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THE ROLE OF FINANCIAL ANALYTICS IN INVESTMENT DECISION MAKING

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Abstract:

Purpose: This study looks at the "Human-Technology Paradox," where large investments in Analytics and Big Data do not always lead to better investment outcomes. The research shifts focus from just the accuracy of algorithms to the important role of Human Analytical Skills in investment decision-making.

Design/Methodology/Approach: Based on a systematic review developed a conceptual model to explore how four independent variables—Financial Analytics Sophistication, Analytical Tools, Access to Diverse Data, and Data Quality—affect the quality of investment decisions, with Analytical Skills acting as a mediator. The study suggests a framework where technology is not a replacement but a tool that supports human intelligence.

Findings: High-quality investment decisions happen only when analytics resources are designed to improve human skills. The research identifies five main hypotheses: the positive link between analytics sophistication and human skills; the role of tools in enhancing skills; the effect of data diversity on complex processing; the importance of data quality for skill effectiveness; and the direct connection between human skills and decision-making quality.

Originality/Value: This paper addresses a notable gap in research by highlighting Human Analytical Skills as a vital link between advanced technology and strategic success. It offers a guide to move past merely adopting technology towards a model that promotes collaboration between humans and machines, ensuring that data-driven insights effectively lead to sustained profitability and strategic flexibility.

Keywords: Financial Analytics, Financial Analytics Sophistication, Financial Analytical Tools, Investment Decision-Making, Human Analytical Skills, Diverse Data, Big Data, Data Quality.

1. INTRODUCTION

The modern financial landscape is changing quickly because of the growth of Big Data and Analytics. Today's market is marked by high volatility and overwhelming amounts of information. Traditional ways of making decisions no longer suffice. Because of this, people are increasingly using Financial Analytics to handle complexity.

Even with the rapid use of advanced tools, such as Machine Learning models and Prescriptive Analytics, a major challenge has arisen: the "Human-Technology Paradox." People are investing heavily in technology, but the quality of their investment decisions still relies heavily on human input.

Many are realizing that technology alone will not solve all problems; its value is revealed only when it effectively boosts Human Analytical Skills.

This article looks at the relationship between the sophistication of financial analytics and investment results. Instead of viewing technology as a direct source of performance, this study suggests that Human Analytical Skills are the key connection. By examining factors like Data Quality, Access to Diverse Data, and Analytical Tools, we explore how these elements enhance human ability to make high-quality, unbiased investment decisions.

Through this perspective, we hope to provide a guide which will not only adopt new technology but also develop the specific human skills needed to turn data into strategic success.

2. REVIEW OF LITERATURE

1. Azeez Zainab Folakemi, (2025): The Role of Financial Analytics in Corporate Decision-Making.

To improve investment strategies and corporate decision-making, this study argues that financial analytics, including machine learning and enhanced forecasting, are essential. By facilitating proactive avoidance of fiscal vulnerabilities, it serves as a crucial tool for attaining sustainable profitability and strategic agility.

2. O. Stepanyuk, Y. Senyk, K. Lishchynska, M. Baluk, A. Senyk, A. Yakubovska, (2025): Application of special data analysis methods for effective investment decisions.

To analyse stock market dynamics and forecast future prices and expected returns, this study uses data mining and an LSTM neural network model. It provides a vital tool for risk-averse investors by achieving the ideal investment portfolio allocation targeted at maximising the Sharpe ratio.

3. Purna Wirawan, (2023): Leveraging Predictive Analytics in Financing Decision-Making for Comparative Analysis and Optimization.

This study demonstrates that employing sophisticated algorithms to optimise investment management and improve credit risk assessment, predictive analytics greatly improves financing decision-making. Strong data governance and thorough ethical thought are necessary to fully realise these benefits, such as optimising asset allocation.

4. Qing Zhou, (2025): Application of Big Data Analytics in Financial Decision-Making: Integrating Computational Models to Optimize Investment Strategies.

This paper describes the Adaptive Investment Optimisation Model (AIOM) and the Market-Aware Optimisation Framework (MOF) for dynamically optimising investment strategies. The model captures dynamic market behaviour and improves portfolio management with sophisticated risk controls like CVaR by combining deep learning and reinforcement learning.

