



Artificial intelligence

The next frontier for investment management firms

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Artificial intelligence in investment management

What is artificial intelligence?

While there is no single, universally accepted definition, artificial intelligence (AI) generally refers to the ability of machines to exhibit human-like intelligence and a degree of autonomous learning. An example would be machines solving a problem without the use of hard-coded software containing detailed instructions. Deloitte recently worked with the World Economic Forum on a report, *The new physics of financial services: How artificial intelligence is transforming the financial ecosystem*. Through that project we developed this definition of what AI is:

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
- Create good rules
- Make good decisions
- Communicate with other people¹

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.

Ten AI use-cases in investment management

Portfolio management and client enablement:

- **Automated insight:** reading earnings transcripts to assess management sentiment
- **Relationship mapping:** identifying nonintuitive relationships between securities and market indicators
- **Alternative datasets:** analyzing 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' behavioral patterns
- **Client outreach:** smart client outreach and demand generation via analytics, using alternative data sources such as social media data

Front, middle, and back office efficiency:

- **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

Where have we seen adoption of machines in investment management?

The operating environment for investment management firms worldwide continues to undergo sustained transformation as well-documented industry challenges intensify. Limited organic growth, volatile capital market returns, and fee and margin compression have created a more challenging context. In this shifting paradigm, technology continues to play a critical role in enabling rapid business transformation, as well as driving opportunities for efficiencies, innovation, and value creation.

To date, the core focus of industry applications of intelligent machines has predominantly centered on boosting operational efficiencies across front, middle, and back office processes. These use cases and applications have typically focused on:

- Identifying trends and patterns to support sales and distribution, product pricing, trade allocation, portfolio construction and analytics
- Streamlining processes across middle and back office activities including trade support, reference data analysis, performance attribution, account set-up and customer onboarding

With traditional sources of differentiation in investment management becoming increasingly commoditized, AI is providing new opportunities which extend far beyond cost reduction and efficient operations. Many investment management firms have taken note and are actively testing the waters, applying cognitive technologies and AI to various business functions across the industry value chain. BlackRock, the world's largest asset manager, announced earlier this year that it has set up a new center dedicated to research in AI—the "BlackRock Lab for Artificial Intelligence"—underscoring the heightened interest among firms around how AI can transform many facets of the industry.²

The next section of this report will examine how AI, where aligned to the four pillars of desired outcomes can be deployed by investment management firms to drive business transformation.

Four pillars for transformation

The evolving status quo in the investment management industry thrusts into the spotlight the growing importance for firms to make bold decisions to allocate capital to capabilities and initiatives which offer potential for transformation and value creation. We have identified the following four pillars for transformation.



Generating Alpha

For firms seeking organic growth through outperformance, big data and alternative data offers up a world of possibilities for generating additional alpha.



Enhancing Operational Efficiency

Firms will continue to deploy AI and advanced automation to continuously improve the efficiency of their operations. However, beyond this, firms have the opportunity to transform these traditional cost centers into AI-enabled “as a service” offerings.



Improving Product And Content Distribution

AI can enable advisers to holistically understand investor preferences in real time, more effectively manage and tailor content, and deliver it with greater agility and speed to clients.



Managing Risk

AI can bolster compliance and risk management functions, enabling firms to:

- Automate data analysis
- Reduce administrative activities
- Refocus employees' time to higher value-add activities

When these four pillars are augmented with AI, investment management firms can rapidly transform business models, operations, and internal capabilities. The successful development and implementation of AI will however be heavily influenced by the choices that stakeholders make today with regards to a firm's technology strategy, standard operating model, core infrastructure, and talent agenda. Firms that move early will likely stand in good stead to capitalize on these four pillars.



