

funds global

Digital transformation in fund administration

THE ROAD AHEAD

A Funds Global survey in partnership with Temenos



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Survival of the fittest

AS TECHNOLOGY EVOLVES, SO MUST FUND MANAGEMENT

Introduction

THE GLOBAL ASSET MANAGEMENT industry is experiencing fundamental shifts that will shape its future. Industry revenues are slowing, operating margins are increasingly under pressure and divergence between winners and losers means that consolidation is inevitable. Only the strongest will survive.

At Temenos, our Multifonds fund administration software is used by the majority of leading fund administrators. It is therefore essential that we support our clients in understanding the concerns of their customers and peers, along with their plans for the future, enabling them not only to survive but also to thrive.

Digital is set to play a large part in this future. It has an increasingly important role in all our lives, including the management of our finances. This trend is set to continue. Fund administration is no different. Without imminent digital transformation and the right digital infrastructure, fund administrators cannot realise the optimum efficiency they require to succeed.

But it's more than that. Having the tools and capabilities to innovate, and delivering the right products and services quickly, is key. However, what the market considers to be digital can vary and, as a result, their success will also be variable. This survey provides real insight into what digital truly means within the industry and how fund administrators will transform themselves to fit their need to be truly digital. In doing so, it will identify what is required to enable you thrive in this environment.

Stephen Quigley, EVP Temenos, Multifonds North America

Introduction to the US survey

AI AND DISTRIBUTED LEDGER TAKE ON RISING IMPORTANCE

This survey reveals that digital transformation is a priority for the US asset management industry – just as it is for the funds industry globally. The industry must implement this transition against a background of declining profitability, with 45% of our US respondents and 55% globally telling us that profits will contract over the coming 12 months.

In this environment, there is an overarching focus on margin and cost and this is driving asset servicing firms to review their existing technology and to identify where long-term efficiency improvements can be generated through process innovation and technology upgrades. A large majority of respondents across both the US and the global survey highlight the importance for asset managers of investing in their operational systems to improve efficiencies and to reduce costs.

It will be important for asset servicers to provide creative solutions to support rising investment flows into alternative asset classes, particularly in the US market where 67% of asset management respondents highlighted the expansion of their

alternative investments product range as being their major focus over the coming 12 months. This will demand investment in automation across the alternative investment lifecycle, as well as ongoing steps to improve efficiency of OTC derivatives processing, collateral and liquidity management.

The US survey highlights the importance of cloud-based solutions for asset servicers in refining their approaches to data management and for meeting service requirements through infrastructure-as-a-service, platform-as-a-service or software-as-a-service delivery models. This is enabling asset servicers to move away from supporting client data 'on premises' on local servers to a consolidated data pool based in the cloud for all global locations.

The survey indicates that third-party technology providers will perform a fundamental role in driving innovation in investment operations in the US and globally. This is based on using a flexible IT architecture, often supported through open application programmable interfaces (APIs) to manage

data flows and to facilitate technology collaboration across this network of participants. This open architecture provides a flexible and secure environment through which service providers can extend services to, or engage in collaboration with, other organisations.

In the coming three years, the US survey identified artificial intelligence (AI) and distributed ledger technology as being the most important areas of technology innovation driving the asset servicing industry. Over a 10-year timeframe, the application of AI will gain further importance with 45% of US respondents indicating this will be a primary driver of their technology strategies.

These investments will demand careful balancing of technology budgets to ensure movement towards digital transformation, while ensuring that problems associated with legacy technology are addressed and resolved. A large majority of respondents across both the US and global surveys indicated that the asset management industry continues to be constrained by the persistence of legacy technology.

The power of digital innovation

WHAT THIS YEAR'S SURVEY REVEALS

Highlights

Fund administrators are adapting to an age of digital transformation, investing to meet the needs of their asset management clients and the investors they serve. But how well is the asset servicing community prepared for these challenges? Which technology should they invest in? And what adjustments to their business culture does this require? *Funds Global*, in partnership with Temenos, surveyed the industry to evaluate how it is managing this change agenda.

Technology and operational requirements

- 93% say that investment in operational systems is essential for asset managers to improve efficiency and reduce cost.
- 54% say that legacy technology remains a problem for the funds industry.

Strategic partners

- 83% say third-party technology providers will play an important role in driving innovation in investment operations.
- 68% say it is important to have one strategic service provider that can support a client's full outsourcing requirements.
- 35% say that they will increase the number of third-party providers that they employ.

Future developments

- 38% of respondents say that digital transformation will be their company's major focus over the year ahead.
- 23% say that improvements in data analytics will be the most important development in the next three years.
- 40% say that developments in artificial intelligence will be the most important development in the next ten years.



MORE THAN

90%

of respondents indicated
investment in operational
systems is essential for
asset managers to improve
efficiencies and reduce costs.

► INFORMATION SUPERHIGHWAY – The speed of change in the digital era has been astonishing.

Focusing on the future

TECHNOLOGY ADVANCES AT A DIZZYING PACE – AND FIRMS NEED TO KEEP UP

OVER THE PAST 15 YEARS, we have seen a transformation in the role that technology plays in the global economy. In 2006, the top ten global corporations by market capitalisation included four energy companies (ExxonMobil, BP, Royal Dutch Shell and Gazprom), along with firms from the financial services (Citigroup, Bank of America), auto (Toyota Motor Corporation), retail (Walmart) and industrial (General Electric) sectors. Microsoft was the only global technology company at this corporate high table.

Fast-forward to 2019 and seven out of the top ten global corporations by market cap are digital technology companies – Microsoft, Apple, Amazon, Alphabet, Facebook, Alibaba Group and Tencent Holdings. This illustrates the power that digital innovation can have in driving the corporate expansion of a group of technology players that were little-known at the start of the millennium. But it has also heralded new approaches to product development and

service delivery made possible by digital technologies – through the use of cloud computing, mobile applications and analytics driven by rapid advances in data science and artificial intelligence.

The digital transformation age

The World Economic Forum (WEF) highlights in its Digital Transformation Initiative how cheaper and better technology has changed the way people communicate with each other and how this has revolutionised the way they access information, goods and services: 8 billion devices are now connected to the internet and the WEF expects that figure to reach 1 trillion by 2030 (World Economic Forum, 'Digital Transformation Initiative: Executive Summary', 2018, page 6).

