canoe

The AI Advantage in Alternative Investments

How structuring your alts data and automating your workflows can accelerate your firm's growth.

Table of Contents

Introduction

Artificial Intelligence (AI) is rewriting the rulebook, transforming how financial institutions operate, make decisions, and serve their clients. Welcome to an era where machines don't just crunch numbers; they decode complexity, offering unprecedented insights and efficiency.

The alternative investment sector, with its unstructured data, complex financial documents, and intricate strategies, stands at the forefront of this AI-driven transformation. As the volume and complexity of investments continue to surge, so do the documents and data associated with each. That means the question isn't whether to adopt AI, but how to harness its power effectively and responsibly.

97%

OF COMPANIES

already believe that the adoption of AI solutions can help their businesses grow.

> "The question isn't whether to adopt AI, but how to harness its power effectively and responsibly."

—NOEL CALHOUN
CHIEF TECHNOLOGY OFFICER
AT CANOE INTELLIGENCE

AI's Potential Impact on Alternative Investments

CURRENT LANDSCAPE

The financial services industry is in the midst of a profound shift, driven by the rapid advancement and adoption of AI. From automated trading algorithms to personalized customer experiences, AI is reshaping every facet of finance. In the alternative investment space, where complexity reigns supreme, AI's potential is particularly exciting.

AI in Alternative Investments

01. INTELLIGENT DATA EXTRACTION

02. DOCUMENT PROCESSING AUTOMATION

03. REAL-TIME PORTFOLIO MONITORING

04. ADVANCED ANALYTICS & RISK MANAGEMENT

THE CHALLENGE AND OPPORTUNITY

Alternative investments, including private equity, hedge funds, real estate, and venture capital, present unique challenges. The sector's reliance on unstructured data, non-standardized reporting, and complex financial instruments has long been a barrier to efficiency and transparency. These challenges make alternative investments a prime candidate for AI-driven solutions.

Can AI transform tedious, manual, and human-error workflows? Yes, the opportunity is clear. AI can transform the historically opaque and labor-intensive world of alternative investments into a realm of unprecedented clarity and efficiency. At Canoe, we're seeing a trend among our clients—those who embrace AI are suddenly asking for more data, not less. When insights are at your fingertips, the appetite for information grows exponentially.

"We're looking at more of the data that Canoe can pull out and considering what other analysis we might want to be doing of clients. We couldn't do that before because it was too time-intensive and manual to get there." — John Schneider, *Managing Partner and COO at Ohana Advisors and Canoe client since 2021*

This transformation isn't just about streamlining existing processes—it's about unlocking possibilities that were previously out of reach. Investment professionals are finally able to pursue the deep analytical projects they've long envisioned but had to shelve due to a lack of data. Whether it's conducting comprehensive vintage year performance comparisons or analyzing fee structures across complex fund families, teams can now execute on their analytical backlog. Even more exciting, the sheer processing capacity of AI opens doors to entirely new forms of analysis that weren't previously conceivable. From identifying subtle patterns across thousands of portfolio companies to running sophisticated cross-fund correlation studies, the analytical possibilities become virtually limitless when freed from manual data constraints.

In order to seize this opportunity, one must first understand the true nature of AI and its applications in finance.

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MANAGING PARTNER AND COO
AT OHANA ADVISORS

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Understanding AI: From Basics to Breakthroughs

DEMYSTIFYING AI AND NATURAL LANGUAGE PROCESSING

Natural Language Processing (NLP), a branch of artificial intelligence focused on the interaction between computers and human language, is the key to unlocking the potential of text-heavy financial documents. At its core, NLP in finance is about doing math with words.

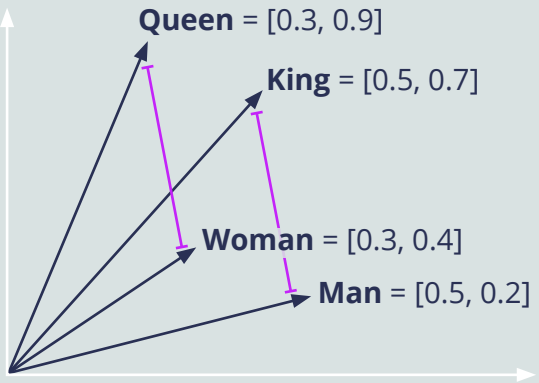
To help put this in perspective, here is a thought exercise: Imagine each word as a point in a multidimensional space. NLP allows us to map words into this space, enabling computers to understand the syntax and semantics of language. In other words, NLP is like teaching a computer to read between the lines, not just the lines themselves. It's the difference between a machine simply recognizing words on a page and inferring the nuances of a complex financial report.

