right directions they are least bothered also. Investors are most of the time less attentive in good time, which leads to mispricing of stocks. When mispricing happens that time they realise and make a random walk.

According to the work done by Lemmon and Portniaguina (2006), Baker and Wurgler (2006) and Gao, Zhan (2008) ‘investor’s sentiment means investor’s optimism or pessimism towards market conditions which is not due to the economical or fundamental variable’. Investors’ sentiments like optimism always. In fact when the investors are in positive mood the price does not go that up as the price comes down during the period of negative moods and sentiments. Pessimism is based on the moods and sentiments of the investors.

Brown and Cliff (2004) has manifested the sentiment as the expectations of market participants to a norm. The normal investor does not have sentiment towards the stock prices compared to a bullish (bearish) investor who expects higher (lower) returns than normal investor does. These high sentiments can push stock prices away from their basic values. In 1996, Federal Reserve System Chairman Alan Greenspan used the term “irrational exuberance” to caution about the bubble burst in technology stock prices during 1990s.

However, his speech was taken into consideration and no one could stop the market from further rise of stock prices. The outcome of it dotcom bubble of 2000.

Schwarz, (2002) has explained and defined the investor sentiment is proportional to investors stock (bearish & bullish) they speculate for further growth in the stock price. This attitude and behaviour is majorly connected to the psychological state of mind of investors. If the investors are in positive state of mind, the investors may follow their routine investment strategies whereas if they are in negative state of mind they take investment decisions with
more consideration and analysis is done very clearly. In fact, they become more emotional when happy and sad things happen in their personal and professional life.

**Rangarajan** (2002) described about the nature of the investors in such a way that they just look into the rewards and as contingent upon their own behaviour. Gupta (1991) stated that designing a portfolio for an investor is very difficult task than just picking up some stocks for investment. Here he also stated that designing portfolio by understanding the psychology of investors is very tough job. Risk tolerant investors’ exhibit about themselves as though they can control the risk also. This theory suggests that risk tolerance is behaving like a proxy for all ‘illusion of control which in turn makes the investors to be more overconfident. This theory was suggested by many authors like Madusoodana (1997) and Odean (1998).

**Singhvi**, (2001) had explained very clearly what the meaning of sentiments is and, he said that the sentiments is the feeling, attitude and opinion of the individual investors towards the investment in stock.

**Robert J. Shiller** (2000) also speaks and blames the presence of sentiment as “irrational exuberance” which initially chopped the stock market very badly and later drove the prices of U.S. stocks well above their fundamental value. Thus, market sentiment and investors sentiment lead to random and irrational walk in stock market prices.

**Barber and Odean** (2000) explored the influence of ‘intuitive thinking’ on investors preference and actual investors. When the preference comes they do think in a rational way. But in reality, it is different. The ET (Economic times) Retail Investors Survey (2004) in the secondary market found out the various categories of investors on the basis of their characters and attitudes towards capital markets investments. Later a study on Kuala Lumpur Stock Exchange reveals the characters of retail investors as far as Kuala Lumpur is concerned are
based on the demography and psychograph. More than this it exhibited that active investors mentality is different from passive investors.

Statman (1988) observed that people trade in the stock market not only for the cognitive reasons but also for the emotional reasons for both cognitive and emotional reasons. The investors trade in the stock market not for the information they have, but for the noise that they create in the market through which they receive happiness. They do the trading to get more jay and pride and it is not for making money also. It is just like gambling to them. Trading brings them pride and prestige when they go right and it becomes profitable and when it goes wrong they feel very bad about their decision too. But here one more thing is to be noted that after losing in the game of trade also though they regret they will not leave the arena of trade, they put the ointment by playing again without realising the losses and they only invest in those companies with low profit and less reputed by not being then scape goats once again.

Barberis et al., (1998) had proposed model of investor’s sentiment in which investors form belief due to investors conservatism and the representative heuristic and other characteristic like herd mentality, mental accounting etc. and the reasons for the stock price volatility.

