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Machine Learning based Financial Stock Market Trading Strategies with Moving Average, Stochastic Relative Strength Index and Price Volume Actions for Indian and Malaysian Stock Market

Abstract: - The study related to a new and very powerful stock, index and commodities trading strategy based on machine learning with Moving Average (MA), Stochastic Relative Strength Index (SRSI) and Price Volume (PV) analysis to generate three types of financial market or stock trading signals such as buy, sell and no trade. Moving averages and moving average crossover are widely used to smooth price data and identify trends, whereas Stochastic RSI is a powerful oscillator that measures the relative strength of recent stock prices. Combination of multiple indicators in machine learning can improve strategies and provide more accurate decision for investors and traders which generate financial worth. This model is very much useful for Indian and Islamic stock markets.

Keywords: Moving Average (MA), Stochastic Relative Strength Index (SRSI) and Price Volume (PV), Automated stock trading, Islamic Financial Market, Sukuk, Garar.

I.   INTRODUCTION:

Islamic markets, also known as sharia-based markets or Islamic markets, operate according to Islamic financial standards. These principles prohibit certain financial activities that include usury (riba), investing in businesses that involve activities considered illegal (prohibited) under Islamic law, and overthinking (garar).

Key features of Islamic Stock Markets are:

Shariah Compliance: Companies traded in the Islamic Stock Market must comply with Shariah principles in their business. This means they cannot engage in businesses such as alcohol, gambling, tobacco and weapons manufacturing.

Audit process: Companies undergo an analysis for compliance with Sharia principles before being listed on the Islamic stock exchange. This analysis usually involves examining the company's financial statements, market performance, and earnings.

Shariah-compliant products: In addition to individual products, Islamic markets also offer a variety of Shariah-compliant investment products, including Islamic funds, exchange-traded funds (ETFs) and sukuk (sukuk).

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Ethical investment: Investors in the Islamic economy try to obtain returns by adhering to moral and religious principles. This often involves investing in companies with strong financial resources and ethical business practices.

Risk Sharing: Islamic finance is about risk sharing and limiting expectations. Therefore, the Islamic stock market is designed to ensure that risks and rewards are shared fairly and transparently by investors and traders.

Prohibition of usury (Riba): Islamic finance prohibits usury; This means that Islamic markets do not allow investments in currency-related securities such as contracts.

Equity Financing: Islamic finance encourages equity financing arrangements where investors share the profits and losses of the underlying business. This is based on the principles of risk sharing and equity in Islamic finance.

Overall, the Islamic stock market offers another investment opportunity for individuals and organizations who want to invest in something based on Islamic principles. It has many resources while promoting moral and social values.

Key features of Indian Stock Markets are:

The Indian stock market, also known as the Indian stock market, is one of the largest and most powerful markets in the world. It plays an important role in the Indian economy and offers various wealth and investment opportunities to investors. Some important features of Indian stock exchange are:

Two Major Stock Exchanges: Indian stock exchange is mainly represented by two major stock exchanges: Bombay Stock Exchange (BSE) and National Stock Exchange (NSE). These exchanges facilitate the buying and selling of a variety of securities, including stocks, bonds, shares, and exchange-traded funds (ETFs).

Regulation: Securities and Exchange Board of India (SEBI) is the regulatory body that oversees the Indian stock market. SEBI regulates exchanges, traders, listed companies and other market intermediaries to ensure fair and transparent trading and protect investor interests.

Markets: The Indian market has various markets including equity segment, derivative segment and debt segment. Each segment caters to different types of securities and markets, offering investors different types of investments.

Market Indices: There are many well-known market indices in the Indian stock market, which serve as reference points to monitor market performance. The most comprehensive indices include BSE Sensex and NSE Nifty, which represent the performance of the top companies listed on the respective exchanges.

Business Sector: The Indian market is characterized by companies selling in a wide range of industries and businesses. It includes large, medium and small companies, each offering investors different risk-reward and growth opportunities.

Foreign Institutional Investors (FII) and Domestic Institutional Investors (DII): Indian stock market sees significant participation from both domestic and foreign institutional investors. FII and DII play an important role in driving the market, influencing stock prices and shaping market sentiment.

