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The Role of Artificial Intelligence In Enhancing Financial Decisions

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Abstract: The current research aims toanalyses the role of artificial intelligence in enhancing financial decisions, the increasing integration of Artificial Intelligence (AI) in the financial sector has revolutionized decision-making processes, offering unprecedented precision, speed, and efficiency. This paper aims to provide a comprehensive overview of AI's applications in financial decision-making, exploring its benefits and challenges. This study employed a descriptive-analytical approach, reviewing literature and previous studies related to artificial intelligence applications in the financial field. It also analyzed applied models for using machine learning algorithms in financial market forecasting and risk assessment. Furthermore, available data on the performance of AI-based systems compared to traditional financial decision-making methods were analyzed. This study explores the transformative role of AI in financial decision-making, highlighting its impact on investment strategies, risk management, and financial forecasting. AI-powered algorithms, such as machine learning and deep learning models, have enabled financial institutions to analyze vast amounts of data in real time, providing insights that were previously unattainable. These technologies facilitate enhanced predictive analytics, enabling more informed investment decisions, portfolio optimization, and asset management. The study results showed that using artificial intelligence (AI) technologies significantly improves the accuracy of financial forecasts, reduces risk levels, and accelerates decision-making by analyzing large amounts of data in a short time. The results also indicated that relying on intelligent systems helps institutions uncover hidden financial patterns, improve portfolio management, and enhance the efficiency of financial planning. However, the study pointed to some challenges associated with implementing AI, such as the need for advanced technological infrastructure and ensuring data protection.

Keywords: Artificial Intelligence, Enhancing Financial Decisions.

Introduction

New solutions powered by artificial intelligence (AI) are revolutionizing traditional decision-making models. These tools can process massive amounts of data with unprecedented speed and accuracy, replacing human intuition and manual analysis as the primary methods for making financial decisions. Because of these innovations, companies in sectors such as banking, investment management, and insurance can streamline their

operations, improve risk management, and offer more personalized services to their clients. Predictive analytics also enables banks to allocate resources more effectively
The integration of artificial intelligence (AI) has revolutionized innovation in risk management and financial forecasting. By processing and analyzing massive and complex datasets with unprecedented precision, AI enables financial institutions to uncover patterns beyond human capabilities. This allows for better predictions of market volatility and the development of effective strategies to manage potential risks. AI's predictive power helps institutions make informed decisions, respond quickly to changing market dynamics, and protect their assets. By leveraging AI-derived insights, institutions can streamline their operations and gain a competitive edge in the rapidly evolving, data-driven financial landscape (Dhaulta, 2024).

With the introduction of artificial intelligence into financial services, the decision-making process has fundamentally changed. It's now all about automation, using data to make decisions, and delivering customized solutions. This is no longer limited to tech-savvy youth or experienced investors; it's now accessible to everyone, regardless of age.
This paper aims to provide a comprehensive overview of AI's applications in financial decision-making, exploring its benefits and challenges. It also addresses the future implications of AI in finance, particularly the balance between human judgment and machine-driven analysis, as financial institutions continue to embrace digital transformation. This paper aims to provide a comprehensive overview of AI's applications in financial decision-making, exploring its benefits and challenges.

Artificial intelligence

A multidisciplinary approach to artificial intelligence (AI) enables better decision-making, increased operational efficiency, and enhanced innovation across various management functions and sectors. AI systems aim to mimic human cognitive processes such as perception, reasoning, learning, and problem-solving (Zhang et al, 2020).

The term artificial intelligence (AI) describes the process of creating computer systems that can carry out operations that normally call for human intellect. Learning, thinking, problem-solving, perception, comprehending natural language, and engaging with the surroundings are a few examples of these tasks (Khandelwal, and Suryawanshi, 2024).