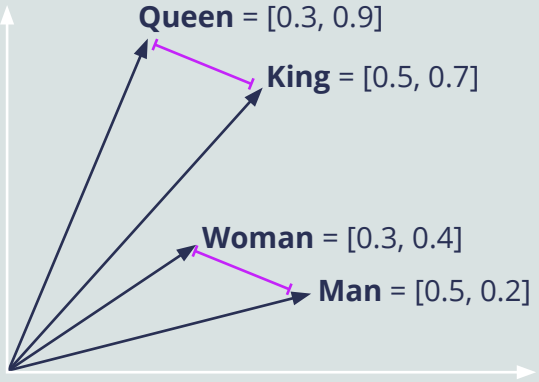
This "math with words" approach transforms the way we (at Canoe) process and analyze financial documents, turning unstructured text into structured, actionable data.

NLP = MATH WITH WORDS

Encoding words as vectors in N-dimensional space. It's like 3-dimensional space, but more.

You can do "mathy" things with the word vectors, like add and subtract them. Then, you can decode the results.

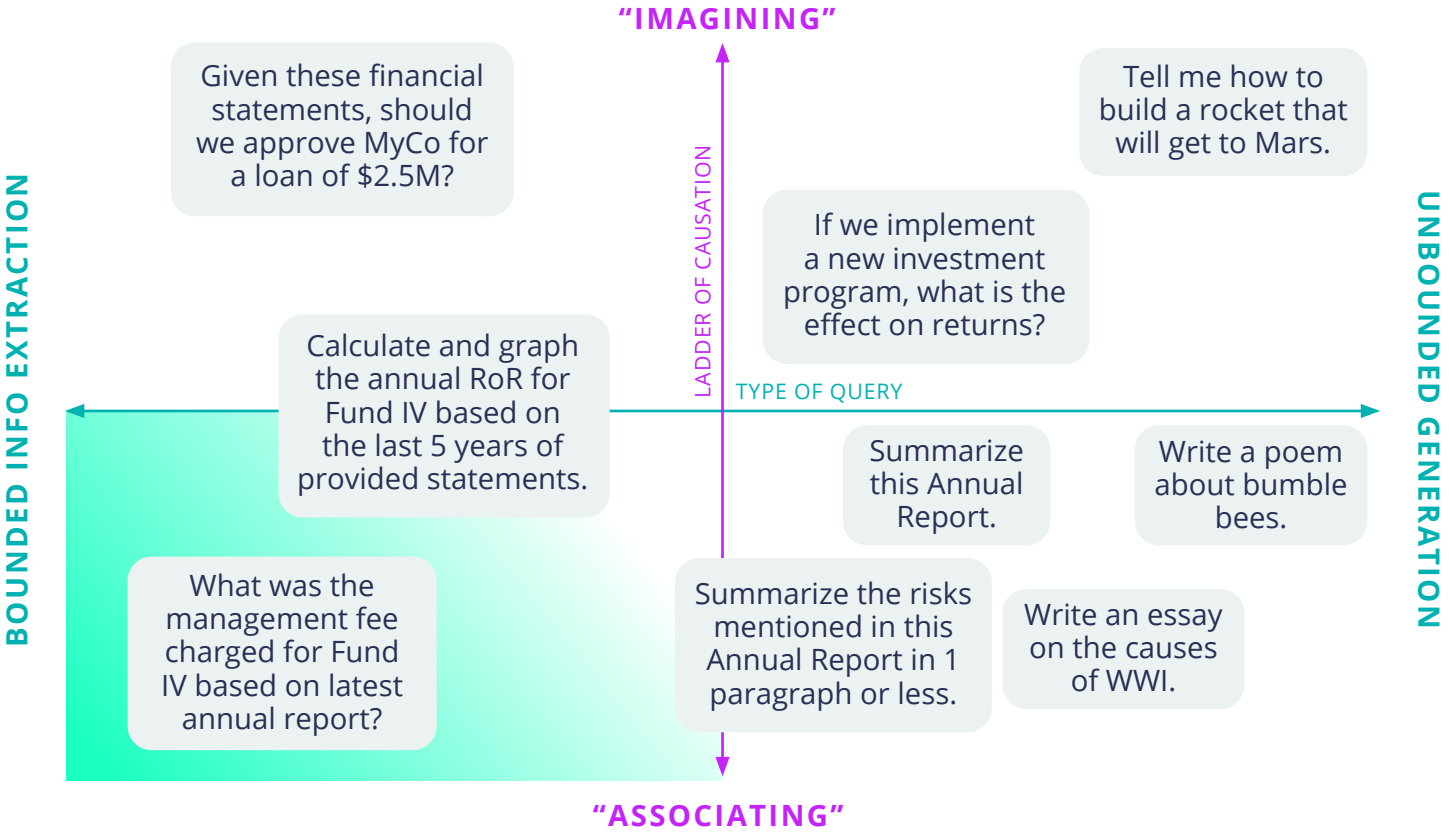




The graph above is a stylized recreation and illustration sourced from the National Science Foundation

The AI Framework: A New Perspective

To truly grasp AI's potential and limitations in finance, we need a framework for understanding its capabilities. Drawing inspiration from Judea Pearl's Ladder of Causation, we can visualize AI applications on two axes: **the level of causation** (from simple association to complex imagination) and **query boundedness** (from highly constrained to completely open-ended).



This framework creates four quadrants, each representing different levels of AI capability and reliability:

Bounded Imagination Requires advanced AI capabilities, potential for bias	**Unbounded Imagination** The "danger zone" - the highest risk of unreliable outputs
Bounded Association Safe zone for AI application	**Unbounded Association** Moderate risk, requires careful implementation

For firms with growing commitments in alternatives, focusing on the "Bounded Association" quadrant offers the most reliable and impactful AI applications. This involves using AI for tasks with clear constraints and specific contexts, such as data extraction from known document types or pattern recognition within defined datasets.

THE POWER AND LIMITATIONS OF AI IN FINANCIAL DOCUMENT PROCESSING

In the high-stakes world of financial data, close isn't good enough. It's crucial to understand that while AI can process vast amounts of data at unprecedented speeds, it's not infallible. From complex fund structures to intricate fee calculations, financial documents demand a level of precision that can challenge even the most sophisticated AI systems.

The goal isn't perfection, but to significantly outperform human capabilities in speed, consistency, and scalability. By focusing on bounded, associative tasks and implementing robust validation processes, we can leverage AI's power while mitigating its limitations. Where traditional manual processing might take hours and introduce human error through fatigue or oversight, AI can maintain consistent accuracy across thousands of documents in minutes.

The key to maximizing AI's potential while accounting for its limitations lies in thoughtful system design. This is where human-in-the-loop validation becomes crucial.