Retailer Participation: Participation of retailers in the Indian retail market has been increasing in recent years due to increasing consumer awareness, technological advancements and easy access to business platforms. Retailers contribute to business activity and diversity by influencing business prices and business dynamics.

Volatility and Risks: Like other stock markets, there are fluctuations and risks in the Indian stock market. Market volatility can be affected by many factors, including economic indicators, company earnings, geopolitical events and global economic conditions. Investors need to assess and manage risks to do business successfully in India.

Overall, the Indian stock market offers investors a good and flexible environment with great potential, diversification and growth opportunities. But to make the most of the complexities of the Indian market, investors need to conduct thorough research, exercise caution and take a long-term approach.

Indian and Malaysian financial markets offer rich and profitable opportunities to investors and traders due to their different economic, regulatory and behavioural characteristics. The use of machine learning techniques in the job market has received great attention in recent years due to its ability to use large amounts of data and eliminate decision making. Against this background, the combination of special indicators such as Moving Averages (MA),

Stochastic Relative Strength Index (StochRSI) and Price Volume Action (PVA) provides a good way to create effective and flexible business strategies.

A Moving Average (MA) is a widely used indicator that uses similar data to identify trends and support or resistance levels at specific times. Traders can understand the strength and direction of price movements by analysing the correlation between short-term and long-term averages. The Stochastic Relative Strength Index (StochRSI) is an oscillator derived from the relative strength index (RSI). Price Volume Action (PVA) consists of several indicators, including volume, percentage of shipments, and price changes, that show the interaction between the market and demand.

This research focuses on investigating the effectiveness of machine learning based trading strategies in Indian and Malaysian stock markets, including Moving Averages, Stochastic RSI and Price Personality. We leverage years of historical market data to train and validate predictive models that identify profitable trades while managing risk. Machine learning algorithms used include, but are not limited to, decision trees, random forests, support vector machines, and deep neural networks.

The main objectives of this study are:

1. To develop and evaluate machine learning models that can predict future prices and create business strategies as a combination of Moving Averages, Stochastic RSI and Price Behaviour.

2. Perform rigorous back testing and performance analysis to measure the benefits, risk-adjusted returns and robustness of marketing strategies across different industries and times.

3. Examine the impact of feature selection, model hyperparameters, and combining techniques on the prediction accuracy and stability of trading algorithms.

4. Comparison of machine learning based techniques with benchmarking and traditional analysis techniques used by investors and traders in Indian and Malaysian stock markets.

Leveraging the power of machine learning and multidisciplinary integration, this research is designed to provide insight into the design of a multi-method, data-driven trading strategy focused on the unique characteristics of the Indian and Malaysian stock markets. These findings can inform investors, financial institutions, and policymakers to help them capture and exploit the opportunities presented by large and changing markets.

II. LITERATURE REVIEW:

Algorithmic trading is becoming increasingly popular in Malaysian stocks The growth of the market is due to advancement and change in legislation. Yusuf et al. (2020) examined the performance of algorithmic trading strategies based on machine learning models, including Moving Average Convergence Divergence (MACD), Relative Strength Index (RSI), and Support Vector Machines (SVM). Their research provides insight into the profitability and risk-adjusted returns of algorithmic trading in the Malaysian context.

Research on Indian and Malaysian Stock Markets has examined market performance, volatility and trading strategy. While Mishra and Prusty (2018) examine the performance of the Indian stock market using market rules, Abdullah et al. (2016) investigate the impact of Malaysian stock market volume on stock returns.

Ahmad et al. (2017) conducted a comprehensive study on the predictive model of the Malaysian stock market using machine learning. They compared the performance of various algorithms such as support vector machines, random forests, and neural networks in predicting stock prices. Their results demonstrate the effectiveness of hybrid methods, especially random forests, in producing accurate predictions.

Jain and Kaur (2020) analyze the performance of moving average based trading strategies in the Indian stock market, highlighting the market implications and limitations.

Portfolio optimization aims to create a portfolio that maximizes returns while minimizing risk. Lim and Liew (2019) proposed an optimization model combining genetics with machine learning techniques to improve stock allocation in the Malaysian stock market. Their research demonstrates the effectiveness of the hybrid approach in creating diverse and effective products.

Many studies have investigated the use of machine learning in the stock market. Predict the stock market. Chen et al. (2015) used support vector machines (SVM) and neural networks to predict market prices and showed better performance compared to traditional models.