To survive in this fast-moving digital era, the WEF suggests that "companies will need to become digital enterprises, rethinking every aspect of their businesses" (ibid, page 19). This will involve automating and streamlining business processes. It may

"THE WEF SAYS COMPANIES WILL NEED TO BECOME DIGITAL ENTERPRISES, RETHINKING EVERY ASPECT OF THEIR BUSINESS."

involve investing in artificial intelligence and machine learning. It will also demand efficient management of key data, preventing mission-critical information from drowning in the data lakes that companies are creating to manage data at enterprise level.

The digital transformation challenge

These present new opportunities, but also challenges for long-established firms that need to adapt to a digital age. Decision-makers in the financial services industry are confronted with uncertainties around how to replace their legacy technologies, which new

“THERE HAS BEEN MASSIVE GROWTH IN THE DATA AVAILABLE TO FINANCIAL SERVICES FIRMS. THIS IS A GOLDEN RESOURCE.”

technology applications they should invest in, and how to ensure their firm has the skills to make this digital transformation work. There has been massive growth in the data available to financial services firms – a golden resource that may be employed to support advances in investment analytics, operational risk benchmarking, analysis of distribution and marketing trends, and for a host of other uses. However, this is useful only if the firm has a well-designed infrastructure to manage its data flows and the analytical skills required to interrogate this data effectively.

Digital transformation a priority

Survey results indicate that the drive to promote digital transformation (fig 2) is at the forefront of respondents' priorities. A majority of survey constituents stated that this will

be their biggest focus over the coming 12 months. Companies in the asset management industry are recognising the importance of pushing ahead with this digital transition, in line with the World Economic Forum recommendations outlined in our introduction.

Against a background of flat or declining industry profitability, asset management companies are seeking innovation designed to reduce the aggregate cost of investment, including their trading and post-trade costs. Mechanisms through which asset servicing companies can deliver flexible, cost-efficient services and which promote industry collaboration are fundamental to this meeting this objective.

Alongside this, respondents highlighted the development of new investment products and a drive to improve operational efficiency high up in their list of development priorities.

For the asset management respondents who indicated they were focused on the development of new investment products, we asked which specific types of products this would involve (fig 3). Two categories of fund product stood out in the survey results: alternative investment funds

and environmental, social and governance (ESG) products.

Private equity, real estate, infrastructure and private debt investment has been growing strongly in European and North American markets and this has presented opportunities for asset servicing companies to support the needs of asset owners and asset management companies investing in alternative investment products. This has extended demand for fund administration and accounting around alternative investment products, delivery of performance measurement and risk analytics, along with the ability to deliver consolidated reporting across the investor's multi-asset portfolio. This is especially prominent in the US market, where 67% of asset management respondents indicated that their primary focus over the next 12 months (in terms of new product development) will be the release of new alternative investment products.

Asset servicers are also supporting asset management clients in delivering efficient management of the large data sets associated with their investment strategies and fund sales/distribution. The key is to build a data infrastructure

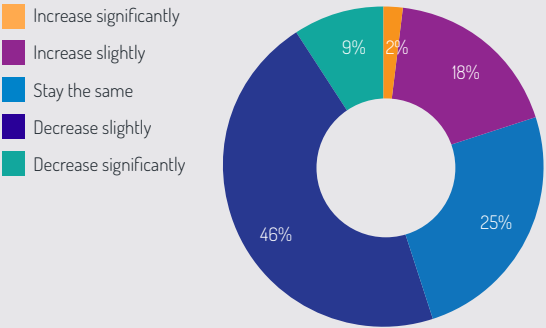
that facilitates better decision-making and insight across the business. The goal is to ensure consistency of data across the enterprise, to verify data quality and to enable the sophisticated analytics required to interrogate these big data sets effectively.

Investing in operational efficiency to survive

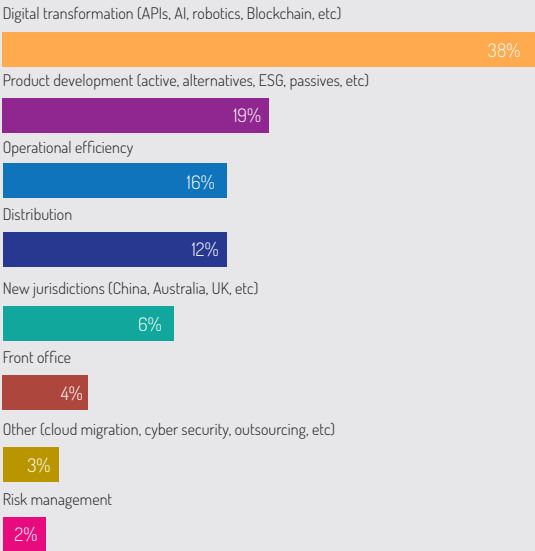
Digital transformation requires that asset management companies invest in their technology and operational processes from front to back, delivering innovation and cost efficiency to their investment strategies, to their trading, investment operations and distribution support functions. Some of these functions may be delivered in-house – others through outsourcing or partnership arrangements with an asset servicing company or other third-party technology providers.

The results of this survey highlight the importance, for asset managers, of investing in their operational systems to improve efficiency and to reduce the aggregate cost of investment. More than 90% of respondents indicated investment in operational systems is essential for asset managers to improve efficiencies

1. Do you think asset managers' profitability will increase or decrease over the next 12 months?



2. In terms of investment, what will be your firm's biggest focus in the next 12 months?





APIs & OPEN ARCHITECTURE

An application programmable interface (API) provides a 'gateway' or 'front door' through which a service provider can provide access to data, services or business logic for an external user or third-party provider. This allows a third-party developer to integrate the API into a service that it wishes to create. It also allows a customer to access services via the API from the service provider.

This open architecture arrangement provides a secure and flexible arrangement through which service providers can extend services to, or

engage in collaboration with, other organisations. A 'restricted' or 'partner' API can be used to communicate data and services with a restricted list of external service partners.