Researchers have defined artificial intelligence with several definitions, including the definition of (Othman, 2015), who defined it as one of the branches of computer science that is concerned with studying the creation of computer systems that display certain forms of intelligence, i .e. systems that learn new concepts and tasks, and systems that can think and draw useful conclusions about the world we live in. Systems that understand natural languages and observe and understand visual scenes, and systems that can achieve": work that requires human intelligence (Othman, 2015: 3) in addition, he described artificial intelligence as a computer application concerned with creating programs for studying and implementing the repetitive activities carried out by humans' and to understand the complex mental processes performed by human thought process

and transferring this mental process into equivalent accounting processes so as to increase the computer ability to solve the complex problems"(Ali, 2025, 7).

AI is generally divided into two categories: artificial limited intelligence (ALI) and artificial general intelligence (AI). AII refers to computer systems designed and trained to perform specific tasks or address particular problems with high efficiency (De Bruyn et al, 2020). These artificially intelligent systems excel in specialized areas and outperform humans in specific tasks, but they lack human-like general intelligence. Artificial general intelligence (AI) is defined as systems with human-like intelligence, capable of performing any intellectual task a human can perform (Sangeetha et al, 2022). Unlike limited AI, AI possesses broad and adaptive cognitive capabilities, allowing it to transfer knowledge and skills across different domains (Haenlein and Kaplan, 2019).

Financial decisions

The financial decision-making process involves selecting, evaluating, and analyzing various options to gather data and use it to make informed decisions to achieve financial objectives. This process centers on studying financial information based on a trade-off between returns and risks, and implementing operational decisions in line with long-term goals. It is a multifaceted process encompassing diverse activities such as setting financial objectives, gathering financial information, evaluating options, identifying alternatives, assessing risks and returns, making decisions, and more (Thapa, 2024).

Financial decisions are crucial for businesses, as they involve judgments about how to allocate and manage financial resources to achieve specific aims. A variety of theoretical frameworks provide a philosophical basis for understanding financial decisions. financial decision-making is an integral part of both personal finance and corporate strategy. It encompasses multiple aspects, including budgeting, investing, financing, and risk management. Effective financial decisions can lead to wealth growth and sustainability, while poor decisions can result in significant losses (Valenta, 2024).

Several widely accepted definitions have been reached in the field of corporate management with regard to financial decisions. Financial decisions determine an organization's financial position and enhance shareholder wealth (Zietlow et al.,2018). These are decisions made by managers regarding the organization's finances and are crucial to its financial health. According to (Graham et al. 2021), financial decisions are fundamental to any organization's success, with the primary goal of maximizing shareholder value. Financial decisions are the process of deciding the optimal option among several ones to choose to allocate financial resources, controlling assets, responsibilities, and investments, and choosing the most effective strategy to achieve specific financial goals (Kimmel et al, 2020).

The financial decisions taken by companies have been classified into three categories: the investment decision, the financing decision, and the dividend decision (Agung et al, 2021).
1. Investment decisions are among the most important decisions because they are directly linked to investment profitability, Harjito & Martono, 2013 indicate that a company's investment decisions are reflected in the types of assets it invests in. This is clearly evident

in the assets section of the company's financial statements, which details the components of current and fixed assets. The significance of this lies in the fact that the composition of current and fixed assets constitutes the company's wealth structure (Santoso, 2019, 104).
2. A financing decision is a decision to obtain a source of funds to finance the purchase of assets. When managers can make the right financing decision, the benefits obtained will be greater than the costs sacrificed so that the company performance will be better. The retention ratio (RR) is one of the important ratios used to measure the financing decision. If the management decides to retain most or all of the company's profits and only distributes a small amount of dividend or does not distribute the dividend at all, this can be a signal to external parties that the company's performance is in a state, which is not good (Imelda and Himelda, 2020, 267). financing decisions also aim to maximize the current value of the owners' wealth within the institution, regardless of its legal form (sole proprietorship, partnership, capital company) (Ali, 2025)
3. Dividend decisions concern the level of profits to be distributed to shareholders. They represent the decision-making mechanism by which management determines dividend payouts. According to Ishtiaq and Muqaddas (2016), dividend distribution is one of the crucial decisions made by the Chief Financial Officer (CFO) regarding payments to shareholders. Similarly, dividend decisions involve the distribution of a portion of the company's profits, as determined by the board of directors. According to Yusof and Ismail (2016), dividend decisions can primarily be described as predictive. The objective is to select the highest sustainable level of dividends in line with an optimal investment program, avoiding external financing through equity or excessive debt. Secondly, as part of the board's decisions, (Marks, 2017) argues that the most appropriate dividend policy is to save funds during surplus years to prepare for future deficits.