PILLAR #1: GENERATING ALPHA

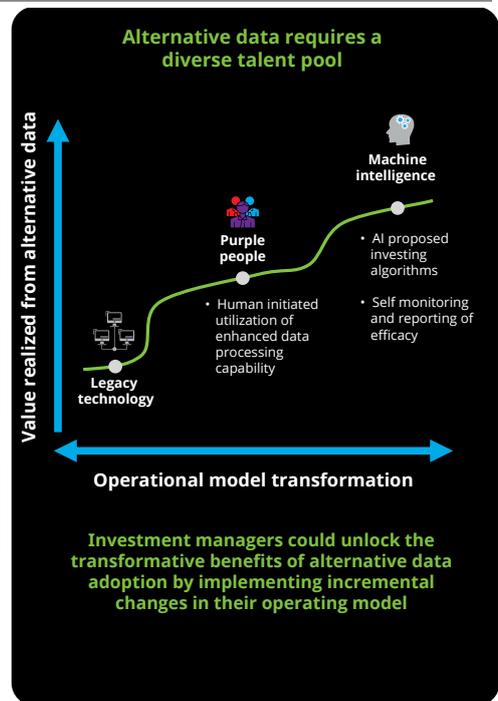
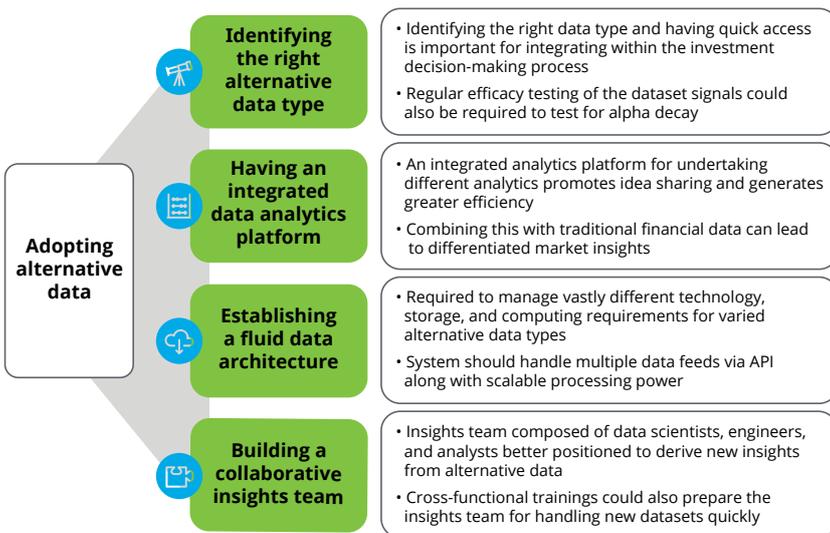
At the core of every active investment manager is the goal to generate alpha for their clients. As technology and data evolve, firms that keep pace, or lead, in the application of new approaches open up the opportunity to outperform. The rate of data creation is growing exponentially, and firms that transform data into fuel for investment insights will improve their opportunity for alpha.

How to get started with alternative data—the operating model³

Alternative data adoption requires operating model changes

An ongoing talent and technology race is on for alternative data implementation as investment management firms see the rewards of implementation.

Points to consider while adopting alternative data



How intelligent machines can help

Idea throughput

With advanced analytics of structured and unstructured data, firms can vastly improve the quantity of information used to support investment ideas. Machines can process events at roughly 2,000 times the speed of humans and they work around the clock.⁴ Imagine a typical analyst, constrained by time, being transformed from reading a few analyst reports and listening to the earnings call for a name that they follow, into having a dashboard that summarizes all of the available reports and compares the earnings call across time and competitors. Machine-assisted analysts will likely be better.

Idea quality

Some insights may come only from digesting vast quantities of data. When faced with extremely large datasets, humans are overwhelmed without computer assistance. Computers don't get frustrated sifting through the data, searching for the magic correlations. When computers can identify these ideas and pass them along in a digestible format to their human bosses, decision quality can improve. Hypothetically, imagine a computer analyzing Boston Marathon data. What if it discovered that the frequency of a running shoe brand being worn sometimes changed from year to year. And that when it changed by more than 2 percent it was highly predictive to the revenues for the shoe brand over the next quarter.

