

A Dynamic News Portal for Stock Market

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Abstract

The "News Portal for Stock Market using Machine Learning" is a dynamic and user-centric platform situated at the intersection of finance and artificial intelligence. This project aims to harness the power of machine learning and natural language processing to provide users with real-time, curated, and insightful information related to the stock market. The portal aggregates news articles from diverse, reputable sources, and employs sophisticated data preprocessing techniques to ensure relevance and accuracy. It goes beyond conventional news portals by offering users the ability to gauge market sentiment through sentiment analysis models. Moreover, users can access daily updates on the top-performing stocks and those facing significant losses, enhancing their decision-making capabilities in the volatile world of finance. Additionally, the portal presents lists of the day's top gainers and top losers in the stock market, providing users with a comprehensive view of market dynamics and opportunities for informed investment decisions.

Keywords: Stock Market, Machine Learning, Natural Language Processing, News Aggregation, Information Top-performing Stocks, Investment Decisions Volatility

INTRODUCTION

In the evolving landscape where finance meets cutting-edge technology, the "News Portal for Stock Market using Machine Learning" stands as a beacon at the convergence of artificial intelligence and investment insights. This groundbreaking platform is a dynamic hub meticulously designed to empower users with real-time, curated, and deeply insightful information spanning the enigmatic realms of the stock market. Harnessing the prowess of machine learning and natural language processing, this portal pioneers a new era of financial news aggregation, offering a comprehensive array of data from diverse, credible sources. Beyond conventional news outlets, it delves deeper, employing sophisticated data preprocessing techniques to ensure the utmost relevance and precision, providing users an unparalleled opportunity to navigate the complexities of financial markets with clarity. At its core, this innovative portal doesn't just disseminate information; it revolutionizes decision-making by enabling users to gauge market sentiment through advanced sentiment analysis models. With daily updates on top-performing stocks and those facing significant fluctuations, it becomes an indispensable tool, equipping users with the insights required to thrive in the volatile ecosphere of finance. Moreover, by highlighting the day's top gainers and losers, it offers a panoramic view of market dynamics, unlocking opportunities for informed investment decisions in a way that transcends traditional financial news platforms.

1. PURPOSE

- **Identify need of Project**

The "News Portal for Stock Market using Machine Learning" answers a critical need in the contemporary financial landscape by addressing the challenges investors face in accessing timely, relevant, and actionable

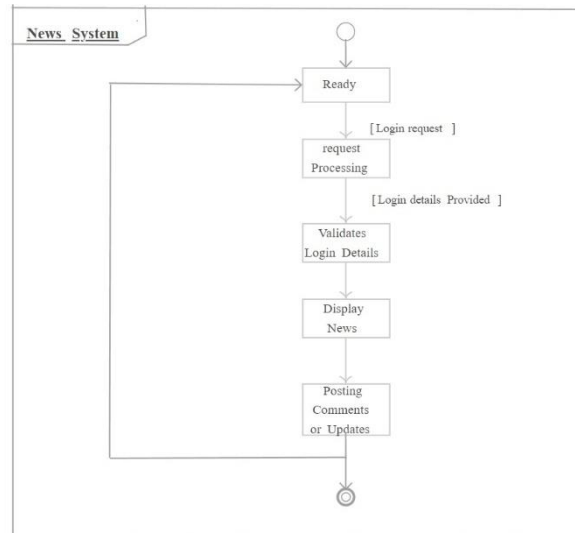
information. In an era marked by data overload and market volatility, this project becomes an indispensable resource, offering a refined lens through which users can interpret and navigate the complexities of the stock market. By leveraging machine learning and natural language processing, it streamlines the overwhelming influx of financial data, distilling it into curated, digestible insights that empower users to make informed decisions.

Moreover, this project satisfies the growing demand for sophisticated tools that go beyond mere news reporting. Its utilization of sentiment analysis and robust data preprocessing techniques adds a layer of intelligence, enabling users to not only consume market news but also discern the prevailing sentiment—a crucial factor in investment strategies. The need for such a platform arises from the ever-changing and sometimes tumultuous nature of financial markets, where access to accurate, real-time information paired with analytical capabilities is paramount for individuals seeking to navigate the labyrinth of investment opportunities and risks.