Artificial intelligence and financial decisions

Artificial Intelligence (AI) has emerged as a transformative force in the realm of financial decision-making, revolutionizing how organizations manage investments, mitigate risks, and optimize resource allocation. The financial industry operates in a dynamic and highly complex environment, where decisions are influenced by a multitude of variables, including market conditions, regulatory changes, and global economic trends. Traditional decision-making frameworks often rely on human expertise and historical data, which may be insufficient to address the volatility and complexity of modern financial markets. Artificial Intelligence (AI), with its capability to analyze massive datasets, identify patterns, and make predictions, offers a robust alternative to traditional methods. AI technologies have been increasingly adopted in areas such as algorithmic trading, portfolio management, credit scoring, and fraud detection (Esther, 2022).

The review results indicated that artificial intelligence plays a significant role in real-world financial decision-making. Furthermore, the perception of neural decision-making processes differed in response frequencies between real-world and virtual environments, suggesting that individuals struggle to simulate real-world financial decisions when questioned in virtual settings. Sujith et al. (2022) conducted a descriptive

analysis using structural equation modeling on 229 responses from banks and financial institutions in India to examine the key components of machine learning, a branch of artificial intelligence, and its impact on effective corporate financial decision-making. According to their findings, machine learning techniques enable the analysis and identification of patterns in massive amounts of data, providing essential information for effective financial decision-making across diverse sectors such as finance, marketing, supply chain, and human resources.

The financial sector has witnessed radical transformations and rapid technological advancements in recent years, primarily driven by the integration of artificial intelligence (1). AI technologies, characterized by machine learning, deep learning, natural language processing, and cognitive computing, have fundamentally altered traditional financial decision-making models. Historically, financial decisions relied heavily on human judgment, expert intuition, and traditional statistical methodologies, which were often limited by human cognitive biases and data processing constraints (2). However, the explosive growth of digital data, coupled with advances in computing power, has ushered in an era where AI technologies play a pivotal role in enhancing decision-making capabilities across various financial fields (Kavitha et al, 2025).

A study by Sugiarto et al,2025 conducted a systematic literature review to explore the integration of artificial intelligence (AI) into financial decision-making, particularly within the context of investment strategies. Based on 52 peer-reviewed articles published between 2018 and 2024, the review identified key application areas for AI in finance, including portfolio optimization, risk management, algorithmic trading, robo-advisory services, and sentiment analysis. The findings highlighted the strategic benefits of AI, such as improved decision accuracy, operational efficiency, and increased financial inclusion. However, the study also highlighted significant challenges, including model interpretability limitations, algorithmic bias, data privacy concerns, and regulatory uncertainty. These dual dimensions underscore the need for ethical governance, transparent model design, and multidisciplinary collaboration to maximize the benefits of AI in investment contexts. The study concluded by identifying future research directions, particularly the integration of environmental, social, and governance (ESG) factors, adaptation to emerging markets, and long-term impact assessments of AI-led strategies.

Result and Discussion

Big Data Analysis: The ability to process millions of transactions in seconds .