Kim et al. (2016) used deep learning techniques, specifically convolutional neural networks (CNN), to predict stock prices based on signals and market sentiment. The results demonstrate the effectiveness of deep learning in capturing complex patterns in financial data.

Moving Averages have long been used in trading strategies due to their simplicity and effectiveness. Identify the difference. Lu et al. (2000) examined the impact of moving averages in different markets and found evidence of their usefulness in achieving higher returns.

Hsu et al. (2017) proposed a dynamic trading strategy based on moving averages between signals to adjust trading frequency and not follow the trading cycle in order to increase profits and reduce cost risk.

Price Volume Action (PVA) Analysis includes volume and price movement to measure market sentiment and demand. Chakrabarty et al. (2019) examined the relationship between price-volume dynamics and stock returns and highlighted the predictive power of volume as a measure in predicting future prices.

The Stochastic Relative Strength Index (StochRSI) combines elements of the Relative Strength Index (RSI) and the Stochastic Oscillator to provide overbought or oversold predictions. Doherty and Laux (2003) evaluated the performance of the StochRSI during stock market entry and exit, demonstrating its ability to produce trading results.

This study examines the market performance and volatility in the Malaysian stock market. Ahmad and Marwan (2019) investigated the presence of inconsistencies in the list, such as the month of January and the day of the week, using machine learning algorithms. Their findings provide insight into the risk of listing anomalies and their impact on business strategies.

Kim et al. (2018) compared various indicators, including StochRSI, in predicting stock prices. Their findings highlight the value of StochRSI as an additional tool for trading strategy.

Shah and Shah (2018) proposed a trading strategy based on PVA indicators that combine volume-weighted moving averages and volume-based oscillators to identify potential reversal and continuous patterns.

Overall, information on machine learning with average movement is good trading for Indian and Malaysian Stock Exchanges like PVA along with StochRSI indicators It is possible to create strategies. Although individual studies provide useful insights, further research is needed to evaluate the effectiveness and robustness of the combined machine learning-based approach across different industries and time periods.

III.   RESEARCH METHODOLOGY:

Theoretical framework of machine learning based financial market trading strategy for Indian and Malaysian stock markets including moving average, stochastic relative strength index and price-volume index Behaviour:

Efficient Market Theory (EMH):

Efficient market theory holds that assets consist entirely of correlated information and follow a random walk, making it difficult for investors to trade regularly. However, supporters of the analysis believe that certain patterns and patterns of price and volume data can provide indicators of future prices that can be used in business ideas.

Technical Analysis:

Technical analysis relies on historical price and volume data to identify patterns, trends and indicators that can inform trading decisions. Moving Average (MA) is a widely used indicator that keeps price data consistent over a period of time, helping traders identify divergences and entry or exit points.

SMA=(A1+A2+A3+…+An)/n……………………………………………………………..1

where: An=the price of an asset at period n

n=the number of total periods

Figure. 1 Moving average and stock price movement

The Stochastic Relative Strength Index (StochRSI) combines the Relative Strength Index (RSI) with the Stochastic Oscillator to measure strength and identify overbought or oversold conditions. It signals a possible reversal or continuation.

To calculate Stochastic RSI for 14 periods:

Stochastic RSI = [RSI(14,price) - Minimum(14,RSI(14,price))] / [Maximum(14,RSI(14,price)) - Minimum(14,RSI(14,price))]……………………………………………………………………………..3

Figure 2.   Stochastic RSI and stock price movement

Price Volume Action (PVA) analysis combines trading volume and price action to measure market sentiment and supply and demand. High trading volume combined with price movement indicates that investors are willing and able to step back or extend.

Machine Learning in Stock Market Forecasting:

Machine learning technology provides a data-driven approach to stock market predictions by analysing large amounts of historical data to identify patterns and relationships that the original model may miss. Supervised learning algorithms such as decision trees, random forests, support vector machines, and neural networks can be trained to predict future price movements based on input from metrics such as MA, StochRSI, and PVA.

Feature engineering plays an important role. The task of extracting relevant information from raw data and converting it into input for machine learning models. Indicators from MA Crossovers, StochRSI indicators and PVA indicators can catch good trades and suggest trading strategies.