Open APIs also simplify integration, with standard HTTP methods and a focus on documentation and examples. Hundreds of API endpoints can be accessed, which cover a very wide range of banking services, and these can be tested in a sandbox. In addition, fund administrators can use this architecture to generate and publish new APIs, without any code, and extend APIs or expose custom services built by themselves, quickly and securely.

and reduce costs (fig 4a).

The survey indicates that third-party technology providers will perform an important role in driving innovation in investment operations (fig 4c). This is reliant on using a flexible IT architecture, often supported through open application programmable interfaces (APIs) to manage data flows and to facilitate technology

collaboration across this network of participants (see above).

Agile methodology

In addition to redesigning their technology architectures, asset servicing firms are reassessing their methodologies for technology design and implementation. One important step has been to embrace agile

methodology more fully into project management.

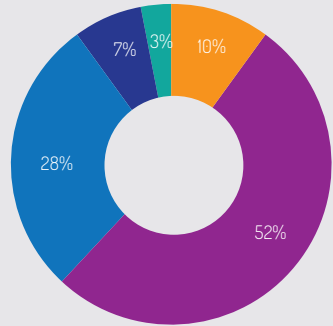
This emphasises close collaboration between development teams and business stakeholders, ensuring that the client is closely involved in the product planning and development process – and that regular product iterations are delivered to the client for testing

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and feedback. This approach is not new to the IT industry – the principles of the ‘Agile Manifesto’ were established from the early 2000s and embrace a range of well-established software engineering principles. However, the goal is to ensure that business specialists and developers work closely together throughout the project – and reflect regularly as a team on how to make the project more effective. These agile principles are being applied more widely across the asset management industry to enhance collaboration and responsiveness in software implementation.

In practice, this may also

3. What type of investment product will be your firm's biggest focus in the next 12 months?



embrace a ‘DevOps’ approach to technology implementation that attempts to break down barriers between ‘development’ and

‘operations’ teams. The aim is to integrate software development specialists directly into operational environments where

4. Please rate your agreement with the following statements:

Fig 4a: Investment in operational systems is essential for asset managers to improve efficiencies and reduce costs

Strongly agree	Partly agree	Neutral	Partly disagree	Strongly disagree
69%	24%	3%	4%	1%

Fig 4b: Asset servicers are keeping pace with the changing requirements of asset managers

Strongly agree	Partly agree	Neutral	Partly disagree	Strongly disagree
12%	41%	24%	19%	4%

Fig 4c: Third-party technology providers will drive innovation in investment operations

Strongly agree	Partly agree	Neutral	Partly disagree	Strongly disagree
50%	33%	13%	3%	1%

Fig 4d: Investment in operational systems is not a priority for asset managers

Strongly agree	Partly agree	Neutral	Partly disagree	Strongly disagree
4%	23%	20%	29%	24%

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5. Which are the top 3 areas where asset servicers can deliver value ?

(Please rank in order of importance)

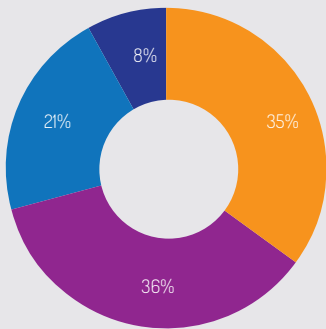
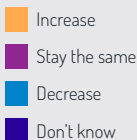
	Ranking		
	1st	2nd	3rd
Opening new markets	50%	20%	30%
Supporting new asset classes	42%	32%	26%
Insights through data analytics	40%	36%	24%
Faster NAV generation	14%	37%	49%
Bespoke client reporting	33%	42%	25%
Faster regulatory adaptation	27%	39%	34%
Data access via APIs	27%	26%	47%

this code is deployed. In basic terms, 'DevOps' is the practice of developers and operations staff collaborating across the project lifecycle from software design through development, implementation and production support. This attempts to break from the 'siloed' approach that has often applied in the past to development and operational functions.

Asset servicing firms are also utilising a 'microservices' architecture which 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.

Within an agile framework, this enables specialised development teams to focus

6. Looking at the number of third-party providers that you employ, do you expect this number to:



on, and take ownership of, each component. This can facilitate testing and debugging, where errors can be tracked to a specific component – and it can facilitate technology upgrades, where individual components can be replaced or upgraded 'block by block'.

Development priorities in asset servicing

Digital transformation will play an important part in shaping the future direction and success of the asset management industry. For asset servicers, this is creating opportunities to help asset management clients to

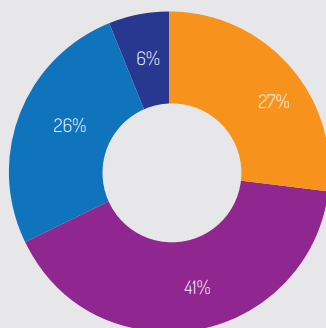
negotiate this journey, providing support around investment performance and risk analytics, regulatory reporting, data management, faster NAV generation and provision of contingent NAVs, along with a host of other areas.

In meeting this demand, asset servicers will continue to broaden their product portfolios and to extend their geographical coverage. The survey asked where asset servicing firms could deliver most value to asset management clients and the dominant answer – in terms of the respondents that selected this as their first priority and on the basis of a weighted-average ranking – was that asset servicers should be extending their coverage into new fund markets and jurisdictions (fig 5).

These results indicate that asset servicers also need to extend their support for new asset classes and product types, potentially including private markets, ETFs and digital assets. There has been a progressive rise in investment in alternative assets for some investors. This meets demand from investors for diversification within multi-asset strategies, as well as responding to a low interest rate environment, tight yields on fixed income securities and

7. How important is it to have one strategic service provider who can support all your outsourcing requirements?

Very important
Important
Not important
Don't know



current caution around equities investment in light of geopolitical political uncertainties (e.g. Brexit, US-China trade tensions) and weak global economic data.

