

funds europe

A Funds Europe survey in partnership with Temenos

The Future of Investment Operations

PREPARING FOR THE NEXT PHASE OF GROWTH
IN THE ASSET MANAGEMENT INDUSTRY

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The future of investment operations

WHAT THIS SURVEY REVEALS

Highlights

Technology lies at the heart of the asset management industry's responses to Covid-19 – and technology will be fundamental to its business recovery as the pandemic recedes. But how are the fund management and asset servicing communities adapting to this challenge? Which technology will they invest in? And what adjustments to their investment culture and operational frameworks does this require?

Funds Europe, in association with Temenos, surveyed the industry to provide answers to these questions. Among its main findings:

Technology and operational requirements

- 56% say that technology and data infrastructure will be the focus of their investment over the coming 12 months; 47% say this will be on ensuring ESG (environmental, social and governance) compliance across their product range.
- 62% say cloud-based solutions are playing a key role in their IT strategy.
- 40% have started to use APIs (application programming interfaces) in the past five years. Only 8% have used APIs for ten years or longer.

Strategic partners

- 83% of asset managers say they will extend their strategic alliances with asset servicing and tech partners, enabling connection of mid- and back-office services straight to their front-office tools and investment book of record.
- 42% say they will consolidate their outsourced relationships, employing a small number of service partners, in the coming two years.

Future developments

- 60% say it is important to augment human expertise into artificial intelligence (AI) models; 50% say that AI must be 'explainable' to clients and to regulators.
- 60% say portfolio analytics and performance measurement functions will benefit most from the application of machine learning (ML) and AI; 57% say this will offer most benefit to data pre-processing.



Mapping out the road to recovery

AS THE WORLD EMERGES FROM A
DEVASTATING PANDEMIC, TECHNOLOGY
WILL PLAY A CRITICAL ROLE IN
DETERMINING THE SHAPE OF THE
FUNDS INDUSTRY.

THE COVID-19 PANDEMIC that began its spread across the globe more than a year ago will have a profound effect on our society – and beyond that, on the technology we use every day, according to leading figures in business and finance.

“What we have witnessed over the past year,” says Microsoft CEO Satya Nadella, “is the dawn of a second wave of digital transformation sweeping every company and every industry. Building their own digital capability is the new currency driving every organisation’s resilience and growth.”

For BlackRock chief executive Larry Fink, one striking aspect of the pandemic was its highly uneven impact. In his annual ‘Dear CEO’ letter to companies in which BlackRock invests, he wrote that Covid-19 had sparked the most severe global economic contraction since the Great Depression and the sharpest fall-off in equity markets since 1987.

“While some industries, particularly those that depend on people congregating in person, have suffered, others have flourished,” he continued. “And although the stock market recovery bodes well for growth as the pandemic subsides, the

current situation remains one of economic devastation.”

Speaking as Covid-19 tightened its hold on Europe in March 2020, Peter Harrison, group chief executive of Schroders, reflected on his approach to the black swan events that every chief executive fears. “The pressing question is currently, ‘How resilient is my business?’, ‘How do we maintain service levels?’ and, most importantly, ‘How do we keep staff safe?’” he said.

For Harrison, technology lies at the heart of the solution. Indeed, several years before the pandemic, Schroders’ management team identified it as fundamental to establishing true cross-business collaboration and business resilience, he said.

Unhindered flexible working was the aim. As Harrison noted: “This wasn’t simply about working from home. This was [an enabling factor] to allow staff to mix with other teams.”

According to cloud computing provider Amazon Web Services (AWS), the pandemic has changed how people interact, receive information and get help. Much of what used to happen in person has shifted online. “Many of our customers

are using machine learning (ML) technology to facilitate that transition, from new remote cloud contact centres, to chatbots, to more personalised engagements online. Scale and speed are important – whether it’s processing grant applications or limiting call wait times for customers. Machine learning tools such as Amazon Lex and Connect are just a few of the solutions helping to power this change with speed, scale and accuracy,” it states.

For these large cloud computing providers, or ‘hyperscalers’, the pandemic has crowned a dynamic period of business expansion. At the end of December 2020, Microsoft announced a 17% annualised rise in revenue to US\$43.1 billion, with net income up 33% to US\$15.5 billion.

Commercial cloud services have been a primary driver, with the Microsoft Azure cloud platform reporting 48% revenue growth and aggregate cloud computing revenue up 34% year-on-year to US\$16.7 billion.

Technology strategy

As we’ve reported above, Schroders CEO Peter Harrison believes technology lies at the heart of the asset management

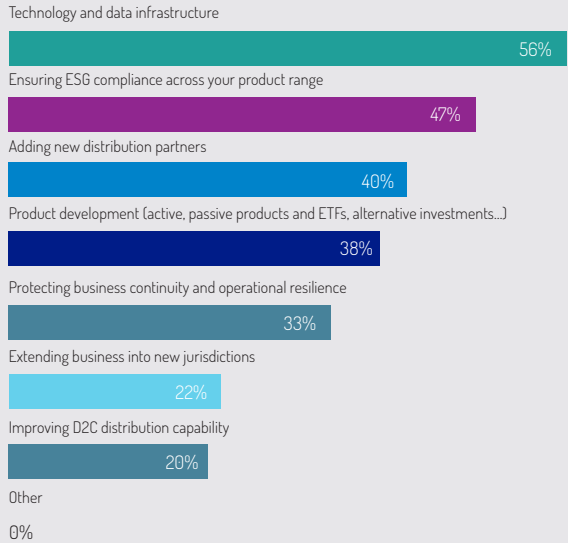
industry's responses to Covid-19. What's more, he thinks technology will be fundamental to its business recovery after the pandemic recedes.

This message aligns with the thoughts of our survey respondents (Fig 1). When asked where their company will focus its investment over the coming 12 months, the largest group opted for technology and data infrastructure (56%). Respondent companies will also prioritise efforts to ensure ESG (environmental, social and governance) compliance across their product range (47%). Perhaps unsurprisingly, measures to drive business expansion by extending distribution coverage (40%) and investing in product development (38%) were also high priorities.