The key to maximizing AI's potential while accounting for its limitations lies in thoughtful system design. This is where human-in-the-loop (HITL) validation becomes crucial. At Canoe, we've found that combining AI's processing power with human expertise creates a powerful synergy. When AI encounters edge cases or unusual document formats, it can intelligently route these exceptions to human experts for review. This hybrid approach ensures both speed and accuracy—AI handles the heavy lifting of routine processing, while human experts provide oversight and handle complex cases that require nuanced understanding. The result is a system that leverages the best of both worlds: AI's unmatched processing capabilities and human judgment's irreplaceable nuance.

This balanced approach transforms what could be seen as AI's limitations into opportunities for enhanced quality control. Rather than viewing AI as a complete replacement for human expertise, successful implementations recognize it as a powerful tool that, when properly integrated with human oversight, creates a more robust and reliable system than either could achieve alone.

IMPLEMENTING AI FOR ALTERNATIVE INVESTMENT OPERATIONS

To effectively leverage AI in alternative investments, firms need more than just algorithms. You need a comprehensive approach that includes:

- **Robust supporting infrastructure:** A foundation of secure, scalable systems that can handle high document volumes while maintaining performance. This includes cloud computing resources, data storage solutions, and networking capabilities that can grow with your needs.
- **Data preprocessing systems:** Sophisticated tools that clean, standardize, and prepare documents for AI processing. For example, systems that can handle multiple file formats, recognize document layouts, and standardize varied reporting structures from different fund administrators into a consistent format.
- **Output formatting tools:** Flexible systems that can deliver extracted data in formats that integrate seamlessly with your existing workflows and downstream systems. Whether you need data formatted for portfolio management systems, risk analytics platforms, or custom reporting tools, the output should align with your operational needs.
- **Quality assurance mechanisms:** Multi-layered validation processes that ensure data accuracy. This includes automated checks that flag unusual values, cross-reference data points across documents, and verify calculations against expected ranges. For instance, ensuring that reported NAV values align with historical trends and detecting any anomalies that require human review.
- **Exception management systems:** Intelligent workflows that can identify, route, and track unusual cases or potential errors. When the AI encounters complex scenarios or low-confidence extractions, these systems ensure the right experts are notified and can efficiently review and resolve issues, maintaining both speed and accuracy in your operations.

