Transformative change

How innovation and technology are shaping an industry

2016 KPMG/AIMA/MFA Global Hedge Fund Survey

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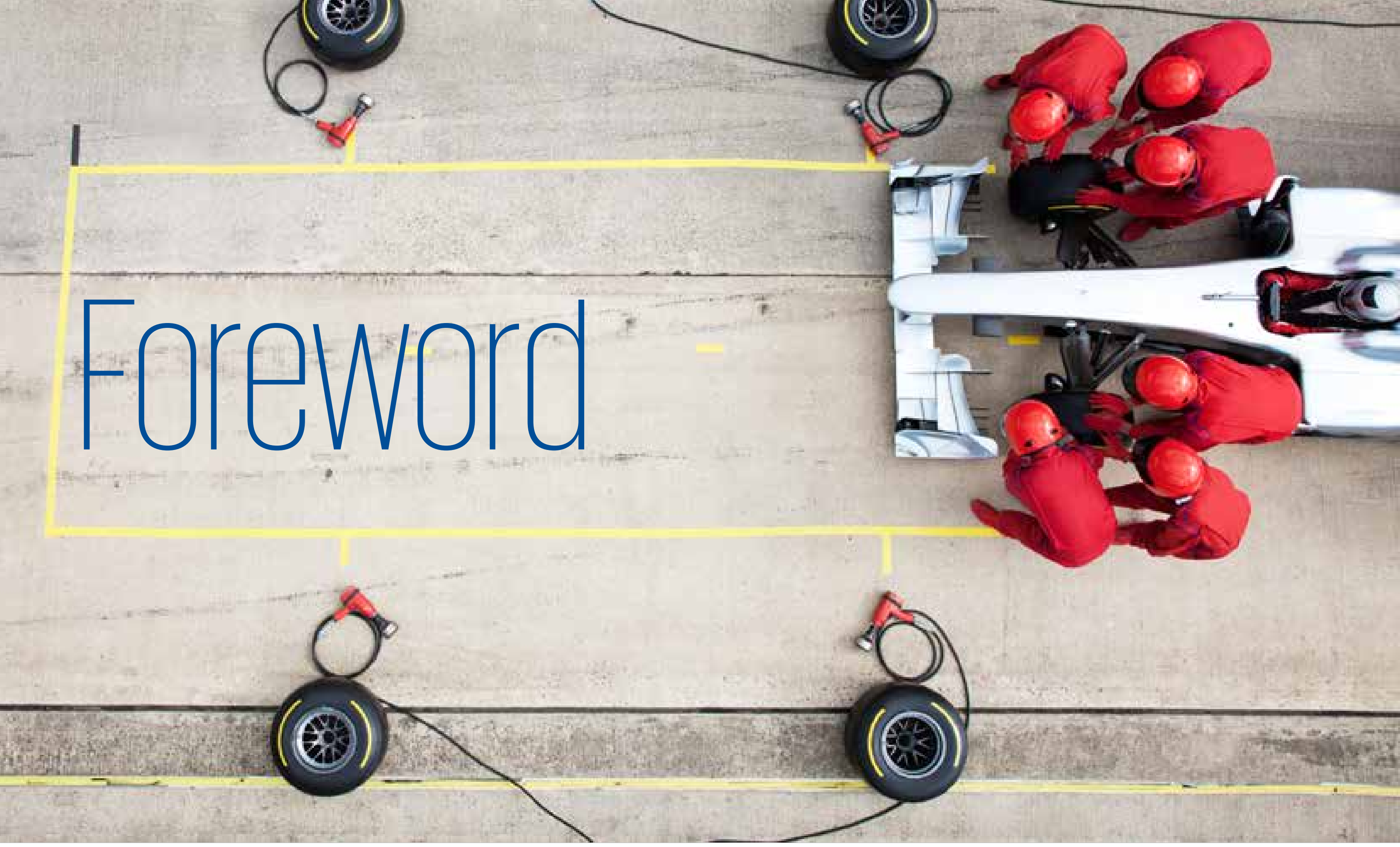


Foreword

Today's leading hedge fund managers are evolving for the future. They are striving to become more innovative. They are investing into and integrating new technologies. And they are rethinking their operating models to drive improved performance.

To survive in today's highly competitive, fast-paced and innovative environment, hedge fund managers must remain ahead of the curve. In part, this is because investors and regulators expect fund managers to maintain robust systems that are — at least — on par with industry norms. But it is also because fund managers are increasingly recognizing the value that innovation can deliver to their funds, their investors and their managers.

This report provides a unique view into the competitive landscape, challenges and opportunities of innovation facing today's hedge fund sector. Within these pages, we outline the current state of the industry and provide insights into the emerging business and operating models of tomorrow.

To develop this report, KPMG International teamed with the Alternative Investment Management Association (AIMA) and Managed Funds Association (MFA), enabling a comprehensive view across the market. We collected data from more than 100 hedge fund managers through an online survey. And we conducted in-depth one-on-one interviews with hedge fund managers and industry experts in key centers around the world.

We believe that this year's Global Hedge Fund Survey offers hedge fund managers a valuable view into the future of the sector. We hope the data contained in this report enables managers to benchmark their operating model against their competitors and peers. And that the advice and insights offered by KPMG member firm partners provides managers with practical ideas to help them evolve into the future.

Robert Mirsky
Global Head of Hedge Funds
KPMG International

Richard H. Baker
President and CEO, MFA

Jack Inglis
CEO, AIMA

About the research

As technology starts to disrupt the broader financial services sector, KPMG teamed with AIMA and MFA to find out how hedge fund managers around the world are responding, where they are investing and how they expect technology to create competitive advantage going forward.

This report — part of our ongoing annual survey of hedge fund managers and firm executives around the world — reflects the views of more than 100 hedge fund leaders and executives representing approximately US$300 billion of assets under management (AUM).

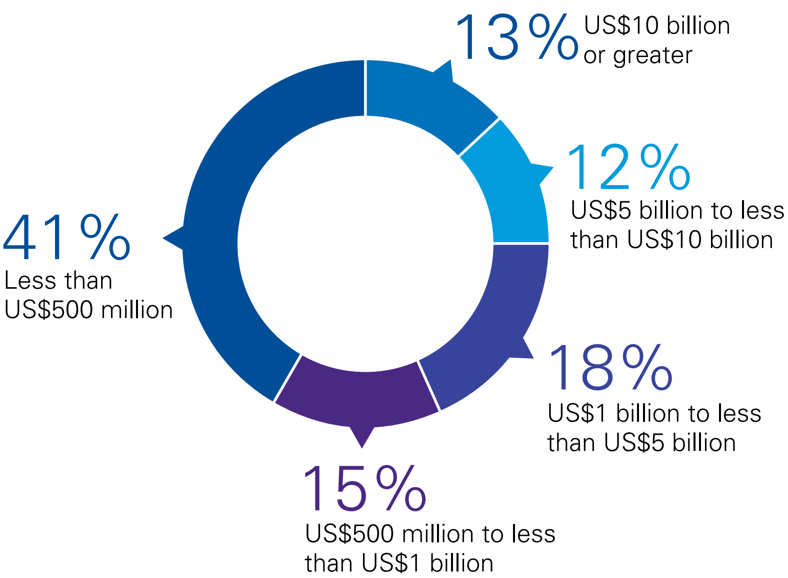
Forty-one percent of respondents represent funds with AUMs of less than US$500 million, 33 percent represent mid-sized funds of between US$500 million and US$5 billion, and 25 percent of respondents represent large funds with AUMs of over US$5 billion. The vast majority of respondents — 92 percent — report being a single fund manager versus a manager of a fund of funds.

Around half of our respondents represent funds with head offices based in North America while 28 percent report head office locations in the UK and 6 percent in wider Europe. Thirteen percent are based in Asia Pacific.

This report also benefited from a series of structured one-on-one interviews with leading hedge fund managers and firm executives who provided deeper insight into the technology challenges and opportunities faced by the sector. Surveys were conducted online between March 2016 and May 2016, while the structured interviews were conducted between July 2016 and August 2016.