In Daniel et al., (1998) Model of Investor’s sentiment, investors are overconfident and make biased self-attribution. This model tells what are factors that determine the investors to be over confident and how it attributes to biased opinion and how a retail investor fools himself is also told.

Harlow and Brown (1990) observes that psychologists invariably believe in the concept that individuals choice is primarily determined by the factors which are unique in nature especially in case of decision making, whereas the economist assume that there is some individual -specific mechanism is playing a common role in all economic decisions.
Warren et al. (1990) and Rajarajan (2000) predict individual investment choices of investment either in stock or bonds is based on the life and other attributes such as age, profession etc., Moreover he says about the investors that the investors look at the like stocks, bonds, real estate) based on lifestyle and demographic attributes.

4.8 predictability of stock markets:

For some years from now, there was a doubt among the investors and general public that whether the past stock price would be useful, relevant and profitable and can the future price be predicted was the subject of discussion and controversial too, among not only the researchers but also the stock market professionals.

Predictability of stock market is carried out by a very large body of people. The one set of people believed that stock market follow certain patterns and trend in taking the prices, whereas other set of people say though it follows certain trends and pattern, it is very difficult to follow, understand and identify. So where the question of prediction arise? This was the attitude of many investors. Later with the thorough investigations and careful study of the history and past price, it was found out that these patterns and trend may be used to reveal and predict the future price, thereby the investors and traders who buy and sell by utilising it make profit out of it. On one side it is argued that predicting the stock price is as easy as flipping of a coin or rolling a die. On the other hand it was found out that the prediction depends on demand, supply, macro-economic factors, company's performance so on and so forth. Initially it was Efficient Market Hypothesis and latter to Random walk theory. The random walk theory says any news available to investors affect the price of stock.

Many researchers and practitioners have proposed many models using various fundamental, technical and analytical techniques to give a more or less exact prediction. Fundamental analysis involves the in-depth analysis of the changes of the stock prices in terms of exogenous macroeconomic variables. It assumes that the share price of a stock depends on its
intrinsic value and the expected return of the investors. But this expected return is subjected to change as new information pertaining to the stock is available in the market which in turn changes the share price. There are various factors affecting investor sentiments. From the literature review, it is understood that very few studies were undertaken in India on investor sentiments. Besides, these studies were not seriously taking into consideration on the relationship between age and the factors contributing investor sentiments. In this situation, it is felt necessary to undertake a study in these aspects. Hence the present paper tries to analyse the various factors like herd behaviour, risk and cost factors, performance and confidence level and best game in the market etc. influencing investor sentiments in the Indian stock market. For example, if a company announces lower amount of dividends it will result into considerably larger reduction in equity share price when market yields have gone up

O’Connor et al (1997) exhibited the usefulness of forecasting the direction of change in the price level, that is, the importance of being able to classify the future return as a gain or a loss. They also said to predict the stock market many variables are required.

Lakonishok et al (1997) in their different studies have worked many cross-sectional analyses across the countries and tried to establish the predictability of the stock prices. Studies revealed that various determinants like firm size, book to market equity, and macroeconomic variables like short-term interest rates, inflation, yield from short- and long-term bonds, and GNP influence in the predictability of stock returns.

Fama & French (1992), measure two variables which can be measure easily, like size and book to market equity, it was combined together to find out the cross-sectional variation in average stock returns associated with market β, size, leverage, book-to-market equity, and earning price ratios. When the test is conducted, it allowed for the difference in β which is not related to size, and the connection of market β and average return is flat when β is the only exploratory variable.
Cochrane (1988), Ferson & Harvey (1991) show that predictability in stock returns are not necessarily influenced by market inefficiency or over-reaction from irrational investors but rather influenced by predictability in some aggregate variables that are part of the information set.

Lo & MacKinlay (1988) claim in their research paper that stock prices do not follow random walks and suggested considerable evidence toward predictability of stock prices. They compared weekly stock market returns with variance estimators derived from different frequencies. Later, it was found the rejection was done because of behaviour of small stock. Again, these small stocks cannot be a reason to effects of infrequent trading or time varying volatilities.