Together, these components create a robust ecosystem that can reliably process complex alternative investment documents while maintaining the high standards of accuracy that the industry demands.

While perfect accuracy is an unrealistic goal, AI systems can approach and often exceed human-level accuracy through:

- Rigorous testing and validation processes
- Continuous performance monitoring and statistical sampling
- Implementing strategies like Retrieval Augmented Generation (RAG)*
- Fine-tuning models for specific financial tasks
- Model competition to identify the most accurate results
- Constraining outputs to ensure reliability
- Continuous retraining to adapt to new document types and formats

**Retrieval Augmented Generation (RAG) is a technique that improves AI language model outputs by incorporating relevant information retrieved from external knowledge sources before generating responses.*

BEST PRACTICES FOR AI ADOPTION

For firms looking to gain operational efficiency by leveraging AI, begin with a focus on manual-intensive, human-error-prone tasks, such as document collection, document categorization, and data extraction. With the newfound time-savings and data accuracy, you and your team can shift your own focus to higher-value tasks and net-new data analysis to help you make more informed investment decisions.

In order to identify your business' use case for adopting AI into your workflows, consider the following best practices whether you're building your own AI solution or evaluating third-party providers:

- **Focus on bounded, associative tasks where AI excels:** Clearly define the scope of what you want the AI to accomplish. Start with structured, repetitive tasks with clear inputs and outputs. Ensure the task has consistent patterns from which the model can learn. Verify there's sufficient quality data available to train the model. Evaluate whether the task truly benefits from AI versus traditional automation.
- **Implement robust governance and exception management processes:** Establish clear thresholds for AI confidence scores. Define explicit criteria for when human review is required. Create documented escalation paths for different types of exceptions. Set up monitoring systems to track exception patterns. Maintain detailed audit trails of all AI decisions and human interventions.
- **Balance automation with human oversight:** Design processes that leverage both AI efficiency and human expertise. Create clear handoff points between automated and manual processes. Implement feedback loops where human corrections improve the AI system. Establish quality control checkpoints at critical stages. Perform regular reviews of automation vs. manual intervention ratios.
- **Establish clear policies for AI use and data governance:** Define data security and privacy requirements. Document data handling procedures and access controls. Create guidelines for data retention and disposal. Establish protocols for model updates and versioning. Develop clear policies for handling sensitive information.
- **Regularly audit AI systems for bias, accuracy, and compliance:** Schedule periodic accuracy assessments against known benchmarks. Monitor for potential biases in training data and outputs. Track regulatory requirements and ensure ongoing compliance. Conduct regular performance reviews of the AI system. Document all audit findings and remediation efforts.
- **Foster a culture of AI literacy across the organization:** Provide training on AI capabilities and limitations. Ensure teams understand their role in the AI-enabled workflow. Encourage feedback and suggestions for improvement. Create channels for sharing AI-related insights and best practices. Develop metrics to measure AI adoption and impact.

When evaluating third-party AI providers, additional considerations include:

- Reviewing their data security certifications and compliance standards
- Understanding their model training methodology and data sources
- Assessing their track record in your specific use case
- Evaluating their exception handling and support processes
- Checking their system's compatibility with your existing infrastructure
- Understanding their approach to model updates and maintenance
- Verifying their business continuity and recovery plans in the case of a data breach

These best practices help ensure that whether you're building or buying an AI solution, you're setting up your organization for successful AI adoption while maintaining appropriate controls and oversight.

DEBUNKING AI MYTHS & COMMON MISCONCEPTIONS

As AI becomes more prevalent in finance, it's important to address common myths and misconceptions:

AI is biased: TRUE

While AI can exhibit bias, this often reflects societal biases in training data. In alternative investments, this bias can be effectively mitigated by focusing on bounded, associative tasks and using carefully curated, industry-specific data. By constraining AI to well-defined tasks with clear parameters and verifiable outputs, we can minimize the impact of potential biases while maintaining high accuracy and reliability.