"What we have witnessed over the past year is the dawn of a second wave of digital transformation sweeping every country and every industry."

SATYA NADELLA,
MICROSOFT

Fig 1: Where will your company focus its investment over the next 12 months? (Select up to three)



The first of these points, highlighting the importance of investment in technology and data architecture, will be addressed throughout this report.

It is timely, however, to reflect on the high priority that respondents accord to ESG compliance and the role technology may play in achieving this objective. Questions around sustainability, diversity and social inclusion have become integral to strategic decision-making across institutional investor and

asset management firms – and this focus is only likely to grow in the times ahead.

Conventional wisdom was that the crisis might divert attention from the climate change agenda. However, according to BlackRock's Larry Fink, exactly the opposite has taken place and reallocation of capital has accelerated even faster than anticipated. "From January through November 2020, investors in mutual funds and ETFs invested US\$288 billion globally in sustainable assets, a

96% increase over the whole of 2019,” he says.ⁱⁱ

Essential to this transition has been the growing availability and affordability of sustainable investment options. “Not long ago, building a climate-aware portfolio was a painstaking process, available only to the largest investors,” says Fink. “But the creation of sustainable index investments has enabled a massive acceleration of capital towards companies better prepared to address climate risk. Better technology and data are enabling asset managers to offer customised index portfolios to a

much broader group of people – another capability once reserved for the largest investors.”

Reflecting on which technology disciplines will be most important to business development over the coming 24 months (fig 2), respondents put data analytics and the capacity to manage big data at the top of the list (42%). The ability to manage large data volumes and high data velocity is fundamental to a wide array of functions in the asset management industry – as an input to factor-based and quantitative investment

“Better technology and data are enabling asset managers to offer customised index portfolios to a much broader group of people – another capability once reserved for the largest investors.”

LARRY FINK,
BLACKROCK

strategies, for example, or for conducting analysis of customer buying preferences as a driver for its product development and distribution strategy.

A third fundamental requirement for managing big data – the ability to accommodate data variety – is becoming ever more important. Investment teams are drawing insights from a wide range of alternative and unstructured data sets to inform their investment strategies – and, beyond the investment decision, this expertise may be important, for example, when applying ESG screening to assets held in a portfolio or received as collateral in secured finance transactions.

Beyond this, control over data quality and the ability to manage large data volumes is fundamental to driving advances in robotic process automation (RPA) and innovation

Fig 2: Which of these technologies will be most important to your business development in the next two years?

Data analytics, managing big data

42%

Robotic process automation

15%

Artificial intelligence/machine learning

13%

Cloud-based solutions

12%

API frameworks

10%

Distributed ledger technology (blockchain)

8%

Other

0%

in machine learning.

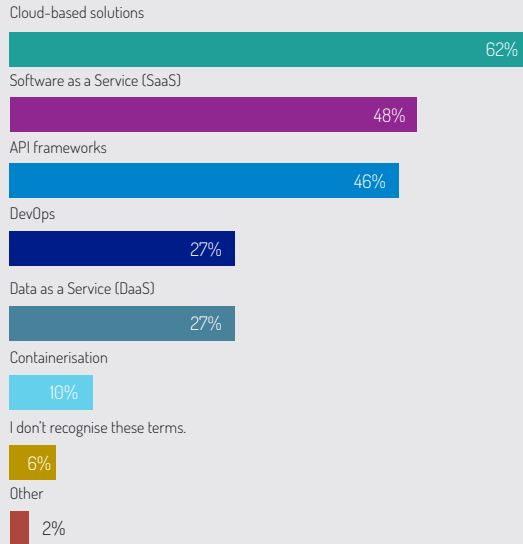
Definitions of RPA vary, but a common one is that it is the use of software with machine learning capabilities to handle high-volume, repeatable tasks that previously were processed by human action. RPA is being applied by asset servicers and, to a degree, by asset managers to realise cost savings and efficiency gains across standardised, repeatable service functions that can be replicated by machine.

One example is in processing trade order flow and providing trade or settlement reporting to key parties in the transaction. Another is in error detection – in identifying data points that lie outside of specified tolerances and handling these robotically where possible, or escalating these to the operations or

“We are helping thousands of organisations to migrate significant workloads to the cloud. These benefit from substantial IT costs savings, as well as improvements in productivity, business agility and operational resilience”

**PUBLIC CLOUD SERVICES
PROVIDER**

Fig 3: Which of the following have an important role in your IT strategy? (Select all that apply)



client service team when they cannot be resolved by the processing engine.

This approach is now being reinforced by more sophisticated artificial intelligence (typically supervised learning) techniques, as we will see later in this report.

Cloud-based solutions

The survey asked respondents to identify, from a list of technology options, which currently play an important role in their companies' IT strategies. Almost two-thirds

highlighted use of cloud-based solutions – specifically use of public cloud and hybrid cloud in their technology strategies (fig 3). Respondents also highlighted the importance of Software-as-a-Service (SaaS) solutions and use of API (application programming interface) technology.

The financial services sector has experienced a sharp acceleration in the use of cloud services over the past five years, reflecting a comparable trend across the

broader economy. A 2020 paper by UK-based industry body The Cloud Industry Forum, based on consultation with UK companies across large enterprise, SME and public-sector organisations, finds that 93% are now using cloud-based services in some form, with 71% of businesses planning to build new applications in the cloud in the future.ⁱⁱⁱ

The potential benefits offered by cloud computing are widely publicised, providing opportunities to develop, host and run IT applications on demand with consumption-based pricing. This enables users to store data and run applications across multiple devices while offering scaling options to meet peaks and troughs in activity.

As one public cloud services provider put it: “We are helping thousands of organisations to successfully migrate significant workloads (such as applications, websites, databases, storage, physical or virtual servers, or entire data centres) to the cloud.