Campbell JY (1987), through his study examined the relationship of between structure of interest and excess of return in the stock price by taking monthly average of US date from 1959 to 1979 and 1979 to 1983, in simple asset pricing models. He identified that conditional variance of excess returns in stock market varies though time, but the relationship between conditional mean conditional variance is reliable positive only in short term.

Chen, Roll & Ross (1986), in their study on ‘Economic forces and stock Market” tested whether macro-economic forces changes the stock price rewards. They also studied the impact of macroeconomic factors like interest rate, inflation, industrial production and found out that there is a significant influence in the stock prices. They also identified market portfolio and aggregate consumption are not priced separately.

Basu (1977) examined the relationship between stock performance and earning ratios. In that work, Basu identified that low B/P portfolio have, on average, earned higher absolute and risk adjusted rates of return than high B/P portfolios. Basu concluded that the information which are available publicly is not going to affect the price instantaneously in the stock price and
there seem to be lags and frictions in the adjustment process. Therefore, E/P ratios would warrant investors’ attention where they are for correct portfolio.

Therefore, dynamic nature of the stock market is a main cause for stock market indices predictability. In literature, a number of different methods have been applied in order to predict stock market returns. These methods can be grouped into four major categories: (i) Technical Analysis Methods, (ii) Fundamental Analysis Methods, (iii) Traditional Time Series Forecasting and (iv) Machine Learning Methods. Technical analysis, is carried out through charts and figures, and they try to forecast the market by tracing and following patterns that come from the study of charts that describe historic data of the market. In fundamental analysis the study is all about the intrinsic value of a stock of a company. Investors can invest on it if the estimate that its current value is lower than its intrinsic value.

In Traditional Time Series forecasting, an attempt is made to create linear models by tracing the trend patterns in historic data which has taken place. Finally, a number of methods have been developed under the common label, Machine Learning. These methods use a set of samples and try to trace patterns in it (linear or non-linear) in order to approximate the underlying function that generated the data. So stock market prediction can be done through many models.

4.9 Investors’ sentiment and social media:

Before analysis of the investors sentiment and social media one should understand the three stages and process of social media in a vivid manner. According to Fan and Gordon the social media has three stages called CUP frame work.

1. Capture
2. Understanding
3. Present
The capture stage captures or explores the suitable social media data by observing, monitoring and listening social media platforms. After this the data is recorded and extracted into meaningful information by using Application Performance Interface (API). Later it goes through various stages called linking, stemming, part of speech tagging, semantic and syntactic operations etc.

The next stage of processing is called understanding. Here the selection of relevant data is taken place by removing noisy low quality data. This is carried out by using different advanced data analytics methods. Therefore, understanding means gaining knowledge by data mining and natural language procession and generating useful metrics for decision making. The process of understanding is a crucial stage in social media analysis.

The last stage is present stage which is the result of the first two stage. It is similar to key findings presented in an easy to understand format, with the support of visualisation techniques as decision maker, in creating important information. This is depicted with the help of a picture below.

Figure 11: CUP Framework
Analytics Process - The CUP Framework

Decision-making is a complex activity. It is a serious mental activity which must take into consideration the all aspects of the situation. The complexities of this activity become much higher for an investor. Because these complexities the investors need better understanding, good insight of the local and global market to get best out of the investment. Investment decision is the most crucial challenge faced by an investor. Every investor is unique in all aspects due to various demographic factors like gender, age marital status, socio-economic background, educational level, occupation etc. So, he can't rely on the decisions already taken by others. While designing the investment portfolio, the investors should consider not only the financial goals, risk tolerance but also other constraints.

The main objective of any investment is to make money. While making investment decisions, one must not be subjective. But the traditional financial literatures point out that the investors were rational because they made mistakes in decision making process. Before the internet era and early times of investment, it was based on the company performance, and market timing called bullish or bearish. By taking into considerations of these mistakes and trying to avoid them and also to transform the quality of investment decisions and results, the impact of psychology in investment is felt. For this very purpose the researchers study the field of finance and understand the psychological factors and the nuances to drive these mistakes. Behavioural Finance identifies that investors decisions making is not moved by consideration also but inconsistent too. In simple words, human decisions are subject to several cognitive illusions like heuristic decision and prospect theory.

