

Citisoft

Outlook 2024

Balancing **Innovation** and Reality

Perspectives on the year ahead

Citisoft’s annual Outlook, now in its 14th year, highlights changes that have impacted asset management and the software and services market over the year past—and how those will likely impact the market in the year ahead. As we reflect back on 2023, two themes were clear: 1) new industry-agnostic technologies dominated headlines and mindshare, and 2) transformation is underway that will set the course of the industry for the next decade. Despite what we might wish, these two themes aren’t cause-and-effect. While the excitement of innovation in cutting edge areas such as artificial intelligence or advanced computing welcomes much prognostication about disruptive change in asset management, the industry at large is still grappling with how to move off installed solutions or find critical data that is stored in Excel spreadsheets.

In discussing our outlook for the industry this year, we are presented with a paradox: emerging technologies have the potential to revolutionize our clients’ businesses, but this potential can’t be realized without an incremental evolution. The industry as a whole must move from legacy systems and processes toward fit-for-purpose, cloud-first solutions. In most cases, this evolution requires years of effort and collaboration between asset managers and solutions providers.

As we continue on this journey toward a modernized operating model, we’d be remiss not to explore forward-looking concepts like generative AI or distributed ledger technology, but our outlook for 2024 grounds the aspirational with innovation happening at present.

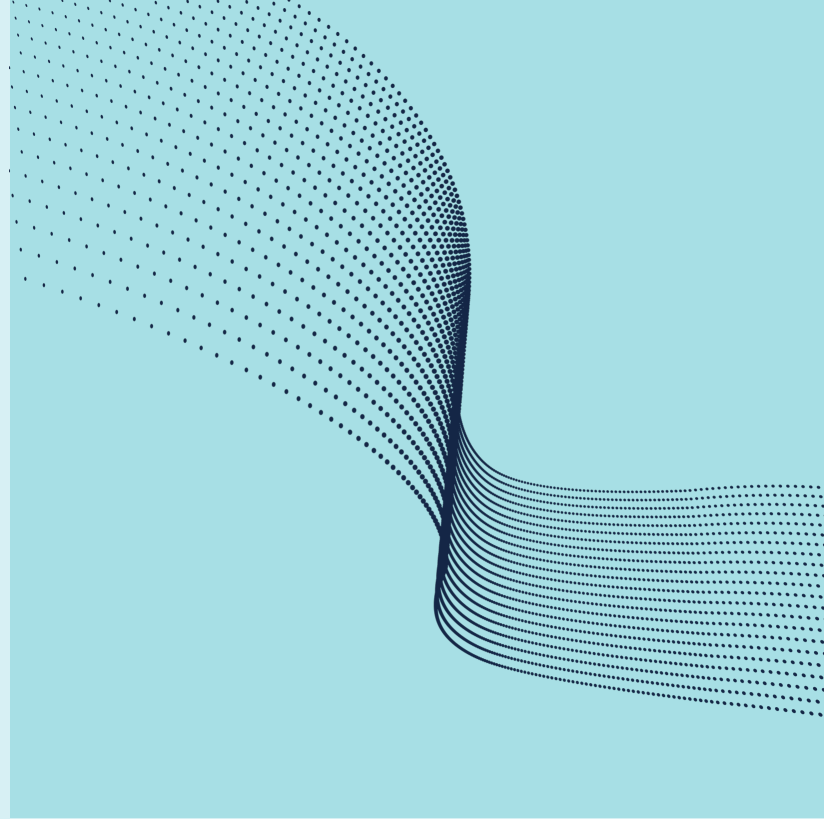
Key takeaways

- Many software and service providers are undergoing transformation in tandem with their clients. It’s critical for asset managers to assess their willingness to collaborate and their requirements for customization.
- Most asset managers are tackling longstanding data challenges around governance, quality, and integration while new tools emerge to support evolving data needs.
- Advancements in AI and tokenization have captured mindshare but asset managers will benefit from focusing on technology fundamentals now and staying abreast of developments that could impact them in the future.
- If our industry is going to take advantage of innovation, there will need to be a concerted industry effort to rapidly develop those hybrid skillsets.

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The solutions market leans on collaboration and partnership



As we look back on some of the key topics in the past five years of Outlook, most still hold true as relevant today and the immediate future. These themes have included blurring lines between system vendors and service providers, the race to front to back solutions, the role of cloud in the vendor market, vendor convergence through M&A, and developing strategic partnerships with solutions providers as an approach to transformation. While all of these themes are still prevalent today, we now have a better understanding of where challenges lie, what the realities of transformation are, and why it is so challenging to prognosticate on the industry as a whole (one size rarely fits all).