“These companies benefit from substantial IT costs savings, as well as improvements in productivity, business agility and operational resilience. They may migrate workloads from an on-premise environment, a

hosting facility or from another public cloud.”

Barry Lee, business solutions director at Temenos Multifonds, observes that firms across the asset management industry are using public cloud provision in several different ways.

“Many asset servicing firms, and some fund managers, are looking to take advantage of the tools, analytics and scalability that cloud infrastructure can offer and to manage their own applications and data storage in a public cloud,” he says.

“Others, particularly smaller clients, may opt for a SaaS-based solution, a hosted solution managed by the service vendor (see box, next page).

“Through our SaaS services, Temenos provides a service layer on top of public cloud (e.g. Microsoft Azure, AWS, Google Cloud), which supports our hosted application, managing upgrades and software patches and ensuring optimised delivery of this solution through to the client.”

While public and hybrid cloud offers benefits in terms of scalability, load management and potential for users to translate fixed into variable costs, there are complexities in managing the transition from an on-premise architecture. Some

“Many asset servicing firms, and some fund managers, are looking to take advantage of the tools, analytics and scalability that cloud infrastructure can offer.”

**BARRY LEE,
TEMENOS MULTIFONDS**

firms have seen their cloud computing expenditure run well over budget in the early stages of this transition before their cloud usage is fully optimised.

New applications that are developed cloud native (i.e. designed to operate on cloud from inception) may be optimised to run in a cloud environment, but processes migrated from on-premise servers may need to be reconfigured to run efficiently and securely in a public/hybrid cloud environment.

Typically, a key part of this redesign will be to reconfigure monolithic applications, built on private servers and data centres, into smaller, independently developed modules that can be deployed more efficiently in a cloud environment.

A ‘microservices’ architecture builds and delivers IT projects as a series of small,

self-contained modules or components. Each component has a single, specific purpose and fits with other modules, like building blocks, to create the bigger project. Embracing longstanding computing principles of 'encapsulation' and 'low coupling', each module should, as far as possible, be independent and can be replaced or upgraded with minimum impact on other modules and the wider IT estate.

If it is run in a microservices environment – through joined-up building blocks – these modules can run in the cloud in 'containers' (such as Docker, a commonly used platform for building, distributing and running containers) and with a container orchestrator (such as Kubernetes, which is owned and developed by Google)

"For the large asset servicers, a dominant theme over the past ten years has been to centralise and standardise their services around a global operating model."

BARRY LEE,
TEMENOS MULTIFONDS

CLOUD-BASED DATA MANAGEMENT AND APPLICATIONS HOSTING

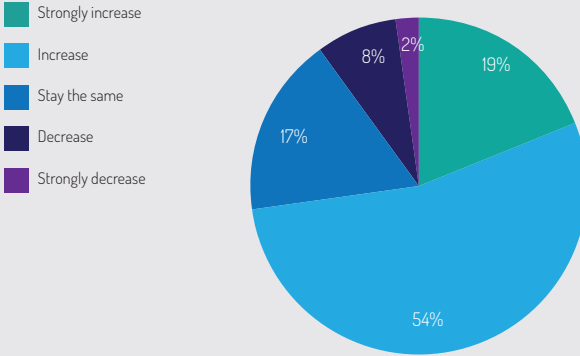
Previously, financial services companies typically used their own private servers to support their service delivery and data management requirements. However, increasingly they are shifting data to public cloud, enabling them to profit from performance advantages, along with cost and scale benefits, while reducing the overhead associated with managing their own server technology on site.

Cloud-based services may apply a number of delivery formats:

- **Software as a Service (SaaS)** – using the provider's applications running on a cloud infrastructure. The applications are accessible from various devices via a thin client interface, such as a web browser (e.g. web-based email) or a program interface. The client does not manage or control the underlying cloud infrastructure, including network, servers, operating systems, storage, or even individual application capabilities, with the possible exception of limited user-specific application configuration settings.
- **Data as a Service (DaaS)** – like Software as a Service, or SaaS – is a cloud-based strategy that involves delivering information to end users via a network, typically utilising APIs, rather than running applications on locally based private servers. Just as SaaS removes the requirement to install and manage software locally, Data as a Service supports data storage, integration and processing operations from the cloud.
- **Platform as a Service (PaaS)** – deployment on to cloud infrastructure of user-created applications generated using programming languages, libraries, services, and tools supported by the provider. The client does not manage or control the underlying cloud infrastructure including network, servers, operating systems, or storage, but has control over the deployed applications and possibly configuration settings for the application-hosting environment.
- **Infrastructure as a Service (IaaS)** – offering provision processing, storage, networks and other fundamental computing resources where the consumer is able to deploy and run arbitrary software, which can include operating systems and applications. The client does not manage or control the underlying cloud infrastructure but has control over operating systems, storage and deployed applications – and possibly limited control of select networking components (e.g. host firewalls).

Many asset managers and asset servicers are now looking for solutions that are both 'cloud native' and 'cloud agnostic'. Cloud native applications are created and deployed directly for a cloud environment, rather than developed for use on 'on premise' servers and later migrated to the cloud. Being cloud native, these support continuous integration and deployment to enable changes to be made quickly and without affecting the whole system.

Fig 4: Will you increase the number of services that you outsource to external partners over the next two years?



to optimise how these are deployed within the cloud.

Managing vendor relationships

Although some asset management houses choose to meet most of their trade processing, asset servicing and accounting requirements through in-house provision, others have chosen to outsource sections of the investment lifecycle, which they deem to be 'non-core', to an external provider.

Almost three-quarters of respondents say that they will increase the number of services that they outsource, with 19% indicating this will be a strong increase (fig 4). This substantially outweighs the

number of respondents – a tenth of the total – who say they will reduce the services they

outsource to external partners.

While respondents indicated they will increase the number of services that they outsource, they do not, in the majority of cases, intend to increase their number of vendor/outsource relationships (fig 5). On the contrary, more than two-fifths of respondents expect to consolidate their vendor list.