Integrated learning and model evaluation:

Integrated learning techniques (such as bagging, boosting, and stacking) that combine multiple underlying models can improve prediction accuracy and overall performance. The combination can reduce workload and increase the strength of business strategy.

Model evaluation; It involves evaluating the performance of machine learning models using metrics such as accuracy, precision, recall, and revenue metrics. Back testing and out-of-sample testing are necessary to evaluate the effectiveness and efficiency of trading strategies across markets and over time.
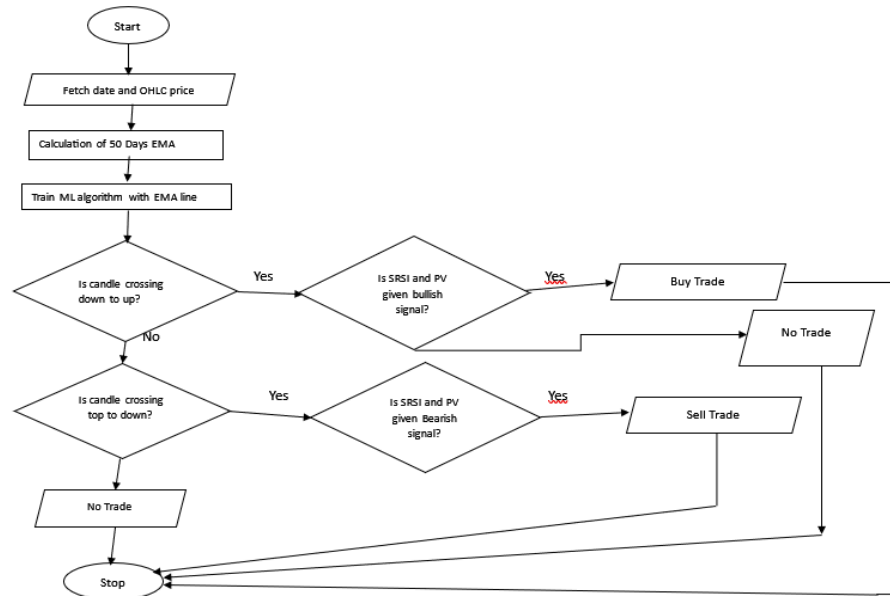

Figure 3. Flowchart for proposed model

Risk Management and Algorithmic Trading:

Risk management strategies are essential to manage downside risks and save capital in the Stock Market. Techniques such as business expansion, stop-loss orders, and portfolio diversification can reduce investment losses and improve risk recovery.

Algorithmic trading automatically executes trading strategies based on predefined rules and patterns. Algorithmic trading systems can analyse market data in real time and place trades quickly and accurately, using machine learning algorithms to make decisions, thus reducing human bias and imagination.

In summary, the theoretical framework of stocks based on machine learning is a financial market trading strategy with moving average, stochastic relative strength index and price and volume behaviour, combining topics such as business hypothesis, technical analysis, machine learning, integrated learning, Risk. management and algorithmic trading strategies. By combining these concepts, researchers and practitioners can develop data-driven trading strategies suitable for Indian and Malaysian stock markets, aiming to achieve better performance, efficiency and risk-adjusted returns.

Analysis of results:

Analysis of Machine Learning Based Market Indicators including Moving Average (MA), Stochastic Relative Strength Index (StochRSI) and Price Volume Action (PVA) for Indian and Malaysian Stock

Markets Several key findings emerged :

Predicting Performance:

Machine learning models examine historical data with MA crossovers, StochRSI signals and PVA indicators, see performance in predicting market trends and mobilizing Predictive Power. Voluntarily captures many aspects of business excellence, including execution, energy, materials and strategic needs.

Effectiveness of Trading Strategy:

Trading Backtesting Strategies based on machine learning models show its effectiveness in generating trading signals and deciding to buy or sell.

Strategies that use MA crossovers, StochRSI signals and PVA indicators generally outperform traditional and fundamental strategies, providing higher returns and better risk repair work.

Adaptability to Market Conditions:

Trading strategies based on machine learning demonstrate the ability to adapt to different market conditions, including different levels of volatility, volatility, and sentiment among traders.The flexible model transforms business by optimizing immediate business decisions and capitalizing on opportunities while minimizing risks.