Vendors prioritize cloud capability and collaboration with clients

Many of our readers may remember the days of DOS-based systems where \$500B asset managers received software upgrades on stacks of floppy disks via mail. The following generation of software became multi-tiered with the rise of Sybase, Oracle, and SQL Server, introducing the age of application and data layers—but this was by no means a fast process, taking many firms years to achieve. From this not-so-distant memory, we can make distinct parallels

to the present move to cloud. The generations of software that followed remain rooted in that initial two-tiered architecture, and still comprise a majority of technology solutions serving the industry today. Only now are we again seeing a complete overhaul of the design of software technology.

For nearly every leading software vendor, the move to cloud has been a slow process. However, the viability of their businesses rests on their ability to offer cloud-capable solutions, if not cloud native. The slow process of transitioning to multi-tiered application architectures and relational databases gave rise to today's industry leading vendors while pushing out numerous incumbents (Shaw Online ring any bells?). It is now imperative for those leading vendors to make the next step in this evolution, especially as new cloud-native entrants make inroads. This journey must be balanced against upgrading features required to handle new products, investments, regulations, client demands, and the perpetual continuation of increased data complexity.

While initial strides in the move to cloud and enhancements of functionality have happened over the past year, many software and service provider solutions are still not fully developed or mature.

This reality presents a continued challenge, and opportunity as these providers are in the midst of supporting significant transformational initiatives of their clients. Asset managers in the role of early adopter stand to benefit from the ability to shape solutions but need to understand the burden of partnership and the accompanying need to be flexible and patient. This is often easier said than done and we advise clients to assess how much patience they're willing to offer today and whether that will change over time.

Flexibility and customization lead solutions strategy

Front-to-back solutions have been so hyped in the past few years that we dedicated our entire 2020 Outlook paper to discussing this trend. What we have actually observed and expect to see more of in 2024 is the continued realization that one platform to rule them all remains a stretch goal and front-to-back will be delivered via software vendors and service providers partnering with one another to deliver more robust functional services coverage, with a focus on single points of data normalization and delivery. One-size-fits-all solutions don't mesh well with our industry, as asset managers are not one-size. Solution flexibility with plug-and-play integration is required to provide the value proposition of the solution as determined by the asset manager, and thus remain relevant in the market.

Software vendors started with technical platform management for SaaS solutions a decade ago, and more recently, some have been expanding their managed services into componentized or full operational business process outsourcing. Ironically, on the service provider side, we are seeing more investment and promotion of underlying technology platforms used to provide services, with prospects and clients interested in "looking under the hood" in their evaluations. The convergence of software vendors providing services, and service providers promoting software has led to opportunity for the industry where software and service providers come together to provide an offering. This also leads to challenges identifying the best strategic operating model and operational partner. Asset managers will continue to be faced with the difficult decision to: 1) maintain multiple providers across the front to back value chain; 2) align services and software with a single provider; or 3) partner with a single provider to

operate a distributed vendor model. The realization of service providers that being OMS agnostic or at least open to other OMS's as part of a solution opens them up to market share interested in option three above and allows clients and prospects to retain their OMS of choice while potentially opening up broader services offered at large providers across the enterprise.

Regardless of the approach, it has become increasingly apparent to asset managers that one standardized solution is not the only path forward. A path that moves the vendor and services landscape increasingly towards flexible partnerships and integrations may offer their clients the best of all worlds.

Focus on underlying systems drives interest in data integration

New partnerships, integrations, and ongoing systems development has led to extremely complex implementations and this is part of what has driven asset managers to expand their focus and due diligence efforts from pure services to also include underlying technology. As decision-makers have become increasingly interested in "how the sausage is made," service providers have met the market by highlighting their underlying platforms and partnerships. Where many transitions stumble, however, is in the underlying data architecture to support this technology. Managers are increasingly wary of promises of leading edge tech without an understanding of how data flows between platforms, providers, and end consumers.

A trend we see growing in 2024 is a focus from solution providers on data flow and data quality. Asset managers are struggling to get value out of their data and with legacy systems still prevalent, service and software providers face major challenges providing clients with granular, timely, and accurate data. While much of the onus is on asset managers to build a data environment that supports their needs, their solution providers are working on new, cloud-based solutions to simplify, streamline, and bring data management to the modern era.

Evolving priorities demand data evolution

As the vendor market continues to mature its technology offerings, the call for asset managers to modernize their data strategy has never been stronger. In order to implement new solution sets and maximize value from solution providers, managers need to take a strategic view of their data ecosystem.