On behalf of KPMG, AIMA and MFA, we would like to thank all of those that participated in the survey. In particular, we would like to thank the managers that gave their time to share their views through our structured interviews. The insights and views of all of our participants — online or in person — have been invaluable in helping form this unique and valuable report.

Respondent AUM in US$



Source: 2016 KPMG/AIMA/MFA Global Hedge Fund Survey

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Executive summary

Hedge fund managers recognize the competitive advantages of innovation

say technology will have an impact on competition over the next 5 years

Investment into technology is rising

of managers identified improved controls and compliance as a top reason for investing in technology

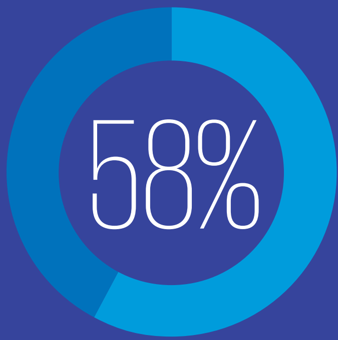
Managers seem bullish about their current capabilities

of managers characterize their front office technology as ahead of industry or innovative

Source: 2016 KPMG/AIMA/MFA Global Hedge Fund Survey

Many expect technology to improve transparency and investor relations

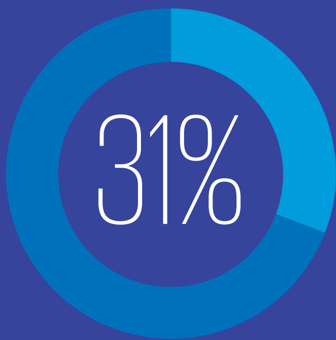
say technology will deliver enhanced reporting



expect to achieve improved transparency

Smaller funds are more focused on outsourcing

of large funds prefer to develop technology internally



of mid-sized funds prefer to purchase an existing system

Disruptive technologies are being embraced

believe artificial intelligence (AI) machine learning will either have a medium or high impact on the way funds are managed in the future

Cyber security and data risk remain top of mind

of managers say they lack confidence in the ability of government bodies to safeguard their data and proprietary information

A new era of competition

Hedge fund managers know that competition will be tight over the next 5 years. And according to our survey, most expect to significantly increase their focus on innovation in order to uncover new operational efficiencies, improve compliance and drive investor relations. A new era of innovation-led competition is emerging.

Disruption arrives

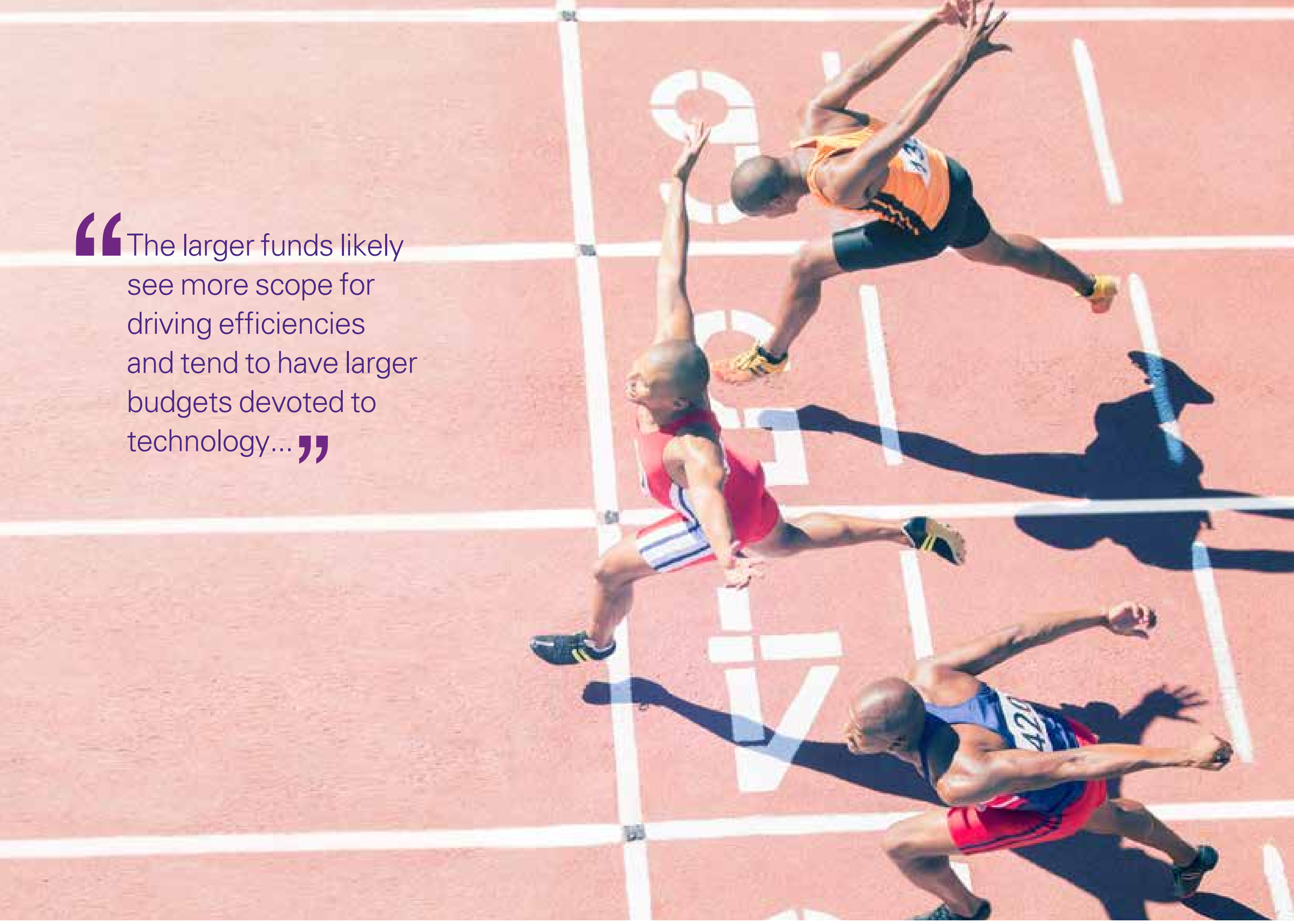
While some may suggest that the hedge fund sector has been somewhat shielded from the disruption that has been wrought on other financial services sectors by digitization and technology, it seems clear that the sector is now undergoing a period of technology and innovation-led competition.

According to our survey, 94 percent of hedge fund managers believe that technology will have an impact on competition over the next 5 years. More than a third — 38 percent — say that technology's impact will be significant.

"I'm pretty sure that — by the time I'm out of this business — it will be completely unrecognizable from where it is today," forecasted one fund manager with more than 25 years of experience.

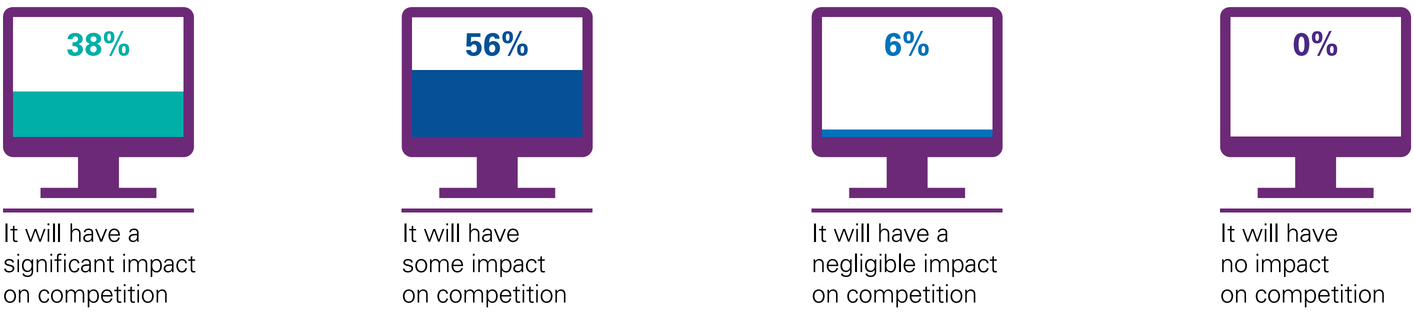
Larger funds seem more concerned about the impact that technology will have on competition. In fact, funds with AUMs of more than US$500 million are around 10 percentage points more likely to say that technology will have a significant impact on competition than those with AUMs of less than US$500 million.