5. Sangeetha Rangasamy, Kavitha Rajamohan, Anju Kalluvelil Janardhanan, and K. S. Manu, (2023): The Role of Financial Analytics in Decision-Making for Better Firm Performance.

This chapter focusses on financial analytics, using AI/ML and Big Data to maximise profit, reduce expenses, and improve business performance. It describes aspects like budgetary control analytics and general ledger, which offer insights for risk management, cash flow optimisation, and strategic resource allocation.

6. Nneka Adaobi Ochuba, Olukunle Oladipupo Amoo, Enyinaya Stefano Okafor, Favour Oluwadamilare Usman, & Olatunji Akinrinola, (2024): Conceptual Development and Financial Analytics for Strategic Decision-Making in Telecommunications, Focusing on Assessing Investment Opportunities and Managing Risks in Satellite Projects.

The importance of financial analytics in strategic decision-making in the telecommunications industry, particularly for satellite projects, is highlighted in this paper. It emphasises the use of scenario analysis and financial modelling to assess investment viability and reduce complicated risks such technological obsolescence and regulatory changes.

7. Olha Chernysh, Oleksandr Smishko, Yuliia Koverninska, Mykola Prokopenko and Ihor Pistunov, (2024): The Role of Artificial Intelligence in Financial Analysis and Forecasting: Using Data and Algorithms.

This study demonstrates that by identifying complicated nonlinear patterns in massive datasets, artificial intelligence (AI) and machine learning (ML) greatly improve the accuracy of financial forecasting and difficult decision-making. AI-powered systems improve risk assessment and allow algorithmic trading to carry out quick transactions for the highest profit and lowest risk.

8. Oyewale Oyedokun, Somto Emmanuel Ewim and Oluwaseun Peter Oyeyemi, (2024): Leveraging advanced financial analytics for predictive risk management and strategic decision-making in global markets.

This study looks at how sophisticated financial analytics (ML, BDA) might improve strategic decision-making and predictive risk management, especially in unstable international markets. By predicting changes in the market, modifying investment portfolios, and allocating resources optimally, it enables organisations to transition from reactive to proactive risk reduction.

9. Waheeduddin Khadri Syed, Kavitha Reddy Janamolla, (2024): How AI-driven Robo-Advisors Impact Investment Decision-making and Portfolio Performance in the Financial Sector: A Comprehensive Analysis.

According to this report, AI-driven robo-advisors use big data and machine learning to transform investment decision-making by improving accuracy, speed, and personalisation. Through better risk management and optimised diversification techniques, these technologies reduce human cognitive biases and enhance portfolio performance.

10. Oluchukwu Modesta Oluoha, Abisola Odeshina, Oluwatosin Reis, Friday Okpeke, Verlinda Attipoe, Omamode Henry Orieno, (2022): Optimizing Business Decision-Making with Advanced Data Analytics Techniques.

By providing real-time insights and automating data processing, this study investigates how integrating sophisticated data analytics (ML, AI, Big Data) optimises corporate decision-making. It looks at the

descriptive to prescriptive analytical hierarchy that businesses employ to spot patterns, reduce risk, and improve resource allocation for strategic expansion.

11. Oluwafunmike O. Elumilade, Ibidapo Abiodun Ogundeji, Godwin Ozoemenam Achumie, Hope Ehiaghe Omokhoa, Bamidele Michael Omowole, (2023): The Role of Data Analytics in Strengthening Financial Risk Assessment and Strategic Decision-Making.

This research demonstrates that by utilising predictive models and real-time processing, data analytics enhances financial risk assessment and strategic decision-making. It describes how these methods use AI-driven scenario analysis to improve creditworthiness evaluation, optimise investment portfolios, and guarantee regulatory compliance.

12. Dr Ahmad Khalid Khan, (2025): The Role of Financial Analytics in Business Decision-Making and Strategic Planning.

With a focus on risk management and cost optimisation, this empirical study explores how predictive and prescriptive models improve financial decision-making. It evaluates investment risks using time series forecasting and Monte Carlo simulations, and it suggests using frameworks like Decision Intelligence (DIF) for strategic investment advice.

13. Md Arman Hossain, (2025): Artificial Intelligence-Driven Financial Analytics Models for Predicting Market Risk and Investment Decisions in U.S. Enterprises.