The term “Big Data” is currently used to describe the massive growth and availability of structured and unstructured data. However, big data is not simply about huge amounts of data; it is a concept that offers the opportunity to discover new insights into existing data, as well as to provide guidelines for collecting and analyzing future data. Big data analytics is the process of examining large data sets to uncover hidden patterns, unknown correlations, market trends, customer preferences and other useful business

information. The analytics of big data plays an important role for decision making in business and society as a whole. Accurate analyses leads to more confident decision-making, which means greater operational efficiencies, cost reductions and reduced risk. The digital transformation of almost everything is leading to the emergence of new types of big and real-time data across various sectors. Much of this data is atypical, such as streaming data, geospatial data, and sensor-generated data, which do not fit easily into traditional structured and relational databases. Today's advanced analytics technologies enable organizations to extract valuable insights from data with unprecedented levels of sophistication, speed, and accuracy. Real-time big data analytics is all about being able to make better decisions and take effective actions in a timely manner (Dutta and Jayapal, 2015).

In the age of big data, numerous technologies generate data in various forms, rates, and sizes. Most organizations have been processing, storing, and analyzing this data, as well as addressing the challenges of big data, in order to make profitable decisions. In the big data literature, the term "big data" refers to datasets so vast and complex that data processing tools cannot handle them all at once (Yaqoob et al, 2016). Big data is also typically described using characteristics such as: size, referring to enormous quantities of data; diversity, referring to data in different forms, such as structured, semi-structured, and unstructured data; velocity, referring to the rate at which data is collected from various sources; reliability, referring to the trustworthiness or reliability of the data; and value, referring to the useful and productive information derived from the data for making informed decisions (Philip Chen & Zhang, 2014).

Because the value of information received is inversely proportional to time, obtaining relevant information quickly is a critical and challenging endeavor. Consequently, a growing number of companies are focusing on real-time data processing and analysis to maintain their competitive edge. For example, it is essential for providing rapid responses to customer inquiries, promoting products, detecting anomalies, identifying credit card fraud, and supporting crisis management. Across various sectors, functional technologies are fundamental, particularly when quick decisions are required. High-capacity data streams necessitate real-time data analysis to continuously update data during information processing, facilitate rapid decision-making, and quickly transform data into other information (Lv et al, 2017). Real-time data analysis is also crucial due to the frequent changes in data generated by sensors, internet services, consumers, traffic, and medical systems (Zheng et al, 2015).

Market forecasting: Using "machine learning" to predict stock and currency trends based on historical data and current news.

The average person's interest in the stock market has grown tremendously over the past few decades. Therefore, it's no surprise that billions of dollars in assets are traded on stock exchanges daily, as investors seek to profit during their investment period. If any market participant, whether an individual or institutional investor, could accurately predict market behavior, they could consistently achieve higher returns, considering risk,

compared to market returns. This is what motivates the use of machine learning and computational intelligence techniques to create accurate stock market forecasting models. Indeed, many published studies have attempted to accurately predict stock markets by developing sophisticated forecasting models/systems, and some studies have reported that their models are capable of generating profits. Overall, stock market forecasting is one of the most important and challenging tasks in financial research. However, the ability of an investor to consistently achieve a higher return, considering risk, than the market return may contradict what is known as the efficient market hypothesis (Kumbure et al, 2022).

In the current economic climate, people are less inclined to rely on intuition or brokers' advice when making decisions. In recent years, stock market uncertainty has caused considerable anxiety for many investors, leading more to focus on stock market forecasting to generate substantial profits using technological advancements. Experts employ various forecasting techniques, and some have proven highly effective. These techniques range from statistical methods and artificial neural networks to genetic algorithms, case-based inference, fuzzy logic, wave transforms, and various hybrid systems, as well as the integration of macroeconomic indicators. Each technique has its strengths and limitations, and each problem has its own unique characteristics, significantly affecting the reliability of these techniques (Saipidinov et al, 2024).

Predicting stock prices using machine learning is a broad research area, yet it still faces many challenges due to the complexity and high volatility that technical analysis and sentiment analysis models attempt to capture. Nearly all areas of machine learning have been tested as solutions for creating an accurate predictive model. The accuracy of most models hovers around 50%, highlighting the need for further improvements in accuracy, data processing, forecasting, and final prediction. Any successful stock trading algorithm will benefit from a forecasting system capable of producing accurate short-term predictions. Several simple machine learning algorithms have been developed to test the hypothesis that, with the right variables, even a basic machine-learning model can produce a reasonable stock price forecast. Systems that integrate and test sentiment analysis and technical analysis are the best candidates for a general-purpose trading algorithm applicable to any stock, futures contract, or traded commodity. However, much work remains to be done in applying natural language processing and selecting text sources to find the optimal combination of sentiment analysis and technical analysis (Wong et al, 2023).

