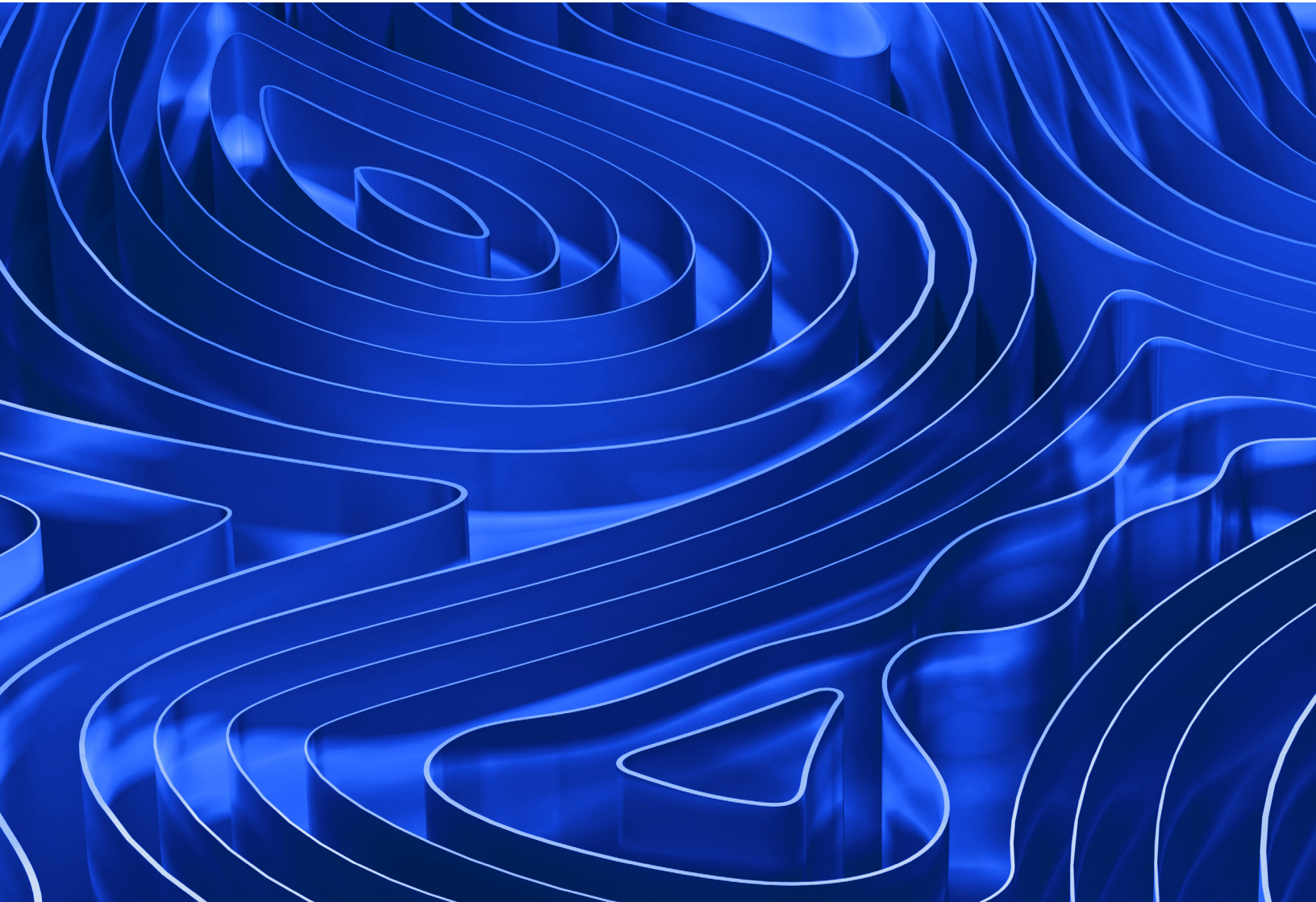# Efficiency Unleashed:
## Capital Markets Operations Reimagined with Generative AI

Designing Trust in AI – *whitepaper series*

**CAPITAL MARKETS FIRMS ARE FACING NEW CHALLENGES:**
Reduced settlement cycles, the continuous quest for efficiency, increasing trading velocity, and new ways of working, to name a few. Although some of these drivers have existed before, the combination is creating significant stress on firms' legacy technology and operating models. There's a pressing need to automate manual, time-consumingtasks to keep up with daily operations.

