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Artificial Intelligence: The Next Frontier for Assets Management

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Abstract: AI examine more systematic techniques and application like; Similarity, Presenso, Aladdin Platform by BlackRock Solutions (BRS), Stocks Analyst by AXYON AI, Sentient Investment Management to concomitant better opportunities and break the challenges. Portfolios that meet performance targets more closely than portfolios created using traditional methods. The trading process can be broken down into pre-trade analysis, trade execution, and post-trade analysis. Pre-trade analysis entails using data to analyse properties of financial assets with the objective of forecasting not only their future performance but also the risks and costs involved in trading them. Insights from this analysis ultimately lead to the execution of trades. The success of AI in asset management is linked to its three key, inherent capabilities. First, AI models are objective, highly efficient in conducting repetitive tasks, and able to identify patterns in high dimensional data that may not be perceptible by humans. AI can also analyse data with minimal knowledge of the data's structure or the relation between input and output, including nonlinear relations.

I. INTRODUCTION

Artificial intelligence (AI) is one of the hottest topics of current times because it has disrupted most industries in recent years, and the financial services sector is no exception. Probably the most affected area is asset management, which is expected to suffer the largest number of job cuts in the near future (Buchanan 2019). Costs and resources were often mentioned when artificial intelligence was suggested for investment strategy workflows. As third-party technology providers become more ubiquitous in investment management, the need for AI has become more apparent and it makes sense to learn from others and rethink current workflow processes. We focus on three major areas: portfolio management, trading, and portfolio risk management. AI examine more systematic techniques and application like; Similarity, Presenso, Aladdin Platform by BlackRock Solutions (BRS), Stocks Analyst by AXYON AI, Sentient Investment Management to concomitant better opportunities and break the challenges. With financial assets and global markets becoming increasingly complex, traditional risk models may no longer be sufficient for risk analysis. At the same time, AI techniques that learn and evolve by using data can provide additional tools for monitoring risk. Furthermore, Robo-advisors are computer programs that provide digital financial investment advice based on mathematical rules or algorithms tailored to investors' needs and preferences. The popularity of robo-advisors stems from their success in democratizing investment advisory services by making them cheaper and more accessible to unsophisticated individual investors. Consequently, a better way to describe AI is as a collection of techniques that automate or facilitate (often small) parts of the practice of asset management, from the capacity to solve portfolio optimization problems with specific conditions to fully automated algorithmic trading systems.

A. Objectives of this Study

1) To know the uses of Artificial Intelligence (AI) for investment management.
2) To study where should uses of artificial intelligence for investment management.
3) To study challenges or disadvantages of applying artificial intelligence in investment management.
4) To find some AI for assets management.
5) To study how artificial intelligence works in investment management.

