Kavikulguru Institude of Technology and Science

Project Preliminary Investigation Report

Name of Department:

Information Technology

Name of Project Guide:

Mr. Sachin Meshram

Name of Project Co - Guide (if any):

Students Details:

Roll No.	Name of Student	Email ID	Mobile No.
IT20011	Kartik Thakre	kartikthakre99@gmail.com	8855839701
IT20025	Samiksha Wanjari	samikshawanjari2019@gmail.com	9373080578
IT20001	Rahul Salame	rahulsalame171@gmail.com	7030204713
IT20020	Manish Golhar	manishgolhar7382@gmail.com	9579937463
IT20089	Rohit Kashti	rohit.kashti@gmail.com	8767759275

Title of the Project:

Multi indicator for stock market prediction using K-NN Algorithm

Area of Project Work:

Stock Market

Problem Statement:

The aim of the project to create a multi-indicator which will be the combination of three indicators for more accurate and perfect stock market prediction, also it will give an opportunity to new investors to work with multiple indicators in stock prediction.

Prior Art (Patent Search):

Patent Application No.	Title of Patent	Existing Solutions (Abstract of Patent)
202341021361	ML based STOCK PRICE PREDICTION Model	We examine both established and emerging stock market forecasting techniques. We tackle the issue from three separate angles: fundamental analysis, technical analysis, and machine learning application. The weak variant of the Efficient Market Hypothesis is supported by research showing that historical prices do not contain relevant information but that out-of-sample data may be predictive. We demonstrate how machine learning and fundamental analysis may be used to help investors make decisions. We explain how Technical Analysis approach has a common problem and how it only generates a small amount of meaningful information. One of the most significant activities in the world of finance is stock trading. Trying to anticipate the future value of a stock or other financial instrument traded on a financial exchange is known as stock market prediction. The majority of stockbrokers employ technical, fundamental, or time series analysis when making stock forecasts. Python is the computer language used to make stock market predictions using machine learning. In this project, we suggest a Machine Learning (ML) technique that will be taught using the stock market data that is currently accessible and develop intelligence before using the learned information to make an accurate prediction. A machine learning method known as Support Vector Machine (SVM) or Long Short-Term Memory is used in this situation (LSTM) to predict stock prices.
202311029384	"Stock Trading Recommender System Using Machine Learning and Method Thereof"	Embodiments of the present disclosure may include a system (100) to recommend stock trades to a user, the system may include a processor (102) and a memory (104) storing a set of instructions that, when executed by the processor (102), cause the processor to collect, stock market data and train, a machine learning model using the collected stock market data. Additionally, the processor (102) analyses current stock market data using the trained machine learning model, and recommends at least one stock trade to the user based on the analysis of the current stock market data.

US 8,560,420 B2	Calculating predictive technical indicators	A suite of predictions is defined to model the financial data commonly used to calculate technical indicators one or more periods in the future. Neural networks are trained to make these predictions. The predictions are then integrated with the standard technical indicator calculations to produce predictive technical indicators which are superior because they lead more and lag less.
US 8,285,619 B2	STOCKMARKET PREDICTION USING OTHER PUBLICATIONS NATURAL LANGUAGE PROCESSING	A method of using natural language processing (NLP) techniques to extract information from online news feeds and then using the information so extracted to predict changes in stock prices or volatilities. These predictions can be used to make profitable trading strategies. Company names can be recognized and simple templates describing company actions can be automatically filled using parsing or pattern matching on words in or near the sentence containing the company name. These templates can be clustered into groups which are statistically correlated with changes in the stock prices. The system is composed of two parts: message understanding component that automatically fills in simple templates and a statistical correlation component that tests the correlation of these patterns to increases or decreases in the stock price. The methods can be applied to a broad range of text, including articles in online newspapers such as the Wall Street Journal, financial newsletters, radio &TV transcripts and annual reports. In an enhanced embodiment of the system statistical patterns in Internet usage data and Internet data such as newly released textual information on Web pages are further leveraged.