That said, there is no universal trend towards vendor consolidation across the industry. A quarter of respondents say they will retain the same number, and 21% say they will increase their number of external service partners – taking advantage of specialist

Fig 5: For services that you outsource, do you intend to reduce (or increase) the number of service partners that you employ over the next two years?

We will consolidate to use a smaller number of external service partners

42%

We will retain the same number of external service partners

25%

We will increase the number of external service partners that we employ

21%

We will bring outsourced services back in-house

6%

Not applicable

4%

We will consolidate with a single provider

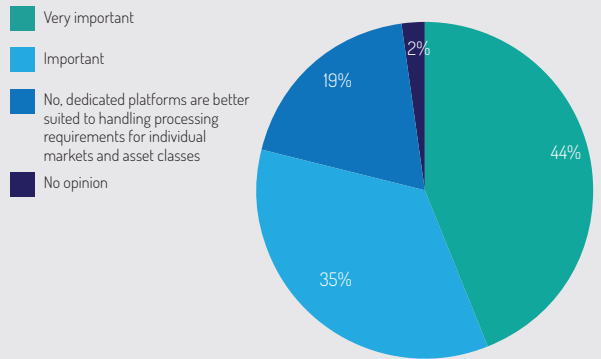
2%

skills these can offer to meet their service requirements.

Commenting on these results, Barry Lee, business solutions director at Temenos Multifonds, says that asset managers are commonly seeking a comprehensive outsourced solution that meets many or all of their asset servicing requirements, including fund accounting and custody, middle-office services and often transfer agency.

The practice of 'modular' or 'component' outsourcing, where asset managers appointed multiple specialist providers to deliver individual services, is becoming less common. Asset managers are, in many cases, looking to reduce the number of vendor relationships from a governance and oversight perspective and also to achieve

Fig 6: Is it important that a service provider (e.g. transfer agent, fund administrator) can support an asset manager's global investment activities, across multiple asset classes, from a single technology platform?



greater consistency of service.

To meet this commitment, asset servicers have been investing heavily in their strategic platforms and have been refining their global operating model in line with asset managers' requirements. In fund administration, for example, leading service providers are now able to support asset managers' business across a wide range of locations globally from a single global platform. This marks an advance on times past, where fund administrators often found it necessary to maintain a number of dedicated systems to support asset managers' needs

across different markets and asset classes.

In line with this point, the survey asked respondents whether it is important that a service provider (e.g. fund administrator, transfer agent) can support an asset manager's global investment activities, across multiple asset classes, from a single technology platform (fig 6). The answer was a resounding 'yes'. Almost four-fifths of respondents said it was important that a service provider could meet this commitment, with 44% of these stating that this capability was 'very important'.

"As a global business, fund

"It can take weeks or even months for asset managers and their fund administrators to deploy new code to support a new product launch or align to new regulations. Platforms like Netflix are doing this continuously."

SERN THAM,
TEMENOS MULTIFONDS

managers wish to avoid receiving data and reports in different formats for different markets and needing to aggregate and reconcile that information,” comments Lee at Temenos.

“For the large asset servicers, a dominant theme over the past ten years has been to centralise and standardise their services around a global operating model, delivering consistency in data, reporting and client experience. Asset managers are looking to take advantage of this greater consistency, and potentially to consolidate their outsourced relationships, when they issue an RFP.”

These trends have, in turn, prompted asset servicers to review how they build their global operating model. “For a fund administrator that has built its operating model around Temenos Multifonds, for example, it makes little sense to be offering standalone services on legacy technology just to support one or two clients in certain markets,” adds Lee.

“Increasingly those clients are also being migrated on to the strategic global platform and asset servicers are decommissioning satellite platforms they have previously maintained to service specific

elements of their global client business.”

Front-to-back integration

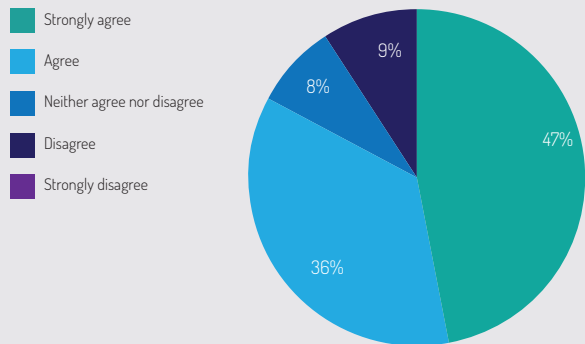
Survey results have indicated that asset management companies are expected to increase the number of services that they outsource over the coming two years, taking advantage of the investment that large asset servicing companies have made in their global operating models to support asset managers’ investment activities across a full range of asset classes and global locations. To enable this process, asset managers are seeking seamless interconnection

between functions along the investment value chain, including integration of middle- and back-office services that may be outsourced.

In all, 83% of survey respondents believe that asset managers will extend strategic alliances with asset servicing and technology partners (fig 7), enabling these partners to connect mid- and back-office services straight through to the asset managers’ front office tools and investment book of record (IBOR).

These types of initiatives are evident across the industry, through partnership and acquisition, with large global

Fig 7: Asset managers will extend their strategic alliances with asset servicing and technology partners, enabling these partners to connect middle- and back-office services straight to the asset manager’s front-office tools and investment book of record.