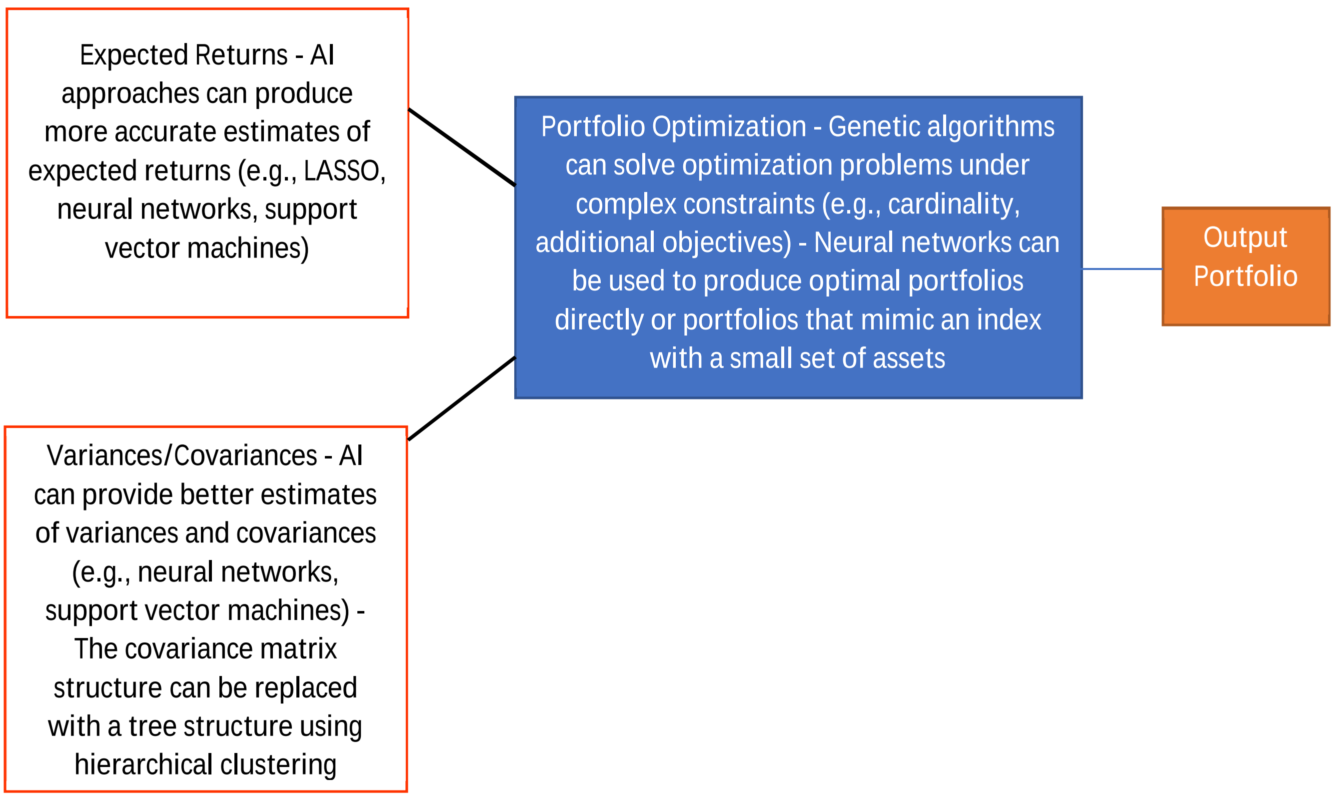
II. RESEARCH METHODOLOGY

This study is primarily based on "secondary" sources of data, gathered from the related literature published in the journals, newspaper, books, statements, reports. The nature of study is "primarily qualitative, descriptive and analytical." However, no quantitative data and statistical tools have been used for analysis.

A. To Know the uses of AI for Investment Management

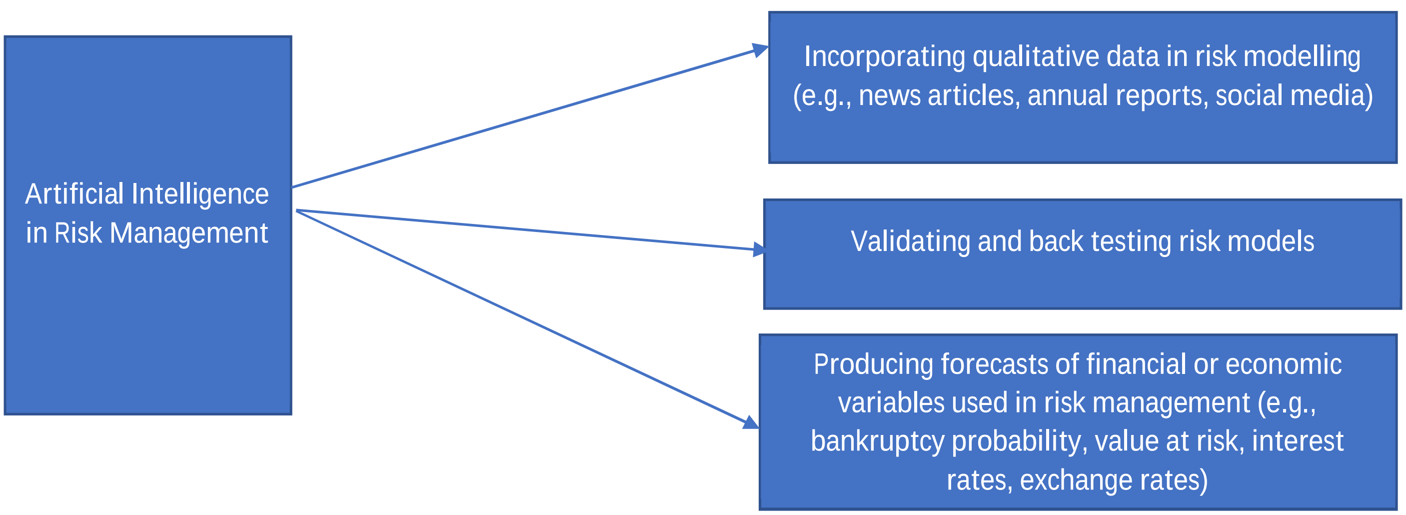
We focus on three major areas: portfolio management, trading, and portfolio risk management. Portfolio management entails making asset allocation decisions to construct a portfolio with specific risk and return characteristics.

1) Portfolio Management AI techniques can be used to perform sophisticated fundamental analysis, including the use of text analysis, and to optimize asset allocations in financial portfolios. Amid various challenges of conventional portfolio optimization approaches, AI techniques often provide better estimates of returns and covariances than more conventional methods do. These estimates can then be used within traditional portfolio optimization frameworks. Moreover, AI can be used directly for asset allocation decisions to construct portfolios that meet performance targets more closely than portfolios created using traditional methods.