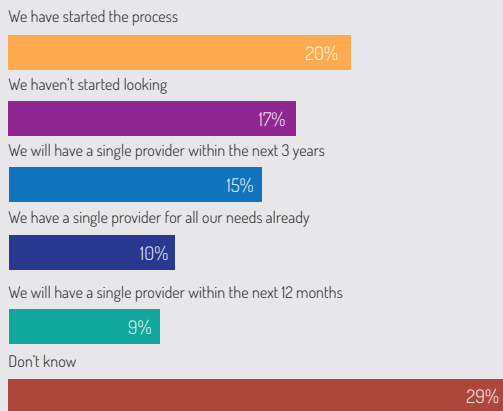
The survey also highlights demand to help asset managers and asset owners to unlock new insights through data analytics. Investment firms that have access to large, high-quality data sets and the skills to interrogate these effectively have opportunities to realise competitive advantage. There is a focus on the use of big data to generate investment outperformance through more effective structuring of investment strategies, along with use of customer segmentation analysis to tailor products for better fund

marketing and distribution.

Respondents also highlighted the importance of being able to offer customised, flexible client reporting to asset management and asset owner clients. Many asset managers and asset owners have outsourced their reporting requirements to asset servicing companies. Some wish to retain flexibility to customise their reporting, potentially using APIs to access their investment data, maintained by the asset servicing provider, and to construct their own reports.

There is also demand for flexibility around the timing of reports. While some asset owners, asset managers or distribution partners (for example, a wealth manager or private bank), may be happy

8. How close are you to appointing a single strategic service provider?



to receive periodic reporting, others are seeking 'smart alerts' triggered when there is a significant change in portfolio performance or asset allocation, for example.

But reporting is not only about customisation. A large asset owner that uses multiple asset managers may not wish to process reporting from each individual manager, requiring that it manages multiple APIs, multiple logins and a range of reporting formats. Rather, many asset owners are looking for consolidated reporting across their full multi-asset programme, employing an asset servicer or third-party reporting

“CLOUD-BASED SOLUTIONS WILL PLAY A MAJOR ROLE IN SHAPING TECHNOLOGY STRATEGIES.”

specialist to pull in data/reporting from these multiple sources and build a consolidated report with this information.

Managing vendor relationships

Although some asset management houses choose to meet most of their trading, settlement and asset servicing requirements through in-house provision, some fund managers

have chosen to outsource parts of the investment lifecycle, which they deem to be 'non-core', to an external provider. This may involve a large-scale investment operations outsourcing contract, where a wide range of the asset manager's activities outside of the money-management function are outsourced to a single provider. In other cases, the asset manager may adopt a 'modular' approach, appointing specialist providers to deliver specific requirements.

So too, asset servicing companies may outsource functions to third-party suppliers – for example, to supply and maintain a fund accounting platform, a payments system, a collateral management module or to provide cloud-based data management services.

A modular, multi-provider approach can add complexity, however, forcing the buyer to interface with multiple services providers and technology systems. With this in mind, some buyers are evaluating opportunities to consolidate their third-party relationships to simplify vendor management and to realise pricing benefits during contract negotiation.

To gauge the direction in which the asset management industry is moving, we asked respondents

9. Which of these technologies are the highest priority for investment?

	Ranking					
	1st	2nd	3rd	4th	5th	N/A
Data analytics	29%	44%	17%	4%	4%	2%
Client digital self-service	25%	45%	19%	9%	1%	1%
Cloud-based solutions	24%	37%	26%	7%	4%	2%
Digital services via APIs	21%	34%	27%	12%	2%	4%
Robotic process automation	18%	24%	28%	15%	10%	5%
Artificial intelligence (AI)	14%	24%	32%	17%	9%	4%
Blockchain/DLT	8%	13%	30%	25%	17%	7%

whether the number of third-party providers they employ is likely to increase, decrease or stay the same in times ahead (fig 6).

Thirty-five per cent of respondents told us that they will increase the number of third-party providers they employ. A slightly larger number, 36%, said they will remain with their current arrangements. This reflects the growing innovation taking place in the third-party supplier market and the desire of some buyers to broaden their appointments to take advantage of this expertise.

However, 21% told us that they aim to reduce their range of service providers, taking advantage of a simpler vendor management structure and the benefits of being able to source a range of service requirements from a single provider, often via a

single technology platform.

To assess this trend in more detail, we asked survey constituents how important it is to have a single strategic service provider (fig 7). The majority said that it is important to have a single consolidated third-party service provider. Moreover, survey results indicate that some respondent firms are already moving in this direction, with more than 30% saying that they have a single provider in place or will do so within three years (fig 8).

Insight and client empowerment a priority

To gain further information about our respondents' technology development strategies, we asked which technology segment or skills area is a priority currently for their technology investment (fig 9).

Data analytics was the dominant response: 29% of respondents selected this answer as their first choice and this also ranked as respondents' highest priority on the basis of a weighted-average ranking.

Initiatives designed to extend client self-service capabilities through digital channels also ranked highly in this priority list. In the introduction to this report, we have highlighted the value that digital transformation may offer in delivering a better user experience, and in providing client interfaces that enable the user to pull out data and analytics customised to their own specialised requirements.

The survey also highlights the important role cloud-based solutions will play in shaping the future technology strategies of asset manager and asset servicing companies. Cloud

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computing typically refers to the use of a network of remote servers accessed via a Web interface to store and manage data and to deliver services to the user – for example via a software-as-a-service (SaaS) or platform-as-a-service (PaaS) type solution (see opposite page).

Interestingly, distributed ledger technology applications ranked at the foot of this list. At the current time, respondents indicate that they expect to be allocating their investment resources to other projects (such as the three areas outlined above) – and in some cases, they are unconvinced by the applicability of DLT to their business area or by the level of maturity of the technology. In the longer term, however, respondents tell us that DLT will play an important role in the technology development strategies, as indicated later in this survey in figure 15.

Cooperating for success

Although the asset management industry remains highly competitive, it is important that firms cooperate with each other across the value chain to ensure consistent use of standards (messaging standards, trade matching standards,

10. How important is co-operation (such as common standards i.e. AML, FCM, Blockchain, etc) within the funds industry?

We are seeing more co-operation in the industry

43%

This requires the creation of more independent industry utilities

20%

We are already co-operating with others

16%

Don't know

11%

The industry is too competitive for co-operation

10%

“IT IS IMPORTANT THAT FIRMS COOPERATE WITH EACH OTHER ACROSS THE VALUE CHAIN.”

standards around corporate actions processing, collateral management and many other areas) to encourage process harmonisation and minimise *ad hoc* ways of working.