If firms can do more and do it better, odds are their results will improve

Adopting alternative data can focus on augmenting existing investment processes, rather than transforming them. This approach may help ease tension between portfolio managers and data analysts. Assessing investment strategies for strategic fit for alternative data is an important early step to take. It starts with a basic question: In a perfect world, what information would you like to know as you analyze a firm? Followed by: What information do you currently use as a proxy for that information? After those two questions are answered, then a search for alternative datasets that also relate to the desired information can commence. Once found, datasets that show initial promise can be fully tested as part of the investment model. Datasets that pass rigorous testing for alpha generation can be evaluated for risk characteristics and desired controls. After the risks are understood then decision models can be adjusted to incorporate the new input from alternative data. At this point, ongoing monitoring of the drivers and results of the investment decisions can track the efficacy of changes.

AI and alternative data in action

Man Group has been a pioneer in using AI and alternative data to support alpha generation with funds incorporating AI now collectively managing in excess of US\$12 billion. The assets under management of the UK-based hedge fund manager's AHL Dimension Fund has quintupled since 2014.⁵ Notably, in collaboration with Oxford University, Man's AHL unit has established the Oxford-Man Institute to accelerate research into machine learning which underpins AHL's investment process.⁶

As alternative data use for alpha generation matures, more firms and investment strategies can be supported. At first alternative data supported event driven or other short-term trading strategies, most often used by hedge fund managers. Now, more sophisticated technologies are creating datasets that support managers with a long-term approach. Alternative data is no longer just for hedge funds.



PILLAR #2: ENHANCING OPERATIONAL EFFICIENCY

Back office “as a service” model—from cost center to profit center⁷

Investment management firms must be more cost sensitive in the current operating environment. Managing the cost of operations remains critical to survival in order to offset the waves of new regulations, fee pressures and the shift to lower-cost passive products. In response, many firms are undertaking large transformation programs with a focus on outsourcing and process automation.

The advancement of AI is also serving as a catalyst for firms to turn traditional operational centers of excellence into services which can be offered as a service to competitors. Non-core activities can in turn be externalized to specialist providers. Early AI adopters will have the advantage of converting these “as a service” capabilities into profit-centers and creating a competitive advantage. AI-enabled services that achieve operational excellence can continuously improve at such a rapid pace that it becomes impossible for competitors to catch up. At that point, the service becomes both a defensible advantage and a sustained revenue source for firms.

AI is also impacting middle and back office functions that firms must retain in-house due to regulatory obligations such as oversight functions. With the power to augment monitoring and decision-making AI is a game-changer for compliance and risk management.

In operations, AI-enabled processes are increasingly being built on modular and cloud-based architecture to enable more agile operating models. Cloud-based architecture makes it easier for firms to “plug and play” with third-party services, as well as to externalize “as a service” offerings. Where service offerings are AI-enabled, they can ingest and process more data to, in turn, facilitate continuous learning and improvement.



Efficiency is no longer a differentiator

Increasing standardization and uniformity of processes results in the commoditization of similar capabilities, prompting firms to seek out new value propositions.



Data solutions as the “epicenter”

The cost of operations and the ever-growing scale and complexity of data are critical speed bumps. Continuous investment in AI-enabled data solutions can help firms innovate, improve services, and reduce costs.

IM in action—externalization of best-in-class processes

Aladdin, by BlackRock, is a great example of a leading investment management firm that developed respected internal services, then made them commercially available. BlackRock’s CEO Larry Fink has stated that he wants Aladdin to make up 30 percent of BlackRock’s revenues.⁸



PILLAR #3: IMPROVING PRODUCT AND CONTENT DISTRIBUTION

AI in investment management is reshaping distribution and enabling firms to extend their distribution models into new markets and customer segments which have been traditionally underserved. AI is also facilitating scaled distribution of customized products and tailored client interactions. As sales team productivity continues to decline, driving growth in a challenging operating environment will require industry incumbents to adopt a new approach to distribution and client servicing models. AI can help firms fundamentally enhance their existing models and time-to-market. Let's take a practical example—customer relationship management (CRM) tools can provide the workflow and interaction with the sales team. AI-enabled analytics can provide differentiated insights and actions. Together, these tools can equip sales teams with easier and quicker access to relevant content.