This systematic study describes how AI-driven models (ML, deep learning) improve financial analytics to forecast market risk and guide investment choices in US businesses. These models greatly enhance portfolio optimisation and asset allocation by achieving improved predicted accuracy for risk indicators like VaR and ES through the integration of high-dimensional and textual data.

14. Georgios L. Thanasas, Georgios Kampiotis, (2024): The Role of Big Data Analytics in Financial Decision-Making and Strategic Accounting.

With a focus on improved financial forecasting accuracy and fraud detection, this study explores how BDA is changing strategic accounting and financial decision-making. Large datasets are processed by BDA using tools like machine learning and Apache Spark to enhance real-time financial reporting, resulting in more flexible resource allocation and operational effectiveness.

15. Dr Suraksha Sharma, (2018): The Role of Big Data Analytics in Financial Decision Making: An Indian Perspective.

Big Data Analytics (BDA) is portrayed as a key instrument for improving financial decision-making, particularly by offering precise, instantaneous insights to enhance investment strategies and reduce risks. By utilising a variety of data sources, the approach challenges conventional models such as the Efficient Market Hypothesis and optimises investment portfolios through predictive analytics.

16. Konda Aashish Reddy, Kanderi Nitheesh Kumar, Althi Giri Venkata Sai Manendra, Kalangi Venkata Nakul, Dr. V. N. Sailaja, (2025): Role of Financial Analytics in Business Decision-Making.

This study looks at financial analytics (AI, BDA, and ML) as a proactive decision-making tool that helps businesses control risks and increase forecasting precision. It places a strong emphasis on optimising budgeting, investment strategies, and fraud detection for long-term competitiveness by prediction models and risk assessment techniques like Monte Carlo simulation.

17. Dr. Ganesh Lande, Dr. Anil Poman, Prof. Shivganga C. Maindari, Prof. Sagar Satpute, Ritwika Haldar, (2023): Financial Analytics in Investment Portfolio Management: A Tool for Efficient Decision Making.

With a focus on risk and opportunity optimisation, this essay emphasises financial analytics as a crucial instrument for effective investment portfolio management. To guarantee appropriate diversification and reduce behavioural biases in decision-making, it incorporates quantitative models, machine learning, and artificial intelligence techniques employing real-time and alternative data.

18. Mary Feyikemi Olagoke, (2025): The Role of Predictive Analytics in Enhancing Financial Decision-Making and Risk Management.

This paper demonstrates that using ML-driven models to improve financial decision-making and risk management requires predictive analytics (PA). By enhancing credit scoring, fraud detection, and liquidity forecasting, PA significantly outperforms conventional static models in providing strong control over credit, market, operational, and liquidity risks.

19. Dr. Vishweswar Sastry V N, Dr. Guruprasad Desai D.R, Dr. Hemanth Kumar, Manjushree M, (2024): Big Data Analytics in Finance: Predictive Modelling for Investment Strategies.

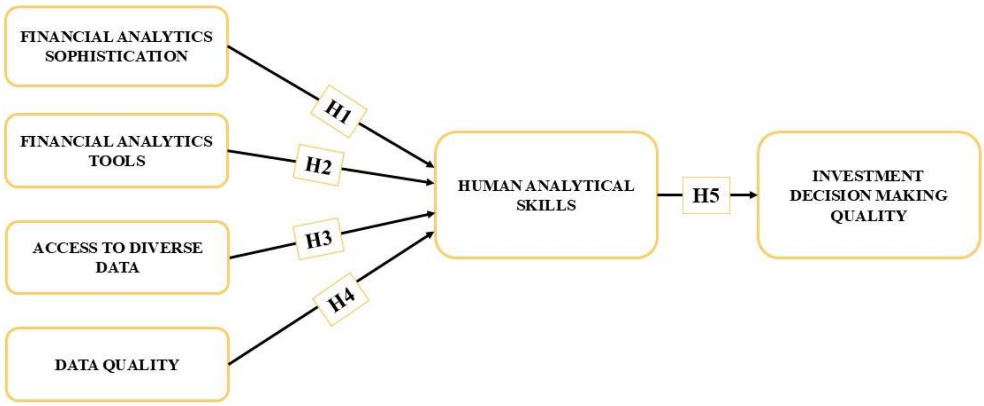
This study studies predictive forecasting for investing strategies utilising Big Data Analytics, combining ML models like LSTM and SVM. To forecast market trends and optimise investment portfolios, these models combine conventional financial data with nontraditional sources (such as social media sentiment and satellite imagery). They frequently outperform benchmarks in terms of returns.