Literature Review:

Title of Paper	Details of Publication with Date and Year	Literature Identified for Project
Study of Market Indicators used for Technical Analysis	Srushti Dongrey, Student, MIT School of Management, World Peace University, Pune, Maharashtra, INDIA (2022)	Anticipating and analyzing the stock market and the price movement is a challenging task as the nature of the stock prices is quite complicated, non-linear and dynamic. Examining the financial time series data and making decisions is the toughest job in stock market. These correct decisions help in improving the returns on investment and minimize the loss and risks incurred. Technical analysis has been a trading tool since the 18th century which is used by investors and traders to evaluate the investments, identify the trading opportunities and forecast the future stock prices movement by analyzing price trends, chart patterns and volume data. Many different statistical tools are available for the investors and traders for making decision in financial market and analyze the stocks intrinsic value on the basis of fundamentals like balance sheet, revenues, industry trends, economic indicators and consumer behavior. Technical analysis helps the traders and investors predict the market situations and build the gap between market price and intrinsic value of the stocks by applying the techniques of behavioral economics and statistics. Many technical indicators like Simple Moving Averages, Weighted Moving Average, Trend Indictors, Momentum indicators like Stochastic, Relative Strength Index, Commodity Channel Index and Volatility indicators like the Bollinger Bands, Average True Range and Volume indicators are commonly available to study the stock price movement. In this project, the importance and the application of market indicators for technical analysis in predicting stock price movement of large-cap, mid-cap and small-cap companies on BSE is researched.

Research on the Effectiveness of Technical Indicators with the Volume	2014, Gang LI, Jin zhu - Published by Atlantis Press	The paper researches on the effectiveness of technical indicator with the volume by choosing the volume weighted moving average (VWMA) which consists of the simple moving average (MA) and volume based on the 2139 stocks from January 1, 2003 to January 1, 2013 in China's A share market. There are four criteria to evaluate the volume weighted moving average: sensitivity, reliability, risk and benefits. Comparing the performance of VWMA and MA in the sample stocks, there are several advantages by adding volume information to technical indicators: issue more trading signals, increase the proportion of profitable trading, reduce the average drawdown, and improve investment returns.
Survey paper on Technical Indicators of the Stock Markets	Yogesh Vitthal Joshi, Rugved Rahul Shahane 3Prathmesh Chandrakant Pachpute, Journal of Emerging Technologies and Innovative Research (JETIR), JETIR December 2021, Volume 8, Issue 12	Stock Markets also known as Temple of Capitalism, which is generally considered to be one of the most interesting things in today's world. Each second Million of Shares are traded, Thousands money and thousands lose. Some consider it to be pure luck and random movement of price, but at least today with advent of internet and smart phones in everybody's hands, the understanding of markets has increased many folds. The science of stock markets for a person coming to markets can be understood using 2 pillars of markets and its behavior, these are the fundamental and the technical aspects of a stocks listed on exchanges. Here we will be mostly discussing the technical analysis, which basically is tracing and charting the OHLC of a stock and the no. of stocks traded in a particular timeframe i.e., Volumes. The indicators part of the technical analysis is by product of price and volume which are played around in a fancy manner using mathematical modulating the OHCL value of a stock and its corresponding Volume. This paper tries to combine various past studies on different technical indicators, their reliability in terms of back testing, use case and the return which can be generated using them, and other dimension of each technical analysis indicator and critically analyze the research papers and to put forward a new methodology to compare performance of different indicators in Indian stock markets context

