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The Effect Of The Implementation Of Artificial Intelligence In Stock Trading Strategies On Profitability: A Managerial Perspective In The Indonesian Capital Market

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Abstract

The following study aims to analyze the impact of artificial intelligence (AI) implementation, limited infrastructure and human resource (HR) skills, capital market regulations, and managerial decisions on profitability in stock trading strategies in the Indonesian capital market. The study employed a quantitative approach by distributing questionnaires to 100 respondents, including individual investors, investment managers, financial analysts, and financial institution professionals. Data were analyzed using multiple linear regression using SPSS version 25 software. The study's findings indicate that artificial intelligence (AI) implementation, capital market regulations, and managerial decisions have a positive and significant impact on profitability in stock trading strategies. Conversely, limited infrastructure and human resource (HR) skills have no significant impact. Simultaneously, the four independent variables explain 81% of the variation in profitability, with the remaining portion influenced by several other variables outside the study. The following study makes a theoretical contribution by enriching the literature on the role of AI and managerial factors in increasing investment profitability. Practically, these findings emphasize the importance of integrated AI adoption, coupled with strong capital market regulations and sound managerial decisions, to support the success of stock trading strategies in the digital era.

INTRODUCTION

The Indonesian capital market has grown rapidly in recent years, becoming a key pillar of the country's economy. However, it still faces a number of significant challenges that require serious attention. One of the main challenges is high market volatility triggered by global economic uncertainty and stock price movements influenced by several external and internal factors, both domestic and international. To address this uncertainty and potential risks, innovation in investment strategies is needed that can reduce risk while increasing profitability. One recent innovation starting to be implemented in various global capital markets is the use of artificial intelligence (AI) in stock trading strategies.(Bhardwaj et al., 2024).

Artificial intelligence (AI) refers to the ability of machines to mimic human intelligence in decision-making, pattern recognition, and data-driven predictions. In the stock market, AI has the ability to analyze large, complex data sets at a faster rate than humans. This speed allows AI to produce more accurate and precise analytical results in a much shorter timeframe, which in turn helps investors make more informed investment decisions.(Rhoda Adura Adeleye et al., 2024). Thus, AI can increase potential profits while minimizing risk. Machine learning (ML) and deep learning (DL) are branches of AI that have proven effective in identifying market patterns and

predicting future stock price movements, which is very useful for making more strategic investment decisions.(Torkian et al., 2025).

The application of AI in stock trading strategies in the Indonesian capital market is still in its relatively early stages. However, in various international capital markets, AI has been applied with great success to optimize investment decision-making. For example, in research conducted by(Rhoda Adura Adeleye et al., 2024)AI is applied by applying machine learning techniques, namely support vector machines (SVM) and neural networks, to predict stock prices and analyze market data in real time. This technology has been proven to enable more accurate predictions, increase profit opportunities, and accelerate the decision-making process, which is typically time-consuming when carried out manually by traders.

In addition to infrastructure and skills challenges, the Indonesian capital market also needs to address the regulatory challenges necessary to ensure effective and responsible AI implementation.(Torkian et al., 2025)He stated that although AI offers numerous benefits, its use in the financial sector and capital markets must be based on clear policies and regulations. Without adequate oversight, uncontrolled AI adoption could lead to market inequities or even potential market manipulation. Therefore, Indonesian capital market regulators need to develop balanced regulations that encourage innovation while protecting investors and maintaining market integrity.

The application of AI in stock trading requires not only technological support but also crucial managerial support.(Lazo & Ebardo, 2023)emphasized that the success of AI implementation depends heavily on strategic decisions made by investment managers and market participants. Managers leading the adoption of this new technology must have a deep understanding of the potential and challenges of AI technology and be able to integrate it with existing trading systems. Selecting the right investment strategy and adapting AI models to market needs are key to the successful implementation of this technology.

In this context, the use of multi-objective models that combine AI with operational research (OR) for portfolio optimization becomes crucial.(Torkian et al., 2025)developed a multi-objective model aimed at minimizing risk and maximizing returns. This model provides a more structured approach to investment decision-making, relying not only on technical market analysis but also utilizing AI algorithms to generate more measured and data-driven investment decisions. This is particularly useful for investment managers navigating volatile market uncertainty.

The integration of AI in stock trading can also address various weaknesses inherent in traditional trading systems. AI allows for the accounting of various external factors influencing the market, including economic news, political conditions, and social factors that manual analysis might miss. With this capability, AI can provide higher returns in big data-driven decision-making, improve the accuracy of stock price predictions, and minimize potential losses for investors.(Lazo & Ebardo, 2023).

However, the success of this technology in supporting investment decisions cannot be separated from an understanding of behavioral finance, a branch of finance that studies how psychological and emotional factors influence financial decision-making. A study by(Almansour et al., 2023)emphasizes that investors often do not act rationally. Biases such as overconfidence, herd behavior, and loss aversion influence decision structures and can lead to market anomalies.

In Indonesia, the dominance of retail investors with low levels of financial literacy creates fertile ground for such behavioral biases. In volatile market conditions, for example, investors tend to follow the crowd (herding), overreact to negative information, or execute transactions based on unverified news. This leads to high levels of speculation and low market efficiency. Research

from(Nugraha et al., 2024)indicates that limited digital and financial understanding is one of the main obstacles in optimally utilizing investment technology.