2) Trading Algorithms can play a role in all stages of the trading process (Nuti, Mirghaemi, Treleaven, and Yingsaeree 2011). The trading process can be broken down into pre-trade analysis, trade execution, and post-trade analysis. Pre-trade analysis entails using data to analyze properties of financial assets with the objective of forecasting not only their future performance but also the risks and costs involved in trading them. Insights from this analysis ultimately lead to the execution of trades. Pre-trade analysis can be a manual stage, meaning it involves some form of human supervision, given that asset managers might want to consider results from pre-trade analyses together with risk assessments and client preferences. In high-frequency or fully automated systems, however, pre-trade analysis does not involve any human intervention. Trade execution implements trades while ensuring low transaction costs. Actual trading outcomes are evaluated during post-trade analysis to monitor performance and improve the trading system. Post-trade analysis often involves some form of human supervision or overlay. In contrast, pre-trade analysis and trade execution are handled mostly by algorithms because they require timely and complex analyses.

3) Portfolio Risk Management AI also has applications in risk management, with regard to both market risk and credit risk (Financial Stability Board 2017; Aziz and Dowling 2019). Market risk refers to the likelihood of loss resulting from aggregate market fluctuation, and credit (or counterparty) risk is the risk of a counterparty not fulfilling its contractual obligations, which results in a loss in value (Figure 6). Although AI has broader uses in risk management, these two categories are the most important in asset management.



4) *To study where uses of Artificial Intelligence for Investment Management Should*

Artificial intelligence is a suite of technologies, enabled by adaptive predictive power and exhibiting some degree of autonomous learning, that dramatically advance our ability to:

•• Recognize patterns
•• Anticipate future events
••Make good decisions
•• Communicate with other people

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To put it another way, AI is a suite of technologies and capabilities which, when adopted, can enable firms to dramatically deliver new kinds of value and reshape operating models. The adoption of AI in investment management is now empowering firms to do things they couldn't do before: augmenting the intelligence of the human workforce, and facilitating the development of next-generation capabilities.

Portfolio management and client enablement:	Front, middle, and back-office efficiency:
•• Automated insight: reading earnings transcripts to assess management sentiment. •• Relationship mapping: identifying nonintuitive relationships between securities and market indicators •• Alternative datasets: analysing alternative data such as weather forecasts and container ship movements, monitoring search engines for words on specific topics to structure hedging strategies •• Growth opportunities: using corporate website traffic to gauge future growth along with clients' behavioural patterns •• Client outreach: smart client outreach and demand generation via analytics, using alternative data sources such as social media data.	•• Operations intelligence: using machine learning to automate functions •• Powering risk performance: AI-based algorithms and machine learning to monitor for suspicious transactions, and trigger response protocols •• Reporting and servicing: generating reporting for clients, portfolio and risk commentary, and marketing material using natural language processing •• On-demand reporting: chatbots and machine learning used to respond to employee or investor queries, generating management reporting on-demand •• Employee insights: monitor employee conduct risk and employee morale.

B. To Study Challenges or Disadvantages of applying Artificial Intelligence in Investment Management

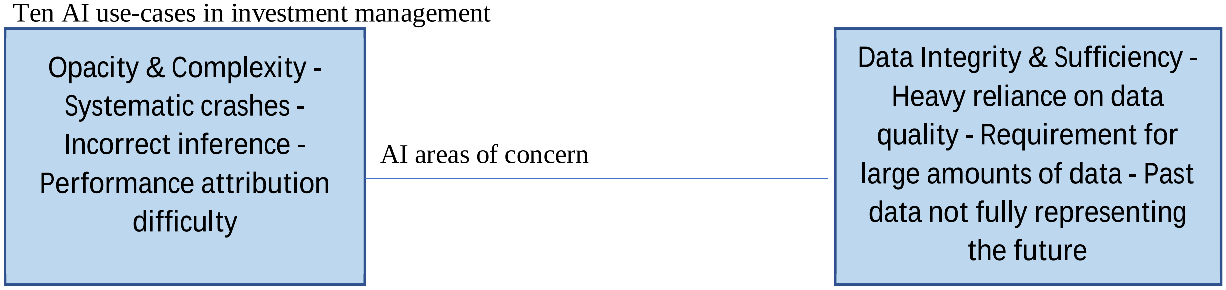
Understanding and explaining the inferences made by most AI models is difficult, if not impossible. As the complexity of the task or the algorithm grows, opacity can render human supervision ineffective, thereby becoming an even more significant problem. This issue might have repercussions for asset managers in three ways.