"The larger funds likely see more scope for driving efficiencies and tend to have larger budgets devoted to technology which often means that they can capture a competitive edge through targeted technology investments," noted Robert Mirsky. "But smaller funds tend to lack the legacy systems and processes that often impede technology implementations at larger firms, so while the scope for competitive advantage may be narrower, the value of technology is certainly broad."



> “The larger funds likely see more scope for driving efficiencies and tend to have larger budgets devoted to technology...”

What impact will technology have on competition in the hedge fund sector over the next 5 years?



Source: 2016 KPMG/AIMA/MFA Global Hedge Fund Survey

Rising investment

Already, fund managers around the world are investing significant sums into technology and tools. And, not surprisingly, the amount invested tends to increase with the size of the fund. More than half — 54 percent — of those with AUMs of more than US$5 billion report spending more than US$5 million per year over each of the past 5 years. Eighty-six percent of funds with AUMs of less than US$500 million report spending less than US$500,000 per annum on technology over each of the past 5 years.

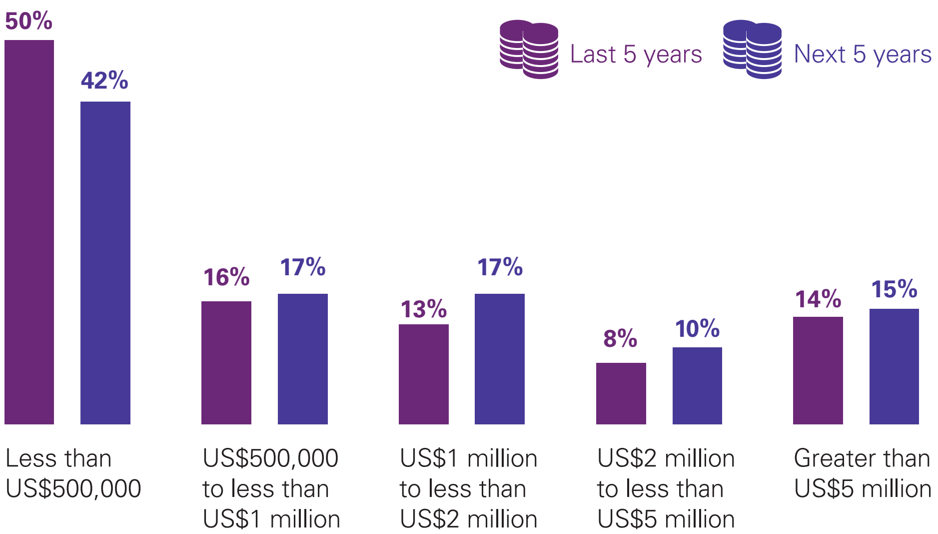
Our data suggests that North American funds are investing more in technology transformation in the hedge fund sector. One-in-five North American respondents say they spent more than US$5 million on technology over each of the past 5 years versus 12 percent of European respondents. And while no funds based outside of North America and Europe report having spent more than US$5 million on technology over the past 5 years, this is likely indicative of the size of funds in Asia Pacific rather than a lack of willingness to invest.

What is clear, however, is that fund managers expect to increase their investments into innovation going forward. Whereas just 16 percent of those who manage smaller funds say they spent more than US$500,000 per year on technology in the past 5 years, 28 percent say they will spend at least that amount over each of the next 5 years. Thirty-six percent of mid-sized (US$500 million to less than US$5 billion in AUM) firms say they spent upwards of US$1 million in the past; 47 percent say they will invest at least US$1 million going forward. And the percentage of large (greater than US$5 billion in AUM) funds that will spend more than US$1 million per year will also increase, albeit only by around 5 percentage points.

Driving for efficiency

Overwhelmingly, hedge fund managers are investing into technology to drive either efficiency or compliance improvements for their business. Upon closer examination of the results, nine out of every ten respondents cite improved controls and compliance as a primary objective

What did your firm spend on technology over the past 5 years and what do you expect to spend over the next 5 years?



Source: 2016 KPMG/AIMA/MFA Global Hedge Fund Survey

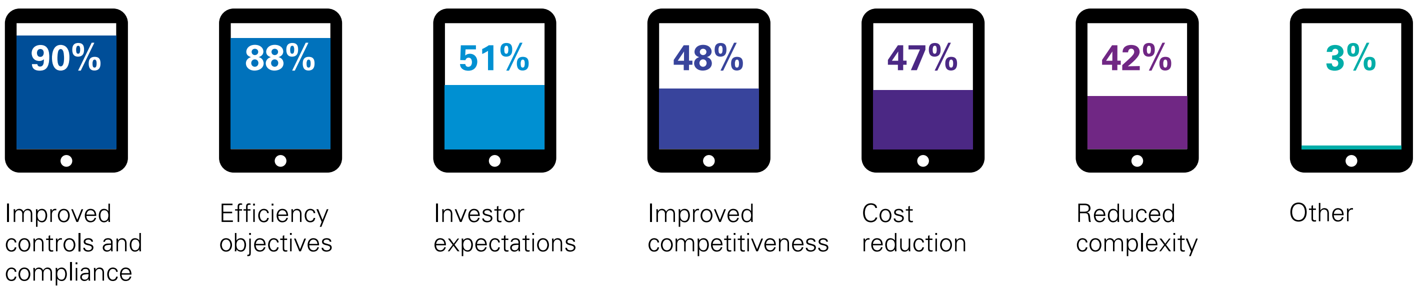
for their technology spend. Given that — in 2013 — we estimated that compliance was costing the industry upwards of US$3 billion per year[1] (and that number has likely risen much higher since), it is not surprising that compliance ranked as a top objective among our respondents.

Almost as many — 88 percent — say that technology is expected to help achieve their efficiency objectives by, for example, stream lining transaction processing and improving controls. "For many hedge fund firms, there is a need to improve operational efficiencies as well as achieving their compliance objectives," argued Jeffery Kollin, Partner, KPMG in the US. "In the new age of operational effectiveness, as well as the ever changing regulatory landscape, firms are finding it necessary to use technology to both improve margins, as well as managing the compliance processes more efficiently and more effectively to improve overall control and better manage risk."

However, our survey also indicates that there are a number of secondary objectives that fund managers hope to achieve from their technology investments. More than half hope to use IT to better meet investor expectations in areas such as transparency and reporting. Almost half say they expect technology to help improve their overall competitiveness or drive cost reductions. And more than two-fifths say they hope to reduce complexity through technology enablement.

"All too often, hedge fund executives and managers focus on the cost and efficiency side of the technology equation without putting enough consideration towards the growth opportunities," noted Adam Hirsh, Director, KPMG in the US. "Even in situations where technology is helping eliminate redundant administrative tasks in the back or middle office, fund managers should be asking how they can reallocate those resources to improve the front office and drive better results."

What are the top reasons for investing in technology? (Select all that apply)



Source: 2016 KPMG/AIMA/MFA Global Hedge Fund Survey

> "We spend a lot of money on technology each year — somewhere around US$10 million per year is invested in some way into technology," stated one large fund manager. "We have three offices, two data centers and an entire proprietary system built out and that requires continuous investment."

[1] The Cost of Compliance, KPMG/AIMA/MFA, 2013

Creating competitive advantage

Hedge fund managers are confident in the maturity and competitiveness of their technology. And many indicate that they are already leveraging technology to improve a wide range of activities in the front, middle and back office. The leaders are demonstrating that technology can deliver value in almost every aspect of hedge fund management.