In this context, AI has the potential to be an effective tool to mitigate the effects of behavioral bias by providing recommendations based on objective, real-time data. However, integrating technological advances with investor psychology remains a challenge. Rational technology must interact with users who have emotional tendencies. Therefore, it is crucial to design AI interfaces that are not only data-driven but also behavior-aware, so that the system can provide recommendations that take into account user behavioral tendencies.(Almansour et al., 2023).

In the context of Indonesia's dynamic capital market dominated by retail investors, the integration of advanced technology, namely AI, and an understanding of financial behavior is becoming increasingly urgent. While AI excels at data processing and algorithmic predictions, its effectiveness depends heavily on how these systems are designed to recognize and respond to irrational investor psychological tendencies.Nugraha et al. (2024)Therefore, a multidisciplinary approach is needed that bridges the gap between AI's mathematical logic and emotional biases in financial decision-making. This integration is crucial for creating systems that are more adaptive, empathetic, and relevant to local market characteristics, and not simply for improving the accuracy of predictive models.(Lazo & Ebardo, 2023; Torkian et al., 2025)In other words, AI in the capital market cannot be separated from the dimensions of investor behavior, which are an inherent part of the investment reality in Indonesia.

International research increasingly confirms that the application of artificial intelligence (AI) in stock trading can increase profitability through higher prediction accuracy and faster execution responses. For example, a study byBaffour Gyau et al. (2024)found that AI innovations have a significant positive impact on the financial performance of financial institutions in various countries, demonstrating increased operational efficiency and more manageable risks. However, when contrasted with the Indonesian context, there is little empirical research examining how managerial perceptions of AI influence the technology's effectiveness in improving stock trading profitability, particularly among local retail and institutional investors.

Several cross-national studies also link the quality of digital infrastructure and regulations to the rate of AI adoption in the financial sector. For example, an IMF study showed that infrastructure availability, quality data, and regulatory policies are key factors influencing a country's AI adoption. Likewise,Alhassan et al. (2025)In the Indonesian context, studies indicate that bandwidth limitations, digital inequality, and low literacy substantially hamper AI's potential to increase stock trading profitability. However, there is a lack of empirical research that simultaneously analyzes the influence of infrastructure, regulations, and managerial roles on AI-based trading profitability in the Indonesian capital market.

Managerial decisions also play a key role in the effectiveness of AI implementation in stock trading.(Csaszar et al., 2024a)found that the use of AI in strategic decision-making can improve the quality of decision-making outcomes, not just by accelerating the analysis process, but also by increasing investment profitability. The study indicates that when management understands and utilizes AI as a strategic tool, rather than simply a technical technology, trading speed, accuracy, and flexibility significantly improve. In other words, the quality of AI-powered managerial decision-making has been shown to improve an institution's financial performance.

Given the challenges and opportunities, the following research aims to explore how artificial intelligence (AI) algorithms can be applied to stock trading strategies in the Indonesian capital market. It will also evaluate the role of managers in ensuring that this technology is effectively

implemented to increase profitability for market participants. Furthermore, it will assess the regulatory and infrastructure challenges that need to be addressed to maximize the potential of AI in the Indonesian capital market, as well as the strategies needed to overcome these challenges.

METHODS

This research uses a quantitative approach. The population comprises all Indonesian capital market players who are directly or indirectly involved in the use of artificial intelligence (AI) technology in stock trading. This population includes individual investors, investment managers, financial analysts, and professionals from financial institutions who utilize AI technology to support investment decision-making.

This study employed purposive sampling as the sampling technique. The target number of respondents was 100. Primary data refers to information obtained directly by researchers from original sources, namely respondents. In the following research, primary data was obtained by distributing online questionnaires to respondents relevant to the research topic: Indonesian capital market players who implement or understand the application of artificial intelligence (AI) technology in stock trading strategies.

Secondary data refers to data obtained from pre-existing sources, not from respondents. This data includes information that has been uploaded or published, for example, in books, academic journals, annual reports, official publications from institutions such as the Financial Services Authority (OJK) and the Indonesia Stock Exchange (IDX), or other related articles. The data collection technique in this study was carried out quantitatively by distributing questionnaires. The analysis technique used was multiple linear regression analysis.

RESULTS AND DISCUSSION

Research Results

Distribution of Research Respondents

The following research employed a questionnaire distributed via Google Form to the respondents, namely Indonesian capital market players who are directly or indirectly involved in the use of artificial intelligence (AI) technology in stock trading. The study population included individual investors, investment managers, financial analysts, and professionals from financial institutions who utilize AI technology to support investment decision-making.

From the distributed questionnaires, 107 respondents were collected. However, for data analysis purposes, only 100 respondents were selected and processed in accordance with the established purposive sampling criteria. The distribution of respondents by category is as follows:

1. Individual Investors: 25 respondents (25%)
2. Investment Manager: 25 respondents (25%)
3. Financial Analyst: 25 respondents (25%)
4. Professionals from Financial Institutions: 25 respondents (25%)

Thus, the questionnaire return rate in the following study is:

Table 1
Distribution and Reception of Respondent Questionnaires

Sample	Amount
Questionnaires Distributed	107
Questionnaire Worthy of Analysis	**100**
100/107 = 93.46%	

Of this number, the data applied for further analysis were 100 questionnaires with a balanced distribution between respondent categories.

Descriptive Statistical Analysis

By Gender.

In the following study, gender was classified into two groups:

Table 2
Respondent Data Based on Gender

No	Gender	Number of Respondents	Presentation
1	Man	73	73%
2	Woman	27	27%
Total		100	100%

Based on Table 2, it can be seen that there were 73 male respondents and 27 female respondents. From the table above, it can be concluded that the majority of respondents were male.