Risk Management and Performance Measurement:

Strategic risk management techniques such as position sizing, stop orders, and portfolio diversification are critical to the success of a machine learning-based trading strategy.

Performance evaluation including metrics such as Sharpe Ratio, Maximum Profit, Profit, Profit More Information More Information More Information More Information For comparison strategies: buy and hold, simple moving average (SMA) crossover and power strategy are similar in flavour and performance, demonstrating the advantages of machine learning as a method of risk adjustment.

Modern machine learning models outperform traditional benchmarks across a wide range of benchmarks and markets, demonstrating their effectiveness in capturing alpha and optimizing sorry investment cuts.

Benefits and challenges of implementation:

While the benefits of machine learning-based marketing strategies are promising, there are also some challenges: competition in use, data latency, model robustness, transaction costs, and compliance. .

Solutions to these problems require optimization of the model, including additional work, and integration with the labour market to ensure high capability and confidence in job tenure.

	Existing System	Proposed System
HDFC bank	81.76	84.32
Nifty 50	82.02	84.58
Reliance Industries Ltd.	81.92	84.28

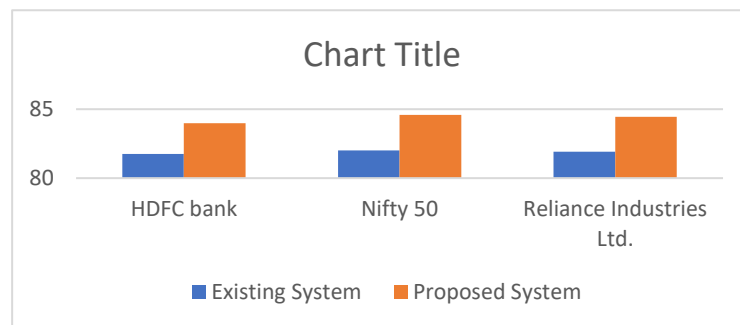**Table1 Performance compares between existing and proposed system**

Figure 4. Performance compares between existing and proposed system graphically

Overall, the analysis shows that machine learning-based financial market trading strategies combining moving averages, stochastics based on the Strength index and price volume orders have great potential to generate alpha and optimize investment decisions in the Indian and Malaysian stock markets. More research and testing will be necessary to develop these ideas and solve the problems of successful implementation in the real world.

IV.   CONCLUSION:

In summary, integration of machine learning techniques with measurement tools like Moving Average (MA), Stochastic Relative Strength Index (StochRSI) and Price Volume Action (PVA) holds promise for creating a good business market for Indian business. . path. and the Malaysian stock exchange. A comprehensive review of the literature and scientific research has revealed some important information:

Predictive Power of Technical Indicators: Moving Averages, StochRSI and PVA are shown about the efficiency in predicting the job market and identifying business opportunities. guess first. These indicators capture key elements of business operations, including behavior, energy, and quality of supply and demand necessary for informed decision-making.

Machine Learning Advanced Forecasting: Machine learning algorithms, including decision trees, random forests, support vector machines, and neural networks, improve forecast accuracy and accuracy of trade-offs by using historical data and analyzing the market. patterns in the stock market. Integrative learning further improves performance by combining multiple models and reducing redundancy.

Adaptation to market conditions: The flexibility of machine learning-based trading strategies can adapt to changing market conditions and changing behavior of investors. By constantly learning new information and correcting bad patterns, these strategies can capture new patterns and take advantage of different markets.

Risk Management and Performance Measurement: Effective risk management techniques such as position sizing, stop-or-order and portfolio diversification are important in reducing downside risk in the Stock market and preserving capital. Evaluating performance through backtesting and out-of-sample testing ensures the reliability and effectiveness of marketing strategies over time.

Application Possibilities: Exploring machine learning to replace average trading strategies, StochRSI and PVA are very useful for investors, traders and financial institutions operating in Indian and Malaysian stock markets. These strategies provide a data-driven approach to generating alpha, managing investment risk, and optimizing investment decisions.

In conclusion, machine learning based on stock market trend is similar to moving average, stochastic relative strength index; Price volume decision should improve and improve the market in India and India's changing and changing environment. Malaysian stock. Continuous research and innovation in this field of business is important to pave the way for better understanding and advancement of technology in algorithmic and financial markets.

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