Analysis and Evaluation of Technical Indicators for Prediction of Stock Market	Gananjay Sandeep Thanekar, Prof. Zaheed Shaikh Department of Computer Engineering K. J. Somaiya College of Engineering, Mumbai-77,26 May 2021	In stock market operations, the data computing logic and processing power can be harnessed to offer one a competitive advantage over the other. The stock markets over the years have provided excellent investment returns, but the amateur traders aren't able to take its advantage thanks to obsession changing market and losing money. During this research work, the principles of different technical indicators are applied on historic data of Indian Stocks segment to realize meaningful knowledge and insights within the sort of strategy, which can help users in taking proper buying or selling decisions while trading in that particular Stocks. This capability gives the choice trader a leading edge over novice traders. By following the right strategy, the user is really trying to attenuate the danger of a loss and increasing the probabilities of earning profits. This project will be focused on various Technical Indicators Strategies. It will comprise of five different indicators which are generally used in the Stock Market. This indicator will be plotted using Python as the basic programming language and will be using NumPy and Matplotlib libraries of python which will help us to plot the chart diagram of that particular technical indicator strategy. The motive of this project is to help the Retail Investors of the Share Market, as they are the individuals who are most prone to losses because they don't make use of technical indicators in their trading methodology.
A Study of Key Technical Indicators for Effective and Profitable Strategy in Option Trading of Nifty	Dr. Bhaskar V. Patil, Dr. Deepali M. Gala Bharati Vidyapeeth (Deemed to Be University), Institute of Management, Kolhapur [M.S.], INDIA,07 April 2022	Investors and traders are constantly on the lookout for profitable stock market trading strategies. They use technical analysis tools of nifty to predict price changes. Technical metrics, both lagging and leading, are used to obtain an advantage when making investment or trading decisions. The trading rules are employed based on analyzing historical market data in order to identify the patterns. In this paper, studies of key technical indicator like Super trend and Relative Strength Index (RSI) with the parameter for both successful and profitable strategy to trade in Nifty

Current Limitations

- Using multiple indicators can make the analysis process more complex, especially for inexperienced traders. Different indicators may provide conflicting signals or lead to confusion when they generate mixed messages about the market's direction.
- Many commonly used indicators are based on past price movements, which means they are lagging indicators. By the time these indicators signal a trend change, the market may have already moved significantly in that direction, resulting in missed opportunities or delayed decision-making.
- Some indicators heavily rely on historical price data, which may not accurately represent the current market conditions or future trends. Market dynamics can change rapidly, and past performance does not always guarantee future outcomes.
- No indicator is perfect, and false signals can occur frequently, leading traders to make poor decisions. False signals can be especially problematic in volatile or choppy markets, where indicators may generate conflicting readings.
- Different traders may interpret the indicators differently, leading to varying trading decisions. This subjectivity can lead to inconsistency in trading strategies and outcomes.

Proposed Solution

1. We propose the creation of a novel multi-indicator that will be the combination of three types of indicators which are Supper-trend, Relative Strength Index (RSI), Average Directional Index (ADX).
2. Each indicator is carefully selected for its unique ability to capture distinct aspects of stock price movements, market trends, and underlying financial health.
3. The construction of this multi-indicator is underpinned by machine learning algorithms and statistical techniques. By leveraging historical stock market data and relevant financial information, we train the model to identify optimal indicator combinations and weightings to generate robust and timely buy/sell signals.
4. Also, we are developing the Supply and Demand Daily indicator which displays daily supply and demand areas on the user's chart. These areas are constructed using the market data within a previous daily interval.

Objectives and Scope of Work

Objectives:

1. To enable real-time monitoring of indicators to promptly respond to market changes and make timely investment decisions.
2. To enhance the accuracy and depth of stock market analysis by incorporating multiple indicators that provide complementary insights.
3. To help new investors identify optimal entry and exit points for stocks based on multiple indicators' signals.
4. To encourage investors to understand the indicators used in the system and their implications, promoting informed decision-making.
5. To minimize emotional decision-making by relying on objective data and multiple indicators, leading to more disciplined investment decisions.

Scope of Work:

The new investors can’t able to use more than three indicators at a time so we are creating one indicator which will be the combination of three indicators itself. Because of this indicator the new traders able to use multiple indicators for making decisions and monitoring their stock.