Based on Age Range.

In the following study, the age range was classified into five groups:

Table 3
Respondent Data Based on Age Range

No	Age Range	Number of Respondents	Presentation
1	≤ 20	1	1%
2	21 - 29	34	34%
3	30 - 39	22	22%
4	40 - 49	28	28%
5	≥ 50	15	15%
		100	100%

Based on Table 3, the age ranges for the first age group, those under 20, comprised one person, or 1% of the total respondents. The second age group, those 21–29, had the largest number of respondents, with 34 people, or 34%. Furthermore, the third age group, those 30–39, comprised 22 people, or 22% of the total respondents. The fourth age group, those 40–49, comprised 28 respondents, or 28%. Finally, the fifth age group, those over 50, comprised 15 respondents, or 15%.

Based on Respondent Identity

In the following research, the respondents' identities were classified into four groups:

Table 4
Respondent Data Based on Respondent Identity

No	Respondent Identity	Number of Respondents	Presentation
1	Individual	25	25%
2	Investment Manager	25	25%
3	Financial Analysis	25	25%
4	Professionals From Financial Institutions	25	25%
		100	100%

In the following research, respondents' identities were grouped into four categories. First, respondents identified as Individuals, comprising 25 individuals, or 25% of the total respondents. Second, respondents from Investment Manager backgrounds also comprised 25 individuals, or 25%. Third, respondents with a background as Financial Analysts, comprised 25 individuals, or 25%. Fourth, respondents who were Professionals from Financial Institutions, comprised 25 individuals, or 25%. Thus, the distribution of respondents' identities in the following research was evenly distributed across the four categories, each contributing 25% of the total 100 respondents.

Descriptive Respondents' Answers

Descriptive statistics involve collecting and presenting data, and help explain the features of the object being studied using information from a sample or the entire population. Descriptive tests of respondents' answers aim to describe the high and low levels of respondents' answers regarding research variables on a scale of 5, namely 0.8, which is derived from 5 - 1; 4 / 5 = 0.8. Based on the results of these calculations, the criteria are obtained, namely in Table 4.5:

Table 5
Descriptive Test Criteria

No	Criteria	Information
1	1.00-1.79	Very Bad
2	1.80-2.59	Not good
3	2.60-3.39	Enough
4	3.40-4.19	Good
5	4.20-5.00	Very good

It can be seen that the criteria that determine the high and low answers from respondents regarding the variables in the research.

Descriptive Analysis of Artificial Intelligence (AI) Application Variables

Based on the responses collected, the distribution of how respondents rated the Implementation of Artificial Intelligence (AI) variable

Table 6
Results of Analysis of Artificial Intelligence (AI) Application Variables

No	**Indicator**	**Average**	**Information**

1	I feel that the use of AI technology in stock trading increases my confidence in the investment decisions made by the system.	3.33	Enough
2	I am more likely to follow the recommendations given by an AI system than the investment decisions I make myself.	3.30	Enough
3	I feel that the use of AI in market data analysis helps me make better investment decisions in volatile market conditions.	3.43	Good
4	I feel the AI system helps me reduce bias in investing, which is decisions influenced by emotions or speculation.	3.43	Good
5	I feel that the application of AI in the Indonesian capital market helps me avoid investment decisions that are influenced by psychological or emotional factors.	3.33	Enough
Average		3.36	Enough

Based on the results of Table 6, the descriptive analysis indicates that the average respondent rating for the Artificial Intelligence (AI) Implementation variable was 3.36, categorized as Sufficient. Examining each indicator, the respondents' assessments can be explained as follows:

1. The indicator "I feel that the use of AI technology in stock trading increases my confidence in the investment decisions taken by the system" received an average score of 3.33 with the criteria (Sufficient).
2. The indicator "I am more likely to follow recommendations given by the AI system compared to investment decisions I make myself" received an average score of 3.30 (Sufficient).
3. The indicator "I feel that the use of AI in market data analysis helps me make better investment decisions in fluctuating market conditions" obtained an average value of 3.43 (Good).
4. The indicator "I feel the AI system helps me reduce bias in investing, namely decisions influenced by emotions or speculation" also obtained an average score of 3.43 (Good).
5. The indicator "I feel that the application of AI in the Indonesian capital market helps me avoid investment factors that are influenced by psychological or emotional factors" received an average score of 3.33 (Sufficient).

Thus, it can be concluded that the Implementation of Artificial Intelligence (AI) variable obtained an average score of 3.36 (Sufficient). This means that respondents' perceptions of the benefits of AI in stock trading, both in terms of market analysis and reducing emotional bias, can

be categorized as generally positive. The following indicates that the use of AI is considered quite helpful in improving the quality of investment decisions through faster and more objective data analysis capabilities. However, some respondents still believe that the implementation of AI is not yet fully optimal in providing strong confidence in the results of investment decisions. In other words, the implementation of AI has been quite influential in supporting profitability in stock trading strategies, but still requires improvements in accuracy, transparency, and better integration to maximize profit potential sustainably.

Descriptive Analysis of Infrastructure Limitations and Human Resources Skills Variables

Based on the results of the responses collected, it can be stated that the distribution of respondents' assessments of the variables of Infrastructure Limitations and Human Resource Skills can be explained, which are presented in Table 7.