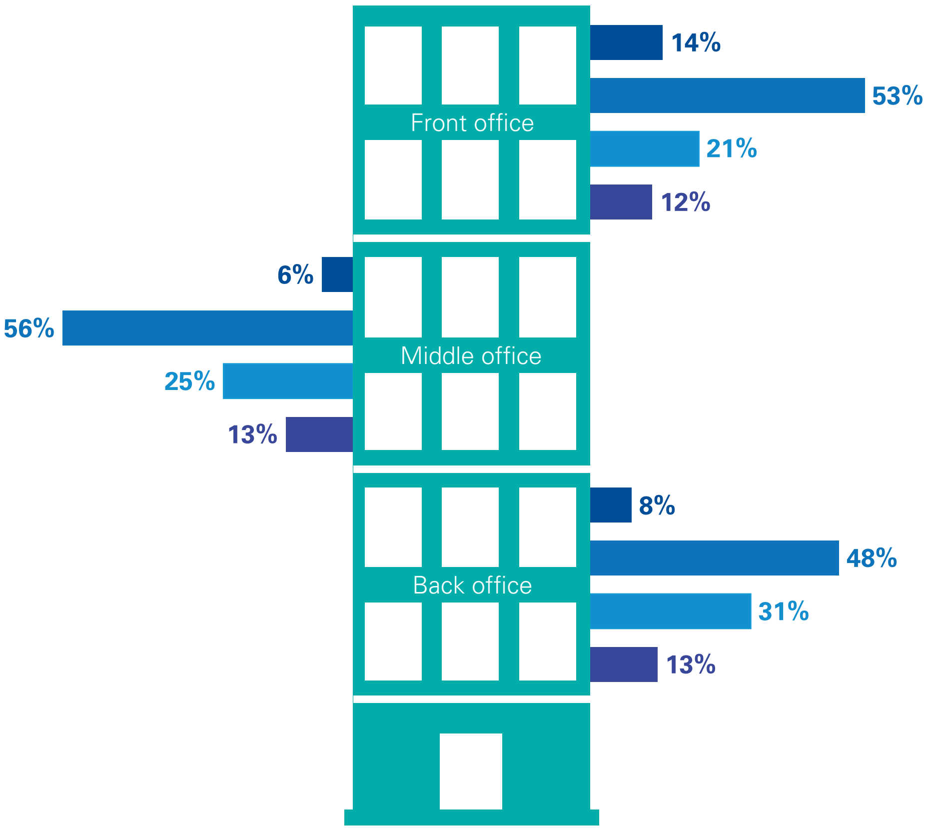
Staying competitive

While many other industries admit that they are struggling to keep their IT environment competitive in today's rapidly-evolving technology market [2], hedge fund managers seem rather confident in the maturity and competitiveness of their technology.

Indeed, a third of our respondents say their use of technology in the front office is ahead of the industry average. Thirty-eight percent feel their middle office technology is above average. And 44 percent claim to be either 'first movers' or 'fast followers' in their use of technology in the back office.

"Clearly, hedge fund managers are bullish about their capabilities, particularly in the back office. But the reality is that not everyone can be ahead of the competition," noted Robert Mirsky. "This data suggests that hedge fund managers may not have a clear understanding of where they sit versus their competitors."

How would you characterize your organization's use of technology in the following areas:



- Outdated but functional (heavy reliance on legacy systems; slow to follow industry)
- On par with industry (some legacy systems; increasing use of new technologies)
- Ahead of industry (few legacy systems; fast followers with proven technologies)
- Innovative and nimble (no legacy systems; first to adopt and develop new technologies)

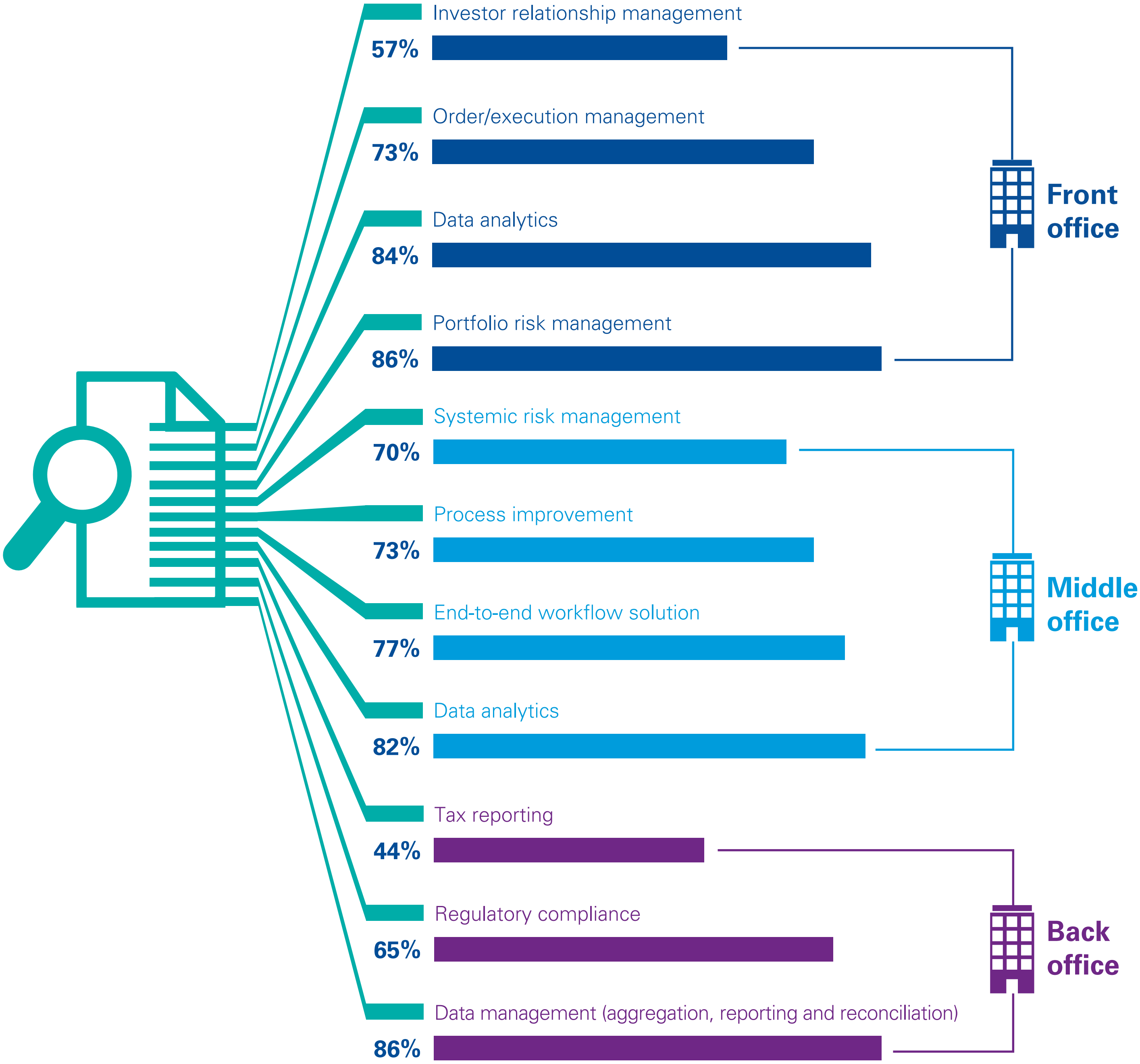
Source: 2016 KPMG/AIMA/MFA Global Hedge Fund Survey

The definitions for front, middle and back office can vary. For this report, we defined as follows:

- The **front office** is the business interface with the market and investors. The front office staff coordinate and handle all the needs of the investment firm and its clients with respect to trading and portfolio management.
- The **middle office** is where transactions are recorded and validated. The middle office staff ensure the control and processing of transactions.
- The **back office** monitors transaction processing and oversees confirmations (including settlements) and the accounting function.

[2] Global CEO Outlook 2016, KPMG International, 2016

Over the next 5 years, how important will the role of technology be in the following areas? Percent of respondents that rated important and very important.



Source: 2016 KPMG/AIMA/MFA Global Hedge Fund Survey

The data also suggests that larger funds may be somewhat more advanced in their application of technology across the enterprise. Across the front, middle and back office, larger funds (those with AUMs of more than US$5 billion) are more than twice as likely to categorize their technology environment as 'innovative and nimble'. Similarly, smaller funds (those with AUMs of less than US$500 million) are more than twice as likely as larger funds to admit that their middle office technology is outdated.

