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Navigating the New Frontier: AI's Expanding Role in Portfolio Management

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The New Frontier

Since the publishing of our previous article entitled, 'A practical approach to evaluating AI applications in investment processes' in November 2021, Artificial Intelligence (AI) has captured the imagination of the world. This is largely due to the record-breaking public debut of Generative Large Language Models (LLMs). The LLM explosion (100 million ChatGPT users in less than 2 months[1]) has ignited an AI arms race amongst technology firms to develop the hardware and software required to capture a share of this new market. Similarly, other firms in all industries are racing to integrate such tools into their businesses to realise efficiency gains and advantages over competitors.

Portfolio management is not immune to this phenomenon, with large global growth anticipated to occur in the use of AI in portfolio management (24.5 % annually from 2023 - 2030[2]). This is hardly surprising as estimations suggest possible productivity, AUM and revenue increases of 13.8 %, 8.1 % and 7.7 % respectively[3]. While these figures are enticing, the road to adoption is not smooth, and there are a number of factors asset managers need to consider when incorporating AI into any area of their business.

In this article, we aim to reassess the state of AI development in portfolio management. We intend to achieve this by charting the evolution of the technology with a particular focus on LLMs, discussing trends in market adoption, considering some of the challenges associated with AI development, such as the accumulation of technical debt and speculating on what the road ahead could look like for the future of AI in portfolio management. In this context, small and agile firms with Data Science at their core are probably uniquely positioned to lead the market in the use of global AI technology in South Africa.

Technological Breakthroughs and Market Adaptation

AI has been a part of the investment tool kit since long before ChatGPT stole headlines across the world. Particularly in quantitative workflows, Machine Learning (ML) models have been used in areas from pattern recognition to forecasting and, in some cases, with great success. However, in recent years, AI has grown to levels of sophistication that allow for its application in areas that have previously never been considered.

LLMs, in particular, have garnered special attention for their potential to revolutionise the way firms and financial advisors interface with clients, the way analysts parse information and even the way trading strategies are formulated. Robo-advisors powered by LLMs like OpenAI's GPT framework are predicted to transform how retail clients engage with firms. 4 out of 5 financial advisors surveyed are expecting to use AI in some form when interfacing with clients,[4] and the amount of funds under management by robo-advisors is expected to more than double over the next 4 years[5].

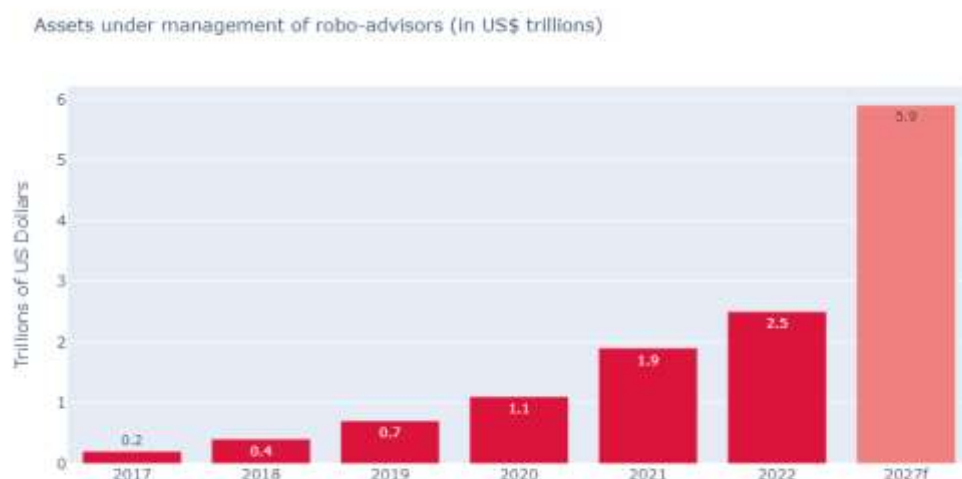2 https://www.grandviewresearch.com/industry-analysis/artificial-intelligence-asset-management-market
3 https://www2.deloitte.com/content/dam/Deloitte/br/Documents/financial-services/deloitte-wealth-and-asset-management-4-0.pdf
4 https://newsroom.accenture.com/news/2022/financial-advisors-in-north-america-say-ai-can-help-grow-their-business-but-adoption-can-be-challenging-accenture-research-reveals
5 https://www.pwc.com/gx/en/issues/c-suite-insights/the-leadership-agenda/ai-and-wealth-management-a-new-era.html

