AWARENESS OF STOCK MARKET INVESTMENT USING AI

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Abstract: In recent years, the stock market has witnessed a dynamic transformation with the integration of Artificial Intelligence (AI), revolutionizing traditional investment strategies. This study aims to explore the extent of awareness among individuals regarding stock market investments that are influenced or supported by AI-based technologies. The research is rooted in the understanding that AI applications—such as algorithmic trading, predictive analytics, and sentiment analysis—are becoming increasingly prominent in aiding investors to make more informed and timely decisions. With rapid advancements in financial technology, it becomes essential to assess whether current and potential investors are aware of the opportunities and tools AI offers in the stock trading landscape. The study specifically focuses on how AI influences the decision-making process of investors, their trust in AI-driven platforms, and the perceived benefits. Data was gathered through a structured questionnaire targeting a diverse group of respondents, varying in age, occupation, and investment experience.

I.   INTRODUCTION

Investing in the stock market has always been a significant revenue for wealth generation. However, a considerable number of individuals shy away from it due to a lack of awareness and understanding of market complexities. The project titled "Predictive Analysis of Stock Market Investment Using AI Based on Awareness Using the Survey Method" seeks to address this gap by leveraging artificial intelligence (AI) to enhance the investment process.

The foundation of this project lies in understanding how individuals perceive and approach stock market investments. To achieve this, comprehensive surveys were conducted to evaluate various aspects of investor awareness, including their familiarity with financial concepts, understanding of market trends, risk appetite, and previous experiences with investments. This survey data served as a vital input to design an AI-driven predictive system tailored to align with the knowledge and comfort levels of each user. By focusing on awareness, the system ensures that even novice investors are equipped to make informed decisions in a highly volatile market.

Ultimately, this project emphasizes the importance of awareness in driving informed and strategic stock market investments. By combining survey-driven insights with the analytical power of AI, it bridges the divide between technology and human understanding. This innovative approach enhances both the accessibility and effectiveness of stock market investments, ensuring that individuals, regardless of their expertise, can navigate the financial landscape with confidence and clarity.

II.   REVIEW OF LITERATURE

1.   **Jain, R. & Sharma, A. (2021) in their paper "AI-Based Stock Market Prediction:** An In Depth Review" highlighted the growing role of AI in financial markets. The authors discuss how machine learning algorithms, particularly deep learning and reinforcement learning, have been successfully employed to predict stock prices and trends. They emphasize that AI has the capacity to analyze vast datasets, identify patterns, and deliver insights that would be impossible for traditional financial models. They also note that AI can be particularly beneficial for novice investors by offering personalized and actionable recommendations, improving their understanding of the market.

2.   **Liu, L. & Zhou, X. (2019) in "The Impact of AI on Stock Market Trading:** A Comprehensive Analysis" examined how AI-powered tools have enhanced decision-making for individual investors and institutional traders alike. The authors argue that AI has transformed stock market trading by automating repetitive tasks such as data collection. They also noted that AI's predictive capabilities, such as sentiment analysis and trend forecasting, have significantly improved market awareness, helping users make more informed decisions.

OBJECTIVE OF MY STUDY:
- To ensure that the AI system delivers accurate, timely, and relevant information regarding stock market investments.
- To ensure the system user-friendly, accessible, and engaging for a broad audience, including people who may not have in-depth financial knowledge.

III. RESEARCH METHODLOGY

Research methodology refers to the structured approach to addressing the research problem. It includes the overall research design, sampling techniques, data collection methods, and analysis procedures. In this study, the research design is descriptive, which involves detailed analysis and reporting of the characteristics of stock market awareness and the use of AI tools.

RESEARCH AREA
The research is conducted in Coimbatore City.

TYPE OF RESEARCH
The research is categorized as a descriptive study. This type of research is conducted to assess the awareness of stock market investment tools and how AI can influence investment decisions. It aims to describe user characteristics, behavior's, and preferences related to AI based stock market analysis.

Source of Data :
The researcher should keep in mind the two types of data while collecting data via primary data and secondary data.

Primary Data : 105 Responds

Sampling Plan :
A Sampling plan is a definite plan for obtaining a sample from a given population is refers to the various techniques for selecting items for the sample. This plan calls for three decisions.

Sampling procedure :
The Non probability sampling method involves a deliberate selection of particular units of the universe for constituting a sample which requests the universe. The Non probability sampling is any procedure in which elements will not have the equal opportunities of being included in a sample

Convenience Sampling :
When the population elements are selected for inclusion in the sample based on the ease of access is known as the convenience sampling. Here the respondents are chosen on the basis of non-probability sampling under which convenience sampling design was used.