Advisor and customer segmentation, and customer experience have emerged as new battlegrounds in investment management. AI is changing how financial institutions attract and retain customers, and through this, offers the opportunity for firms to innovate and enhance the investor journey, from segmentation and outreach through to content distribution and reporting. What is certain now is that investment management firms can no longer rely solely on price and outperformance to attract investors. Firms that adapt their products and integrate AI, data, and analytics into their service delivery models will be better placed to optimize and execute their product and content distribution strategies.

Enhanced digital engagement can also enable improved sales efficiency by using AI-enabled robo-advisors and chatbots to impact the sales and servicing cycle. Firms have recognized a new opportunity to gain direct distribution to investors, benefit from enhanced efficiencies in servicing small accounts, and offer value-added services for advisors. This has translated into a wave of investment activity, with asset managers and intermediaries acquiring or investing in robo-advice technology.

IM in action—B2B platforms

In 2018 UBS Asset Management announced that it is launching a white-label platform, UBS Partner, which will allow advisors to assess client portfolios against individual goals and risk appetites, as well as make buy or sell recommendations, based on proprietary algorithms.⁹

How intelligent machines can help	Example
 <p>Seamless client experience Leverage digital technologies to deliver a personalized, consistent and efficient client experience, customized by tier and segment</p>	<p>Robo advice: Hybrid solutions to enable AI-based automated advice which supports customers when and where they make decisions</p>
 <p>Marketing and sales optimization Empower business development and relationship management sales teams with the insights and tools they need to more efficiently engage their clients to win and/or retain flows</p>	<p>AI-enabled intelligent dashboards which adapt to every interaction that advisors have with their customers to make critical information accessible on-demand</p>
 <p>Content effectiveness Produce and distribute relevant, high-quality and timely content on demand to internal and external consumers</p>	<p>Predictive modeling can provide unexpected insights, enable better insight-driven decision making, and provide a competitive advantage</p>



PILLAR #4: MANAGING RISK

AI can bolster compliance and risk management functions as risk issues typically include ambiguous and/or improbable events.¹⁰ Traditional methods of risk analysis can no longer handle the ever increasing volume of data. AI-enabled risk management can identify and manage both known and unknown risks in these vast pools of data. In terms of practical examples, AI can help investment management firms to:

- **Automate** consumption and analysis of data
- **Reduce** administrative activities
- **Focus** employees’ time on exception-based handling and resolution of identified errors, inconsistencies in expected outcomes, and compliance violations



IM in action—Liquidity risk management

In 2017, BlackRock announced that it would incorporate internal trade data into its existing market liquidity model, and apply machine learning techniques to more accurately calculate the cost of redemptions and gauge liquidity risk.¹¹

Adoption and implementation risks

The journey to successfully adopting and implementing AI will involve strategic and operational risk considerations which early adopters, niche innovators, and large-scale players will need to carefully evaluate and address. An essential part of this roadmap will involve understanding, identifying, and managing the risks which will punctuate the AI journey.

BEFORE IMPLEMENTATION

As is the case when making strategic decisions around the implementation of other emerging technologies, firms struggle to strike a balance between being:

Early adopters

Finding themselves subject to a “learning fee” to overcome the complexity and uncertainties associated with newer technologies

VS



Late adopters

Running the risk of being left behind as the industry evolves to establish a new normal

DURING IMPLEMENTATION

Consider the following to help mitigate implementation risk:



Engage compliance and the firm’s enterprise risk management framework early on to ensure that any firm or regulatory requirements are not overlooked



Identify mature, well-defined, rules-based processes as candidates for automation and AI. Selecting “broken processes” for implementation first will result in errors being compounded by AI



Establish a robust testing program that includes a production readiness checklist to:

- Enable proactive identification of errors
- Manage development and integration

ONGOING MONITORING

As emerging AI technologies are leveraged, new risks will evolve across **operational**, **regulatory**, and **technological** dimensions.