Figure 1: Assets under management of robo-advisors (in US$ trillions)

Assets under management of robo-advisors (in US$ trillions)

Source:

https://www.pwc.com/gx/en/issues/c-suite-insights/the-leadership-agenda/ai-and-wealth-management-a-new-era.html

LLMs and other sophisticated ML frameworks allow for parsing huge amounts of complex, unstructured data. This affords analysts with access to such tools a huge advantage over competitors, as they can be provided with the most relevant information needed in real-time from a variety of non-traditional sources. In fact, this trend is postulated to impact the types of jobs available at portfolio management firms. Entry-level analyst jobs will be hit by AI as many of the tasks previously performed by junior staff members can now be accomplished using AI[6]. This has the potential to level the playing field between boutique firms and large investment houses. However, it raises a question about the talent pipeline – How do firms obtain senior analysts without junior analysts?

While larger firms are incorporating AI-based solutions amongst their services, very often, large amounts of technical debt accumulated by these companies over time act as a hindrance to their implementation, a problem not as prominent in newer, smaller firms[7]. In general, smaller firms are less likely suffer from such legacy issues and can be more agile in the exploration and adoption of this new technology.

More advanced AI frameworks also have a place in the development of trading strategies. In fact, studies suggest that even stock LLMs such as OpenAI's GPT models may be able to develop alpha generating stock selections, subject to human supervision[8]. These tools can also facilitate greater automation in the management of passive funds.

Because of these new developments, there has been a proliferation of pure AI funds seeking to capitalise on the associated wave of excitement. Unfortunately, many of these products have greatly underperformed, and several of the firms that developed these products have closed their doors. Pure AI-based trading remains the domain of boutique hedge funds, and insiders opine that this will not change for some time. These insiders also suggest the development of a "disillusionment cycle" in which firms try out AI strategies based on the latest technology and abandon them when they aren't successful[9].

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6 https://www.lseg.com/en/insights/data-analytics/how-might-ai-impact-investment-management
7 https://www.mckinsey.com/capabilities/mckinsey-digital/our-insights/tech-debt-reclaiming-tech-equity
8 https://www.cnbc.com/2023/03/29/chatgpt-and-ai-might-have-a-future-as-your-portfolio-manager-study-suggests.html
9 https://www.investmentexecutive.com/newspaper_/focus-on-products/ai-is-an-evolving-portfolio-management-tool/

Similarly, the AI uptake amongst South African asset managers is growing. If global trends are reliable, many local firms will suffer a comparable 'disillusionment cycle'. However, evidence suggests that persistence and commitment are required to unlock the true value of novel technologies such as AI. Such a mentality has rewarded participants in the past, even those who initially struggled. A number of these firms are now industry giants (Warren Buffet, Renaissance Technologies, etc.)

Despite these sobering perspectives, the managing executives of asset managers surveyed perceive greater inclusions of Generative AI in all aspects of their businesses, with the three greatest areas of adoption being data ingestion to drive alpha generating strategies, investment operations and financial advice[10].