Sample Size :
Sample size of 105 respondents will be considered for the study, With data collected through the questionnaire method to ensure representative insights into user perceptions and the effectiveness of AI in the stock market.

TOOLS USED
Percentage Analysis :
Percentage analysis will be employed to interpret and analyze the collected data. This statistical tool will help in identifying the proportion of respondents who are aware of AI assisted stock market tools, as well as their level of satisfaction with these tools.

SIMPLE PERCENTAGE METHOD :
The simple percentage method will be used to analyze the relative importance of different features and improvements suggested by the respondents. This method will help determine the most significant factors driving user engagement with AI-based stock market tools.

CHI-SQUARE ANALYSIS :
- Chi-square analysis is a statistical method used to determine if there is a significant association between categorical variables.

OVERVIEW OF AI IN STOCK MARKET INVESTMENT

1970s: The Foundations
- Early Algorithms like linear regression and time-series analysis used to study market trends.
- Efficient Market Hypothesis (EMH) led to interest in identifying inefficiencies through algorithms.

1990s: Machine Learning Emerges
- ML Algorithms such as decision trees and neural networks applied to market data.
- Algorithmic Trading and High-Frequency Trading (HFT) developed.

2000s: AI Gains Traction
- Hedge Funds like DE Shaw used AI for predictive analytics.
- Natural Language Processing (NLP) analyzed news and sentiment.

2010s: Big Data & Deep Learning
- Big Data included alternative sources like web traffic and satellite images.
- Deep Learning Models enhanced forecasting and portfolio management.

2020s: AI Dominates
- Autonomous Hedge Funds (e.g., Numerai) fully AI-driven.
- Robo-Advisors became common for retail investors.

DATA ANALYSIS AND INTERPRETATION

- **Data Analysis** refers to the process of examining, organizing, and processing data to extract useful information. It involves identifying patterns, trends, and relationships within datasets using statistical or computational techniques.

- **Data Interpretation** is the step where insights gained from analysis are explained in a meaningful way. It helps in making informed decisions by converting raw data into understandable conclusions.

- Together, analysis and interpretation ensure that data-driven insights are accurate, relevant, and actionable.

FOLLOWING STATISTICAL TOOLS ARE USED:

PERCENTAGE ANALYSIS
- Percentage analysis is a method of expressing numerical data in terms of percentages to compare different values relative to a total.

- This method is widely used in finance, business, and research to analyze growth, trends, and distributions.

$$\text{PERCENTAGE} = \frac{\text{Number of respondents}}{\text{respondents}} \times 100 \text{ Total}$$

CHI-SQUARE ANALYSIS
- Chi-square analysis is a statistical method used to determine if there is a significant association between categorical variables. It compares observed frequencies to expected frequencies under a null hypothesis. The test is commonly used for two purposes: the goodness-of-fit test and the test of independence.

$$x^2 = \frac{(O - E)^2}{E}$$

IV. DATA ANALYSIS, INTERPRETATION & INFERENCE

TABLE 1 AGE OF THE RESPONDENTS

CATEGORY	NO OF RESPONSE	PERCENTAGE %
18-25	42	40%
26-35	36	34.3%
36-50	18	17.1%
51 and above	9	8.6%
Total	105	100%

INTERPRETATION

The pie chart represents the age distribution of respondents showing 40% fall within the 18-25 age group, followed by 34.3% in the 26-35 group, while with minimal representation from older age groups.
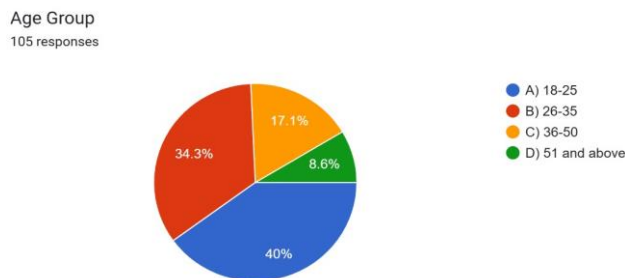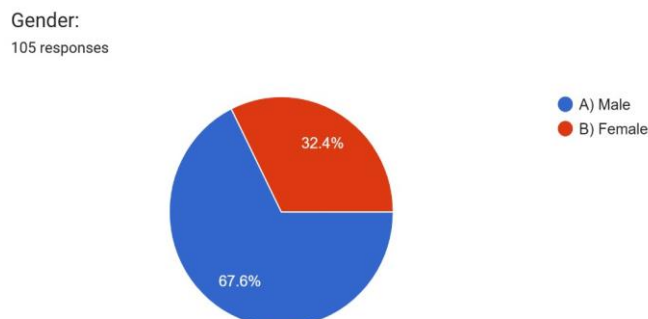