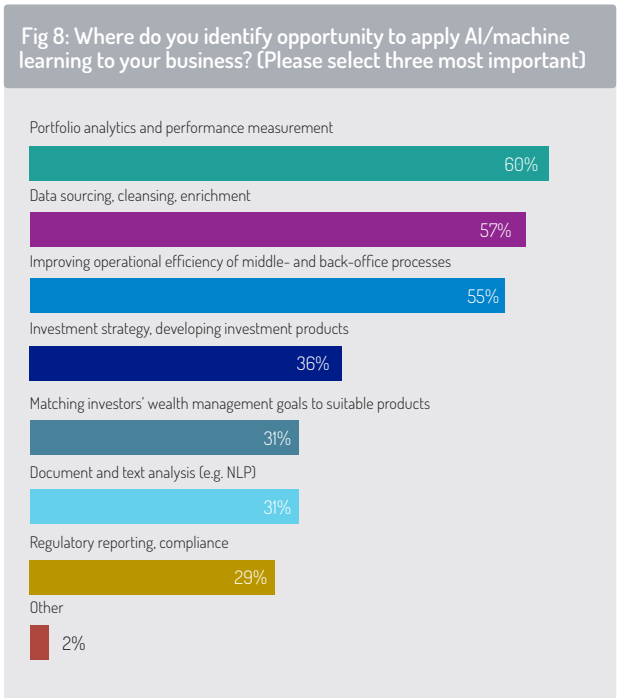
asset servicers exploring mechanisms to deliver third-party operational services directly into their clients' common front-to-back applications.

For example, asset servicing companies have also been working with front-office systems vendors to reinforce linkages between their middle-office technology and the order management and execution management tools available on the market.

A single data model is central to achieving this optimised front-to-back approach. The target is to operate a common data architecture that supports the data requirements of all modules across this front-to-back model. Although individual modules may have bespoke data requirements, this is fed from a standardised data model wherever possible.

Artificial intelligence and machine learning

AI and ML are being applied by asset management and asset servicing companies to support an expanding range of functions across the investment lifecycle. This includes applications in portfolio modelling and investment decision-making, in trade execution and transaction



cost analysis, in collateral and liquidity risk management, and across a broad range of functions designed to minimise operational risk and cost (fig 8).

A priority in applying AI, respondents tell us, is the ability to augment human expertise into AI models (fig 9). Augmented intelligence typically refers to the use of information technology and AI techniques to supplement and deepen human capabilities – to reinforce human intelligence, rather than simulate or replace it.

Building on this point, respondents indicate that the AI model must be easily adaptable to the requirements of product and business teams – enabling these personnel to make refinements through information dashboards or through 'low code, no code' inputs. This enables changes from staff that do not have full coding skills – allowing the company to shorten the gap between defining a business use case and implementing changes to the model.

“Asset management companies will move towards a service model that is event-driven, on demand with updates moving closer to real time.”

**BARRY LEE,
TEMENOS MULTIFONDS**

Alongside this principal of ‘adaptability’, the survey finds that AI modelling must be ‘explainable’. Google’s AI Platform team define ‘explainable AI (XAI)’ as a set of tools and frameworks to understand and interpret predictions made by machine learning models. This can debug and improve model performance and help others understand the model’s behaviour. This can also generate feature attributions (identifying how much an explanatory variable in the model contributed to the predicted result) and visually investigate model behaviour utilising scenario analysis (or ‘What if’) tools.

“Initially a large amount of the automation applied to financial operations was grounded in automating standardised, repetitive tasks,” says Temenos

Multifonds’ product director, Sern Tham. “For security prices falling outside of a specified threshold, for example, these would be identified as a possible exception and flagged for investigation.

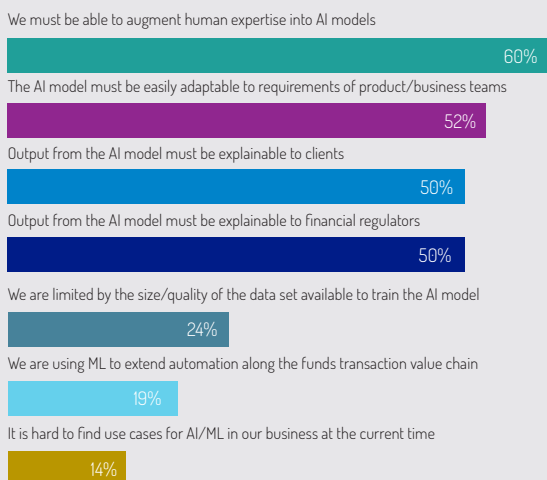
“However, during volatile periods, the number of possible exceptions may rise sharply and we have applied XAI to help manage this challenge – particularly to reduce the number of false positives. This has delivered greater efficiency to exception management, reducing false positives and therefore eliminating the need

for manual investigation.”

However, says Tham, a prerequisite for AI to be applied to a business use case is that the model’s findings must be explainable to financial regulators and to the client – and there must be a clear digital audit trail in place to support why the model has predicted a specific outcome.

Similarly, Brown Brothers Harriman (BBH) has applied AI to NAV (net asset value) calculation and certification, utilising a supervised learning model to identify securities that are incorrectly valued and which

Fig 9: Applying AI/ML models to your business. Please select all that apply.

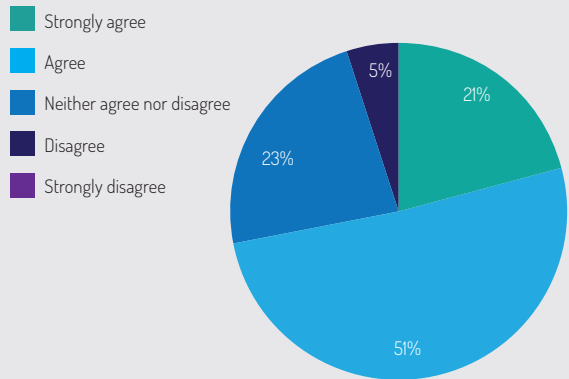


may potentially lead to a NAV error. BBH indicates that this Anomaly NAV Tracking System (ANTS) has been important in reducing false positives in NAV error detection. On backtesting ANTS against its legacy model, BBH identified a 77% reduction in pricing exceptions that needed to be investigated further (see BBH's Kevin Welch in the expert comment section that starts on page 19).^{iv}

NAV oversight

Even when asset managers have taken the decision to outsource NAV calculation to a third-party administrator, they will retain responsibility for oversight

Fig 10: There will be stronger demand from asset management companies for independent oversight of fund accounting and related outsourced services (NAV calculation, provision of contingent NAV...) over the coming 12 months. Do you agree?