Putting IT to work in the middle and back office

Given that most hedge fund managers are hoping to secure operational efficiencies from their technology investments, it is perhaps not surprising that the greatest focus has been on the middle and back office.

"We've absolutely increased our use of technology across the back and middle office," noted the CFO at one large fund. "We're using it to track transactions, improve our accounting and reporting and to help ensure that our managers are accessing the information they need quickly and efficiently."

For the most part, fund managers expect to see the greatest middle office impact in areas such as process improvement, end-to-end workflow solutions and data analytics. More than eight-in-ten respondents say they expect technology to have a major impact on their middle office data analytics, while 75 percent hope to see technology improvements in their end-to-end workflow solutions.

"We've seen a lot of focus on technologies that support the automation of processes and reinforce operational control, particularly in areas such as collateral management and, increasingly, newer areas such as cash wire processing," noted Adam Hirsh.

In the back office, managers place the highest importance on technologies that support improved data management (in particular any measures used to help aggregate, reconcile or report fund data), a critical element in managers being able to meet the increased regulatory and investor reporting demands being placed on them. Not surprisingly, almost two-thirds of all manager respondents to this survey say that technology will be important in helping achieve their regulatory compliance objectives.

Our findings also suggest that investment will broadly match the importance that fund managers place on technology in the middle and back office. In the middle office, technologies that improve portfolio risk management and data management and analytics are expected to see the most significant levels of investment.

"We are automating our standardized reporting and building out our investor data warehouse to improve our reporting, and we are planning to develop an investor bridge to allow our investors direct access to their accounts," noted one large fund manager. "We want to improve transparency and respond to investor demands for access, but we need to be careful about how quickly we move and carefully consider the risks involved."

Focus on the front office

In the front office, hedge fund managers seem to place higher focus on technologies that improve decision-making and drive investor relations versus those that drive efficiencies. Respondents to our survey place the greatest importance on technologies that support portfolio risk management and data analytics.

"The front office is where fund managers differentiate — it's where the alpha is derived — so the focus here really needs to be on technologies that improve manager performance and optimize their processes in that regard," noted Daniel Page, Head of Asset Management Advisory, KPMG in Ireland. "When it comes to front office technology investment we see less cost sensitivity than we do elsewhere."

> "Clearly, hedge fund managers are bullish about their capabilities, particularly in the back office. But the reality is that not everyone can be ahead of the competition."

Build, buy or outsource ?

As hedge fund managers start to compete based on technology, many are continuing to explore the optimal operating model for their organization and their technology estate. Some believe that outsourcing is the only viable approach while others seem determined to build their capabilities 'in house'. As fund managers start to evolve their perception of technology, many are recognizing that there is no single path to technology enablement in the hedge fund sector.

A matter of size

On face value, our data would suggest that hedge fund managers are trying a variety of approaches to access technology. Twenty-seven percent say their preference is to develop technologies internally, 26 percent indicate that they prefer to outsource to third party providers and 25 percent say they will likely purchase an existing platform or service.

Dig a little deeper, however, and it becomes clear that the approach to technology acquisition largely depends on the size of the fund. Smaller funds (those with AUMs of US$5 million or less) report a much higher preference for outsourcing their technology. "For smaller firms and funds, outsourcing isn't just about reducing complexity, it's also about staying current with the latest technologies in an environment that is constantly changing," added Jeffery Kollin.

That being said, our data suggests that large funds (those with AUMs of US$5 billion or more) demonstrate a much stronger preference for developing technology internally. And mid-sized firms report a slight preference for purchasing existing platforms and services.

"This is largely an issue of budget and control," noted Robert Mirsky. "Larger funds have the resources to develop, maintain and improve their own proprietary systems, which allows them unprecedented control over their IT environment, but smaller funds with lower technology budgets and fewer control concerns will likely prefer to simply outsource the responsibility at the lowest cost possible."

Yet outsourcing could also yield significant advantages for smaller firms. As one US-based fund CEO noted, "The smaller guys don't have the same legacy investment costs for technology, which gives them an absolute advantage because they can simply build from scratch. They can become best in class quite quickly and create a significant competitive advantage."

Secret sauce or commodity process?

Perhaps not surprisingly, approaches for sourcing technology also vary depending on the function. In the front office, most fund managers say they prefer to build their own technology and systems. In the back office, they indicate a strong preference for outsourcing their technology requirements. And in the middle office, respondents were evenly split between building, buying and outsourcing.

"The front office is where you make the 'secret sauce' and few managers feel comfortable placing that in the hands of a third party provider," noted Robert Mirsky. "But when you get into the more commoditized areas of the middle and back office — particularly accounting systems and data management systems — outsourcing becomes a no-brainer."

When it comes to building and buying back and middle office technologies, our interviews suggest a blurring of the lines. As the CFO of one large fund noted, "All technology that we buy requires some sort of build component to customize it to our existing environment. You can't just buy an off-the-shelf solution and plug it in."

As another large manager noted, "We tend to build our own systems or buy with excessive customization. Of course, we still outsource to third party administrators — that will always be necessary — but our preference is to build our own proprietary systems or customize existing platforms where possible."

Partnerships and platforms

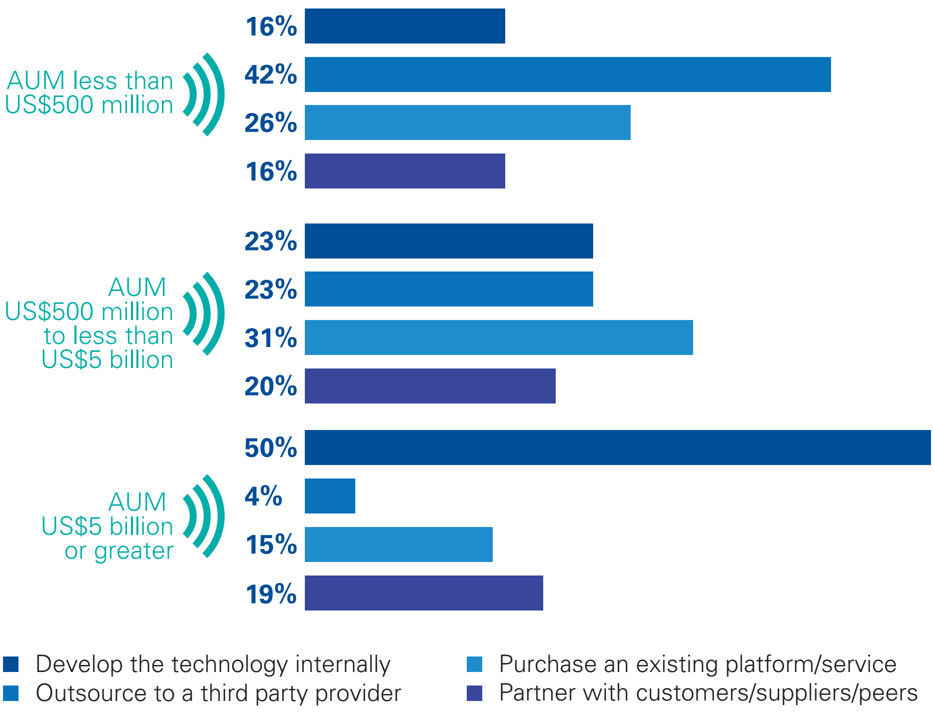
Interestingly, while only 18 percent say that their top preference is to partner with customers, suppliers and peers to develop new technology, our data suggests that many are exploring the potential of these partnerships. In fact, almost half (47 percent) of our respondents report they have partnered with a third party in the past 5 years to develop technologies.

While in other financial services sectors, partnering is often viewed as a way for smaller organizations to build scale with their investments, our data shows that — in the hedge fund sector — it is the larger fund managers that are most active in exploring partnerships. In fact, large managers are almost three times as likely as their smaller competitors to say they had entered into partnerships recently (73 percent versus 28 percent).

At the same time, our interviews suggest that some of the larger fund managers may have larger ambitions for their technology investments. A number of larger funds are now exploring how they might commercialize their end-to-end or point-to-point solutions to create new revenue streams and — equally importantly — tap into new data sources.

