Project Report: Stock Price Prediction with Technical Indicators and Sentiment Analysis

1. Introduction
Stock market prediction is one of the most challenging tasks in finance due to high volatility and external influencing factors such as news, investor behavior, and global events. In this project, we built an AI-powered Stock Prediction App using Streamlit that integrates technical indicators, sentiment analysis, and machine learning.

2. Objectives
- Fetch real-time stock data from Yahoo Finance.
- Calculate and visualize technical indicators: MA20, MA50, RSI, MACD.
- Perform sentiment analysis of financial news articles using NewsAPI + TextBlob.
- Predict stock prices using an LSTM deep learning model.
- Deploy the project as an interactive web app for end-users.

3. Methodology
3.1 Data Collection: Stock data from yfinance, news articles from NewsAPI.
3.2 Technical Indicators: MA20, MA50, RSI, MACD.
3.3 Sentiment Analysis: TextBlob applied to news headlines.
3.4 Prediction Model: LSTM trained on scaled stock prices.
3.5 Deployment: Web app built with Streamlit and deployed on Streamlit Cloud.

4. Results
- Interactive stock trend visualizations.
- Technical indicators help identify momentum, volatility, and trend strength.
- Sentiment scores show how news impacts stock movement.
- LSTM predictions demonstrate feasibility of AI in stock forecasting.

5. Conclusion
This project demonstrates how data science + AI can be applied to stock prediction by combining technical analysis, sentiment analysis, and deep learning.
The app is:
- User-friendly: Streamlit interface.
- Comprehensive: Technical + sentiment analysis.
- Extensible: Can add more advanced features.

6. Future Scope
- Improve prediction accuracy with hybrid models.
- Add real-time stock alerts.
- Integrate social media sentiment.
- Deploy on mobile platforms.