Table 7
Results of Analysis of Infrastructure Limitations and Human Resources Skills Variables

No	Indicator	Average	Information
1	I feel that the limited technological infrastructure in the Indonesian capital market affects my confidence in AI-based trading systems.	3.25	Enough
2	I feel that limited human resource skills in understanding AI technology can reduce investor confidence in decisions generated by AI systems.	3.28	Enough
3	I feel that inequality in access to AI technology is affecting my investment behavior and that of other investors.	3.25	Enough
4	I am concerned about my or other investors' lack of understanding in managing AI technology, which may influence investment decisions.	3.40	Good
5	I feel that the limitations of technological infrastructure reduce the accuracy and effectiveness of using AI in stock trading.	3.50	Good
Average		3.34	Enough

Based on the descriptive analysis results in Table 7, the average score for respondents regarding the Infrastructure and Human Resources Skills Limitations variable was 3.34, categorized as Adequate. Examining each indicator, respondents' assessments can be explained as follows:

1. The indicator “I feel that the limitations of technological infrastructure in the Indonesian

capital market affect my trust in AI-based trading systems" received an average score of 3.25 with the criteria (Sufficient).

2. The indicator "I feel that limited HR skills in understanding AI technology can reduce investor confidence in decisions generated by AI systems" received an average score of 3.28 (Sufficient).
3. The indicator "I feel that inequality in access to AI technology affects my investment behavior and that of other investors" received an average score of 3.25 (Sufficient).
4. The indicator "I feel worried about my or other investors' lack of understanding in managing AI technology, which could influence investment decisions" received an average score of 3.40 (Good).
5. The indicator "I feel that limited technological infrastructure reduces the accuracy and effectiveness of using AI in stock trading" obtained an average score of 3.50 (Good).

Thus, it can be concluded that the variable "Infrastructure Limitations and Human Resource Skills" obtained an average score of 3.34 (Sufficient). This means that respondents' perceptions of infrastructure and human resource skills barriers to AI implementation in the Indonesian capital market can still be categorized as positive, although these limitations are considered to significantly impact trust and the effectiveness of AI use. The following indicates that technological infrastructure readiness and human resource competency are crucial factors that must be continuously improved to optimize AI utilization in the capital market. Furthermore, existing limitations also impact profitability in stock trading strategies, because without adequate infrastructure support and strong human resource skills, AI's potential to generate more accurate and profitable investment decisions cannot be fully utilized.

Descriptive Analysis of Capital Market Regulation Variables

Based on the responses that have been collected, the distribution of respondents' assessments of the Capital Market Regulation variable can be explained, which is presented in table 4.8.

Table 8
Results of Capital Market Regulation Variable Analysis

No	Indicator	Average	Information
1	I would feel safer investing in the Indonesian capital market if there were clear and transparent regulations regarding the use of AI in stock trading.	3.46	Good
2	I trust the Indonesian capital market to regulate the use of AI in the stock market to protect investors from potential manipulation or system errors.	3.50	Good
3	I would be more likely to trust investment decisions generated by AI if there were regulations in place to ensure accountability and	3.41	Good

	transparency of the algorithms used.		
4	I feel that regulatory uncertainty regarding the use of AI in the capital markets is affecting my investment decisions or causing anxiety.	3.54	Good
5	I am more likely to invest in a regulated stock market with strong regulations regarding the use of AI technology than a less regulated market.	3.66	Good
Average		3.51	Good

Based on the descriptive analysis results in Table 8, the average respondent rating for the Capital Market Regulation variable is 3.51, categorized as Good. Examining each indicator, the respondents' assessments can be explained as follows:

1. The indicator "I feel safer investing in the Indonesian capital market if there are clear and transparent regulations regarding the use of AI in stock trading" received an average score of 3.46 with the criteria (Good).
2. The indicator "I trust the Indonesian capital market in regulating the use of AI in the stock market to protect investors from potential manipulation or system errors" received an average score of 3.50 (Good).
3. The indicator "I tend to have more confidence in investment decisions generated by AI if there are regulations that ensure the accountability and transparency of the algorithms applied" obtained an average score of 3.41 (Good).
4. The indicator "I feel that regulatory uncertainty regarding the use of AI in the capital market influences my investment decisions or causes anxiety" obtained an average score of 3.54 (Good).
5. The indicator "I am more likely to invest in a regulated stock market with strong regulations regarding the use of AI technology compared to a less regulated market" received an average score of 3.66 (Good).

Thus, it can be concluded that the Capital Market Regulation variable obtained an average score of 3.51 (Good). This means that respondents' perceptions of the importance of regulations in the implementation of AI in the Indonesian capital market can be categorized as positive. The majority of respondents assessed that clear, transparent, and robust regulations are influential in increasing the sense of security, trust, and interest in investing in AI-based capital markets. Furthermore, effective regulations are also considered to be related to increased profitability in stock trading strategies, as they provide a legal basis and certainty that encourages the optimal and more targeted implementation of AI technology.

Descriptive Analysis of Managerial Decision Variables

Based on the results of the respondents' responses that have been collected, the distribution of respondents' assessments of the Managerial Decision variable can be explained as

presented in Table 9.