20. Bambang Mahmudi, (2024): Exploring the Landscape of Big Data Analytics in Financial Decision Making.

The success of Big Data analytics in corporate financial decision-making is comprehensively investigated in this study. It concludes that optimising BDA's efficacy in improving risk assessment and forecasting accuracy requires strong analytical abilities, strong security, sufficient technology infrastructure, and excellent data quality.

3. RESEARCH METHODOLOGY

- **CONCEPTUAL MODEL**



- **PROBLEM STATEMENT**

A "Human-Technology Paradox" has arisen because of the quick integration of Analytics and Big Data in finance: people are making significant investments in advanced analytics, but investment choices are frequently not optimal. The gap between technical outputs and human interpretation is the root of the issue. Technology remains a "black box," resulting in data overload rather than better decision-making quality, if it is unclear how these tools are directly related to human analytical skills.

- **RESEARCH GAP**

Although earlier studies concentrate on the significance of Big Data infrastructure and the technical accuracy of algorithms, there remains a crucial gap concerning the Human Element. Most of the research ignores human analytical skills as a mediator and instead views technology as a direct driver of performance. Empirical evidence about how data quality and tool sophistication specifically affect a human analyst's capacity to digest complex information and make impartial, high-quality decisions is lacking.

- **HYPOTHESES**

- **H1:** The level of Financial Analytics Sophistication (e.g., use of AI/ML, prescriptive modelling) is positively correlated with and enhances Human Analytical Skills in investment contexts.
- **H2:** The availability and utilization of Financial Analytics Tools (e.g., data visualization, forecasting software) are positively correlated with and enhance Human Analytical Skills.
- **H3:** Greater Access to Diverse Data (e.g., Big Data, alternative data) is positively correlated with and enhances Human Analytical Skills in processing complex information.
- **H4:** High Data Quality (accuracy, completeness, timeliness) is positively correlated with and enhances the effectiveness of Human Analytical Skills.
- **H5:** Human Analytical Skills significantly and positively influence Investment Decision Making Quality.

- **OBJECTIVES OF THE STUDY**
  - Examine how human analytical skills are affected by financial analytics resources.
  - Analyse how human analytical skills affect the quality of investment decisions.
  - Analyse how financial analytics affects the quality of decisions.
- **DATA ANALYSIS**

This study uses a quantitative, cross-sectional research design to look at the role of financial analytics in investment decision-making, focusing on human analytical skills. The research relies on numerical data and one-time observations, helping to identify relationships and patterns among key variables like financial analytics resources, human analytical skills, and investment decision quality.

Data was taken from 186 respondents through a structured questionnaire sent via Google Forms, making it easy to access while keeping responses confidential. A convenience sampling method targeted individuals familiar with financial analytics and investment decision-making. The questionnaire included a five-point Likert scale from 1 (Strongly Agree) to 5 (Strongly Disagree), with multiple items for each construct.

Data analysis was done using reliability analysis with Cronbach's Alpha, correlation analysis, and regression techniques for testing. Ethical standards were followed throughout the study, ensuring voluntary participation, informed consent, anonymity, and that data was used solely for academic and research purposes.

- **RELIABILITY ANALYSIS**

Variables	No. of Items	Cronbach's Alpha
Awareness of Financial Analytics and Financial Analytical Tools.	5	0.818
Impact of Financial Analytics Resources on Human Analytical Skills.	5	0.882
Role of Human Analytical Skills in Investment Decision-Making Quality.	5	0.720
Impact of Financial Analytics on Investment Decision-Making Quality.	5	0.747

Interpretation

The reliability analysis demonstrates acceptable to high internal consistency across all study constructs. All Cronbach's alpha values exceed the acceptable threshold of 0.70 with Cronbach's alpha values ranging from 0.720 to 0.882. The construct *Impact of Financial Analytics Resources on Human Analytical Skills* exhibits the highest reliability ($\alpha = 0.882$), indicating excellent consistency among its items. *Awareness of Financial Analytics and*

Analytical Tools also shows strong reliability (α = 0.818). The constructs *Role of Human Analytical Skills in Investment Decision-Making Quality* (α = 0.720) and *Impact of Financial Analytics on Investment Decision-Making Quality* (α = 0.747) remain within acceptable limits. Overall, these results confirm the robustness of the measurement scales and support their suitability for further statistical analyses.