Here the researcher reviews the existing literature in behavioural finance and present taxonomies proposed by different authorities on sentiments, moods and stock market anomalies. The 21st century is a place for modern form of traditional gossips and rumours predominately spreads or diffused virally through social media and other internet accesses
such as blogs and news. The social media users widely tweets on twitter to innumerable topics such as desire to purchase, the quality of a product, service, product usability, stock market etc., and the need all other things are discussed and analysed. Significantly a large amount of information is gathered and disseminated between users, which can be obtained by organizations from social media sites. Twitter with 140 character which was started in the year 2006 to support the stock market with a greater amount of useful insights and knowledge on specific behaviour and certain needs. This customer feedback is also known as "consumer insight" (Stone et al., 2004). This information mostly reflect what one individual is feeling, emotions, sentiments thinking based on his or her perceptions towards certain stock or stock market (Chamlerwatet et al., 2012). This information or perceptions make other persons also behave in the same way which in turn gives business entities a clear chance to predict the future investors needs, wants and demands which is known as market needs. And all the investors share their information in these social media public forum which is influencing others too. By making use of these data one may have merit to increase their innovative capabilities. The current thesis gives suggestions and recommendations for investors to make use these resources to fulfil stock market needs, which finally leads to better innovations, which is useful for trading strategies and investment decisions through predictive analysis. Recent academia provides evidence that the identification, collection and analysis of social media data is essential to make adequate decisions within an organization.

Batool, R et.al (2013) wrote about the social media which has changed the general perspective of lifestyle of socialisation and personalisation. They collected and analysed 40000 tweets for various purpose in a collaborative task. The information such as food, diet, diabetes, education, and movies were collaborated. They took the help of First knowledge generator to distinguish the tweets into different categories, and then knowledge enhancer with synonym binder was applied to increase the information gain. Alchemy API was used to
enhance the knowledge in the generation phase. Later, Synonym binder was used to the bind synonyms with entity and keyword extracted by knowledge generator and knowledge enhancer. Results showed that overall significant improvement from 0.1% to 55% had been achieved using the said approach. Hence, social media can be used for any type of sentiment analysis.

Aditya Bhardwaj et al. (2015) described about the change in interne- based technology and its impact in the Indian stock market. They used the technology of Big data analysis and cloud computing. They also said sentiment analysis have changed the way of doing business.

Sentiment analysis or opinion mining makes use of text mining, natural language procession (NLP) and extract the subjective content. They evaluated the sentiments attitudes and emotions and predicted the market.

Li, S., Wang et al. (2015) analysed the sentiment by taking the twitter data and applied for predicting the success rate of the movies. They classified the movie into three types say, Flop, Hit and Average one. For this purpose, they collected the tweets from 2009 to 2013 and further they segregated into three types namely positive negative and neutral. They used Lingpie sentiment analysed to test these sentiments and the result exhibited that movie prediction accuracy was 64.4% which is very much better than the conventional system.

Henrik Bockstette (2015) attempted to explore whether social media has predictive power capacity or not. Then various techniques are used to predict the stock market future trends and price. A wide range of products are described to be sued by social media analytics process, which consist of several steps, for example they have taken, the term capture, understand and present, which are derived from Twitter raw data. The researchers tap the untapped source of information which is called Twitter for any future customer behaviour. It was concluded that the techniques and models used are modified to reflect useful information
which predict the future events be it stock market or anything. To enable to work in a better manner the with Twitter raw data ‘Extended Market Pull Innovation Process can be sued as an effective tool. It is used by all the departments such as marketing, stock exchange and fiancé department.

M. Meral & B. Diri (2014) conducted sentiment analysis on taking the nine various verticals such as insurance, sports, finance, food, automotive, politics, real estate, telecommunications and health. They performed sentiment analysis through collection of Turkish tweets on the above said nine verticals. Collection of tweets were done through Naïve Bayes classifier, Support vector machine and Random forest. The tweets were divided as neutral, positive and negative. Food, real estate, sport, and automotive were segregated into neutral category, insurance in the positive category and the remaining like health, politics, finance and telecommunications in negative category. The outcome concludes that compared to all the three classified Support Vector Machines gives the best results.