TOWARDS A REAL-TIME ARCHITECTURE FOR SERVICE DELIVERY

Sern Tham, product director, Multifonds at Temenos, proposes that a reason why technology leaders such as Netflix have become a central part of consumers' lives is their constant ability to innovate and to improve customer experience. This is exemplified by the speed at which they can deliver new products and features with no significant interruption to their service.

"Now compare this model to asset management," says Tham. "Currently, it can take weeks or even months for asset managers and their fund administrators to deploy new code to support a new product launch or align to new regulations. Platforms like Netflix are doing this continuously, with their engineers deploying code hundreds of times every day, maximising their agility and accelerating

innovation." With this in mind, it is hardly surprising that survey respondents prioritise speed to market with new products and services, the value of real-time updates, and the ability to collaborate effectively with external partners.

How close is the asset management industry to this Netflix-like model of product releases and upgrades? "It is not close currently," says Temenos' Barry Lee. "Asset management remains a complex business with data moving at scale through mid and back offices. These data and processes need to be highly accurate and it is a major task to re-engineer this in the back end."

"Asset management companies will move towards a service model that is event driven, on-demand with updates moving closer to real time."

"It will take time to get there, but there will be huge competitive advantages for companies that are first to achieve this."

through the fiduciary, or stewardship, responsibility they bear to their investors.

More than 70% of survey respondents said there will be stronger demand from asset management companies for independent oversight of fund accounting and related outsourcing services over the coming 12 months. In contrast, only 5% disagreed with this statement (fig 10). Fear of reputational damage (77%) and concerns over possible penalties from financial authorities for poor standards of oversight (63%) were the primary drivers for this trend (fig 11).

With this in mind, fund managers are taking steps to ensure they have independent oversight in place to review the activities of third-party (or in-house) administrators that they employ, including NAV provision and contingent NAV arrangements. This is becoming integral to the fund governance standards required by financial regulators and demanded by institutional investors for asset managers they employ.

Conclusion

This survey finds that investment in technology and data infrastructure sit at the top of asset managers'

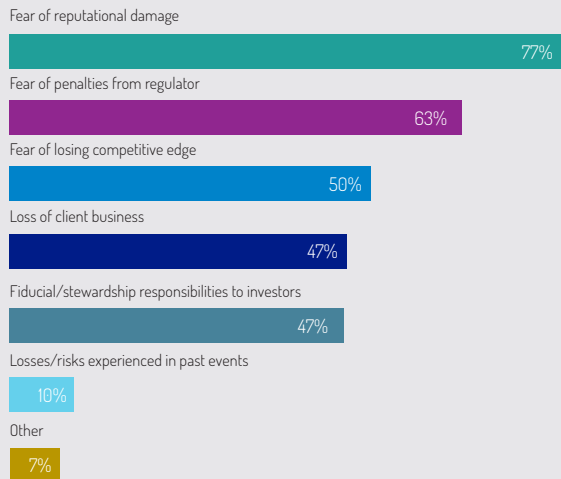
priorities as they position themselves to deliver business growth in the recovery from the Covid-19 pandemic. Funds companies will also prioritise their commitment to high ESG standards across the investment lifecycle – and investments in technology and data engineering (including enhanced ability to manage alternative data sets) will be central to delivering this objective.

Asset management companies are expected to increase the number of services that they outsource over the coming two years, taking advantage of the

investment that large asset servicing companies have made in their global operating models to support asset managers' investment activities across a full range of asset classes and global locations.

While asset managers will continue to outsource 'non-core' services, many will also look to consolidate their vendor relationships to a smaller number of service partners, taking advantage of the benefits this may deliver in simplifying oversight of outsourced relationships and maximising consistency of service.

Fig 11: If yes, what will drive this focus on oversight? (Please select the three most important)



Alongside this, some asset managers (particularly large global investment houses) are exploring the opportunity to manage their front-to-back investment lifecycle from a centralised data model and common technology platform. This may include strategic alliances with asset servicing and technology partners, enabling these partners to connect mid- and back-office services straight to the asset manager's front-office investment tools and IBOR.

Against this background, use of public and hybrid cloud computing will increase. Some asset managers and asset servicers will take advantage of the comprehensive tool set and analytics offered by the public hyperscale cloud providers (e.g. AWS, Google Cloud, Microsoft

Azure, Alibaba) to build and run applications, and to store data, in the cloud. Other users may source software via a SaaS option that is hosted on public cloud by their service vendor.

However, as regulated financial entities, asset management and asset servicing firms will continue to confront questions around data privacy and data governance and may continue to store some data on private cloud and on-premise data centres.

Covid-19 has pushed firms to review their IT strategies and their transition to public/hybrid cloud. But many work teams are now operating remotely and doing as much as they can in a digital environment. The IT architecture must be efficient, secure and flexible enough to support this. It's also worth noting that some weeks of the Covid-19 crisis saw high volatility and a surge in trading volumes. Financial services companies must have sufficient elasticity in their IT systems and data architecture to support these spikes in business activity.

At the same time, firms must think carefully about how to manage the transition to a public or hybrid cloud environment. This will involve adopting new cloud-native applications and reconfiguring existing applications to work securely and efficiently in the cloud. Firms must also assess how to get the best out of consumption-based pricing schedules. One interviewee told *Funds Europe* that close to 35% of public cloud expenditure by UK companies is currently wasted. This occurs primarily because firms do not know what size of cloud instance to buy when they transition to a public cloud infrastructure.

Against this background, augmented AI and explainable AI will play a growing role in delivering insights, both predictive and ex post analytics, across the investment lifecycle. Crucially, this can deliver business intelligence in a way that is explainable to product teams, customers and financial supervisors. **fe**

"Digital technology will help transform raw data into valuable information that decision-makers across our industry can use to benefit their businesses and validate their decisions."