OBJECTIVE OF SYSTEM

- **Real-Time Information Dissemination:** Ensure the delivery of timely, curated, and accurate information from diverse, credible sources. This involves employing machine learning algorithms for data preprocessing, enabling the platform to aggregate and present up-to-the-minute news on stocks and financial markets.
- **Enhanced Decision-Making:** Empower users with tools to make informed decisions by leveraging sentiment analysis models. By gauging market sentiment, the platform helps users interpret news in context, providing deeper insights beyond raw data and aiding in strategic investment decisions.
- **Comprehensive Market Overview:** Offer a holistic view of market dynamics through daily updates on top-performing stocks, those facing significant fluctuations, top gainers, and losers. This panoramic perspective equips users with a nuanced understanding of market trends and opportunities, fostering a more informed investment approach.
- **User Engagement and Accessibility:** Prioritize user-centric design and accessibility to cater to a wide spectrum of users, from seasoned investors to newcomers in the financial domain. Implement intuitive interfaces and functionalities that simplify complex financial information, making it accessible and actionable for all users.
- **Continuous Improvement and Innovation:** Foster ongoing development and integration of advanced technologies. This involves staying at the forefront of machine learning advancements and refining algorithms to enhance data accuracy, relevancy, and predictive capabilities, ensuring the platform's sustained relevance and effectiveness in the dynamic realm of finance.

FLOW CHART



LITERATURE SURVEY:

AUDELIANO WOLIAN LI, " Stock Market Forecasting Using Deep Learning and Technical Analysis: A Systematic Review,"[1] 2020 - This paper Stock market forecasting is one of the biggest challenges in the financial market since its time series has a complex, noisy, chaotic, dynamic, volatile, and non-parametric nature. However, due to computing development, an intelligent model can help investors and professional analysts reduce the risk of their investments. As Deep Learning models have been extensively studied in recent years, several studies have explored these techniques to predict stock prices using historical data and technical indicators. However, as the objective is to generate forecasts for the financial market, it is essential to validate the model through profitability metrics and model performance. Therefore, this systematic review focuses on Deep Learning models implemented for stock market forecasting using technical analysis. Discussions were made based on four main points of view: predictor techniques, trading strategies, profitability metrics, and risk management. This study showed that the LSTM technique is widely applied in this scenario (73.5%). This work significant contribution is to highlight some limitations found in the literature, such as only 35.3% of the studies analysed profitability, and only two articles implemented risk management. Therefore, despite the widely explored theme, there are still interesting open areas for research and development.

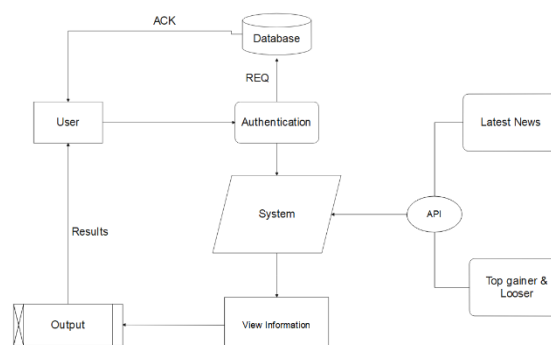
Byungun Yoon, " Detecting a Risk Signal in Stock Investment Through Opinion Mining and Graph-Based Semi-Supervised Learning,"[2] 2020 – The objective of this study is to develop an algorithm to support a decision-making process in stock investment through opinion mining and graph-based semi-supervised learning. For this purpose, this research addresses the following core processes: (1) filtering fake information, (2) assessing credit risk and detecting risk signals, and (3) predicting future occurrences of credit events through sentiment analysis, word2vec, and graph-based semi-supervised learning. First, financial data, including news, texts in social network services, and financial statements, were collected. Among these data, fake information such as rumors and fake news was filtered by author analysis and a rule-based approach. Second, credit risk was assessed by opinion mining and sentiment analysis for both social data and news in the form of a sentiment score and the trend of documents for each stock. A signal for a credit event was then detected by the degree of assessed risk. Consequently, the possibility of credit events such as delisting and bankruptcy in the near future was forecast based on the risk signal using logistic regression. This research illustrated the real case of a company to validate the applicability of the proposed approach. The results of

this study can help investors monitor a large amount of historically accumulated data and detect hidden signals of risk events ahead of time..