Prevailing differences in settlement cycles across markets and asset classes will exert additional pressure on manual operational processes for both sell- and buy-side participants across multiple trade lifecycle functions. These include clearing, settlements, trade execution, margins, and fails processing.

The shortening of settlement cycles has forced firms to evaluate legacy systems, reduce batch and manual processing, focus on Straight Through Processing (STP), and reduce fails. Emerging technology advancements in Generative AI (GenAI) and Large Language Models (LLM) are starting to augment, automate, de-risk, and transform how post-trade functions are performed, and are expected to accelerate significantly in the future - driving productivity, increasing scalability and enhancing risk management. In settlement fails for instance, firms recognize the power of this technology to not just quickly and accurately

research complex settlement fails questions, but also take action to resolve when integrated within operational workflows.

Our early estimates indicate that the application of GenAI and LLM technology could lead to at least 40%–60% productivity gains in multiple areas affected by T+1. This step-change in productivity is driven by the ability to use natural language to tap into data and insights, as well as a deeper reasoning capability to predict the next best action and integrate these recommended actions into operational workflows.

Firms that can harness this technology's power can unlock value that is not just critical to meeting T+1 requirements, but also to propel longer term transformation of their operational functions.

Broadridge is innovating with architectural design patterns that, in conjunction with safety and accuracy controls, implement GenAI technology responsibly. Our approach, rooted in principles of compliance, safe interfaces, data privacy, and entitlement-driven data access as well as a strategic choice of LLM drives our product development. **Above all, we're designing trust with this technology — a crucial component to any successful GenAI implementation.**

## The top challenges for Capital Markets firms include:

1. **Reduced Settlement Cycles**
   With the adoption of T+1 settlement in the U.S. and Canada for transactions in cash equities, corporate debt, and unit investment trusts, institutions were required to transform their operations which added to their operational burdens in the process.

2. **Continuously Accelerated Operational Productivity:**
   The pursuit of operational efficiency and cost reduction year-over-year will require automating manual, time-consuming tasks, especially in shorter settlement cycles. Current manual intervention in trading and settlements is neither sustainable nor efficient.

3. **Retaining Talent:**
   The new workforce needs common, easy-to-use system interfaces that allow the fungibility of teams and talent across multiple geographies and asset classes, among other factors.

4. **Accelerate Product Development and Expansion Lifecycle:**

   a. **New Asset Classes:**
      As capital markets expand, firms will venture into new asset classes with unique trading intricacies. This introduces added operational complexities.

   b. **Global Expansion:**
      Operating in a globalized market brings challenges related to cross-border regulations, currencies, and trading hours — further complicating operations.

5. **Data Accessibility:**
   Timely, transparent, and reliable data is critical for decision-making and compliance. Fragmented data across various systems creates access challenges.

   **LLM technology**, a specialized field within Artificial Intelligence (AI), is trained on vast amounts of text to understand existing content and generate original output (such as text, audio, and images).

**THE OPPORTUNITY**

With challenges come opportunities. Adopting T+1 is expected to reduce settlement risk by 50% while improving market efficiency. Investors will be able to access their funds earlier, leading to enhanced liquidity and expedited recovery from market volatility. The shift to T+1 settlement will also pave the way for future advancements in market infrastructure.

In 2024, we can expect further innovation and digitization of market infrastructure, including same-day and block-level clearing, tokenized atomic settlement, and bilateral settlement, to name a few. Technologies such as distributed ledger technology (DLT) and AI will be at the forefront of executive minds as they look to further streamline their post-settlement operations.[1]

To operate at peak efficiency, banks and broker-dealers must minimize manual intervention in favor of automation. To prepare, firms need to look beyond tactical changes and start investing in longer term transformation, including streamlining the front-to-back trade lifecycle, enabling global real-time processing, and consolidating key business capabilities across asset classes on their roadmap.

AI can help firms' post-trade operations be more efficient and scalable. Operations teams can use GenAI and LLM technology to scale effectively by conducting complex research activities, empowering teams to self-serve, and providing necessary insight into key risk indicators (KRIs). GenAI helps us build modern, chat-based, easy-to-use interfaces that allow teams to access data and insights in seconds while also enabling the fungibility of teams and talent across multiple geographies, asset classes, and more.

> "We will be keeping a lean team, so we need to layer in tools that increase productivity across the team. We expect T+1 to put further strain on our teams, who will have less time to do the same amount of work. Additionally, as the business grows, we will need a team that can scale."
>
> *– Head of Ops,*
> Global Investment Bank

> "We have done a good job at cleaning up data and post-trade processing. However, we still have challenges managing inventory movements, which are the majority of our fails. That only becomes more challenging in a T+1 world."
>
> *– Managing Director in Ops*
> Global Investment Bank

**Fast Trade Matching:**
T+1 demands rapid trade matching and AI automates this process — identifying discrepancies promptly and ensuring compliance with accelerated settlement cycles.