Table 9
Results of Analysis of Managerial Decision Variables

No	Indicator	Average	Information
1	I feel that the investment manager's decision in choosing AI technology influences my confidence in the investment strategy implemented in the capital market.	3.29	Enough
2	I feel that the manager's decision to support the strategic implementation of AI technology reduces uncertainty and increases my confidence in the Indonesian capital market.	3.26	Enough
3	I feel that the involvement of managers in AI performance evaluation can influence my investment decisions and increase my confidence as an investor.	3.22	Enough
4	I tend to follow investment decisions made by managers who implement AI compared to managers who do not implement this technology.	3.40	Good
5	I feel that managerial decisions involving AI-based monitoring and risk management influence my investment decisions and behavior.	3.33	Enough
Average		3.30	Enough

Based on the results of the descriptive analysis in Table 9, the average respondent rating for the Managerial Decision variable is 3.30, categorized as Adequate. Examining each indicator, the respondents' assessments can be explained as follows:

1. The indicator "I feel that the investment manager's decision in choosing AI technology affects my confidence in the investment strategy implemented in the capital market" received an average score of 3.29 with the criteria (Sufficient).
2. The indicator “I feel that managers’ decisions that support the strategic implementation of AI technology reduce uncertainty and increase my confidence in the Indonesian capital market” received an average score of 3.26 (Sufficient).
3. The indicator “I feel that manager involvement in AI performance evaluation can influence my investment decisions and increase my confidence as an investor” obtained an average score of 3.22 (Sufficient).
4. On the indicator “I tend to follow investment decisions made by managers who implement

AI compared to managers who do not implement this technology" the average score was 3.40 (Good).

5. The indicator "I feel that managerial decisions involving AI-based risk monitoring and management influence my investment decisions and behavior" received an average score of 3.33 (Sufficient).

Thus, it can be concluded that the Managerial Decision variable obtained an average score of 3.30 (Sufficient). This means that respondents' perceptions of the role of managerial decisions in the implementation of AI in the Indonesian capital market can be categorized as positive, although generally still at a sufficient level. The following indicates that managerial involvement in the selection, implementation, and evaluation of AI technology is considered influential in influencing trust and investment behavior. Furthermore, appropriate managerial decisions in utilizing AI also influence the profitability of stock trading strategies, and respondents' confidence in this contribution is considered strong enough to support the effectiveness of AI implementation in the capital market.

Descriptive Analysis of Profitability Variables in Stock Trading Strategies

Based on the results of the responses that have been collected, it can be stated that the distribution of respondents' assessments of the Profitability variable in Stock Trading Strategies is presented in table 10.

Table 10
Results of Profitability Variable Analysis in Stock Trading Strategies

No	Indicator	Average	Information
1	I feel that the application of AI technology in stock trading helps increase the profitability of my investments.	3.54	Good
2	I believe that limited infrastructure and adequate human resource skills impact the profitability of AI-based stock trading strategies.	3.40	Good
3	I believe that clear and robust capital market regulations can increase the profitability of using AI for stock trading.	3.66	Good
4	I believe that making the right managerial decisions in selecting and managing AI can significantly increase the profitability of stock trading strategies.	3.43	Good
5	I believe that overall, the use of AI in stock trading has significantly contributed to increasing the profitability of my investments.	3.52	Good

Average	3.51	Good

Based on the results of the descriptive analysis in Table 10, the average respondent rating for the Profitability variable in Stock Trading Strategies was 3.51, categorized as Good. Examining each indicator, the respondents' assessments can be explained as follows:

1. The indicator "I feel that the application of AI technology in stock trading helps increase the profitability of my investments" received an average score of 3.54 with the criteria (Good).
2. The indicator "I assess that the limitations of adequate infrastructure and human resource skills affect the profitability of AI-based stock trading strategies" received an average score of 3.40 (Good).
3. The indicator "I believe that clear and strong capital market regulations can increase profitability in using AI for stock trading" obtained an average score of 3.66 (Good).
4. The indicator "I feel that the right managerial decisions in selecting and managing AI have an impact on increasing the profitability of stock trading strategies" obtained an average score of 3.43 (Good).
5. The indicator "I assess that overall the use of AI in stock trading has significantly contributed to increasing the profitability of my investments" obtained an average score of 3.52 (Good).

Thus, it can be concluded that the Profitability variable in Stock Trading Strategies achieved an average score of 3.51 (Good). This means that respondents' perceptions of AI's contribution to improving the profitability of stock trading strategies can be categorized as positive, with AI deemed capable of providing tangible benefits through analytical support, clear regulations, and sound managerial decisions in its implementation.

Quantitative Test Results

The analysis tool applied in the following research is SPSS statistical software version 25.

Validity Test

The validity test in the following study applies the Pearson Product Moment correlation technique. The research instrument is declared valid if the calculated R value is greater than the R table and has a significance value (p-value) <0.05. The number of respondents in the following study was 100 people, so the r table value at a significance level of 5% is 0.196. Thus, each statement item in the questionnaire is declared valid if its correlation coefficient is higher than the r table value. The following presents the results of the validity test for each research variable indicator:

Table 11
Validity Test Results

	Variable Indicator	Question Items	R Count	R Table	Valid R count > R table
Variable X	Application of Artificial Intelligence (AI)	X 1.1	0.688	0.196	Valid
		X 1.2	0.591		Valid
		X 1.3	0.717		Valid
		X 1.4	0.634		Valid
		X 1.5	0.690		Valid
	Infrastructure and Human Resource Skills Limitations	X 2.1	0.741		Valid
		X 2.2	0.612		Valid
		X 2.3	0.701		Valid