First, the difficulty in predicting how AI models will respond to major surprises or "black swan" events could lead to systematic crashes. Even in the absence of major events, AI algorithms may make the same errors at the same time, introducing the risk of cascading market crashes. Indeed, the considerable cost of producing AI algorithms has led to most asset management companies using the same tools and algorithms.

As a result, AI-driven crashes could be much more likely than other cascading algorithmic crashes we have experienced. Cascading algorithmic crashes are not specific to AI systems and may arise from even simple widespread quantitative approaches, such as value investing. What makes AI different, however, is that its opacity may prevent such risks from being properly modelled and monitored. Second, AI can make wrong decisions based on incorrect inferences that have captured spurious or irrelevant patterns in the data.

For example, ANNs that are trained to pick stocks with high expected returns might select illiquid, distressed stocks (Avramov et al. 2019). Third, attributing investment performance can become more challenging when using AI models. For example, the widely used Barra Risk Factor Analysis, based on linear factor models, might not suit AI-based strategies that capture nonlinear relationships between characteristics and returns. Consequently, in cases of poor fund performance, explaining to investors how and why the investment strategy failed can be difficult, which could undermine investors' trust in the fund or even in the industry. To better understand the behavior of AI models, some people approximate an AI model's prediction behavior by constructing an additional, simpler, and interpretable "surrogate model."

Ten AI use-cases in investment management



C. To find AI Technologies for Assets Management

Overview of Common Artificial Intelligence Techniques Several AI techniques are widely used in asset management. These include ANNs, cluster analysis, decision trees, evolutionary (genetic) algorithms, LASSO regression, SVMs, and NLP. This section briefly characterizes these techniques, discusses their strengths and weaknesses, and notes their areas of application.

Technique	Strengths	Weaknesses	Areas of Application
ANNs	• Complex and nonlinear relationships • Incremental and transfer learning • Can generalize well	• Data and computationally intensive • Predictions not explainable • Possible overfitting	• Image processing and recognition • Speech recognition and synthesis • Forecasting
Cluster Analysis	• Labels unnecessary • Helps to understand data	• Clusters may be intertwined • May require cluster count • Choosing attributes can be difficult	• Data analysis • Anomaly detection
Decision	• Classifications are explainable • Complex and nonlinear relationships	• Possible overfitting • Complex trees possible • Poor at predicting continuous variables	• Decision making • Classification
LASSO Regressions	• Identify most relevant features • Flexible and fairly simple	• Model can be unstable and hard to interpret • Perform poorly when independent variables are correlated	• Forecasting and robust regression analysis • Sparse solutions
NLP	• Analyzes and generates text and speech • Finds information in large textual datasets	• Currently primitive and unable to fully understand text	• Search engines and news filtering • Text classification and summarization
SVMs	• Structure of data can be unknown • Can generalize with less overfitting risk	• Difficult to interpret • Kernel difficult to choose for nonlinear classification	• Classification • Regression

III. CONCLUSION

The use of AI in asset management is an emerging field of interest among both academics and practitioners. AI has vast applications for portfolio management, trading, and portfolio risk management that enable the industry to be more efficient and compliant. It also serves at the heart of new practices and activities, such as algorithmic trading and robo-advising. Nevertheless, AI is still far from replacing humans completely. Indeed, most of its operations within asset management are confined and controlled by some form of human supervision.

Consequently, a better way to describe AI is as a collection of techniques that automate or facilitate (often small) parts of the practice of asset management, from the capacity to solve portfolio optimization problems with specific conditions to fully automated algorithmic trading systems. The success of AI in asset management is linked to its three key, inherent capabilities. First, AI models are objective, highly efficient in conducting repetitive tasks, and able to identify patterns in high dimensional data that may not be perceptible by humans. AI can also analyze data with minimal knowledge of the data's structure or the relation between input and output, including nonlinear relations. This feature is especially useful for forecasting, yielding more accurate estimates because AI does not rely on restrictive assumptions inherent in more traditional methods. Second, AI can extract information from unstructured data sources, such as news articles, online posts, reports, and images. As a result, a tremendous amount of information can be incorporated into financial analysis without manual processing and intervention. Third, AI algorithms, unlike other statistical techniques, are often designed to improve themselves by readjusting in accordance with the data. This ability means that the manual reconfiguration or parameter re-estimation that is essential for traditional models is unnecessary with AI. Finally, AI's greatest strength—its ability to process data with minimal theoretical knowledge or supervision—can also be its greatest weakness. Indeed, a popular saying asserts that AI will always generate a result, even when one should not exist. This tendency causes problems when data quality is poor, when the task being performed is too complex for humans to monitor or understand, and when cascading systemic failures could occur as a result of several AI algorithms reacting to each other. Asset managers must bear such issues in mind as the role of AI becomes more pervasive and significant.

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