**Trade Lifecycle Oversight:**
AI monitors trade lifecycle events to promptly highlight bottlenecks, enable proactive intervention, and avert delays.

**Real-time Data Analysis:**
AI processes real-time market data that aids trend identification, risk mitigation, and trading strategy optimization within T+1.

**Reducing Manual Work:**
AI automates rule-based tasks, thereby expediting settlements and minimizing human error.

**Enhanced Compliance:**
AI integrates rule-based algorithms to validate trades against T+1 regulations, reducing compliance breaches.

**Risk Mitigation:**
AI's real-time monitoring and predictive analytics identifies potential settlement risks, which reduces failures and financial losses.

**Client Services:**
AI improves customer support, providing rapid responses and guidance in the new settlement cycle.

**Complex Data Analysis:**
AI enables quick and accurate data insights, ensuring transparency and accessibility for timely decisions.

**Scalability:** AI easily scales to meet T+1's demands without an infrastructure overhaul.

## OpsG PT: A CO-PILOT FOR OPERATIONS USERS

Building on the successful design patterns of Broadridge's first GPT powered application, BondGPT, OpsGPT by Broadridge is a GenAI- and LLM-powered application — a co-pilot for operations users, analysts, and management teams to better manage operations across the post-trade lifecycle.

Although several operational functions remain fragmented by asset class and market, the industry has made notable progress towards modern unified workflows across key functional areas. Broadridge's Operations Console unifies operations through a single interface that enables clients to tackle day-to-day functions, manage access to information and systems, and self-serve through ad-hoc querying — all in one place. Integrating these workflows with GenAI and OpsGPT will create a further step change in productivity for operations.

Take trade settlements, for example. The Depository Trust and Clearing Corporation (DTCC) estimates that a trade settlement failure rate of just 2% costs firms up to $3 billion globally.[2] Beyond financial costs, which include Central Securities Depositories Regulation (CSDR) penalties and a potential cost of carry, a trade fail has significant implications on firm liquidity, systemic risk, reputational risk for the firm, staff usage, and time.

> **"OpsGPT changes the landscape of securities operations processing and supervision by bringing the answers to everyday and more complex scenarios to the users' fingertips, with AI allowing them to query to data across multiple platforms and present the results in a concise easy to understand format."**
>
> **– Brian Hayes,**
> *Sr. VP, Operations, Broadridge*

OpsGPT provides data and insights in an easy-to-use interface that's consistent across multiple systems with complex workflows, removing some major time-consuming and error-prone activities. These include:

- Opening multiple screens to collate data needed to research a fail

- Extracting and transforming data to Excel to get initial insights

- Confirming the next best action for resolution

Replacing these complex set of activities across multiple systems into a simple natural language interface, OpsGPT unlocks expected productivity gain of 40% to 60% by:

- Reducing research time to identify root cause of fails (fails due to insufficient position — typically 14% of total fails in the industry)

- Accelerating research of next best action and integrating workflow to resolve the fail

- Prioritizing key risk items (helping to structure an operations analyst's day by surfacing the oldest fails)

- Providing management insights to better manage workflow and teams through dashboards

A key advantage of OpsGPT is faster, seamless data accessibility. OpsGPT is trained on curated and harmonized data from our global multi-asset post trade systems, which is based on a common Broadridge ontology. This streamlines access, connectivity, and understanding of data across multiple asset classes in Broadridge and third-party systems. Enhanced understanding of the data and resulting insights help analysts collect information on where and why trades have failed in seconds, as well as how to correct them.

With the help of GPT technology, analysts can increase the speed at which they resolve breaks, decrease the number of fails and breaks, and increase their capacity for higher-level and fungible tasks across multiple asset classes, geographies, and systems.

Additionally, OpsGPT's knowledge management assistance (AI SME) feature helps clients with just-in-time "how to" assistance on the nuances of correcting operational issues, helping to accelerate the identification, prioritization, and resolution of settlement fails. For example, a user could enter, "Where can I find my failed trades?", "How do I find my open positions?", or "Do I need special permissions?" The AI SME allows follow-up conversations to enable users to ask follow-up questions about the same subject (e.g., "Tell me more about this functionality.")