		X 2.4	0.746		Valid
		X 2.5	0.734		Valid
	Capital Market Regulation	X 3.1	0.756		Valid
		X 3.2	0.702		Valid
		X 3.3	0.698		Valid
		X 3.4	0.750		Valid
		X 3.5	0.682		Valid
	Managerial Decisions	X 4.1	0.699		Valid
		X 4.2	0.734		Valid
		X 4.3	0.746		Valid
		X 4.4	0.659		Valid
		X 4.5	0.708		Valid
Variable Y	Profitability in Stock Trading Strategy	Y 1.1	0.750		Valid
		Y 1.2	0.659		Valid
		Y 1.3	0.682		Valid
		Y 1.4	0.717		Valid
		Y 1.5	0.760		Valid

Based on table 11, the variable statements of Artificial Intelligence (AI) Implementation, Infrastructure Limitations and HR Skills, Capital Market Regulations, Managerial Decisions, Profitability in Stock Trading Strategies have a calculated R score > R table, namely the calculated R is higher than 0.196 until all statement items are stated until all statement items are declared valid or relevant based on the measurement objectives.

Reliability Test

Reliability testing was conducted using the Cronbach's Alpha analysis method. In the following study, 100 online questionnaires were distributed to respondents. With a total sample size of N = 100, the Cronbach's Alpha score was >0.70. Each statement item was considered reliable if the Cronbach's Alpha value was >0.70. The following are the results of the reliability test:

Table 12
Reliability Test Results

Number of Questions	Cronbach's Alpha	Condition	Information
25	0.957	0.70	Reliable

Based on table 12, it is known that the Cronbach's Alpha score is 0.957 and the number of statement items is 25. Based on this, it can be concluded that it can be taken as reliable because 0.957 > 0.70.

Classical Assumption Test

Normality Test

Based on the Kolmogorov-Smirnov test, the Asymp. Sig. value is 0.194 > 0.05. This indicates that the residuals are normally distributed.

Table 13
One-Sample Kolmogorov-Smirnov Test

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
N		100
Normal Parametersa,b	Mean	.0000000
	Standard Deviation	1.61489593
Most Extreme Differences	Absolute	.074
	Positive	.074
	Negative	-.033
Test Statistics		.074
Asymp. Sig. (2-tailed)		.194c
a. Test distribution is Normal.		
b. Calculated from data.		
c. Lilliefors Significance Correction.		

Multicollinearity Test

Based on the Tolerance and VIF values, all independent variables have a Tolerance > 0.1 and a VIF < 10 (Application of Artificial Intelligence AI = 2.350; Infrastructure Limitations and HR Skills = 2.625; Capital Market Regulation = 2.476; Managerial Decisions = 2.346). The following matters mean that there is no multicollinearity problem.

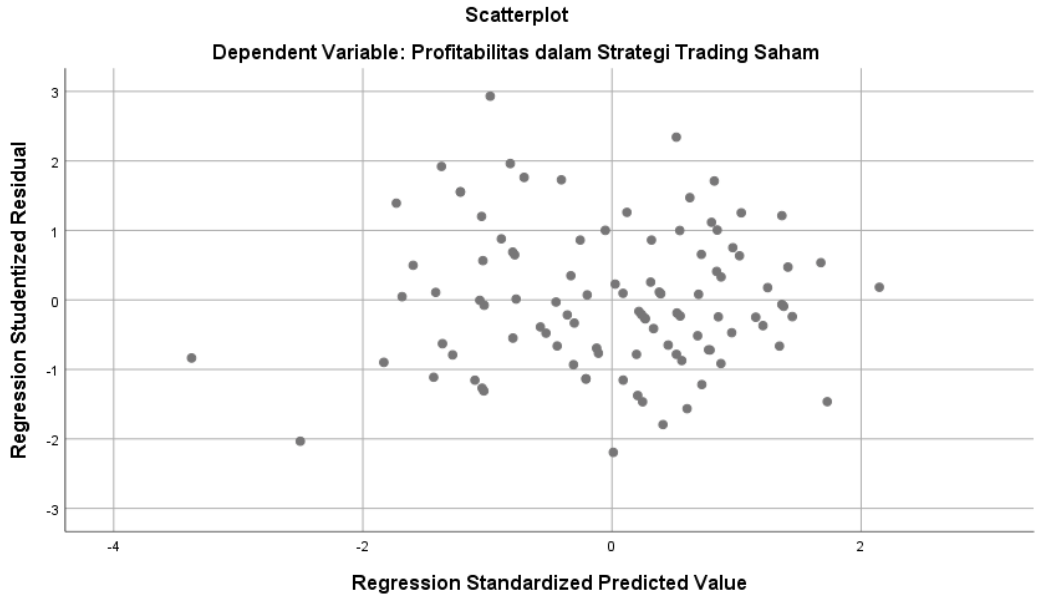
Table 14
Coefficientsa

Coefficientsa								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1,065	.846		1,258	.212		
	Application of Artificial Intelligence (AI)	.195	.068	.196	2,856	.005	.426	2,350
	Infrastructure and Human Resource Skills Limitations	.026	.065	.029	.396	.693	.381	2,625
	Capital Market Regulation	.438	.065	.471	6,700	.000	.404	2,476
	Managerial Decisions	.308	.066	.320	4,675	.000	.426	2,346
a. Dependent Variable: Profitability in Stock Trading Strategy								

Heteroscedasticity Test

Based on the residual scatterplot, the points are randomly distributed and do not form a

specific pattern. This indicates that there is no heteroscedasticity in the regression model, making it suitable for use.