Figure 10 explores how levels of co-operation between industry participants – including application of common industry standards and use of collaborative technology such as blockchain – is changing across the investment funds industry. Survey results provided

a positive outlook on levels of collaboration between industry participants, with a majority of respondents indicating that they are seeing levels of collaboration rising within the industry or that they are currently involved in collaborative ventures with other firms. This illustrates the importance of flexible technology infrastructure – often API-based and built around a microservices architecture – that can adapt as standards evolve.

However, the asset management industry continues to be constrained by legacy technology and both asset management and asset servicing companies need to consider how they drive digital transformation while addressing any ongoing legacy issues.

CLOUD-BASED DATA MANAGEMENT AND SERVICE DELIVERY

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 the cloud, enabling them to utilise performance advantages – for example, the load-balancing and auto-scaling features offered by large cloud providers such as Amazon Web Services, Microsoft Azure and Google Cloud Platform. Other incentives are the cost and scale benefits, and being able to reduce the overhead associated with managing their own server technology on site.

Cloud-based services take three main forms:

- **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).
- **Platform as a Service (PaaS)** – deployment on to the cloud infrastructure of consumer-created or acquired 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.
- **Software as a Service (SaaS)** – using the provider's applications running on a cloud infrastructure. The applications are accessible from various client devices through either 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.

Cloud-native, Cloud agnostic

Many fund administrators are now looking for solutions that are both 'cloud-native' and 'cloud-agnostic'. Cloud-native applications are created and deployed explicitly for a cloud environment, rather than developed for use in 'on premise' data centres and later migrated to the cloud. Being cloud-native, these support continuous deployment to enable changes to be made quickly and without affecting the whole system.

Being 'agnostic' means technology (even single, multi-asset systems) is designed to work across multiple clouds, enabling users to optimise services across vendors and the architecture they support. A cloud-agnostic application can be migrated from one cloud provider to another without significant impact on its performance and without any need to reconfigure the application significantly to enable this transition. This arrangement minimises the contingency risk of being situated on a single cloud and it largely eliminates the downtime required in migrating to another cloud. This provides the flexibility to operate multi-cloud, cloud-to-cloud or cloud-to-on-premise models if required.

11. To what extent is the funds industry constrained by legacy systems?

Legacy systems remain a problem for the industry

54%

We are working with technology partners to minimise the risk

13%

The issue of legacy systems has substantially been solved

10%

Legacy systems are just a fact of life and will never go away

9%

We are currently migrating away from our legacy systems

9%

Don't know

5%

Legacy systems and change management

Technology employed by asset servicing and asset management firms can degrade quickly and it is important for firms to invest if they are to perform at the leading edge of the industry. A well-designed technology strategy is not just about committing resources – it is also about foresight and about forward planning. When a firm buys a new technology system, it is important to be thinking about its upgrade strategy at each point in the development cycle and to do so right from the start of each new technology contract.

When we asked our survey

“IT IS PERHAPS A LITTLE ALARMING THAT JUST 9% OF RESPONDENTS SAID THAT THEY ARE MANAGING A MIGRATION PROGRAMME AWAY FROM EXISTING LEGACY SYSTEMS.”

constituents how far the funds industry is constrained by legacy technology (fig 11), they told us unequivocally that legacy issues remain a major problem. A majority said that

legacy technology is still a major constraint (54% of respondents across the global survey and 60% of respondents in the US market) or that “legacy systems are a fact of life and will never go away”.

It is noteworthy, and perhaps a little alarming, that just 9% of respondents said that they are currently managing a migration programme away from their existing legacy systems. This illustrates the migration challenges that asset management and asset servicing firms encounter in upgrading to new technology systems, while needing to minimise disruption to customers and to their ongoing business processes as technology is being migrated.

This point is confirmed in figure 12, where almost one-fifth of respondents said that fear of technical change continues to inhibit innovation and efforts to improve service levels.

On a positive note, there was a strong belief among our survey constituents that the industry is getting better at managing technology change. As the industry makes greater use of agile implementation methodology, microservices-based architecture, cloud-based data services and API-driven client-server interfaces, these

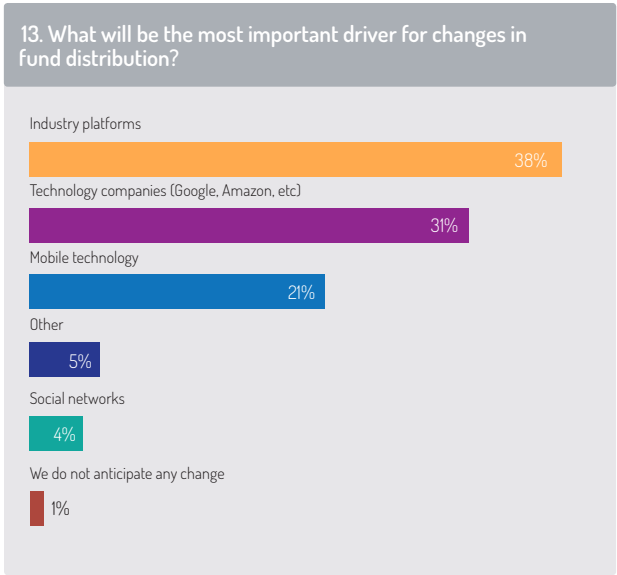
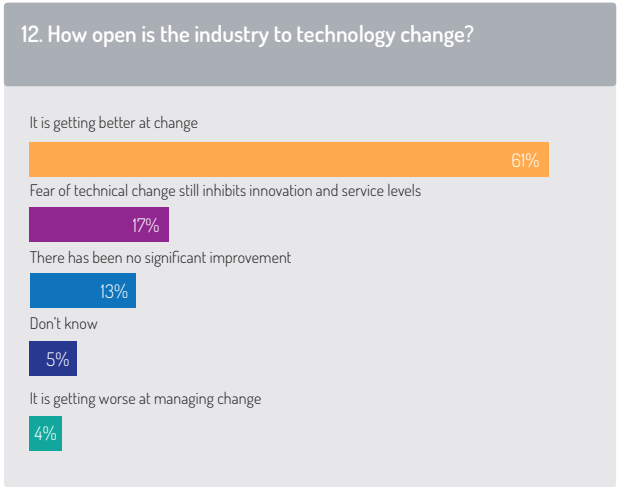
tools are making asset servicing companies better equipped to deliver high-quality services through digital channels.