This is just one example. OpsGPT is the co-pilot that will create a step change in productivity for the operations teams, creating front-to-back trade lifecycle event transparency, and empowering users to swiftly remediate, reduce, and prevent risks over time. This is accomplished by:

- Allowing users to personalize the assistance they receive through predictive analytics and actionable insights

- Enabling data-driven decision making through their ability to access richer, harmonized, and contextual data through a unified, universal data model

- Creating seamless workflows helping to enhance user adoption for maximum efficiency and scale

- Driving cross-team insights with access to real-time information and workflows

## INNOVATING RESPONSIBLY TO ADDRESS INDUSTRY NEEDS

Broadridge has designed OpsGPT with a clear focus on responsible AI practices, addressing the unique needs and challenges faced by the industry. Our approach is rooted in principles of compliance, safe interfaces, data privacy, and entitlement-driven data access as well as a strategic choice of LLM.

### 1. Safeguarding client data

Capital markets operates with a wealth of sensitive data, with data privacy being a key priority for firms. That's why OpsGPT has advanced technologies and design patterns to mitigate these risks. The application uses a comprehensive compliance layer to ensure the protection of sensitive business data, personally identifiable information, and proprietary knowledge, allowing our clients to harness the power of LLMs without the risk of data exposure.

OpsGPT leverages Broadridge's capability to seamlessly integrate with multiple LLM providers, such as OpenAI and Broadridge cloud-hosted LLMs. The Broadridge AI platform provides the flexibility to choose a model based on specific use case needs, as well as both functional and non-functional requirements. The platform provides a consistent and scalable API interface that makes it easy to switch between different models based on client needs and risk governance processes.

User inputs and LLM responses are persisted securely in an internal Broadridge datastore for review and audit purposes, ensuring compliance with regulatory requirements. Furthermore, use of a common harmonized data "language" helps to de-risk implementation, accelerate client onboarding, and improve decision-making on fails resolution.

As a trusted partner to capital markets firms for decades, Broadridge has a track record of safeguarding both client and internal data.

### 2. Avoiding LLM hallucinations

The accuracy and reliability of LLM responses are of paramount concern, especially in the financial sector. There are potential challenges related to LLM hallucinations, which can lead to misleading or erroneous information. OpsGPT relies on verified and curated sources to address this challenge, ensuring that the responses it provides are accurate. By refraining from LLM-generated responses, OpsGPT design patterns instead focus on retrieving precise data from trusted sources and surfacing it via the LLM chat interface. This approach not only eliminates hallucination risks but also enhances the quality of responses, aligning with industry standards and reliability.

### 3. Meeting regulatory requirements

Regulations in the financial services industry are constantly evolving and play a pivotal role in shaping AI deployment. OpsGPT is built with regulatory requirements and industry-specific laws in mind.

Similar to BondGPT, the design pattern includes a compliance layer in the form of an AI agent that monitors the application's output. Trained on existing compliance rules, all OpsGPT outputs are subject to this scrutiny. The application architecture is ready to incorporate upcoming regulatory rules as they come into effect, allowing for compliance updates. This proactive approach allows financial institutions to use OpsGPT confidently, knowing that it helps safeguard clients and institutions themselves.

### 4. Protecting your IP

In the competitive landscape of capital markets, safeguarding intellectual property (IP) is imperative. Broadridge places a strong emphasis on protecting its clients' IP, as well as its own. OpsGPT achieves this by sourcing information directly from Broadridge rather than individual clients, adding an additional layer of security and obfuscation. Additionally, our strategic choice to use a privately hosted model ensures client and Broadridge data are within our compliance and privacy walls. This approach extends to clients' IP, granting the necessary protection and peace of mind.

## WHY BROADRIDGE?

Broadridge is innovating with architectural design patterns that, in conjunction with safety and accuracy controls, implement GenAI technology responsibly to address these concerns systematically.

Broadridge's AI platform safeguards both the client's and Broadridge's proprietary information, providing safe access to LLMs including commercial SaaS products like ChatGPT as well as private, Broadridge cloud-hosted models.

The combination of our front-office trading and connectivity solutions, as well as our comprehensive post-trade processing solutions, allows us to offer unique benefits for Capital Markets firms through:

- Simplification and innovation across the trade lifecycle

- Better trading decisions and client insights

- Improved controls, reduced risk, and increased compliance

- Greater agility, faster time to market

- Improved scalability and reduced fragmentation of interfaces and tech costs

## ACCELERATING POST TRADE OPERATIONAL TRANSFORMATION — SAFELY

Every firm will have a unique roadmap towards T+1 preparedness. AI can accelerate this by creating end-to-end trade lifecycle event transparency through fragmented trade processing ecosystems, empowering its end-users to swiftly remediate, reduce, and ultimately prevent risks over time.