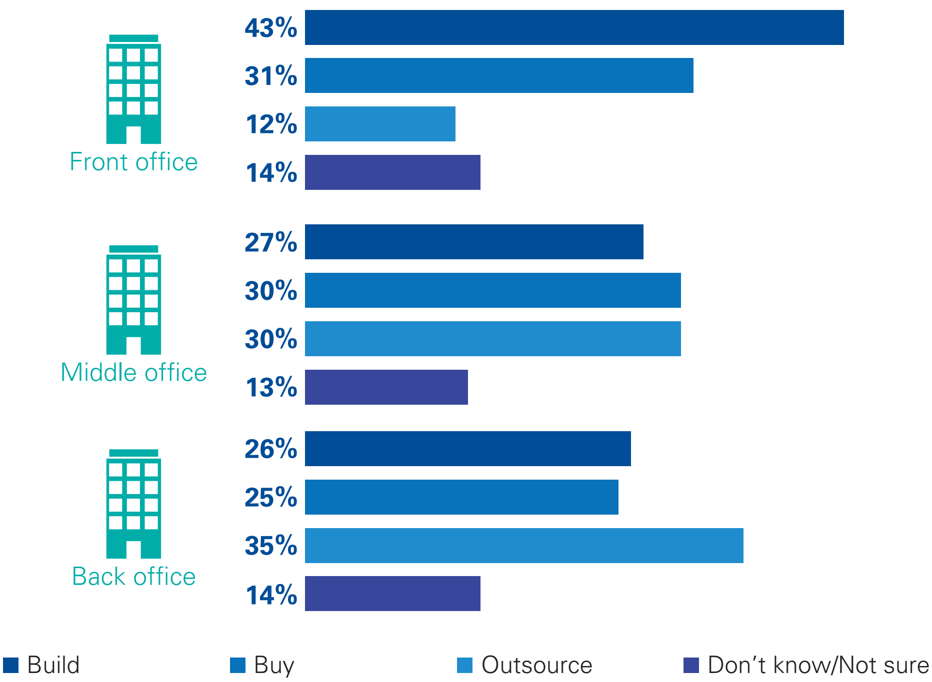
"We have been building out a new front-end for the firm — it's an entirely new P&L and risk engine," noted the COO of one large fund. "We are building it for ourselves, but we are doing it with an eye to maybe marketing it at some point."

Generally speaking, what is your organization's preferred approach to accessing technology?[3]



Source: 2016 KPMG/AIMA/MFA Global Hedge Fund Survey

Does your organization plan to meet your front, middle and back office technology needs over the next 5 years by building, buying or outsourcing?



Source: 2016 KPMG/AIMA/MFA Global Hedge Fund Survey

[3] 'Other' not included in the chart, therefore may not add to 100%.

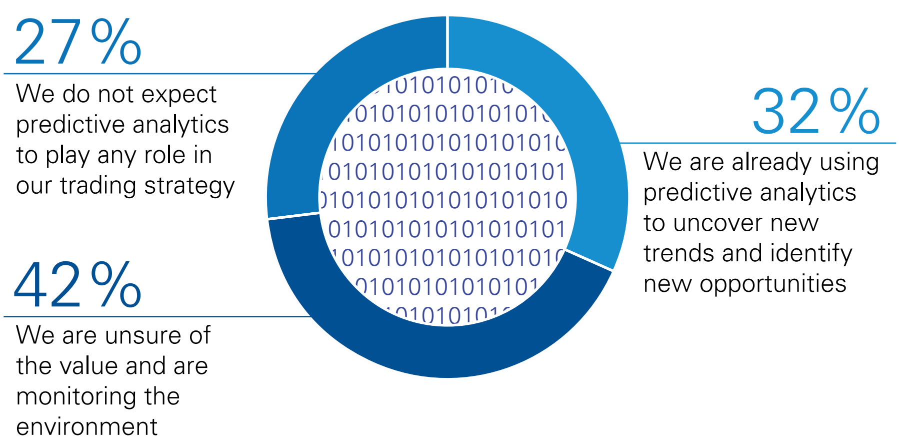
Investing into disruptive innovation

While technology may be driving the next wave of competition in the hedge fund sector, our survey suggests that most managers are taking a somewhat pragmatic approach to implementing new technologies and disruptive innovations such as AI, predictive analytics and automated trading. Yet there are a small but growing number of managers that are actively embracing innovation and, in doing so, they are creating new opportunities for competitive advantage.

Staying with the pack

Hedge fund managers are looking to new technologies to stay competitive. While most industry estimates suggest that 'quant strategies' account for just 20 percent of the hedge fund universe, a significant number of managers (32 percent) report they are already using predictive analytics to uncover new trends and identify new opportunities. Interestingly, however, 42 percent of our respondents (largely made up of smaller funds) say they are still unsure about the value of predictive analytics and are monitoring the environment before investing.

What role do you expect predictive analytics to play in the trading strategy of your funds?



Source: 2016 KPMG/AIMA/MFA Global Hedge Fund Survey

> “We’re not a quant shop in any way, but we are certainly looking for patterns and trends that can help us generate unique alpha.”

Clearly, there are different views of predictive analytics. “We’re not a quant shop in any way, but we are certainly looking for patterns and trends that can help us generate unique alpha,” noted the CFO of one large fund. “Predictive analytics can make a good trader even better and provides a big edge to our investors.”

This suggests a new landscape for quant investing is emerging, where new technology-led strategies are starting to play a more central role.

Any room for robots?

Technologies such as AI and machine learning are also expected to have a transformational role with 58 percent of managers saying these technologies will have a medium to high impact on the sector. “AI is going to continue to make inroads in the sector,” noted one interviewee. “There’s a very strong business case for replacing humans with algorithms in a lot of areas of the business.”

Almost three quarters of respondents say they expect automated trading technologies to have an impact on hedge fund returns over the next 5 years. There are some sceptics, as 26 percent say it will have either negligible or no impact at all.

This is in direct conflict with recent media reports which suggest that ‘systematic strategies’, CTA funds and quant equity funds are in high demand by investors.

“The ability to have over-the-counters (OTCs) cleared centrally rather than picking up the phone to execute the trade will have a massive impact on the sector,” noted Adam Hirsh. “More to the point, regulation is clearly driving away from bilateral agreements and towards substantially cleared trades which, in itself, will drive major uptake of automated trading over the coming years.”

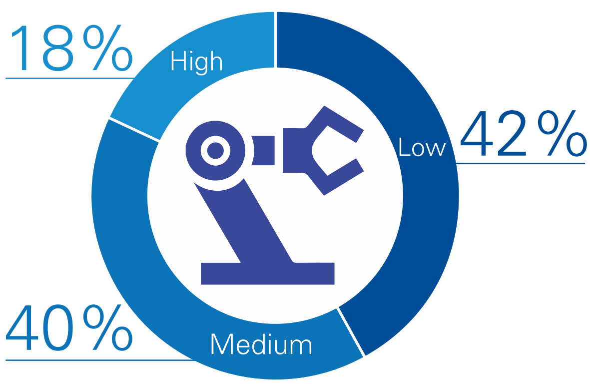
Looking into the future

Do first movers enjoy a competitive advantage in the hedge fund sector? Will the adoption of innovative technologies deliver a ‘killer advantage’ to those who move ahead of the competition? Will managers be completely replaced by machines and robots?

“I think most of these technologies — particularly AI and robotics — will find niche applications and we will start to see more and more programming start to displace human capital, particularly in trading and execution,” noted one interviewee. “But I’m not sure that robots will completely take over the firm.”

According to a mid-sized European fund manager, future technologies will continue to gain adoption as the sector evolves. “With the generational shifts we are seeing in today’s market, we see a significant role for predictive analytics in not only equity decisions but also credit decisions,” he noted. “But I think it will be the smaller, more nimble funds that will capture the early advantages here.”

What impact will artificial intelligence and machine learning have on the way funds are managed?