Driving transformation in fund distribution

Turning our attention to change management with the fund distribution layer (fig 13), the survey asked: “What will be the most important driver for changes in fund distribution?”

The largest group of respondents, representing 38% of answers received, said that the growth of distribution through industry fund platforms will be the most important driver for changes in distribution and marketing strategies. Over two decades, we have seen the rise of fund platforms, such as Allfunds, FundsNetwork, Charles Schwab Global or Cofunds, establishing an extensive fund distribution network and extending access to a wide universe of investment funds and ETFs.

Technology companies – potentially including ‘Big Tech’ such as Google and Amazon – will be a major promoter of change in this sector. A number of global technology firms have been establishing strategic relationships with firms in the financial sector, deepening



their understanding of the financial ecosystem and how its technology requirements are evolving. Given the huge

network that Big Tech online retailers have established for merchandise distribution, as well as the expertise that

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they can offer in distribution supply chain management, financial payments and platform technology, these retailers are now realising the opportunity to extend their service coverage into the funds distribution sector. For example, Ant Financial Services Group, an affiliate of the of the Chinese Alibaba Group, announced in August 2018 that 14 newly approved target-date retirement funds operated by Chinese asset management firms, including China AMC, Bosera Funds, GF Fund Management and ICBC

Credit Suisse Asset Management, will be made available on the company's wealth management platform, Ant Fortune.

Mobile technology will be key to digital transformation in fund distribution, enabling investors to trade on their mobile applications, and to manage their global investments through app-based services extended by their asset manager or distribution intermediary.

Future direction

In this final section of the survey, we asked survey

"BIG TECH HAS BEEN ESTABLISHING STRATEGIC RELATIONSHIPS WITH FIRMS IN THE FINANCIAL SECTOR."

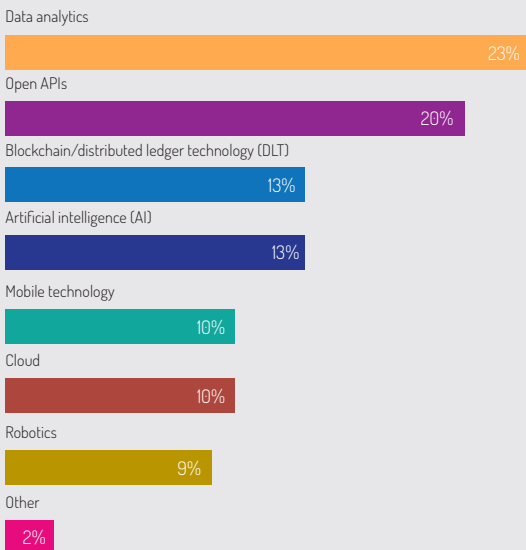
constituents to predict which types of technology will be most important to their business in three years' time (fig 14).

This generated a wide variety of responses, with no single technology element clearly dominant.

Data analytics will play a key role – crucial, for example, in supporting performance measurement and attribution, for assisting the development of new investment products, for benchmarking the performance of sales teams or evaluating the performance of distributors within an asset manager's distribution network. This may also be important in analysing operational efficiency and operational risk, thereby enhancing the safety and efficiency of post-trade processes.

Another important technology development will be the greater use of APIs. These provide client access to data and resources

14. Which technology development will have most impact in the next 3 years?

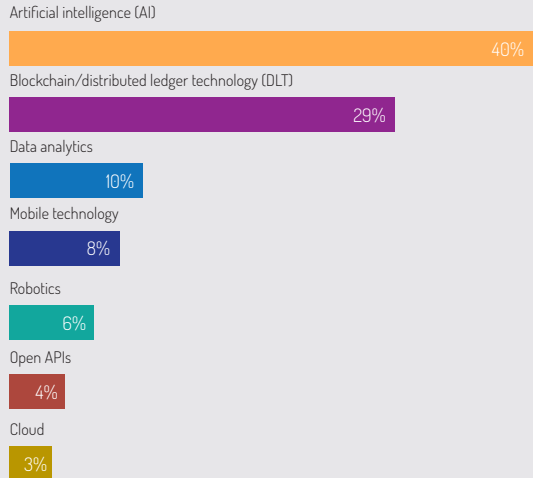


from a service provider's server network, enabling the client to send 'requests' and receive 'responses' in a standardised format required by the interface. This provides a secure mechanism through which a service provider can extend selective access to its database and the applications that it supports.

Northern Trust Global Fund Services, for example, has invested in a transformation of data infrastructure and its channels for delivering fund services to asset management clients. This has included the creation of a 'data fabric' or 'data matrix' that masks differences in data requirements and interface design across its core technology packages. By providing access via API, this enables clients to access Northern Trust's suite of fund services, while enforcing data quality and ensuring that data flow to and from the user adheres to consistent standards.

Other important technology applications over a three-year time horizon will include distributed ledger technology and artificial intelligence. The survey also highlighted the importance of cloud technology to support data management and potentially to support

15. Which technology development will have the most impact in the next 10 years?



“RPA INVOLVES USING SOFTWARE TOOLS FOR REPETITIVE PROCESSING AND LOW-COMPLEXITY TASKS WHILE REMOVING HUMAN INPUT.”

service delivery through software-as-a-service (SaaS), infrastructure-as-a-service (IaaS) or platform-as-a-service (PaaS) type delivery models.

The advance of artificial intelligence

Taking a longer time horizon, the survey asked: “Which technology changes will be most important in the next ten years?” Respondents tell us that artificial intelligence is likely to become increasingly important over the next decade (fig 15). Some basic applications of AI may be employed, for example, to support robotic process automation (RPA). This involves the use of robotics to process transactions, manage data and to interface with other digital systems. Typically, RPA

involves using software tools for repetitive processing and for handling standardised, low-complexity tasks while removing human input.