Singh, P. K et al., (2014) study on users’ reviews and opinion as the world is relying heavily on opinion expressed by friends and peers. The study was done recently on Flipkart E commerce website which was an approach towards feature specific opinion mining and sentiment analysis was done across Flipkart E-commerce websites for filtering of irrelevant reviews and Mongo DB database technology was used at backend for this research work. Here the opinion mining and sentiments analysis is compared for the utmost level of consumer satisfaction.

Gunduz et al., (2014) conducted study on sentiment analysis. It was a comparative analysis and the relationship on sentiments of people on social network and Turkish universities academic success. Later it was found out that there is a relationship between sentiments for academic success based on the social media with the help of Naïve Bayes classifier. For this purpose, 10 top successful universities were taken into account in analysis the sentiments
about the universities on the social media. Twitter, which was allowed to share with their social friends or followers, was chosen as a specific media for study. The tweets were gathered and then differentiated as positive, negative and neutral then it was sent for processing. It was one of the successful moves in finding out the sentiments of the public and predicting it.

Molla et al., (2014) explained about sentiment analysis on twitter by taming Samsung Company official account to find out the emotions about the social media. The result of user’s opinion data visualization tool was used for the social network graph. To include emotions in the future work the location management of each tweet is to be considered. From this one can know how much importance is to be given for sentiments and emotions.

Lu, Y., & Chen, (2014) performed a study of opinion analysis and micro blog content. The divided the study into 4 modules. They are Data collection module, corpus processing module, sentiment analysis module and data management module. Later to understand, the data was retrieved through micro blog content crawler. Then to classify the micro blog text classification method named (Support Vector machine) was used. Through this sentiment was analysed and it was found that SVM is the best model to analyse the sentiments.

Shradha Tulankar, et al., (2013) explained that stock market is a reflection of sentiments opinion and moods. For the very reason the investors are to be always aware of the fact that the external forces interact deeply with the stock market and affect the stock market and over a period and mark the difference in prices in the short run. As far as the Indian stock market such as NSE and BSE is concerned they proved that National tragedy, low economic growth, IPO releases, RBI decisions on interest rates, foreign matters and many more have an increasing impact on public mind set. Indeed, the inflationary market also evidenced a considerable impact on public’s opinion and on the country’s future growth aspects. They have designed a model which can forecast the present market trends with accuracy measured
on the basis of sentiment analysis. In today's world Sentiment analysis is new and emerging trend in determining the market highs and lows. Visualisation is provided to assist the end used who are called investors and traders to understand the market volatility in a better way and decide their investment strategy. Investors invariably invest maximum time in checking out which strategies will be more beneficial for them so as to get more profit on the current trends by taking into various considerations. Invest decision taken by an investors is solely depend upon information and current data of the current market and on the top of it the market will be bullish or bearish in the forthcoming days. This helps the investors in deciding the investment strategy.

Likewise, in another study conducted by Wang, X., & Luo(2013), same prediction of movie was considered based on not only from the twitter but social networking site like you tube was also taken into account and prediction of movies is done by different machine learning algorithm called K- means clustering algorithm and predicted the performance of the movie.

Robert P. Schumaker, Yulei Zhang and Chun-Neng Huang (2012) have built and tested the financial news article system that incorporated sentiment analysis techniques in its predictive arsenal. Choice of words and tone used by authors itself, when correlated with stock price movement predict the stock market direction. They explored the Arizona Financial Text system (AzFin Text). They paired it with sentiment analysis tool. It could predict the direction of the movement along with garnered return. They also believed that the result can be attributed to investors and market traders in a contrarian model like whenever any good news appears, sell and for bad news buy strategy.