- **REGRESSION**
- **Objective 1:** Examine how human analytical skills are affected by financial analytics resources.

Variables	Beta Coefficient	R^2 Value	P-Value
Financial analytics sophistication, Financial analytical tools, Access to Diverse Data, Quality Data and Human Analytical Skills.	0.390 0.463	0.593	0.000

Interpretation

The multiple regression results indicate that financial analytics sophistication, use of financial analytics tools, access to diverse data, and data quality have a significant and positive influence on Human analytical skills. The regression results show that all independent variables have a strong and statistically significant impact on Human Analytical Skills as indicated by p value 0.000. Overall, the findings confirm that advanced financial analytics capabilities and high-quality, diverse data significantly enhance human analytical skills, thereby supporting more effective data-driven investment decision-making.

- **Objective 2:** Analyse how human analytical skills affect the quality of investment decisions.

Variables	Beta Coefficient	R^2 Value	P-Value
Human Analytical Skills and Investment Decision Making Quality.	0.668	0.446	0.000

Interpretation

The results confirm that human analytical skills significantly and positively influence investment decision-making quality ($R^2 = 0.446$, $p < 0.001$). Human analytical skills explain 44.6% of the variation in investment decision quality, and the regression coefficient ($\beta = 0.668$, $p < 0.001$) indicates a strong positive effect. These findings support the hypothesis that stronger analytical capabilities enhance effective, data-driven investment decisions, highlighting the importance of developing human analytical skills in financial analytics–driven investment environments.

- **PEARSON's CORRELATION**
- **Objective 3:** Analyse how financial analytics affects the quality of decisions.

Variables	Beta Coefficient	R^2 Value	P-Value
Human Analytical Skills and Investment Decision Making Quality.	0.668	0.446	0.000

Interpretation

The Pearson correlation analysis shows a strong and positive relationship between financial analytics and investment decision-making quality, with a correlation coefficient of $r = 0.774$, which is statistically significant at the 1% level ($p < 0.001$). This indicates that higher levels of financial analytics are associated with better investment decision-making quality. Overall, the findings confirm that effective use of financial analytics improves quality of investment decisions.

4. FINDINGS

The study finds that human analytical skills serve as the crucial link between technology and better investments. These human skills are demonstrated to be much enhanced by analytical tools and high-quality data. Consequently, these enhanced abilities result in significantly superior investing choices. The study demonstrates that technology functions best as a tool to hone human analytical skills, which aids in making better investment decisions, with a significant overall correlation between analytics and decision quality.

5. CONCLUSION

This study concludes that financial analytics is a powerful enabler of high-quality investment decision-making only when it is effectively integrated with human analytical skills. The empirical evidence confirms that financial analytics sophistication, tools, diverse data access, and data quality significantly enhance human analytical skills, which in turn strongly influence investment decision-making quality. Thus, human analytical skills serve as a critical bridge between technological capability and strategic decisions. The study contributes to financial analytics literature by shifting the focus from technology-centric decision models to a human-centred analytical framework. It provides practical insights on fostering collaboration between human intelligence and analytics systems rather than relying solely on automated decision-making.

LIMITATIONS

- The study is based on a limited sample, which may restrict the generalizability of the findings.
- The analysis is based on self-reported responses, which may involve respondent bias and perception errors.
- Investment decision-making quality can be influenced by external market volatility that is outside the control of both the analyst and the technology.
- While the study focuses on human analytical skills, other behavioural and psychological factors were not explicitly examined.

FUTURE SCOPE OF THE STUDY

- Future studies can explore additional human factors such as cognitive biases, risk perception, decision confidence, and emotional intelligence to gain deeper insights into how these traits interact with analytics for better investment outcomes.
- Further research could examine the differential effects of specific analytics technologies (AI, ML, prescriptive models, robo-advisors) on human decision-making effectiveness.
- Future research can adopt a longitudinal approach to examine how human analytical skills develop over time with continued use of specific financial analytics tools.

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