Another application of AI, natural language processing (NLP), applies algorithmic models to analyse human dialogue, whether written or spoken, and to identify key 'markers' or 'tags' from unstructured text. This is finding growing application in compliance software, for example, where this may be applied to identify keywords from unstructured text input and to populate these into structured data fields to enable audit, reconciliation and reporting functions.

Some fund companies are applying AI to customer segmentation analysis, classifying customers into groups with similar characteristics that may be targeted with fund products that align with their investment objectives and risk appetite. Others may be applying AI more directly to their investment strategies, using algorithms to identify patterns in investment data and applying this to support their investment decision-making.

Distributed ledger technology is also expected to gain currency

over this period. DLT, applying secure permissioned blockchain, enables stakeholders to a transaction to access a real-time view of the transaction and agree the terms of transaction settlement working from a single, accurate set of records. On finalising settlement, transfer of ownership is adjusted automatically on the record, delivering a common book of record across trade participants that is updated in real time. Because settlement parties have a common view of the settlement terms on blockchain, this simplifies settlement requirements across participants and can also facilitate regulatory reporting obligations.

Concluding thoughts

In our introduction, this report highlights the importance of digital transformation for financial services companies. Companies need to rethink their technology strategies to ensure they remain relevant to customers and able to deliver high-quality products and services in a digital era.

The survey results indicate that participating firms – a blend of asset management companies, asset servicing firms and a range of other specialisms (see methodology, page 27) –

“OVER A TEN-YEAR TIMEFRAME, DEVELOPMENTS IN ARTIFICIAL INTELLIGENCE WILL BECOME INCREASINGLY IMPORTANT.”

recognise the importance of this message. Many of these firms are focusing on their digital innovation strategies as a matter of priority.

Over the coming three years, the survey tells us that improvements in data analytics will be the most important advance that will be delivered to the funds industry through investment in digital innovation. Over a ten-year timeframe, developments in artificial intelligence will become increasingly important – continuing to feed advances in data analytics that may be applied across manufacturing, distribution and operational components of the investment value chain. Alongside this, distributed ledger technology will play an important role in delivering greater efficiency and transparency to fund transaction processing in the decade ahead.

Respondents tell us that

asset management companies must continue to invest in their operational systems to remove inefficiencies, to eliminate operational risks and to reduce costs. This investment is essential to optimise the efficiency of processing that the asset manager currently does in-house, as well as sharpening its interface with asset servicing firms and other third-party providers to which it may outsource services.

According to the survey results, fund administrators (and other asset servicing specialists) can add value by extending their support across an expanding array of asset classes and product types (digital assets, private markets and so on).

Also important is the ability of asset servicing firms to help clients to unlock new insights

through data analytics. To support this, a number of asset servicers are investing in changes to their data infrastructure, establishing a 'data layer' or 'data lake' that provides a golden source of investor-level and fund-level data. Typically, this will enable the user to deliver and access data via a series of APIs, ensuring that data is delivered into, and received from, the asset servicer in a standardised form.

The survey provides insights on how firms will structure their vendor relationships in times ahead. The dominant view is that firms will either retain their existing number of third-party service providers or they will look to widen their vendor relationships by adding new names to their vendor list.

This may reflect the creative development that is being done by financial software firms, fintech houses and by asset servicing firms (often working in partnership) and a desire to tap into this innovation by appointing new providers. In this time of rapid technological change, it can also be hard to pick a 'winner' and clients are extending their vendor relationships to allow performance comparison and to ensure they are working, in the long term, with their preferred solution.

These points notwithstanding, respondents believe that it is important to have a single strategic service provider that can support all of a client's outsourcing requirements. Over time, therefore, we may expect firms in the asset management industry to consolidate their vendor networks and to reduce the number of third-party service providers they employ.

Two important points stand out as we conclude this survey. The investment funds industry continues to be constrained by legacy technology, a problem that respondents tell us urgently needs to be solved as firms move forward with their digital innovation strategies. However, the survey reveals that the industry is getting better at managing technology change. That is an encouraging conclusion as we advance further into a digital age of financial services.

With these considerations in mind, it is vital for their future business performance that asset servicing companies – and other firms in the financial services industry – manage this digital transformation effectively. To do so will open a broad set of creative opportunities. Failure will present the danger of becoming irrelevant. **fg**

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The incredible journey

EXPERTS COMMENT ON KEY DEVELOPMENTS IN FUND ADMINISTRATION

In which areas will fund administrators deliver most value to asset management clients in the coming three years? Which new technologies will have the biggest impact? And what are the main barriers to promoting digital transformation in the asset servicing sector?



CLIVE BELLOWES
HEAD OF GLOBAL FUND
SERVICES FOR EMEA,
NORTHERN TRUST

At our core, we will always be the guardians of our clients' assets. We can take advantage of new technology by using it to help us focus on value-added activities such as knowledge provision,

data management, liquidity and risk management.

What will never change, regardless of new technology, is the need to deliver a quality and personal service. Technology is no substitute for this, which is why automation should enhance the service delivered by human employees, rather than replace them.

In promoting this agenda, our focus first and foremost is on keeping our clients' assets safe. As custodians, we need to be careful with the technology we adopt – making sure it doesn't compromise the safety of clients' assets through cyber attacks while ensuring we're compliant.

Rather than thinking of these factors as 'barriers', we believe these have led to a more considered approach to digital transformation – enabling us to assess where we can deliver the most value, without trying to reinvent ourselves as a straight technology company.

Artificial intelligence (AI) and automation are having a positive impact on process and

efficiencies, which is why we're making significant investments into these technologies.

Importantly, we're also making a significant time investment, working closely with our clients to build the right solutions using these technologies.

There's no one-size-fits-all approach as clients will have different needs across the value chain. AI and automation comes in different forms, so at Northern Trust we're working hard to collaborate with our clients to understand their needs and tailor solutions that deliver the most value.

For asset managers, the key to managing technological change is to choose the right solutions – for example, by choosing the right order management (OMS) and execution management (EMS) systems – which have a significant impact on their businesses.