Figure 2: Top Areas of Generative AI Impact in Asset Management
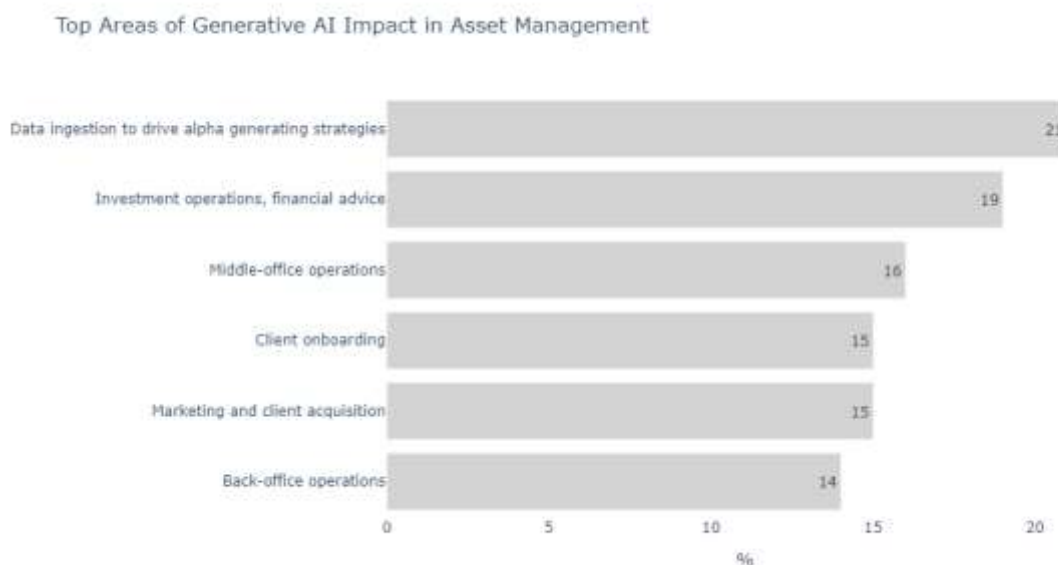
Source: https://www.ey.com/en_us/financial-services/generative-ai-transforming-wealth-and-asset-management

Overcoming Challenges

AI is a rapidly developing technology that is not without its challenges. Estimations suggest that while the potential growth value of AI can be incredibly high, approximately 300 million jobs worldwide will be affected by this phenomenon[11]. With this in mind, we believe that the greatest value in these tools can be unlocked when combining their massive efficiency gains with human creativity and expertise. We feel that the complete supplanting of humans by AI is unlikely and, in fact, undesirable. We agree with other insiders that suggest:

"*AI will not replace human beings, but human beings who use AI will replace human beings who don't use AI*."[12]

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10 https://www.ey.com/en_us/financial-services/generative-ai-transforming-wealth-and-asset-management
11 https://www.rothschildandco.com/en/newsroom/insights/2023/08/rothschild-martin-maurel-the-impact-of-artificial-intelligence-on-portfolio-management/
12 https://www.investmentexecutive.com/newspaper_/focus-on-products/ai-is-an-evolving-portfolio-management-tool/

One of the more immediate labour concerns for firms attempting to capitalise on the advantages offered by AI is access to talent. There is a significant shortage of the necessary skills required to develop and implement AI based solutions. This means individuals with the required skills can often command high salaries in the labour market and have their choice of employment opportunities. One way to address this issue for firms is through the implementation of upskilling programs to equip their current workforces with the necessary skills[13].

One cannot speak about AI without discussing the issue of data bias, which goes both ways. AI models can assist analysts in making unbiased investment decisions by parsing previously unavailable data sources, but model outputs are dependent on the data they are trained on. Great care and consideration must be taken when building training datasets, as any biases contained within the training data will be reflected in the model output.[14]

Bias is not the only concern when dealing with AI and data. Models require large amounts of high-quality data to provide accurate predictions and classifications. MIT postulates that firms can lose up to 20 % of their revenue on poor-quality data[15]. In the case of asset management, poor data quality results in a loss of alpha. Very often, the necessary quantities of high-quality financial data are not always available for use in AI applications. Frameworks that allow for the synthesis of this data do exist, but usage of these tools requires caution, and their limitations must be understood.

With growing model sophistication comes growing complexity, a feature which makes explaining the decisions models make more difficult. The lack of transparency/explainability of more sophisticated models can dissuade customers from investing in products developed using such tools. This creates the need for frameworks to provide transparency for investors to assuage their concerns and allow for easier performance monitoring and auditing of complex systems[16].