Risk management: Assessing the creditworthiness of individuals and companies more accurately, thus reducing the rates of non-performing loans.

Wherever risk exists, risk management is essential, risk management involves identifying, assessing, and prioritizing risks, along with using coordinated and cost-effective resources to mitigate, track, and control the likelihood of adverse events, as well as monitoring their consequences. Adequate risk management positively affects bank stability, while poor risk management negatively affects stability, potentially leading to

bank failure. In other words, risk is an opportunity that, if managed well, can generate a substantial return, thereby improving financial performance. Risk disclosure is fundamental to promoting transparency and accountability, as it provides stakeholders with vital information about the bank's risk exposure. Effective risk disclosure not only enhances investor and depositor confidence but also supports regulatory compliance and decision-making (Ogundele And Nzama, 2025).

The banking sector plays a pivotal role in economic development, serving as the primary driver of economic growth in many countries. Numerous studies have indicated that non-performing loans were a contributing factor to the 2007 financial crisis. Banks differ from other industrial institutions or companies in that they create value by using their liabilities and assets for the benefit of their shareholders. Despite the rapid changes banks undergo, their fundamental objective remains constant: maximizing the return on the risks they assume, Banks manage various types of risks. This leads us to the term risk management, which Hubbard (2017) defines as "acting intelligently when seizing opportunities". Banks are institutions that operate under a climate of risk, facing various types of risks, such as market risk, credit risk, operational risk, technology risk, liquidity risk, insolvency risk, and interest rate risk (Maseke and Swartz, 2021).

The sound management of credit activities in banks, and their ability to manage the risks associated with these activities, significantly affects the profitability and overall performance of these banks. Accurate measurement of credit risk and the capacity to manage it lead to a reduction in the marginal cost of debt and capital, and consequently, a reduction in the cost of funds owed by banks. Therefore, good credit risk management protects banks from financial distress and unexpected losses. Furthermore, poorly performing banks, whose situation is exacerbated by increased credit risk and its persistent negative effects, may abandon their clients, reschedule their plans, change their strategies, alter their capital structure, or even resort to mergers with other, better-performing banks on potentially unfavorable terms, which they may have to do as a last resort (Al Zaidanin and Al Zaidanin, 2021).

Conclusion

Artificial intelligence has undeniably revolutionized financial decision-making by enhancing the efficiency, accuracy, and scalability of traditional methods. Its applications in investment strategies, risk management, and fraud detection have provided financial institutions with powerful tools to navigate the complexities of modern markets. The decision of financing continues to be one of the main decisions of financial managers, and attracting the cheapest and most adequate source of finance is the main preoccupation for them . The financial sector is undergoing a radical transformation thanks to artificial intelligence (AI), which enhances innovation, efficiency, and data-driven decision-making. However, the full adoption of AI is hampered by obstacles such as low trust, high implementation costs, ethical concerns, and data privacy issues, despite its enormous potential. The importance of balancing technological advancements with human control is

evident in the growing demand for hybrid models that combine AI with human knowledge. Despite banks having risk management systems in place, external factors still play a major role in the increase of non-performing loans.

Financial decision taking cannot be based exclusively on financial considerations and mathematical calculations, but we must take into account other complex factors. Depending on the availability, the cost and their accessibility, other sources of financing. To fully leverage AI's capabilities in building a resilient and sustainable financial system, these challenges must be addressed directly through transparency, awareness, and good governance. Future researchers should study the role of information technology in helping banks manage risk. Regular assessments and updates of the risk management framework are recommended to adapt to changing market conditions.

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