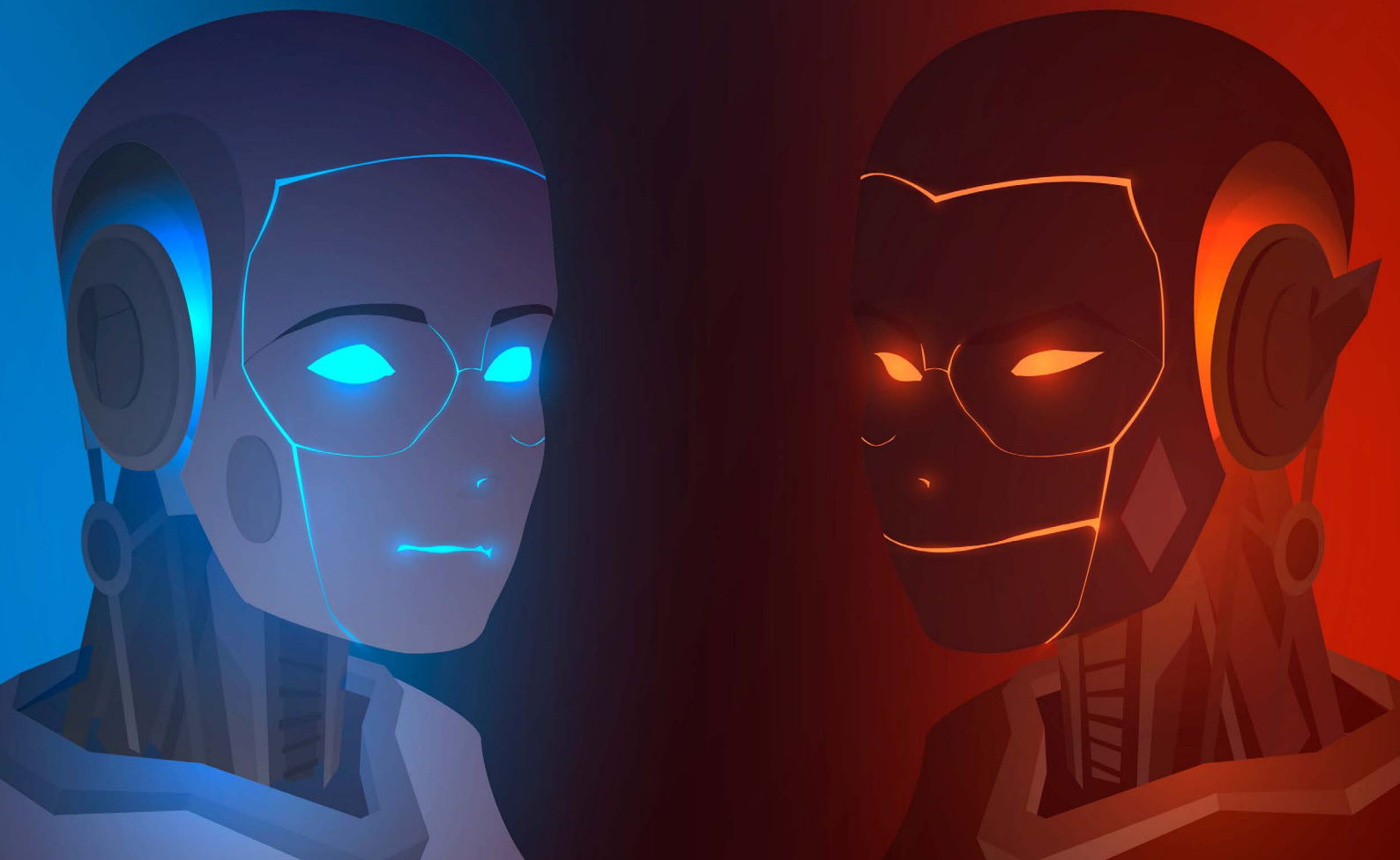


Powering the Trade Lifecycle with Generative AI



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In the rapidly evolving landscape of the capital markets industry, Generative AI has provoked both concern and excitement. Whether for good or ill, Generative AI is poised to revolutionise the capital markets landscape, and this cutting-edge technology has the potential to make a deep impact across the entire trade lifecycle, affecting everything from front-office to back-office processes. In this article, GreySpark Partners explores the potential impact of Generative AI on trading.