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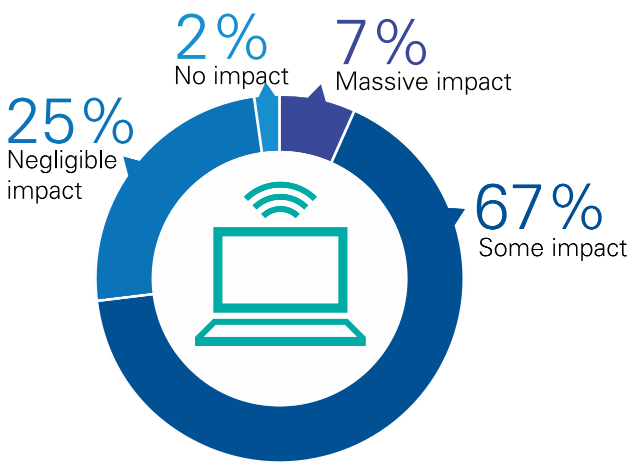
What impact will new automated trading technologies have on hedge fund returns over the next 5 years?



Source: 2016 KPMG/AIMA/MFA Global Hedge Fund Survey

What exactly is blockchain?

Our respondents showed little interest in blockchain as a digital currency platform. It is much more likely that based on recent market developments, hedge fund managers may be utilizing blockchain-based technologies to provide faster and more secure transactions, streamlining and automating back office operations and reducing costs.

As a distributed ledger database, blockchain is able to maintain a continuously-growing list of transaction records that are considered immutable, and it is increasingly becoming the destination platform for financial services companies.

1

Initiate transaction

— Multiple parties transact
— All transactions are recorded including transaction's date, time, parties, and amount wanted to do a transaction

2

Post & Record transaction to the network

— The transaction is added in order into a network's "block" and presented
— Entries can be added but not deleted
— Each node in the network owns a full copy of the ledger

3

Broadcast

— The "block" is broadcasted to every party and their nodes in the network
— Network of computer nodes verifies and validates by running a software which continuously replicates the ledger

4

Validate via Consensus and confirm

— The network verifies, validates, and approves; the confirmation is broadcasted to the other nodes
— Consensus (agreed mathematical mechanism) is recorded and provides the basis for trust mechanism

5

Immutable, encrypted block

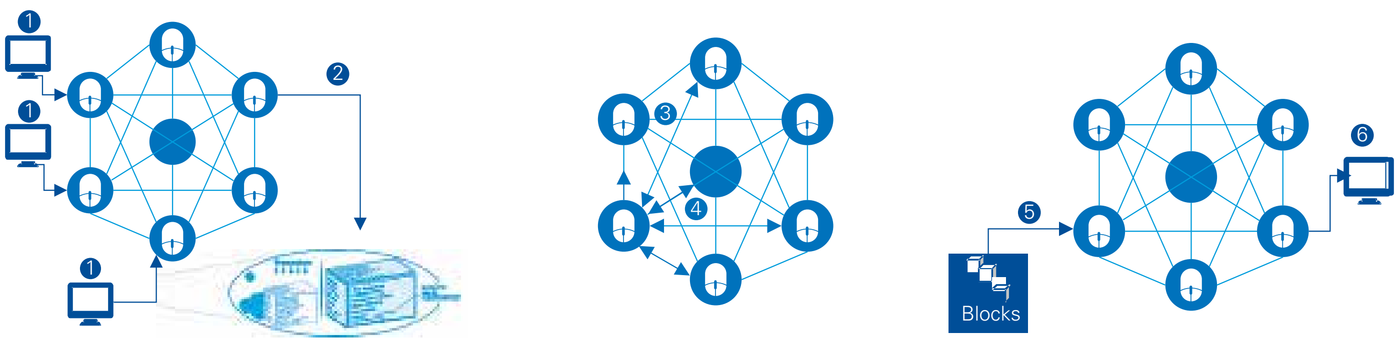
— The confirmed block is added in a linear and chronological order to the chain
— That provides a transparent record of transactions; audit trail; traceable digital fingerprint
— Data is pervasive and persistent and creates a reliable transaction record

6

Transaction completed

— Nodes have access to a shared single source of truth
— A completed block gives way to the next block in the blockchain

Consensus Mechanism Applied



Source: KPMG Research, Seizing new potential, KPMG's Digital Ledger Services

Managing risk in a data-driven world

As hedge funds start to rely more heavily on technology across their front, middle and back office, many managers are becoming increasingly concerned about data risk. Cyber security is a top level agenda item and will attract significant investment. But, at the same time, many managers also seem concerned about how their data is protected when it is outside of the control of the firm.

From risk to differentiator

Hedge fund managers around the world are clearly worried about the safety of their most valuable data. Indeed, cyber security is ranked as an important technology capability by 83 percent of our respondents. Not surprisingly, larger companies are more focused on cyber security than most; 92 percent of large funds say they see cyber security tools as an important technology over the next 5 years.

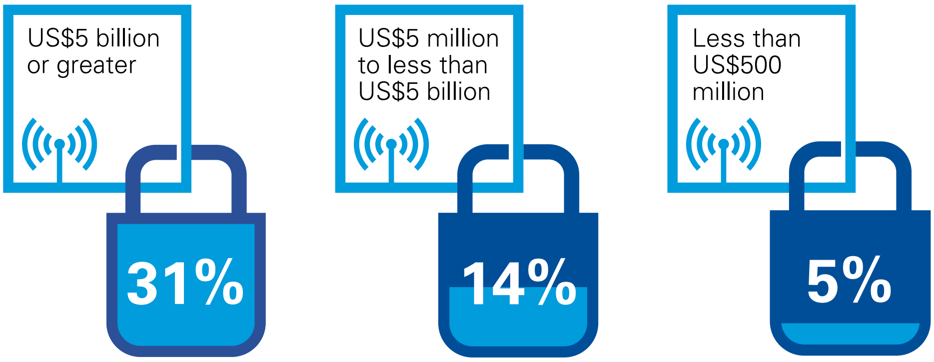
Cyber security technologies are also expected to enjoy a flood of new investment from hedge fund managers over the coming years, with 65 percent of our respondents saying they would put significant or very significant investment into cyber capabilities. Thirty-one percent of the largest funds in our survey went so far as to say that cyber security would be a key differentiator for their firm.

"Cyber is a massively important issue for our firm and we put a lot of effort into improving our control over our data," said the COO of one large firm. "We do security intrusion testing twice a year, we do technology training every quarter and we spend a lot of time educating our employees about threats like phishing emails and targeted attacks."

Making cyber a boardroom priority

While concern may run high, our data also suggests that cyber security may not be receiving the attention it deserves at the management or the Board level. Less than half of our respondents (46 percent) say cyber security is raised at every Board meeting while 38 percent say it is raised only annually. Around one-in-six managers say that cyber security is only brought to the attention of their fund's board when there is a problem. Interestingly, large funds are twice as likely as small funds to say that cyber is raised at every Board meeting.

Cyber security will be a key differentiator for our firm



Source: 2016 KPMG/AIMA/MFA Global Hedge Fund Survey

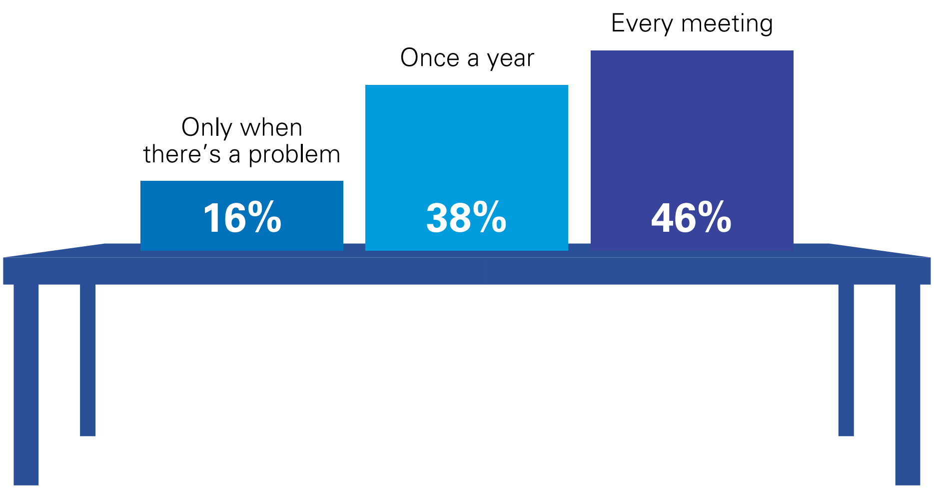
"I think a lot of fund managers rely heavily on the belief that their outsourced providers are taking care of their cyber security but the reality is that you can't rely on a third party to protect your data," added Robert Mirsky. "You need to have a really strong oversight function because, at the end of the day, it is the fund manager that is left dealing with the fallout, not the service provider."