Kietzman et at.,(2011) defined social media as “ mobile and web based technologies to create highly interactive platforms via which individuals and communities share, cooperate. Discuss and modify user generated content” Hahn, Rohm and Critenden (2011) revealed
social media has transformed the internet from platform information to platform of influence.” User spend over 20% of their time on online social media platforms. Social media now-a-days is very important because of the other benefits such as minimum cost.

Chong Oh et al., (2011) in their study attempt to explore and evaluate the predictive power of stock micro blog sentiment on future stock price with the directional movements. There were some set of robust models were built based on sentiment analysis and data mining algorithms. In behavioural finance by using 72,221 micro blog postings for 1909 stock tickers authors, the study exhibited that stock micro blog sentiments do have predictive power for simple and also market adjusted returns. It also revealed that predictive power accuracy is consistent with the under-reaction hypothesis. They established stock micro blog with its succinctness. When high volume and real-time features are taken into account, it revealed that they have predictive power over future stock price movements. Furthermore, their study was aligned with the model of irrational investor sentiment. In fact, it suggested a complimentary investing approach by using user-generated content.

Ray Chen, Marius Lazer (2011) investigated the relationship between Twitter feed content and stock market movement. In fact, they would want to look if, and how well the sentiment data extracted from the tweets can be utilised to forecast the future price changes. A list of words was used to evaluate the moods and sentiments and from then sentiment index is calculated. After which a model was built to find out the accuracy of the model, later put it to the test for real market data using mock portfolio. The outcome indicates that the model is successful in generating additional profit.

Birau, (2011). While identifying Behavioural finance, it provides a different perspective, complexities and unconventionalities. Behavioural finance paradigm performs that investment decision is affected in a large proportion by psychological and emotional factors. Human emotional complexity includes the following primary feelings: fear, panic, anxiety,
envy, euphoria, greed, satisfaction, ambition or vanity. Very likely that all these emotions interfere in certain proportions in a financial investment decision making. Some of the Behavioural finance principles forecast the waves of irrational sentiments, i.e. pessimistic and optimistic on asset prices. Apart from this even the individual investors do not trade dependently and are more likely to react market rumours in financial market. If this herding behaviour or animal behaviour is not present the market will be affect by systematic sentiments. Most of the investors agree on the investors sentiments which are significant. the concept itself is still largely regarded as cryptic and abstract. Investor sentiment, defined broadly, is a belief about future cash flows and investment risks that is not justified by the facts at hand. Investor sentiment can be thought of as potentially erroneous beliefs that investors have about some aggregate economic variations.

**Barber and Odean** (2011) has studies about the behaviour of individual investors and draw a conclusion that the men investors have over confidence that the women investors. The men investors are more in number as compared to women investors. But because of this overconfidence they underperform standard bench marks and sell the winning investments and hold the losing investment. They are mainly influenced by a limited amount of information available to them and take a bad decision.

**Shmueli & Koppius** (2011) approach to extract relevant features in building a robust set of models in understanding the predictive relationship between stock micro blog sentiments and future ten days of stock price movements. Initially sentiment polarity of a subset is done then using sentiment analysis and labelled postings, the features for written text is identified from micro blog and automatically predict sentiment polarity of other postings. By and large, the study shows that micro blog sentiments do contain valuable information for investing decision making and supports the investor sentiment hypothesis that irrational investors do influence market prices.
Johan Bollen et al., (2011) exhibited clearly moods, sentiments and emotions influence the individual in their decision making in prediction of stock market. For this they collected Twitter tweets and investigated the tweets into different types of moods. They also experimented whether it affect the society as a whole also. After collecting these tweets, they correlated with public moods and economic indicators to Dow Jones Industrial Average for a time period. The text content was analysed by two mood tracking tools, namely opinion finder that measures the positive vs. negative moods and Google- Profile of Mood States (GPOMS) that classify the mood in further 6 types called calm, alert, sure, vital, kind and happy. It was later cross verified and validated on the president thanks giving day in 2008. There was a accuracy of 86.7 % with this prediction.