Even though the growing sophistication of AI brings the possibility of complete automation and, potentially, more efficient markets, human monitoring and regulation play a pivotal role in the safe and secure operation of AI frameworks and the more complex trading environments they create. Without regulation and monitoring of competing automated trading strategies, compounding effects from erroneous signals can result in automated mini market crashes (e.g. high frequency trading). In the robo-advisor format, the unsupervised output can result in 'hallucinations' (a known feature of LLMs) that can inspire and re-enforce herd behaviours in retail clients (e.g. memestock phenomena)[17].

Data privacy and security is a growing concern, especially in the age of Generative AI where questions continue to be raised surrounding copyright. The growing shift from on premises data storage to cloud-based solutions brings with it lower costs and the outsourcing of the physical security of data. However, the onus still lies on firms to ensure the data used is sufficiently protected within the cloud and meets regulatory requirements[18].

The above challenges to the integration and usage of AI serve as prime use cases for the combination of human judgement with machine technology. Teams of experienced fundamental analysts, working alongside highly

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13 https://www.ey.com/en_us/news/2023/12/ey-survey-ai-adoption-among-financial-services
14 https://www.investmentexecutive.com/newspaper_/focus-on-products/ai-is-an-evolving-portfolio-management-tool/
15 https://www.sia-partners.com/en/insights/publications/role-artificial-intelligence-asset-management-industry
16 https://www.financemagnates.com/fintech/from-brokers-to-bots-how-ai-is-reshaping-asset-management/
17 https://www.lseg.com/en/insights/data-analytics/how-might-ai-impact-investment-management
18 https://www.grandviewresearch.com/industry-analysis/artificial-intelligence-asset-management-market

skilled data scientists and engineers, all of whom are directed by a culture that emphasises data-driven decision-making are best suited to overcoming usage and integration issues.

The Road Ahead

AI promises to be a truly disruptive technology in portfolio management, different from other technologies that preceded it. This is because of the sustained strategic impact it can make in every aspect of a business, from client engagement to marketing, to operations. While the extent of the disruption is hard to predict, the technology promises not only to refine business activities but also to democratise access to financial advice, making wealth management services available to a broader segment of the population. However, the path forward requires careful navigation of the ethical and practical challenges that accompany these advanced technologies.

The integration of AI into portfolio management marks a new era in all of finance, offering opportunities to enhance efficiency, accuracy, and client service. As we move forward, it will be imperative for industry leaders to embrace these changes, addressing the challenges head-on while capitalising on the vast potential of AI to transform investment strategies and outcomes.

Generative AI was used in the planning and structuring of this article.

Glacier Research would like to thank Musa Malwandla and William Wright for contributing to this week's *Funds on Friday.*

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Musa, one of the co-founders at Differential Capital, serves as the Co-Chief Investment Officer (Co-CIO) and oversees the data science team. His responsibilities include the development of data science models and ensuring the team stays current with the latest global developments in finance, mathematics, and computation. Additionally, he plays a crucial role in providing input on the research process and guiding the team in enhancing adherence to the investment philosophy and process. In his previous positions, Musa excelled as a highly-rated equity analyst on the sell-side, achieving a top 3 ranking for Insurance research in the Financial Mail rankings. With 12 years of experience in Finance, he has worked for SBG Securities and Investec Securities. Musa holds a Master of Science in Statistical Sciences and a PhD in Finance from the University of Cape Town. He is also in the process of completing Normative Skills requirements to register as an Actuary.

William Wright
Lead Data Scientist
Differential Capital

William assumed the role of Lead Data Scientist at Differential Capital, where his responsibilities encompass spearheading the design, implementation, and upkeep of data science solutions. In addition to this, he plays a key role in mentoring junior Data Scientists and Machine Learning Engineers. William possesses expertise in constructing Data Science tools and developing Machine Learning models tailored for clients across diverse industries, including Fast Moving Consumer Goods, Manufacturing, and Public Utilities. With 6 years of industry experience, he brings a wealth of knowledge to his role. William holds a PhD in Physics from the University of the Witwatersrand.