By understanding the functionalities that they need and by working with the right partners, asset managers have learnt how to manage

technological change while enhancing their investment strategies and complying with regulations.



RONAN GARRIGAN
CHIEF OPERATING OFFICER,
ALTERNATIVE FUND
SERVICES, BNP PARIBAS FUND
ADMINISTRATION SERVICES
(IRELAND)

Fund administrators are constantly seeking opportunities to deliver additional value to their asset management clients. At the top of the list are steps to enhance their data services and to extend the data and solutions accessible to clients via application programming interfaces (APIs). Investment managers are seeking faster and more flexible reporting, often via web-based or secure FTP (sFTP) channels, including more detailed insights on their front-end systems. The continuing expansion of the exchange-traded fund (ETF) marketplace is also creating openings for asset servicers to expand their ETF service offerings.

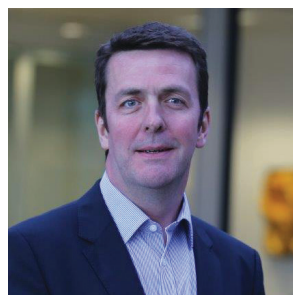
The application of technology will play an important part in this transformation. Use of robotics will assist the automation of relatively standardised low-complexity tasks and artificial intelligence will be applied more widely to data analytics and other processes. We will continue our migration towards exception-based controls and apply higher levels of automation across the fund transaction lifecycle, including trade processing.

Over time, we believe that the fund industry continues to get better at managing technology change – and this is a virtuous circle. With each ongoing technology development there is scope for the pace of change to increase further.

This said, the asset servicing sector continues to face barriers in meeting its digital objectives. Many firms continue to operate legacy technology and face a challenge in maintaining connectivity between their legacy systems – and ultimately in decommissioning them.

Lack of standardisation and process harmonisation also continues to hold back the investment funds industry – for example, the lack of an industry-wide standard for identifiers, flat file formats and data formats. This is accentuated by a rising regulatory cost incumbent on asset managers and their asset servicing partners. Additional regulatory reporting

requirements, for example, have required firms to maintain more data points to satisfy this compliance obligation. Collectively, these challenges present a heavy adaptation cost at a time when firms face significant budgetary pressures and may see limited operational payback in the short-to-medium term.



JOHN FLOOD
EMEA ADVISORY LEADER,
WEALTH & ASSET
MANAGEMENT, EY

Over the next few years, the global asset servicing industry will face significant changes as it adapts to shifts in market structure and incorporates new technologies. Asset managers are placing a higher demand on their service providers not only to provide the core services better, cheaper and faster, but also to offer solutions to solve the challenges they, and their clients, are presented with.

More and more asset managers are diversifying their portfolios across alternative investments

(i.e. real estate, hedge funds, private equity), increasing the need for outsourced administration. Institutional investors are becoming more selective and demanding greater transparency. This is creating a valuable opportunity for asset servicers to upscale their services and build closer relationships with investors and asset managers.

Fund administrators will therefore deliver most value to asset management clients by providing operating efficiencies (for traditional and alternative asset classes) and differentiation by enabling (real-time) access to data and service-delivery processes, as well as enhanced reconciliation between the managers' front office and the asset servicers' middle- and back-office platforms.

In considering the barriers to digital transformation, it is clear that digitisation is here to stay. While it may be unevenly distributed, we are still in the beginning phase. Digital is set to remain one of the leading CEO agenda items in the years to come. While asset servicers understand that having a coherent digital vision and strategy is essential, many companies are facing the challenge of where to start and what to invest in. Others have made investments and are

struggling to achieve the benefits they seek.

In addition, increasing client demands and regulation requirements are placing enormous pressure on technology budgets – while at the same time pressure on revenues and cost is increasing. Consequently, the development of digital solutions is essential for the future success of their business. However, on the other side, the initial investment costs are significant.

Data technology is starting to play a transformational role, adding new services or enhancing existing ones. Over the next few years, the industry will experience significant changes as it incorporates new technologies such as automation via robotics (which is already a common technology), but also artificial intelligence and advanced data analytics, blockchain and distributed ledger technologies (DLTs). The increased use of technology is also redefining job roles and driving the need for new skill sets.

With the advanced technology also comes increased and new threats of cyber risks. When deploying new technologies, fund administrators need to remain vigilant and tackle concerns such as cyber security and data integrity. Asset safety will no

“RECRUITMENT IS MOVING DATA SCIENTISTS, AND AI AND MACHINE LEARNING SPECIALISTS, TO THE TOP OF THE PRIORITY LIST.”

longer just be about safekeeping. It will also include data protection against cyber crime.

The asset management industry is adapting to the technology change, continuously increasing investments in scalable, value-add platforms that offer outcome-oriented solutions and new emerging and complex technologies such as robotic process automation (RPA), artificial intelligence (AI), blockchain, and more. Recruitment is moving data scientists, and artificial intelligence and machine learning specialists, to the top of the priority list, while collaboration between asset managers and fintech firms is increasing.

Firms that adopt and integrate technology thoughtfully into their product offerings will be best-positioned to win. After initial hesitation or even uncertainty on how and where to start, we see a clear positive trend in managing this technology change. **fg**

Survey methodology

A total of 184 professionals drawn from across the readership of *Funds Europe* and *Funds Global* participated in the survey, conducted online during June and July 2019.

Respondents were asked to say which sector of the asset management industry that they worked in:

Asset manager:	36%
Fund administrator:	24%
Consultant:	17%
Fund platform:	9%
Custodian:	8%
Asset owner:	3%
Other:	3%

Respondents were also asked to identify their role:

Executive management:	30%
Business development:	24%
Product management:	15%
Client management:	11%
Technology:	10%
Operations:	8%
Other:	2%

The respondents worked in these locations:

United States:	28%
United Kingdom:	18%
Luxembourg:	16%
Ireland:	5%
France:	4%
Spain:	3%
Belgium:	2%
Singapore:	2%
Australia:	2%
Other Europe	14%
Other Asia (incl Hong Kong, India, Japan)	5%
Africa	1%