KATE WEBBER,
NORTHERN TRUST

i – <https://www.blackrock.com/corporate/investor-relations/larry-fink-ceo-letter>.

ii – Larry Fink, "Dear CEO letter, 2021", Blackrock, op.cit.

iii – Cloud Industry Forum, *The Changing Role of the IT department, 2020*, page 5.

iv – <https://www.bbh.com/us/en/insights/investor-services-insights/anticipating-the-unexpected-takeaways-on-ai-amid-historic.html>.

What the specialists say

WE ASKED INDUSTRY EXPERTS ABOUT THE FUTURE OF GLOBAL FUND SERVICES AND INNOVATION OPPORTUNITIES TO STRENGTHEN INVESTMENT DECISION-MAKING.



KATE WEBBER

LEAD PRODUCT MANAGER,
GLOBAL FUND SERVICES,
NORTHERN TRUST

In which areas of global fund services will technology investment deliver greatest advances over the next three years? What are the key components to building an efficient, event-driven funds architecture?

Some of the biggest advances will be in how technology will transform the servicing of investment data. Digital

technology will help transform raw data into valuable information that decision-makers across our industry can use to benefit their businesses and validate their decisions across both their front and back offices.

This will play an important role in ending reliance on outdated legacy architecture on which much of the funds industry still operates today – from mainframes and batch overnight feeds to reports and electronic faxes. Digitalising these processes will offer transformative benefits for asset management clients and their investors by moving from inefficient, manual investment processes to enable powerful new user experiences.

This means, for example, enabling an investor to visualise all their investments in a single place, or providing

a distribution team with the real-time valuation status of every single investor in their funds. We have developed our enhanced digital technology platform, Northern Trust Matrix, to help our clients embrace this power of digitalisation and we are working to roll out its functionality for our European transfer agency clients.

At the same time, we are investing in Northern Trust Whole Office. This is an

“While there is no shortage of information available to asset managers, the ability to provide it to clients in meaningful, intuitive forms is increasingly central to the variety of roles performed by the asset servicer.”

KATE WEBBER,
NORTHERN TRUST

advanced open-architecture, multi-asset class solution that integrates proprietary architecture with innovative partners to provide our clients with access to new technologies and capabilities across areas such as strategy and trading, operations, data and digital, and analytics.

Whole Office and Matrix are complimentary in delivering advanced capabilities that collectively span an asset manager's business. Whole Office delivers advanced technology solutions to facilitate decision-making across the middle and front offices, while Matrix's focus on delivering real-time accurate investment data constitutes back-office transformation and will support

the complete value chain of our asset servicing products.

Changing client expectations

Asset managers are demanding accurate, real-time investment data to inform their decision-making across areas ranging from portfolio management to distribution.

While there is no shortage of information available to asset managers today, the ability to provide it to clients in meaningful, intuitive forms – rather than in a deluge of raw data – is increasingly central to the variety of roles performed by the asset servicer.

We also observe an evolution in how asset managers are using outsourcing to focus more exclusively on 'core' functions such as portfolio management. From our position as a global custodian and asset servicer, we see some managers outsourcing up the 'value-chain' – including outsourcing functions such as their trading desks, foreign exchange or transition management capabilities. In some cases, this includes moving towards full outsourcing of all front-office capabilities. This has enabled our clients to focus on core alpha-creating activities of their own.

In promoting a successful event-driven funds architecture, again data is central to success. It is critical to arrange architecture to deliver accurate, reliable, real-time data utilising the power of digital technology to be more efficient in terms of how it is processed and delivered and how clients can consume it.

It is not enough simply to build a portal on top of a legacy solution. Rather it means moving away from obsolete legacy systems that maintain duplicate records of the same information in lots of different places.

You need to build an architecture that captures every transaction upfront and delivers a single, 'golden' record of that event that can be used by you and your clients in the format they wish.

As an asset servicer, getting that data foundation right opens up future opportunities to deliver products and services to clients to support them with the challenges and opportunities that are most critical to them. It creates a well-constructed end-to-end architecture, where change becomes rapid, responsive and relevant to our clients' future needs.

"The seamless integration of front, back and middle office is an excellent example of what can be achieved through collaboration between providers."

ARNAUD CLAUDON,
BNP PARIBAS



ARNAUD CLAUDON

HEAD OF ASSET OWNERS & MANAGERS CLIENT LINES AT BNP PARIBAS SECURITIES SERVICES

What role do technology partnerships play in delivering efficiency gains in global fund services ?

How do these translate into greater value for asset management clients?

Effective partnerships with fintechs and other service providers can be a real game-changer, enabling us to offer our clients enhanced user experience and product innovation as well as the benefits that come from platform mutualisation, process harmonisation and the latest technologies.

Partnerships, and more broadly business cooperation, can help solve age-old industry issues. The seamless integration

of front, back and middle office is an excellent example of what can be achieved through collaboration between providers. Last year, we partnered with BlackRock Solutions' Aladdin Provider ecosystem, bringing together our back-office and post-trade services with Aladdin's front and middle office. What this means in practice is that we operate on a shared platform and workflows with our clients, which reduces duplication of data models, communication breaks, operational risk and therefore increases efficiency throughout the process.

Another area that can be complex is fund distribution, where fund buyers and manufacturers have to enter into different contracts, interface with different systems and manage separate processes in multiple locations.

Through our partnership with Allfunds, one of the biggest fund distribution platforms in the world, we aim to increase operational efficiency throughout the fund buying and selling process for our institutional clients whilst making Allfunds data analytics available to our fund buyer clients.

"Partnerships have a huge role to play in developing our offering and enabling our clients to manage their cost base, enhance efficiency and take advantage of what fintechs have to offer."

ARNAUD CLAUDON,
BNP PARIBAS

Increasingly, we are also using partnerships to provide asset manager clients with better insight and intelligence on their investments. Our Manaos platform is a case in point, giving our clients access to a range of leading fintechs in the ESG arena. Our clients easily and securely store their fund data on Manaos, a platform which meets the highest level of banking security, select the fintechs they want to work with from the app catalogue and analyse their portfolio at the push of a button. This strategy, which we call Open ESG, perfectly illustrates the benefits of banks partnering with specialist fintechs for the benefit of our clients.