Generative artificial intelligence (AI) describes the process whereby a machine scours the internet to create unique text - or other outputs - in answer to a query or instruction. This emerging technology is driving debate in every industry, but its potential to enhance trading and investment banking has prompted a great deal of concern and elation, in equal measure. The introduction of AI could be a catalyst for rapid change and advancement, similar to the level of change introduced by electronic trading.

Most people have been introduced to generative AI using the well-known application, ChatGPT, which was released by OpenAI in 2023. To say that ChatGPT is AI's 'killer app' would not be an exaggeration - it is the most popular app in the history of the world, with the closest rival being TikTok. To further put this into context, it took TikTok 10 months to reach 100 million users, while [ChatGPT](#) achieved this in just two.

What is less well known, and particularly relevant to the investment banking space, is that Generative AI is also capable of creating new datasets and models based on the wealth of information it can draw on via the internet. Generative models can be used to create synthetic data to train machine learning algorithms, which can, in turn, help traders identify patterns and make more accurate predictions of market trends. The lure of AI is potent and, as it has the potential to reduce costs, improve efficiencies and provide new insights and opportunities, it cannot be ignored. The development and implementation of AI could be the next step in IT evolution, and as such banks are sinking significant investment into the analysis of current AI capabilities.

Leveraging an 'AI Bundle'

In the financial services it is likely that 'bundles' of AI technologies will form the basis of successful implementations. Natural language processing (NLP) is already being used for analysis of news articles and social media posts to identify market trends and sentiment far more quickly than a human could do. Together, machine learning (ML) algorithms to identify patterns in large datasets, NLP to assess sentiment in news articles and Generative AI to create reports for clients on investment possibilities make a powerful toolset.

While banks are taking a careful, incremental approach to the introduction of AI techniques for a limited number of ring-fenced use cases, a tidal wave of innovative applications and features are being developed by Fintech firms, with novel functionalities that pave the way for a more agile and customer-centric financial ecosystem. The considerable benefits AI presents when applied to trading and investment banking must be balanced against the risks. Some of the risks have gained widespread attention, partly due to high-profile figures such as Elon Musk. Musk famously described AI as "...our biggest existential threat," in stark contrast to the optimistic vision of AI pioneer John McCarthy at the 1956 Dartmouth Conference. McCarthy envisioned a future where machines could use language, form abstract concepts, solve human-centric problems and self-improve. Today, we stand at a pivotal moment in technological advancement, and it is crucial to carefully navigate the hype and identify safe and practical applications of AI. As AI techniques evolve and are adopted across the financial services sector, thoughtful, flexible and dynamic risk management strategies must be implemented to address potential challenges responsibly.

One of the main concerns is the risk of bias, which can all too easily be introduced into AI models by even the most careful developer. Indeed, AI algorithms are only as good as the data with which they are trained and, if that data is biased, the output will also be biased. Biases can manifest in various adverse ways in investment banking. For instance, models may unintentionally favour specific traders or indirectly incite market fluctuations. Training for traders must be put in place to empower them to detect biases and take corrective action effectively.

The use of AI algorithms in investment banking processes could present cybercriminals with additional attack vectors, and if hackers were to gain control of an AI system, they may be able to manipulate markets or steal sensitive information. All technology platforms and applications are vulnerable to cyber-attack, but as AI technology is not widely understood, there are fewer eyes looking for the vulnerabilities than there would be on software created using more traditional approaches.

Application of Generative AI in Investment Banks

Generative AI has the potential to revolutionise investment banking specifically, but there are also more generic advantages that could benefit banking as much as they do other sectors. For instance, Generative AI can help banks to:

- **Reduce costs:** Generative AI can be used to automate a wide range of tasks and activities currently performed by humans, and this can lead to efficiency gains and cost savings, giving humans the capacity to spend more time on tasks that create more value. For example, AI-powered chatbots can handle simple customer inquiries and provide support quickly and efficiently, leaving the human staff free to work on the more complex cases. Additionally, AI systems can be used to identify inefficiencies and streamline processes.
- **Improve efficiency:** Processing large amounts of data quickly and accurately, Generative AI can better support human decision making. There is far less criticism of this use case than some, as most people would agree that identifying patterns and anomalies in data is something that technology can do far more quickly and accurately than humans.
- **Provide new insights and opportunities:** A less well explored use case, Generative AI models can be used to create synthetic data to train machine learning algorithms. These models can quickly and efficiently identify patterns and increase the reliability of market trend predictions.