TABLE 2 GENDER OF THE REPONDENTS

GENDER	NO.OF.RESPONDENTS	PERCENTAGE
Male	71	67.6%
Female	34	32.4%
Total	105	100%

INTERPRETATION

The pie chart represents the gender distribution of respondents, showing that 67.6% are male and 32.4% are female, indicating a significant male dominance in the sample.

CHI- SQUARE ANALYSIS – 1 HYPOTHESIS:

H_0 - There is no significant association between gender and the awareness of Stock Market

H_1 - There is a significant association between gender and the awareness of stock market investment.

Formula:

$$x^2 = \frac{(O - E)^2}{E}$$

O = Observed frequency

E = Expected frequency

OBSERVED FREQUENCY TABLE

GENDER	AWARE	NOT AWARE	TOTAL
MALE	61	10	71
FEMALE	29	5	34
TOTAL	90	15	105

Awareness for male:

$$E = \frac{Row\ total \times Column\ total}{Grandtotal}$$

$$= \frac{71 \times 90}{105}$$

$$= 61$$

Awareness for male:

$$E = \frac{Row\ total \times Column\ total}{Grandtotal}$$

$$= \frac{71 \times 15}{105}$$

$$= 10.14$$

AWARENESS FOR FEMALE:

$$E = \frac{Row\ total \times Column\ total}{Grandtotal}$$

$$= \frac{34 \times 90}{105}$$

$$= 29$$

NO AWARENESS FOR FEMALE:

$$E = \frac{Row\ total \times Column\ total}{Grandtotal}$$

$$= \frac{34 \times 15}{105}$$

$$= 5$$

OBSERVED FREQUENCY

GENDER	AWARE	NOT AWARE	TOTAL
MALE	61	10	71
FEMALE	29	5	34
TOTAL	90	15	105

EXPECTED FREQUENCY

GENDER	E(AWARE)	E (NOT AWARE)	TOTAL
MALE	61	10	71
FEMALE	29	5	34
TOTAL	90	15	105

TABLE TO ASSESS CHI- SQUARE VALUE

(O-E) AWARE	(O-E) NOT AWARE	(O-E)2 AWARE	(O-E)2 NOT AWARE	(0-E)2 AWARE	(0-E)2 NOT AWARE
28	-10	799	107	24	5
6	-9	38	81	2	6

$$x2 = \frac{(O - E)^2}{E}$$

$$= 37.08$$

DEGREES OF FREEDOM (df):

The degrees of freedom for the chi – square analysis is calculated as $df = (r - 1) \times (c - 1)$

$$= (2 - 1) \times (2 - 1)$$

$$= 1$$

For df = 1, the critical value from the chi-square distribution table is approximately **3.841**

INFERENCE: The differences between the observed and expected frequencies were larger for males (with a significant difference of 28 for awareness) compared to females, indicating that the relationship between gender and awareness is more pronounced among males in the sample.

FINDINGS:
This research on AI in stock market investing highlights several key insights. While 77.1% of people are aware of AI tools for investing, only 46.7% have actually used them, and 58.1% understand how AI supports decision-making by predicting trends, assessing risk, and managing portfolios. Even though 85.7% know about stock market investing, only 59% have invested, mostly aiming for short-term profits (47.6%), long-term wealth (32.4%), or passive income (20%).

SUGGESTIONS:
To improve the usefulness and trust in AI investment platforms, several steps can be taken. First, enhance AI education by providing simple guides, interactive tutorials, and real-time insights to help users understand how AI works. Third, build trust by using explainable AI, allowing users to understand decisions and adjust automation levels, while ensuring data privacy and compliance with financial regulations.

V. CONCLUSION

This study highlights AI's potential to transform stock market investing by improving decision making, reducing bias, and enhancing financial inclusion. While awareness of AI tools is high, usage remains limited due to trust issues, lack of financial literacy, and concerns about accuracy. With these improvements, AI can make investing more accessible, efficient, and empowering for a wider audience.

REFERENCES

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