Feasibility Assessment:

I. Expected Outcomes of the Project

- An indicator can also help confirm the strength of a trend. In an uptrend, the Indicator tends to stay above 50, indicating positive momentum. In a downtrend, the indicator tends to stay below 50, indicating negative momentum. Traders can use this information to assess the strength of a trend before making trading decisions.
- Using multi-indicators in stock market analysis can be beneficial as they provide a more comprehensive view of market trends and potential opportunities.
- Divergences between the price chart and the RSI can provide valuable insights.
- Indicator can help identify the direction of the market's trend (upward, downward, or sideways). Traders may use this information to determine whether to take long (buy) or short (sell) positions.
- These indicators can aid in setting stop-loss levels and defining risk parameters for trades. This helps traders manage their risk and protect their capital.
- Supply and demand zones are a popular analysis technique used in day trading. The zones are the periods of sideways price action that come before explosive price moves, and are typically marked out using a rectangle tool in the stocks, forex or CFD trading platform.

II. Innovation Potential

- Combining various indicators, such as technical indicators, fundamental metrics, sentiment analysis, and macroeconomic data, can lead to a more comprehensive understanding of market dynamics.
- By incorporating machine learning and AI algorithms, the multi-indicator system can adapt to changing market conditions and learn from historical data.
- An innovative system should be capable of processing and analyzing data in real-time.

III. Task Involved

1. Data Collection: Gather historical stock market data, including price, volume, and other relevant indicators, such as moving averages, relative strength index (RSI), moving average convergence/divergence (MACD), etc. You may also consider collecting external factors like economic indicators, news sentiment, and macroeconomic data.
2. Data Preprocessing: Clean the data to remove missing values, handle outliers, and deal with any inconsistencies in the dataset. This step is essential for ensuring the quality of the data used in the model.
3. Feature Engineering: Create additional features from the collected data that could be relevant for stock market prediction. This could include lagged versions of the target variable, technical indicators, and sentiment scores derived from news data.
4. Data Splitting: Divide the dataset into training, validation, and test sets. The training set is used to train the model, the validation set is used to tune hyperparameters, and the test set is used to evaluate the model's performance.
5. Model Selection: Choose appropriate machine learning algorithms for the prediction task. Common models include linear regression, support vector machines (SVM), decision trees, random forests, gradient boosting, and deep learning models like neural networks.
6. Model Training: Train the selected models using the training data. The model should learn from the historical data to find patterns and relationships between the input features and the target variable (stock price movement).
7. Model Validation: Use the validation set to fine-tune the model's hyperparameters and avoid overfitting. Techniques like cross-validation can help in selecting the best model and hyperparameters.
8. Model Evaluation: Assess the performance of the model on the test set using appropriate evaluation metrics such as mean squared error (MSE), mean absolute error (MAE), or accuracy.
9. Backtesting and Strategy Implementation (Optional): If the model's performance is satisfactory, you may choose to implement it in a trading strategy to test its real-world effectiveness. However, be cautious as past performance does not guarantee future results.
10. Regular Updates and Maintenance: Markets are dynamic, so the model will require regular updates and maintenance to adapt to changing market conditions and data availability

IV. Expertise Required

1. Inhouse Expertise:

- Should know about modeling with the help of pine editor.
- Should know about the programming language i.e pine script version 5.

2. External Expertise:

- Guidance and suggestion of project guide Mr. Sachin Meshram.

V. Facilities Required

1. Inhouse facilities:

- Internet access
- Lab access

2. External facilities:

- Historical data of stock market.

Milestones and Time Plan

	Task	JULY 2023	AUG 2023	SEP 2023	OCT 2023
Design	Conceptual Design	✓			
	Detailed design	✓			
	Design Modifications	✓			
	Final Design		✓		
Develop	Procurement (If any)		✓		
	Prototyping			✓	
	Modifications			✓	
Deliver	Testing and Validation			✓	
	Final Modifications				✓
	IPR / patent draft				✓
	Thesis and Poster				✓

Name and Signature of Project Guide

Mr. Sachin Meshram

Signature of HOD

Mrs. Saroj Shambharkar