Anshul Mittal & Arpit Goel (2011) identified the ‘public sentiments’ and ‘market sentiments’ through sentiment analysis and machine learning principles and correlated the relationship with them with twitter tweets. With the twitter data the public moods and sentiments were formulated and used to predict DJIA values and stock price movements. New cross validation methods were proposed for financial data and obtain 75.56% accuracy using Self Organizing Fuzzy Neural Networks (SOFNN) on the Twitter feeds and DJIA value. A naive portfolio management strategy was implemented based on our predicted values.

E. Bennet, M. Selvam, Eva Esther Shalin Ebenezer (2011) analyses individual investors’ sentiment. The goal of the study is to analyse the stock specific factors that influences on investors’ sentiment. The investors’ attitude towards investing is determined by rumours, intuition, herd behaviour along with media coverage. Their outlook on stock market provides the positive, negative and neutral trends. This prediction is based on the comparative approach of prediction by brokers with sentiment analysis of live streaming data. The results obtained from sentiment analysis are compared by visualization techniques with the closing
price of EOD of stocks. This study helps in assisting the investors whether to buy, sell or hold the stock.

E. Bennet, M. Selvam, N. and Eva Esther Shalin (2010) SPERTEL studies that the risk affects the value of equity shares as far as the equity shares are concerned. The study on Indian investment business on accessing the retail investors further revealed that it is not the markets that don’t behave neatly but also the individual decision makers who don’t behave in accordance with the tenets of expected utility theory.

Zhang & Swanson, (2010), in their social enterprise zone described about the importance of social media and sharing of information which catalyses and transforms the essence of investment the way that investors invest, trade, acquire and share information. Initially, it was more of aggregating public information such as financial data, market updates and public news.

Chen et al., (2009) explained about tacit knowledge sharing is part and parcel of human interaction. It is based on three main factors such as affect based trust, internal control and lastly external control. At the same time, they revealed one interesting fact that tacit knowledge sharing does not lead to tacit knowledge sharing behaviour.

Sabherwal et al., (2008) suggested that despite prevalent belief and sentiments from VICS (virtual investment communities) have predictive value, scholars have provided little evidence that these sentiments play any significant role in predicting stock price. It was posted that these different characters of stock micro blogs may present a nascent set of dimensions in uncovering the predictive value of online investor sentiment.

Ullrich et al., (2008), described vividly that with the advent of social media and WEB 2.0 with user generated content (UGC), it incorporates private information in addition to public information. They told that technologies along with its functions have converted the world of
interaction and the internet language. This conversion influenced the perceived attractiveness of websites too. Ultimately the expectation of the user of internet is to throw the light on the usage of it and it also gives insights to how the social media instruments can be evaluated.

Gu et al., (2007). Established a relationship between bid-ask spread of a frequently traded Chinese stock listed on the Shenzhen stock exchanges and explained using the limit order book data. The data was taken before the transaction, and highest buying price or lowest selling price changes and fixed time interval. Here correlation activities in virtual communities to stock market outcome is explored with predictors such as volume, disagreement and bullishness of postings are taken into account.

Das and Chen (2007) propose some sentiment analysis and predictive analytics from stock message boards for small investors. He explained about the experimental applications evidence of a relationship with stock return – using phase lag analysis. He explained about the sentiment which has an idiosyncratic component and developed algorithms to access the impact on the investors opinion.

Antweiler & Frank, (2004) investigated the financial press reports and internet stock messages can move the market. They discovered that bullishness is measured using computational linguistic methods. They find that the stock messages help in prediction of stock market. The news and stories are used here as control. Because of this the stock market returns are statistically proved to be significant.

Similarly, Wolfers and Zitzewitz (2004) have shown that social media is indeed an effective medium to make predictions. Over a period of time stock market investors and advisers and experts, researchers have been challenged when they are faced with unexpected market needs, due to rapidly changes and volatility in the market. However, sometimes the case that predictions may “come out of the blue” or “fall from the sky”, but in most cases observing
and analysing the market increases the success rate of prediction. Therefore, a prediction of market needs, and trends would give a competitive advantage and enable the investors to give a trading strategy through which the right decision can be taken. Twitter tweets not only help the investors to predict the market but also help to take investment decisions. It serves as a guideline to facilitate investors in their decision-making process by explaining how data from social media could be transformed into successful prediction.