AI is too expensive: MAYBE

Due to the inflated hardware costs, the cost of quality assurance and validation of those AI solutions can also run up costs easily. Initial implementation costs can be significant, but the long-term ROI often justifies the investment. AI can dramatically reduce labor costs associated with repetitive tasks. It may be extremely expensive today, but as the hardware required to support AI becomes more commoditized, the cost is likely to decrease over time. For firms looking to modernize their processes, create long-term efficiencies, and position themselves ahead of the rest, the cost is likely worth it.

AI is inaccurate: TRUE

The risk of AI producing incorrect information can be minimized by constraining AI to bounded tasks and implementing rigorous validation processes. However, if you wonder outside of the bounded tasks, AI can confidently present convincing but 100% incorrect data, otherwise known as hallucinations. While keeping queries "bounded," it's critical for firms to incorporate a human feedback system.

AI is exposing sensitive data: MAYBE

Concerns about AI exposing sensitive data are manageable through internal hosting, strict data governance policies, and integration with existing security frameworks. Without these guardrails, the risk of your data being leaked (or being fully exposed) is extremely high. If you, or a trusted third party like Canoe, can host your model, the risk of exposing your data is greatly reduced due to the security parameters that are set in place. For example, Canoe has an eight-layered cybersecurity infrastructure to safeguard our clients' data.

AI is approaching human intelligence: FALSE

For the foreseeable future, this is completely false. Regardless of how much we learn about the human brain, it always remains a thousand times more complicated than we thought it was. In May of 2024, scientists performed a cellular scan of one cubic millimeter of the human brain. If they had tried to include the whole brain, it would have required 1.6 zettabytes of storage, $50 billion for the hard drive alone, and a 140-acre data center. Despite exponential progress on the AI front, we're still likely decades away from truly tapping out how complex the human brain is and being able to match it.

AI is causing job displacement: TRUE

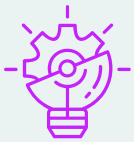
AI is more likely to augment human capabilities than cause wholesale job losses, shifting focus from repetitive tasks to more strategic, high-value activities. However, many of the jobs that exist today, including software engineering, once did not exist. Some jobs will become more efficient and higher-value, and some will disappear altogether, but new jobs will also be created to fill new needs.

Canoe's Approach: Navigating the AI Landscape

We're finding that our clients' experiences often contradict common AI myths. For instance, rather than job displacement, many report that AI has allowed them to reallocate talent to more strategic roles.

Before most of the tech world was just beginning to grasp the potential of machine learning, companies like Canoe were already deep into pioneering applications for specific use cases (in our case, alternative investment document collection and data extraction). Now that the industry is starting to catch up and feel the impacts, Canoe continues to lead with our models, data, and applications. For context, we have a robust fund master with over 44,000 funds and process over 50 million documents per year. *(Data as of February 2025)*

Our approach to AI in alternative investments is grounded in three key principles:



Infrastructure that is forward-compatible with the latest AI industry advancements

Proprietary data models trained exclusively in-house using only contextually relevant alts datasets as inputs

Rigorous testing & monitoring standards, including using a secondary AI agent to check the initial output of the first

At Canoe, AI isn't an afterthought, it's the culmination of years of alternative investment expertise. Our models have been purpose-built to handle the nuances of alts data with unparalleled accuracy. Blending these AI advancements with our deep alts expertise enables our clients to stay ahead, even as the alts operations landscape continues to rapidly evolve.

"Building models and putting data into models is actually relatively easy. But if you want industrial-strength AI with really strong governance, there's a ton of supporting infrastructure required. That's where Canoe differentiates - in the rigorous testing, validation, and governance that ensures reliability." —Noel Calhoun, Chief Technology Officer at Canoe Intelligence

Another advantage to hosting and training our models in-house, we ensure that sensitive financial data remains within our secure environment. Client data is never fed into public AI models or used to train systems—in fact, client data never leaves our firewalls.

Our commitment to responsible, trustworthy AI use means we focus on the "safe zone" of bounded, associative tasks. This approach allows us to deliver reliable, actionable insights while avoiding the pitfalls of more speculative AI applications.