Multiple Linear Regression Analysis

Coefficient of Determination

Based on the Model Summary table, the R value is 0.900, meaning that there is a very strong relationship between the independent variables (AI Implementation, Infrastructure & HR Limitations, Capital Market Regulations, and Managerial Decisions) and the dependent variable (Profitability of Stock Trading Strategies).

The R Square (R^2) value = 0.810 indicates that 81% of the variation in changes in the profitability of stock trading strategies can be explained by the four independent variables, while the remaining 19% is influenced by other variables not included in the following research model.

The Adjusted R^2 value = 0.802 confirms that the applied regression model is quite good and does not experience bias even though the number of independent variables is quite large.

Table 15

Model Summary

Model Summary					
Model	R	R Square	Adjusted R Square	Standard Error of the Estimate	Durbin-Watson
1	.900a	.810	.802	1,649	1,792
a. Predictors: (Constant), Managerial Decisions, Artificial Intelligence (AI) Application, Capital Market Regulation, Infrastructure Limitations and HR Skills					
b. Dependent Variable: Profitability in Stock Trading Strategy					

F test

In the ANOVA table, the F test results indicate an F-count value = 101.425 with a significance value = 0.000 (< 0.05).

The following indicates that all four independent variables (AI, Infrastructure & HR,

Regulation, and Managerial Decisions) simultaneously have a significant effect on the profitability of stock trading strategies. In other words, the regression model developed is suitable for explaining the dependent variables.

Table 16
ANOVA

Table 4.16 ANOVAa						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1102,569	4	275,642	101,425	.000b
	Residual	258,181	95	2,718		
	Total	1360,750	99			
a. Dependent Variable: Profitability in Stock Trading Strategy						
b. Predictors: (Constant), Managerial Decisions, Artificial Intelligence (AI) Application, Capital Market Regulation, Infrastructure Limitations and HR Skills						

T-test

Table 17
Coefficientsa

Table 4.17 Coefficientsa						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1,065	.846		1,258	.212
	Application of Artificial Intelligence (AI)	.195	.068	.196	2,856	.005
	Infrastructure and Human Resource Skills Limitations	.026	.065	.029	.396	.693
	Capital Market Regulation	.438	.065	.471	6,700	.000
	Managerial Decisions	.308	.066	.320	4,675	.000
a. Dependent Variable: Profitability in Stock Trading Strategy						

Based on the Coefficients Table, the results are as below:

1. Implementation of Artificial Intelligence (X1) → The coefficient value is 0.195 with a t-test of 2.856 and a Sig. of 0.005 (<0.05). This indicates that the implementation of AI has a positive and significant impact on profitability. The greater the implementation of AI in a trading strategy, the higher the level of profitability that can be achieved.
2. Infrastructure and Human Resource Limitations (X2) → The coefficient value is 0.026 with a t-test of 0.396 and a Sig. of 0.693 (>0.05). These results indicate that infrastructure and human resource skill limitations do not significantly impact profitability. This means that constraints in this aspect are not the primary factor determining the profitability of stock trading strategies.
3. Capital Market Regulation (X3) → The coefficient value is 0.438 with a t-value of 6.700 and a significance level of 0.000 (<0.05). These results demonstrate that capital market regulation has a positive and significant impact on profitability. Clear, transparent, and efficient

regulations will increase the profitability of stock trading strategies.

4. Managerial Decisions (X4) → The coefficient value is 0.308 with a t-value of 4.675 and a Sig. of 0.000 (<0.05). The following indicates that managerial decisions have a positive and significant effect on profitability. Appropriate decisions in investment strategy, risk management, and capital allocation will support increased profitability.

Multiple Linear Regression Equation

Based on the results of multiple linear regression analysis, the regression equation is obtained as below:

$$Y = 1.065 + 0.195X_1 + 0.026X_2 + 0.438X_3 + 0.308X_4$$

Information:

Y = Profitability in Stock Trading Strategy

X_1= Application of Artificial Intelligence (AI)

X_2= Limited Infrastructure and Human Resources Skills

X_3= Capital Market Regulation

X_4= Managerial Decisions

Interpretation of regression coefficients:

1. The constant value of 1.065 indicates that if all independent variables are zero, then profitability remains at 1.065.
2. X $Coefficient_1$(0.195) means that every 1 unit increase in AI Artificial Intelligence Implementation will increase profitability by 0.195 units.
3. X $Coefficient_2$(0.026) is not significant, so that Infrastructure Limitations and HR Skills do not have a real influence on profitability.
4. X $Coefficient_3$(0.438) indicates that every 1 unit increase in Capital Market Regulation will increase profitability by 0.438 units.

X $Coefficient_4$(0.308) means that every 1 unit increase in Managerial Decisions will increase profitability by 0.308 units.

DISCUSSION

The Impact of Artificial Intelligence (AI) Application on Profitability in Stock Trading Strategies

The research findings indicate that the application of artificial intelligence (AI) has a positive and significant impact on profitability in stock trading strategies, with a regression coefficient of 0.195, a t-test of 2.856, and a significance level of 0.005 (<0.05). This demonstrates that the application of AI significantly contributes to increasing profitability, and the research hypothesis is accepted.

More in-depth, these findings indicate that the greater the use of AI technology in trading strategies, the greater the potential profits. AI has been shown to improve the quality of investment decisions because it operates with greater accuracy and speed than manual analysis. These results also demonstrate that AI can be a solution amidst the high volatility of the Indonesian capital market.