According to Barber & Odean, (2001) the Internet, as a whole, has become an enabler that aggregates vital information for stock investor decision making. They reminded the usage of internet and tapping of the resources from it. They described through the internet the fixed cost and marginal cost for all the industries are lowered to a great extent and new, small firm also can enter into the market. It is changing how information is delivered to investors and the ways in which investors can act upon that information.

Tumarkin & Whitelaw (2001), observed anecdotal evidence on how the virtual investing communities (VIC) as yahoo Finance and Ragging Bull are publishing relevant data which is valuable for investment decisions and analysis. From the investment and investors perspective it is all pervasive. These channels and forums guides the investors and enriches the investors ability in making better decisions by allowing then to keenly monitors the process of decision making. This it is mandatory for all the researchers and professionals to understand the individual investors in these communities and correlate with future predictive outcomes. This now-a-days attracted the attention of researchers with many interesting streams of literature. It gains its moments and interaction among the members of communities. It explores its focus on the topic of homophily, network externalities and reputation.

Louis, B. Mendelsohn, (2000) explored about interpretation totally lays on the intellectuality of the analyst. Alternatively, technical analysis centres on using price, volume, and open
interest statistical charts to predict future stock movements. The main thing behind the technical analysis is that all of the internal and external factors that influence a market is already explained in market price. Apart from these commonly used methods of prediction, some traditional time series forecasting tools are also used for the same. In time series forecasting, the past data of the prediction variable is analysed and modeled to capture the patterns of the historic changes in the variable. These models are then used to forecast the future prices.

Stock market by itself consists of so much chaos and confusion in its system. It has been found out by the researchers and professional for this type of confusion and chaos. The word chaos has different non-linear deterministic system which appears random because of its all-time volatilities. These systems are highly sensitive to the initial conditions of the systems. These systems are highly dynamic, and complicated and on the top it periodic too. The system because of these conditions it is very difficult to manage with normal analytical skills. The artificial neural networks are efficient and effective in learning the non-linear chaotic system because they create only few assumptions about the functional form of the underlying dynamic dependencies. This may eventually question the traditional financial theory of efficient market.

Epstein and Turnbull, (1980) & Diane Scott Docking and Paul D. Koch, (2005). Revealed that announcement of higher dividends, immediately influences the stock price to go higher and at the time of market earning is also increased. At times, market earnings have been down or normal, this last one propensity and lacks statistical significance. The clarification for such equity price behaviour finds its roots cause from the implication of a dynamic rational expectation equilibrium theory with behavioural aspects that tie the sensitivity of investors to market volatility and trend.
As per the efficient market hypothesis the value of the asset prices are equal to intrinsic value but in reality intrinsic value is not observable. Empirical evidences are presented to suggest that Investor’s Sentiment play important role in stock prices. Seyhun (1990) documented that insider can accurately predict a firm fundamental but cannot anticipate the crash. The evidence proves that something other than fundamentals is reason for crash.

4.10 Conclusion:

It is assumed that in Efficient Market Hypothesis that stock market is efficient and share prices reflect all available information, and there is in fact no possibility of earning abnormal return. More over according to Efficient Market Hypothesis human being is assumed to be rational. However, review of literature in this chapter evidently exhibits that human being is not always rational. Apart from this market inefficient as unexpected price behaviour in the equity segment has been proved as market anomaly. Further it emerged into new field called behavioural finance which considers human behaviour in market pricing process. In Behavioural Finance Investor’s sentiment is one of the important aspects which will be important in short term investment decision in equity shares. It is due to change slowly but the prices fall tremendously when the market crashes and market moves on sentiments. The present chapter contains definition of individual investor’s sentiment given by different researchers. It comprises different models of investor’s sentiment and their limitation. It also shows how moods and sentiments can be tapped to useful data analysis by taking the information disseminated in the internet since we are in the era of internet of things. Researcher has specified reason for selection of predictive strategy by taking into consideration the internet of things through sentiments and moods and constructed particular model for further study.