Application of Generative AI in Trading Processes

Near-term use cases for Generative AI models can be found across the trade lifecycle. **Figure 1** shows where Generative AI models can be used in the FX trade lifecycle, as an example.

Figure 1: Near-term Use Cases for Generative AI-enhanced Tools in the FX Trade Lifecycle

Source: GreySpark analysis

Use Case	Challenge(s)
Pre-Trade, Preparation and Documentation	
1. Analysis of Text, Including News and Social Media Sentiment: using advanced transformer models such as GPT-3, AI-powered sentiment analysis has become more accurate and efficient, enabling traders to make better-informed decisions based on real-time data. 2. FX Trading Signal Predictions: including AI techniques in the process improves human decision making and risk management and enables traders to optimise their trading strategies. The strong dependency on trustworthy and reliable data has created opportunities for market data providers. For instance, Refinitiv has recently collaborated with Bank of China to enhance Eikon's FX trading signal prediction application.	▪ Data Quality and Quantity: Effective use of Generative AI requires access to large accurate data sets. These can be difficult to obtain, especially for FX markets which by nature are highly fragmented and siloed. Critical elements such as data security and privacy raise concerns that cannot be overlooked. ▪ Bias and Fairness: There is a risk that AI-generated content could inherit biases present in the training data. This could lead to severe financial and reputational loss when these models are used for trading or decision-making purposes and could create systemic risk in the markets as too many firms rely on similarly constructed AI models.
Trade Execution	
3. Order Flow and Market Impact Predictions: AI-driven execution algorithms can help prevent slippage and minimise the costs of execution. Using Generative AI, a trading team can make more trades in a shorter amount of time and increase their profits.	▪ Explainability: Generative AI models can be extremely complex with many parameters factoring into their output. As much of the analysis is stochastic, the explainability of AI models is tricky. Compliance teams are hampered by the inability to understand the rationale behind the signals generated. This issue remains an area of concern for regulators. Added to this, Generative AI can 'hallucinate' facts. When Generative AI software is trained on a non-existent dataset, the model may 'guess' the output with potentially disastrous results.

Risk Management	
4. Identification of Counterparty Risk: Generative AI platforms monitor counterparties in near-real-time to quickly identify and respond to potential risks. For example, Generative AI algorithms can monitor news articles and press releases to determine a counterparty's creditworthiness, which will be relevant for counterparty risk management. Ultimately, Generative AI predictive analysis capabilities could be transformative for assessing risk levels associated with different counterparties based on historical data and real-time market conditions.	▪ False Positives / Negatives: AI algorithms must strike a balance between flagging potential issues (avoiding false negatives) and minimising the number of alerts (avoiding false positives). ▪ Data Accuracy: The success of Generative AI in identifying counterparty risk relies on the use of accurate and up-to-date training data. If the data used for training and verification is incomplete or outdated, it can lead to incorrect identification.
Trade / Deal Booking	
5. Completing Trade Data for Settlement: By analysing historic patterns, market trends, and transaction data, AI tools can detect potential irregularities that may result in settlement failures. Generative AI leverages sophisticated machine learning methods to identify anomalies in trade records and evaluate the associated risks within a context-search framework.	▪ Real-time Processing: The need for a real-time audit trail of events requires AI systems to operate efficiently and without delays, especially in high-frequency trading environments. Complex models take time to produce outputs, which makes it challenging to generate data quickly without compromising its quality.
Trade Confirmation	
6. Reduction in Rekeying Generative AI streamlines trade confirmation documentation by automatically populating templates with trade details, ensuring accuracy and efficiency. This technology optimises the documentation process, making it ideal for legal and compliance purposes.	▪ Integration with Existing Systems: Integrating Generative AI into existing confirmation and settlement systems will require technical adjustments and thorough testing.
Netting and Settlement	
7. Post-trade Automation: Generative AI leverages machine learning and advanced algorithms to mitigate settlement failures. It automates and optimises processes, reducing manual errors, detecting anomalies, ensuring precise trade matching and improving operational efficiency. Its predictive analytical capabilities can provide insights into potential failures, enabling proactive measures to mitigate the risks.	▪ Liquidity Constraints: FX settlement often depends on liquidity - not all currency pairs have the same level of liquidity. Generating accurate settlement predictions for illiquid pairs can be difficult.