This finding is in line withBhardwaj et al. (2024)AndTorkian et al. (2025)which states that AI can increase the accuracy of stock price predictions through machine learning and deep learning, as well as reduce investor behavioral bias.(Almansour et al., 2023)also emphasized that

AI can mitigate the impact of cognitive biases, such as overconfidence and herd behavior, resulting in more objective investment decisions. In other words, the following research findings strengthen the empirical evidence that AI has a positive impact on profitability.

The practical implication of these findings is the need to accelerate the adoption of AI technology by investors and investment managers in Indonesia. AI is not merely a technical tool, but also a strategic instrument that can create competitive advantage. Financial institutions and securities firms need to allocate resources for training and AI system development to make investment strategies more adaptive, efficient, and sustainable.

The Impact of Infrastructure Limitations and Human Resource Skills on Profitability in Stock Trading Strategies

The research findings indicate that limited infrastructure and human resource skills do not significantly impact profitability in stock trading strategies, with a regression coefficient of 0.026, a t-test of 0.396, and a significance level of 0.693 (>0.05). Therefore, the hypothesis confirming a significant influence is rejected.

The significance of these results is that limited infrastructure and human resources are not the primary factors determining profitability among the research respondents. This could be because most respondents already have access to adequate infrastructure and basic technological skills, making infrastructure and human resource constraints no longer a significant barrier to profitability.

However, these results differ from studiesSuryono et al. (2021)as well asMaspul & Putri. (2025)which emphasizes that limited digital infrastructure and low financial technology literacy are serious barriers to AI adoption. This difference can be explained by the context of the following study: respondents were capital market players who were relatively familiar with technology, so the negative impact of limited infrastructure and human resources was not as pronounced.

The implication is that, even though empirical results indicate insignificant results, increasing human resource capacity and infrastructure still requires serious attention. Education and training on AI in the financial sector, along with the equitable expansion of digital infrastructure, will ensure this technology is widely accessible, not only to institutional investors but also to general investors. This way, profitability can be increased in a more inclusive and sustainable manner.

The Influence of Capital Market Regulations on Profitability in Stock Trading Strategies

The research findings indicate that capital market regulations have a positive and significant effect on profitability in stock trading strategies, with a regression coefficient of 0.438, a t-test of 6.700, and a significance level of 0.000 (<0.05). These results demonstrate that the better the capital market regulations implemented, the greater the profitability achieved in stock trading strategies, thus supporting the research hypothesis.

The significance of these results is that capital market regulations play a crucial role in creating a healthy, transparent, and fair investment environment. Clear regulations boost investor confidence, prevent the misuse of AI technology, and provide legal protection for market participants. Strong regulations contribute to greater capital market stability, enabling stock trading strategies to generate more consistent profitability.

This finding is consistent withDanielsson & Uthemann Bank Of Canada (2024)as well

asTartaro et al. (2024)which emphasizes the importance of adaptive regulation in maintaining market stability amidst the rapid development of AI technology. Inadequate regulation risks leading to market manipulation and investor distrust. Therefore, the following research findings reinforce the urgency of comprehensive policies for AI governance in the Indonesian capital market.

The implication of these results is the need to strengthen the role of the regulator, namely the Financial Services Authority (OJK), in developing technical regulations regarding the use of AI in the capital market. This includes algorithm transparency, AI system audits, and investor protection mechanisms. With robust regulations, AI can be utilized ethically and optimally, increasing profitability while maintaining public trust in the Indonesian capital market.

The Influence of Managerial Decisions on Profitability in Stock Trading Strategies

The research findings indicate that managerial decisions have a positive and significant impact on profitability, with a regression coefficient of 0.308, a t-test of 4.675, and a significance level of 0.000 (<0.05). This means that the more accurate the decisions made by investment managers, the greater the profitability, and the research hypothesis is accepted.

In essence, the following points indicate that despite the significant role AI technology plays, human judgment remains a key factor in the success of a stock trading strategy. AI merely serves as an analytical tool, while the final decision rests with managers who understand the business context, market risks, and investor behavior. Therefore, the quality of managerial decisions is key to the success of AI implementation for profitability.

These findings support researchCsaszar et al. (2024)AndCathy et al. (2025)which emphasizes that the combination of AI and managerial leadership results in better investment performance. Visionary managers are able to integrate AI into business strategies, increase investor confidence, and reduce resistance to the use of new technologies. In other words, the quality of managerial decisions strengthens the effectiveness of AI in increasing profitability.

The practical implication is that investment managers in Indonesia need to develop strategic competencies and technological literacy to optimize the use of AI. Companies should provide managerial training covering the technical, ethical, and strategic aspects of AI use in the capital markets. With adaptive leadership, AI technology can be optimally utilized to boost profitability and strengthen competitiveness in the digital era.

CONCLUSION

Based on the research findings that have been explained in the previous chapters, the researcher draws several conclusions, including:

1. The application of artificial intelligence (AI) has been proven to have a positive and significant impact on profitability in stock trading strategies. The following indicates that AI can improve accuracy, speed, and objectivity in investment decision-making.
2. Limited infrastructure and human resource skills did not significantly impact profitability in stock trading strategies. This indicates that these factors are not major obstacles for research respondents, although theoretically, they still have the potential to impact the effectiveness of AI utilization.
3. Capital market regulations have a positive and significant impact on the profitability of stock trading strategies. Good regulations promote transparency, investor confidence, and the more ethical and accountable use of technology.

Managerial decisions have a positive and significant impact on profitability in stock trading strategies. Leadership, strategy, and decision-making quality have been shown to play a crucial role in optimizing AI implementation to support profitability.

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