Saud S. Alotaibi, " Ensemble Technique With Optimal Feature Selection for Saudi Stock Market Prediction: A Novel Hybrid Red Deer-Grey Algorithm,"[3] 2021 - The forecast of the stock price attempts to assess the potential movement of the financial exchange's stock value. The exact estimation of the movement of share price would contribute more to investors' profit. This paper introduces a new stock market prediction model that includes three major phases: feature extraction, optimal feature selection, and prediction. Initially, statistical features like mean, standard deviation, variance, skewness, and kurtosis is extracted from the collected stock market data. Further, the indexed data collected are also computed concerning standard indicators like Average True Range (ATR), Exponential Moving Average (EMA), Relative Strength Index (RSI), and Rate of Change (ROC). To acquire best-predicted results, it is more crucial to select the most relevant features. Such that, the optimal features are selected from the extracted features (technical indicators based features, statistical features) by a new hybrid model referred to Red Deer Adopted Wolf Algorithm (RDAWA). Further, the selected features are subjected to the ensemble technique for predicting the stock movement. The ensemble technique involves the classifiers like Support Vector Machine (SVM), Random Forest1 (RF1), Random Forest2 (RF2), and optimized Neural Network (NN), respectively. The final predicted results are acquired from the Optimized Neural Network (NN). To make the precise prediction, the training of NN is carried out by the proposed RDAWA via fine-tuning the optimal weight. Finally, the performance of the proposed work is compared over other conventional models with respect to certain measures.

Nagaraj Naik, " Novel Stock Crisis Prediction Technique—A Study on Indian Stock Market,"[4] 2021 - A stock market crash is a drop in stock prices more than 10% across the major indices. Stock crisis prediction is a difficult task due to more volatility in the stock market. Stock price sell-offs are due to various reasons such as company earnings, geopolitical tension, financial crisis, and pandemic situations. Crisis prediction is a challenging task for researchers and investors. We proposed a stock crisis prediction model based on the Hybrid Feature Selection (HFS) technique. First, we proposed the HFS algorithm to removes the irrelevant financial parameters features of stock. The second is the Naive Bayes method is considered to classify the strong fundamental stock. The third is we have used the Relative Strength Index (RSI) method to find a bubble in stock price. The fourth is we have used moving average statistics to identify the crisis point in stock prices. The fifth is stock crisis prediction based on Extreme Gradient Boosting (XGBoost) and Deep Neural Network (DNN) regression method. The performance of the model is evaluated based on Mean Squared Error (MSE), Mean Absolute Error (MAE), and Root Mean Square Error(RMSE). HFS based XGBoost method was performed better than HFS based DNN method for predicting the stock crisis. The experiments considered the Indian datasets to carry out the task. In the future, the researchers can explore other technical indicators to predict the crisis point. There is more scope to improve and fine-tune the XGBoost method with a different optimizer.

SYSTEM ARCHITECTURE



ADVANTAGES

- **Real-Time Insights:** Provides up-to-the-minute information, enabling users to react swiftly to market changes and capitalize on opportunities. Accurate
- **Aggregation:** Uses machine learning to aggregate data from diverse sources, ensuring comprehensive and reliable news coverage.
- **Sentiment Analysis:** Offers sentiment analysis tools to gauge market sentiment, aiding in understanding investor emotions and potential market movements.
- **Informed Decision-making:** Equips users with the knowledge to make well-informed investment decisions by presenting comprehensive data and insights.
- **Enhanced User Experience:** Tailored interfaces and user-centric design simplify complex financial information, making it accessible to a wider audience.
- **Predictive Capabilities:** Utilizes machine learning algorithms to analyze historical data and potentially forecast market trends, assisting users in proactive decision-making.
- **Comprehensive Market Overview:** Provides a holistic view of market dynamics, including top-performing stocks and market trends, aiding users in understanding the bigger picture..

SYSTEM REQUIREMENTS

- **Software Used:**
 1. Programming Language – Python
 2. Libraries – numpy, skitlearn
 3. Database – SQLite
 4. Tools – VS code
 5. Algorithm – Hashing
- **Hardware Used:**
 1. Processor – i3 or above
 2. Hard Disk – 150 GB
 3. Memory – 4GB RAM

CONCLUSION

In conclusion, the "News Portal for Stock Market using Machine Learning" project represents a pioneering venture at the intersection of finance and artificial intelligence. By leveraging advanced machine learning techniques, this platform offers users a comprehensive and data-driven approach to understanding the stock market. From real-time news aggregation and sentiment analysis to predictive modeling and daily market performance updates, this portal equips investors and traders with the tools they need to navigate the complexities of the financial world. Ultimately, this project seeks to enhance financial literacy, empower decision-makers, and provide a valuable resource that can foster informed investment strategies and contribute to more successful outcomes in the dynamic realm of the stock market.

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