AI tools can help professionals research and resolve fails in minutes versus hours, and quickly understand the next best action for a quick resolution. These tools can also find operational efficiencies throughout their organization, providing a competitive advantage that translates into smarter decisions.

Broadridge is committed to continuing innovation, providing safe and responsible AI products at scale while also building a pipeline of both client-facing products in our Capital Markets post-trade and front office businesses, as well as internal productivity and efficiency enhancements. We work hands-on with each of our clients who are interested in incorporating AI into their operations in a safe, compliant way.

[1] **Journey to Meet T+1 in 2024 and Beyond. Datos Insights. Retrieved December 5, 2023, from https://datos-insights.com/reports/journey-to-meet-t1-in-2024-and-beyond/**

[2] **Depository Trust & Clearing Corporation. (2019, April). DTCC Outlines Path to Reduce Trade Failures, Increase Security and Efficiency of Markets. Retrieved from https://www.dtcc.com/news/2019/april/17/dtcc-outlines-path-to-reduce-trade-failures-increase-security-and-efficiency-of-markets.**
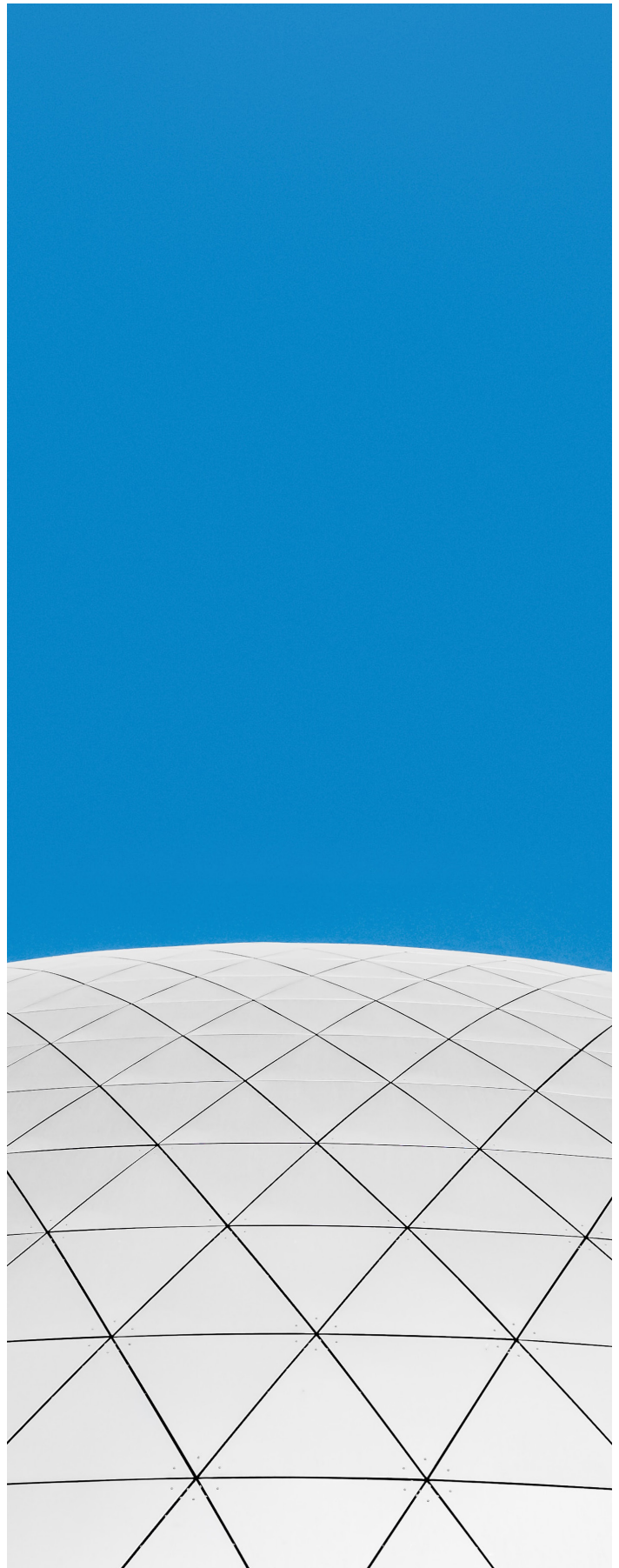
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