Where Things Could Go Wrong

The integration of Generative AI into capital markets firms' processes presents the industry with a unique set of ethical, modelling bias and cybersecurity challenges:

- **Ethical Concerns:** Financial institutions are bound by industry-specific regulations and firms face a complex landscape of financial, legal and ethical considerations when dealing with content generated by AI. Firstly, financial institutions must prioritise the ethical and transparent use of client data. Generative AI can facilitate the extraction of valuable insights from this data, but it also introduces concerns related to consent and data ownership. Without clear ethical guidelines for its design and deployment, Generative AI may inadvertently lead to adverse consequences and real harm.
- **Model Bias and Limitations:** One key challenge in the context of Generative AI is the presence of model bias and limitations, which are particularly pronounced in the highly regulated capital markets. Model bias can emerge when data used to train the platform are incomplete or misrepresented, or it may stem from human biases embedded in the AI algorithm's design or even from apparent correlations of parameters with a spurious relationship. In the capital markets, model bias can result in unethical financial practices, financial exclusion, and an [erosion of public trust](#), among other issues. For example, there was a case in 2021 in which Apple and Goldman Sachs were investigated by the New York State Department of Financial Services for algorithmically offering smaller lines of credit to women.
- **Cybersecurity Risks:** As Generative AI is an emerging technology, it has the potential to be exploited for the creation of more sophisticated phishing messages and emails, offering malicious actors opportunities to impersonate individuals or organisations. This raises the risk of increased identity theft and fraud. Additionally, the [rise of deep fakes](#), which are highly realistic AI-generated videos, audio, or images, may cause significant harm to both individuals and organisations. For example, there was a case in 2019 that involved the use of [fake social media accounts](#) using realistic-looking AI-generated photos of people who did not really exist. One fake account tried to extract information from short sellers of Tesla stocks.

The potential of Generative AI to generate false and malicious content that could shake investor confidence may cause clients to doubt a firm's ability to manage their investments effectively. For example, a hacker could use Generative AI to intercept and alter values in a trading system or bid prices in a trading application, to influence a trader to initiate a move based on fake data. The use of the AI toolkit itself presents another attack vector into the financial institution and the risk this presents for InfoSec teams can be less well understood for this new technology. If a hacker can break into a firm's trading system, they can extract personal information, investment strategies, client accounts, as well as any other commercially sensitive data.

GreySpark Partners' view is that Generative AI technology offers great promise for use in applications within capital markets, but its application – especially in technology that manages the trade lifecycle – should be approached with a high degree of caution. While Generative AI can enhance efficiency, improve client experience, and bolster risk management and compliance, its inherent risks have the potential to jeopardise the reputation and stability of the capital markets sector and, ultimately, to erode public trust.

Next-Generation Creation: Navigating the Future

Generative AI could prove to be a game changer which revolutionises trading by automating trade execution and algorithmic trading strategies to enhance risk management and provide real-time insights. Its ability to analyse vast amounts of data, identify patterns, simulate scenarios and generate trade signals could provide new opportunities for traders to capitalise on market sentiment, predict volatility and adapt to changing market conditions swiftly. Generative AI's adaptive learning capabilities can ensure that trading strategies evolve in line with market dynamics, leading to enhanced performance over time.

However, it is important to acknowledge that although Generative AI has immense transformative potential, the basket of new risks it presents could lead to foreseen and unforeseen challenges. Issues such as unavailability of accurate and high-quality training data, the unexplainable behaviour of complex AI models, biased results, potential systemic risks and ethical concerns must be strategically addressed before the capital markets become too deeply mired in the technology to easily extricate themselves.

As technology continues to evolve, the integration of Generative AI in the capital markets is expected to become more sophisticated, providing market participants with new tools to navigate the complex and ever-changing trading landscape. However, human expertise and oversight in running AI systems and interpreting the generated insights is likely to remain indispensable.

The introduction of regulations such as the [EU AI Act](#) reflects the urgency of acting to counter the evolving risks as well as the speed of adoption of this technology. This framework should allow banks to establish controls and implement governance measures to ensure both safety and effectiveness of the application of the technology in the financial services.

“The transformation of unstructured data sources into structured datasets, real-time sentiment analysis and Generative AI will undoubtedly soon facilitate innovative trading strategies for financial institutions.”

Matthew Cheung, CEO, ipushpull