OPERATIONAL

Varied risks create the need for varied and adaptable risk management

- Poor design, coupled with the high-execution speed of bots (i.e., software applications) can multiply processing errors without the right stop-controls
- Ineffective and outdated oversight procedures can lead to high-impact errors going unidentified

REGULATORY

Regulators will expect enhanced monitoring capabilities to oversee the adoption of AI

- Incorrect regulatory reports generated through automated data extraction and report preparation may result in regulatory issues
- Bot-processing may inadvertently violate the law or firm policies

TECHNOLOGICAL

Added onus on the maintenance and oversight of technology and cyber architectures

- Lack of robust business continuity, including disaster recovery programs, may lead to ineffective handling of bot and AI breakdowns and prolonged operational risk
- Cyber breaches can expose the bots to added threats, compromising the processes

Effective risk management practices will be imperative to the successful adoption of AI. Leadership should articulate these practices and embed them across the entire organization. Boards, senior management teams, and control functions will be required to increase their understanding of AI. Similarly, technology staff specializing in AI should develop a clear understanding of the risk and regulatory implications of AI.¹²

The AI journey—where to start

AI unquestionably presents compelling opportunities for investment management firms, from exponential improvements to business-as-usual processes to the radical reshaping of business models. Investment management firms can start to unlock the transformative benefits of AI by implementing incremental changes to their operating model. Firms will however need to carefully manage and monitor **talent** and **converging technologies**.

Talent—planning for augmented workforces

Rolling out AI will require agility in development, as well as the right combination of people, processes and technology. With a limited talent pool, there is a “war for talent” as financial institutions compete with other industries to attract and retain people with the knowledge, skills and capabilities needed to create an AI-enabled workplace. The absence of a long-term talent strategy could be a major speed bump down the line for firms looking to gain a competitive advantage and fully benefit from larger-scale AI opportunities. Early adopters need the right mix of talent to accelerate their progress.

Converging technologies—don’t develop AI in isolation

The recent World Economic Forum report, *How Artificial Intelligence is transforming the Financial Ecosystem* prepared in collaboration with Deloitte, emphasized the importance of recognizing that AI is not an independent, standalone technology or capability.¹³ The potential benefits and capabilities which AI can offer are, and will be, firmly interlinked with the development of other technologies such as blockchain and cloud.

Data and analytics

Firms are exploring new possibilities, and AI-enabled rapid data processing is increasing the volume and quality of idea generation. The exponential increase in data, including alternative data, and computing power is a key enabler to developing and sustaining a competitive advantage.

Cloud computing

Many firms are implementing agile cloud solutions as they look to modernize operations by shifting to a cloud-based architecture. The shift to cloud enables organizations to “plug and play” with third-party solutions. This in turn offers up greater data storage and processing power required to train new AI models.

Blockchain

Blockchain provides a source of data for investor identity management. An investor’s digital identity can be bolstered by AI which uses image recognition to verify an identity. When married with blockchain, AI can also enable complex and automated smart contracts to be executed, and allowing for increased deployment to the blockchain.

Quantum computing

When fed with big data, firms will be able to utilize quantum computing capabilities to learn about the subject and recommend actions. This will enable firms to optimize AI solutions to more quickly identify correlations to support functions. Quantum computing can also enhance secure encryption capabilities, to the benefit of blockchain.

Where should investment management firms start?

- **Clearly define your AI strategy**, articulating your business goals and understanding how AI will be utilized as part of your business model. As part of this process firms will need to evaluate implications from a risk perspective.
- **Determine your go-forward path.** A “pilot, prove, and scale approach” can rapidly demonstrate business value. Firms can start today by identifying and evaluating use cases and presenting leaders with options for creating value. Operational discipline through robust project management and change management will be critical to enabling scale.
- **Continue to focus on short-term value and quick wins.** However, don't let short-term priorities distract from understanding and appraising the long-term implications of AI. Make the appropriate investments in talent and technology needed for the transformation ahead.
- **Embrace strategic collaborations and partnerships** to solve for issues collectively and benefit from collective ideation, shared capabilities, and investment. Co-development will enable firms to sustainably develop unique and differentiated products and services.
- **Work with industry stakeholders** and engage with industry associations and regulators. Successful wide-scale adoption of AI in investment management will require firms to work with a broad set of stakeholders. Collaboration with industry associations and regulators will be important to ensure that investment managers have a voice at the table to appropriately influence standards and regulatory developments.

The AI journey will undoubtedly be challenging but the opportunities for investment management firms will be transformative. Are you ready for AI?

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