Of course, the goal of data maturity isn't limited to the value derived from the vendor market. Managers need to think strategically about their data ecosystem to empower new business users with rich and timely information, reach new investment goals, comply with evolving and anticipated regulation, uncover new investment insights...the list goes on. More than ever, technology and operations agendas are being driven by data, and more specifically the exploration of exciting data architecture concepts that have emerged as points of interest to solve for growing data challenges.

Data architectures evolve to support data proliferation

Over the past decade, asset managers have become increasingly sophisticated in their approach to data architectures—shifting from a pure data warehousing strategy to endeavoring toward big data technologies and data lakes that are capable of storing and analyzing structured and unstructured data. As we entered the 2020's, asset managers accelerated the movement of data architectures to the cloud which has opened up new possibilities for data storage, integration, and advanced analytics.

As a result of this shift, new paradigms for data discovery, preparation, and delivery were shaped in 2023 and will no doubt continue to evolve in the year ahead. One area of particular focus over the last year has been the concept of data lakehouses, a hybrid data architecture that combines the benefits of a data lake and a data warehouse. Like a data

A **data lakehouse** is particularly well-suited for advanced analytics as it can store data in its raw form and apply schema-on-read (transformation that occurs at the time of query). A use case for an asset manager might look like this following:

- A data lake ingests and stores unstructured data like economic indicators alongside structured data like historic stock pricing
- A data lakehouse is then used as an analytical layer by a data scientist who applies a custom analytical model to this data to explore what might happen to stock pricing next quarter
- This data scientist then selectively moves data from the lakehouse to the data warehouse which can then be easily pulled into a standardized dashboard for a portfolio manager

lake, a lakehouse can store all types of data in a centralized repository, including structured, semi-structured, and unstructured data. However, like a data warehouse, a lakehouse is also designed for interactive analytics.

A lakehouse solution has the benefit of reducing maintenance and development costs associated with ETL processes, improving flexibility in terms of types of data stored, and is cloud-native which, when optimized, will reduce data storage costs. However, for many managers who have implemented data lakes, gaps in metadata, data quality, and lack of structure have formed what some refer to as a 'data swamp.' Those looking to explore a lakehouse approach will benefit from implementing well-planned data governance frameworks in tandem with or before more advanced data architecture projects.

Data democratization drives innovation

At the risk of looking too far ahead of the industry, we think it worth exploring a few concepts that have emerged to help address the rise in data users and use cases. As many data organizations will attest, a cultural shift has emerged in recent years where an increasing number of business users want self-service access to support data-driven decision-making. However, few firms have developed their data environment to support the diversity and scale of new user groups. This has introduced new challenges around governance, toolsets, data types, and data storage. As the imperative to democratize data access grows, these issues will intensify and in 2024, many investment managers will be considering how to better support this shift.

A few new technologies have emerged in investment management to support better data access—one of which is the concept of a data fabric. A data fabric is an architectural layer that provides a unified view of

data across different systems and silos. While a data lakehouse offers underlying data storage, a data fabric acts as a layer capable of integrating data from various sources, incorporating data catalog and metadata management, and transforming data for a variety of uses. A data fabric is not one singular technology, but rather an ecosystem of tools, processes, and frameworks. Examples of tools that may exist as part of a data fabric include data integration platforms, data virtualization solutions, or data catalogs. Among the technologies in this ecosystem is also the emerging concept of data mesh.

In a data mesh, a functional data product team (e.g., a distribution data team or a portfolio management data team) is responsible for managing their own data. This includes owning the data, defining its schema, and ensuring its quality. This de-centralizes data ownership and governance and empowers data users with better access and agility.

Tech leaders balance near-term goals with new advancements

When we discuss technology with our clients, we typically segment conversations into two categories: systems or tools that can be implemented now, and underlying technologies and concepts that may meaningfully change their business in the future. Our focus tends to be on the present as there are no shortage of challenges to be solved around data integration, systems implementation, and service transitions. However, innovation in fundamental technologies is accelerating and is driving significant interest from tech thought leaders and dilettantes alike—especially as we see new tools hit Main Street before they hit Wall Street.

With that context, we cover a few trends that are very much rooted in the present but introduce and discuss other concepts that are still in early development. Our overarching message to readers and clients is that tech leaders must walk before they run, but not lose sight of where and when the destination changes.