It is encouraging to note, however, that most managers expect to increase their investment into cyber security over the next 5 years. Almost two-thirds (64 percent) report that their cyber investment will increase in that time while 36 percent say it will likely remain the same. No managers involved in our survey suggest that they will decrease cyber funding over the next 5 years.

Interestingly, it is the smaller funds that express the greatest intention to increase cyber security investments. In fact, where 73 percent of small funds (those with AUMs of less than US$500 million) say cyber investments will increase, just 54 percent of large funds (those with AUMs of more than US$5 billion) say the same. However, this may be indicative of the current low level of spend on cyber security by smaller funds rather than a reflection of any higher risk.

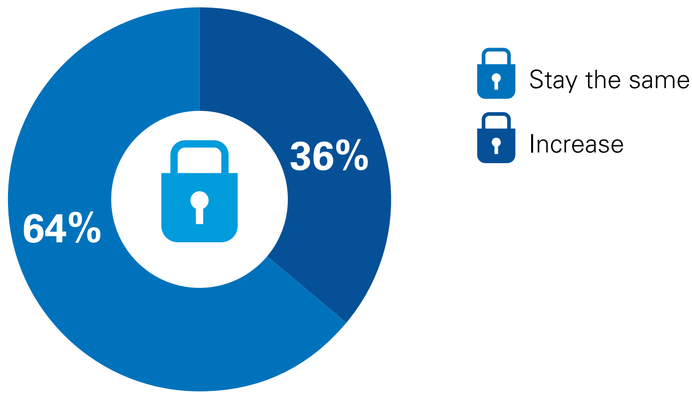
"Cyber security is a key concern for our members and for the industry at large," notes Jack Inglis, CEO of AIMA. "One of our key areas of focus has been on helping prepare our members for cyber security challenges and regulation.

How frequently is cyber security raised at the board level?



Source: 2016 KPMG/AIMA/MFA Global Hedge Fund Survey

Over the next 5 years, will your annual investment in cyber security increase, decrease or stay the same?



Source: 2016 KPMG/AIMA/MFA Global Hedge Fund Survey

Extending your control

Where fund managers and executives demonstrate less confidence, however, is in the security of their data when it leaves the control of the firm. In our interviews, many hedge fund managers voiced concerns about the cyber capabilities of their service providers, particularly smaller funds who may be using a 'public cloud' service platform.

"A challenge with security preparedness on the public cloud often comes down to support. If an incident occurs on a public cloud, clients are often left sitting in a public queue waiting for the next available service technician rather than picking up the hotline to your dedicated helpdesk," noted Daniel Page. "Private clouds are purposely built for alternative investment firms and the associated applications, which allow these providers to provide customized services and rapid support to clients. Those fund managers relying on public cloud and off-the-shelf applications will have a hard time defending their approach to investors if their data gets hacked."

According to our survey, this lack of confidence extends from service providers to government bodies. In fact, just one-in-ten of our respondents voice a high level of confidence in the ability of governmental bodies to keep their fund data secure. Six-in-ten indicate a strong lack of confidence.

"Today, the globally-regulated alternative investment industry is more transparent than it has ever been," said MFA President and CEO Richard H. Baker. "Regulators have substantial information about many funds, including data on activities, holdings, size, leverage and liquidity. The security of this often sensitive and proprietary information is a top concern for MFA Members."

As the MFA noted in a recent letter to the SEC, the list of federal government cyber breaches is long and growing, including the White House (2014), Department of State (2014), Federal Deposit Insurance Corporation (2015, 2016), Federal Aviation Administration (2015), Department of Defense (2015), Internal Revenue Service (2015, 2016), Office of Personnel Management (2015), the Pentagon (2015), and the Federal Reserve (2011-2015)[4]. It is perhaps not surprising, therefore, that managers' trust in government security is low.

At the same time, however, respondents also suggest that current cyber regulations may be nearing maturity with almost half — 48 percent — of our respondents saying that current regulatory requirements are sufficient for the industry. Just 30 percent say that current cyber regulation was insufficient.

"You can't count on simply meeting current cyber security regulatory standards as a strong defense against the evolving cyber threat," noted Robert Mirsky. "You need to be at least as good as the industry and — if you hope to avoid litigation and regulatory fines — you probably want to be above average in your cyber capabilities."

6 in 10 lack confidence

in government to secure fund data

[4] https://www.managedfunds.org/wp-content/uploads/2016/07/MFA-Letter-on-SEC-Consolidated-Audit-Trail.pdf

Next steps from KPMG:

Creating value in a technology-driven environment

Our data tells a compelling story: Fund managers want to remain competitive and are investing into new technologies. And many are finding ways to apply their new capabilities across the enterprise. Yet most are still struggling to create a strong and sustainable strategy for applying technology to their business. Based on our experience, KPMG member firm partners believe fund managers and executives should be focusing on the following five areas:

Articulating the vision: Creating competitive advantage from technology requires fund managers to have a long-term vision for how they want to change and a clear roadmap for implementing their strategy. This will require a keen ability to prioritize investments that deliver short-term benefits while leading towards a longer-term goal.

Setting the tone: Fund managers and executives will need to set the tone from the top if they hope to encourage technology adoption. Organizational inertia will need to be overcome and fund managers will need to see an incentive in adapting to new models and processes. At the same time, back and middle office functions will need to be encouraged to find new ways to improve efficiency and compliance.

Rethinking the operating model: As the pace of change quickens, fund managers need to continuously rethink their technology and their operating models to ensure they are taking full advantage of new innovations that help them remain best in class. While some ideas may not seem immediately applicable, understanding their place in your market will enable you to act proactively when required.

Improving access to data: Driving efficiency, reducing risk and enhancing compliance all require fund managers and executives to have reliable and timely data about their funds, their investors and their performance. Whether or not you use a data warehouse, the ability to access, manipulate and visualize data will be a key capability and competitive advantage going forward.

Focusing the investment: Fund managers and executives will need to develop a clear understanding of how they differentiate in the marketplace and then focus CapEx investments towards generating competitive advantage in those spaces. Non-core or non-value-adding capabilities should then be outsourced to providers better able to drive functional innovation.

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Robert, now a partner with KPMG in the US, has over 15 years experience in advising financial services companies and hedge funds. Robert, a US-trained lawyer joined the UK firm after overseeing the creation of an independent UCITS platform. He has worked in London, New York, Washington DC, Milan, Bangkok and the Cayman Islands. He has considerable experience in the establishment, operation, and structuring of both offshore and onshore hedge funds. He has handled the tax aspects of cross-border financings, financial products, international mergers and acquisitions, insurance and project financings.

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Adam has over 21 years of experience in the Asset Management space. His focus is to engage market participants to drive transformation of their operations, technology and data environments. His specialization includes middle office optimization, derivative processing and product innovation targeted towards the Buy Side portfolio management/risk analytic functions. His subject matter specialization spans across Equity, Fixed Income, Foreign Exchange, Private Equity, Bank Loans and OTC Derivatives covering both transaction and security lifecycles.

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Daniel has worked on both sides of the investor coin; as such, he is well placed to understand the pressures that new managers face when it comes to the first stage of enterprise risk management. He is a senior advisory professional with more than 17 years capital markets experience. His previous roles were at Deutsche Bank and Goldman Sachs and he was also managing director of Swiss-based Bedrock RealTime, part of the Swiss Asset Management Group, Bedrock. His remit at KPMG focuses on the development of the advisory practice, which serves those who manage and invest in hedge funds and other alternative investments. In addition he works in a transactional capacity with corporate finance where he is a dealmaker for financial services.

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