Partnerships have a huge role to play in developing our offering and enabling our clients to manage their cost base, enhance operational efficiency and take advantage

“The goal is not just building a slightly better version of an existing tool or process; it’s about creating an entirely new way to operate.”

KEVIN WELCH,
BROWN BROTHERS
HARRIMAN

of what fintechs have to offer. Through these partnerships, our strategy is to join the dots between providers for better platform interoperability and to connect our clients to the wider ecosystem which, after all, is one of our key functions as a custodian.



KEVIN WELCH
MANAGING DIRECTOR
INVESTOR SERVICES AT BROWN
BROTHERS HARRIMAN (BBH)

What potential does artificial intelligence offer to deliver

EXPERT COMMENT

better decision-making in global fund services?

For most companies, the pursuit of artificial intelligence (AI) solutions often focuses on two goals: reducing costs and driving efficiency. The path to delivering true, lasting value, however, is through harnessing intelligent automation that can act as a catalyst for end-to-end operational change. The goal, then, is not just building a slightly better version of an existing tool or process; it’s about creating an entirely new way to operate. This approach – what we call pragmatic transformation – still has cost reduction and efficiency at its core, but it has the potential to have much greater impact.

The central premise of our transformation journey has been that AI will enable better decision-making. Using BBH’s Anomaly NAV Tracking System (ANTS) as a case study, this hypothesis was proven during last year’s significant market volatility. In 2018, we introduced ANTS into our net asset value (NAV) calculation process for investment funds. Our model was designed to identify securities that were incorrectly valued and could, in theory, cause a NAV error.

This technology uses predictive analysis and machine learning to eliminate the noise of false positives and highlight exceptions that might not have been previously detected. Analysts spend less time sorting through recurring exceptions and more time on evaluating potential NAV issues.

This model was put to the test with the spike in trading volume right after the pandemic began. The average daily market change of security prices in March 2020 was over 5%. Our previous model’s data set had not seen this level of volatility, so adjusting the model quickly was essential. When back-testing ANTS against our legacy model, we saw a reduction of 77% in pricing exceptions that needed to be reviewed.

“No prediction model lasts forever – they will all degrade over time... It is critical that the business and IT work together to address changes in real time.”

KEVIN WELCH,
BROWN BROTHERS
HARRIMAN

The events of last year left us with several key takeaways.

First, *recalibrate and adjust to improve over time*. No prediction model lasts forever – they will all degrade over time due to seasonality, changes in production data, new events, and patterns which lead to continual adjustments and fine-tuning. It is critical that the business and IT work together to address changes in real time.

Second, *data purity and accessibility is a prerequisite for agile methodology*. Data, it's often said, is the fuel that ignites the AI engine. That's why real-time views into volumes and trends are paramount in adjusting to a dynamic environment. Data is useless unless it can be easily accessed, normalised, and understood by business users and IT alike.

Third, *precision beats speed to market any day*. Precision and accuracy should not take a back seat to speed to market. Given the business-critical function of NAV calculations, oversight and auditability are central to the sustainability of an AI program.

We continue to keep these lessons learnt in front of mind as we look to the future of AI in our industry. **fe**



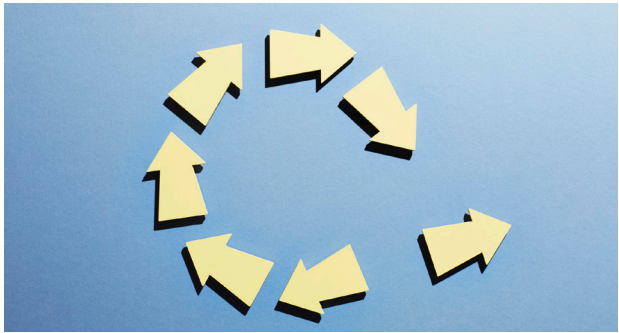
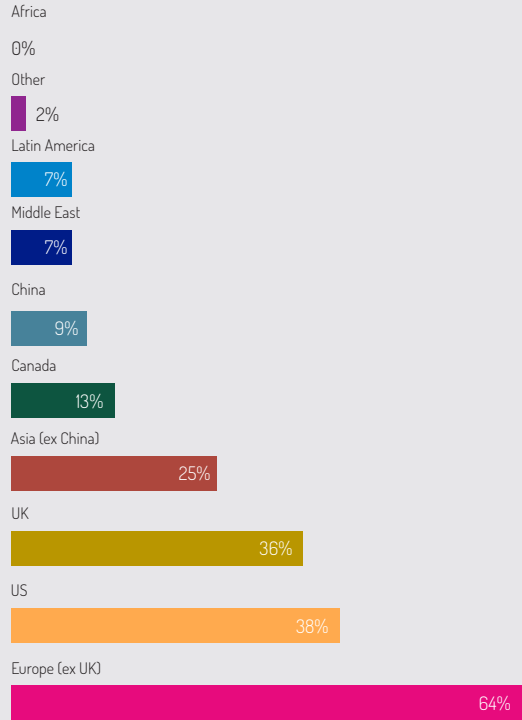


Fig 12: Which regions/markets are your priority for business expansion in 2021?



A total of 56 investment professionals participated in the survey, conducted online during January 2021.

Respondents were asked to say which part of the funds industry they worked in:

Asset management: 34%

Asset servicing: 29%

Distribution: 16%

Asset owner: 7%

Other: 14 %

Respondents in the “other” category were asked to specify the nature of their work.

Responses included financial technology, legal, financial research, regulator.

The respondents worked in these regions:

UK: 28%

Rest of Europe: 42%

Asia-Pacific: 13%

US: 9%

Other: 8%

Our final survey question asked which regions or markets will be most important in driving respondents’ business expansion during 2021. As shown in fig 12, they identify the greatest opportunity in European markets ex UK (64%), in the US (38%) and in the UK (36%) in the year to December.



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