> "Building models and putting data into models is actually relatively easy. But if you want industrial-strength AI with really strong governance, there's a ton of supporting infrastructure required. That's where Canoe differentiates; in the rigorous testing, validation, and governance that ensures reliability."
>
> —**NOEL CALHOUN** CHIEF TECHNOLOGY OFFICER AT CANOE INTELLIGENCE

5 WAYS CANOE INTELLIGENCE IS UTILIZING AI*

1. **Document processing:** Sophisticated AI-powered systems deployed to ingest and process various document types, dramatically reducing manual data entry and enhancing accuracy.
2. **Data extraction:** Advanced NLP techniques leveraged to extract critical information from complex financial documents, transforming unstructured data into actionable insights.
3. **Data validation:** Multiple validation techniques employed, including competing models and rules-based expectations, ensuring consistently high data accuracy across all document types.
4. **Exception management:** Sophisticated AI infrastructure implemented to identify and route complex cases to human experts, maintaining efficiency while ensuring accuracy for edge cases.
5. **Continuous learning:** AI models continuously retrained using real-world feedback and usage patterns, ensuring systems evolve alongside new document formats and industry trends.

**Data and use cases as of February 2025*

HOW OUR AI APPROACH HELPS ALTERNATIVE INVESTORS

Increased operational efficiency: Leverage AI and automation to dramatically reduce manual data entry and document processing time. Get your documents and data faster with superior accuracy, while automatically delivering structured and validated information across your workstreams.

Enhanced accuracy: Trust in AI that consistently outperforms human-level accuracy in data extraction and validation, minimizing errors and reducing the need for multiple review cycles.

Scalability: Process exponentially higher volumes of documents and data without a proportional increase in resources or costs. Handle growing document volumes and new fund relationships while maintaining consistent processing times and quality.

Expanded analytical capacity: Free your team from routine data processing to focus on high-value activities like deep portfolio analysis, risk assessment, and strategic decision-making. Transform previously routine roles into analytical powerhouses.

Improved decision-making: Gain faster access to accurate, structured data for more timely and informed investment decisions. Turn around investor requests quickly and spot trends across your portfolio with confidence in your underlying data.

As Canoe's client base grew, so did the power of our systems. What began as individual customizations evolved into collective intelligence, driving the entire industry forward. This collaborative approach to machine learning set a solid foundation for the continual evolution of our core extraction technology.

THE FUTURE OF AI IN ALTERNATIVE INVESTMENTS

The future of alternative investments isn't just about big data—it's about smart data. While big data provides the raw material, AI can standardize and package specific datasets, ultimately providing you with actionable intelligence by identifying patterns, anticipating trends, and surfacing insights that would be impossible to discover through traditional analysis. This evolution from data quantity to data intelligence represents a fundamental shift in how investment firms operate and make decisions.

As AI continues to evolve, we anticipate emerging trends such as:

Enhanced natural language understanding for more complex document analysis, enabling AI to comprehend and extract information from increasingly sophisticated financial documents and unstructured data sources

Advanced predictive analytics for investment strategy optimization, allowing firms to identify patterns and opportunities across vast portfolios with unprecedented precision

Increased integration of AI with process automation technologies to create end-to-end intelligent workflows, streamlining operations from document intake through reporting and analysis

> **"We surround our AI models with rules and heuristics that prevent errors, while maintaining a very in-depth exception management and sampling process.**
>
> **Every piece of feedback gets moved back into the retraining of our models automatically. That's how we ensure responsible advancement—through continuous validation and improvement."**
>
> —**NOEL CALHOUN** CHIEF TECHNOLOGY OFFICER AT CANOE INTELLIGENCE

Conclusion: Preparing for Success in the AI Era

The AI revolution (and full-scale adoption) in alternative investments is not a distant future—it's happening now. According to Forbes, 97% of companies already believe that the adoption of AI solutions can help their businesses grow. It's clear that most businesses anticipate AI eventually having an outsized impact on operations but many are slow to adopt it or fail to see how it can impact their day-to-day workflows. Firms that embrace AI-powered solutions today will be best positioned to thrive in an increasingly complex and data-driven landscape.

At Canoe, we're committed to driving this innovation forward, providing alternative investment professionals with the tools they need to navigate the AI landscape successfully. By harnessing the power of AI responsibly and effectively, we can unlock new levels of efficiency, accuracy, and insight into alternative investments.

CANOE CLIENTS AUTOMATE

up to **90%**

of their alts document and data management workflow

The future of finance is intelligent.
Will you be part of it?

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