Alternative investments require custom solutions

Alternatives have been the fastest growing active asset class over the last ten years and that is set to continue, with a predicted rise in AUM to \$23.3tn by 2027, a compound annual growth rate increase of 9.3% from 2021.¹ With this rise has come a near ubiquitous increase in interest from investment managers to invest in new alternative asset classes. Historically, companies sought a single, one-size-fits-all solution that provided the full suite of alternatives functionality. For many technology teams, this approach was attractive though perhaps aspirational.

Implementation timelines were one of the biggest challenges of the one-size approach, especially if the required data and availability was not addressed first. In 2023, we interviewed over a dozen senior operational leaders on how their technology and operations strategies were supporting increasing investment in alternative asset classes. One interviewee recalled that it took so long to implement a full suite solution that it was obsolete before it started to be used because of new regulations, new product types, or new structures. Differing levels of functionality across the system modules also causes issues. Often systems started out doing one thing very well and were then layered in other alternative investment functionality and capabilities. However, these systems rarely met expectations or needs once applied to new asset classes.

These two challenges have led to a shift toward a best of breed strategy which offers less complex implementation, delivery, and upgrades. This multi-system, component-based environment, in turn, has shifted the focus towards how to best link those systems together to enable event-driven processing,

With alternative asset classes like private assets, there may always be some manual component to generating or normalizing data.

consistent data quality, data to speed up and automate processing and reduce manual efforts. As always, the bottom line comes back to data—however, with alternative asset classes like private assets, there may always be some manual component to generating or normalizing data. The trick lies in how to balance manual data processes within a well-governed data management culture.

Managers pursue a client book of record

Investment managers are behind other sectors in their focus on their customers, whether retail, wholesale or institutional. The reasons for this are well-known: ranging from organizational structures based around portfolios, legacy tech, data silos, and multiple intermediaries obscuring the true end customer. The most progressive investment firms are tackling those challenges head on, particularly in their pursuit of a client book of record (CBOR). A CBOR is a data ecosystem that contains comprehensive data pertinent to their clients, from fund flows and holdings, to communications and profiling. This

¹ Preqin, "Preqin Global Report 2023: Alternative Assets"

database requires integration from many systems including CRM, OMS, accounting, and reporting systems. As with many technology initiatives, success is dictated by the sophistication of a firm's data management strategy.

Perhaps the most compelling reason to consider building a CBOR is the combined information from transfer agents on fund flows with client information, making it an incredibly valuable tool for distribution, sales, and marketing teams to determine which clients, funds, and distributors matter most. In a climate of continued fee pressure, focusing efforts on the right clients and distribution channels may be the most expedient way to maximize revenues.

That said, there are no out-of-the-box CBOR solutions to pluck off the shelf. Because the systems, providers, and data underpinning a CBOR are so unique to each investment manager, the process to establish a CBOR is bespoke and complex. Some firms are utilizing manual processes and data analysts to normalize information from various systems and providers while others are exploring ways to standardize data received from their transfer agents and other providers. We anticipate that a true CBOR will still be an aspiration for most managers in 2024—but fortune may favor the expedient.

AI hits the mainstream

One of the biggest stories of 2023 has been the rise of natural language processing technology. Most of our readers will have some familiarity with ChatGPT which is a free-to-use chatbot that leverages OpenAI's large language model. While there are current use cases for this specific platform in nearly every sector, it's the promise of advancements in natural language processing (NLP) and generative AI that could have a major impact on financial services.

Generative AI processes massive amounts of human language to learn, glean new insights, and offer something that few thought AI capable of: new, creative outputs. This could have a major impact on how front office strategy is shaped, how client communications are crafted, and how market opportunities are uncovered. Vendors are already exploring how to use generative AI technologies in their platforms and will likely lead the market on

Quick definitions

Natural Language Processing (NLP)

The algorithms and models that enable computers to understand, generate, and respond to human language in a way that is contextually appropriate.

Generative AI

AI systems and models that can generate new data that is not directly copied from existing data. These models use learned patterns to generate new, creative outputs. Generally referred to as a subset of NLP.

Large Language Model (LLM)

A type of machine learning model that is trained on massive amounts of text data to understand and generate human language. Generally referred to as a subset of generative AI focused on human language.

new use cases—however, with the kind of direct-to-consumer access OpenAI is pioneering, applications within asset management may start to pop up from users across functions.

Right now, the most prominent use case we are seeing coming from solutions providers is using a chatbot to enhance reporting and visualization (e.g., State Street ChatGPT and BlackRock eFront Copilot). Empowering clients to leverage their own data is the goal here—but much of the power of generative AI relies on being trained on vast amount of data, both in-house and external. Solutions providers will likely be challenged to find a balance where they can enhance data availability for these tools to reach their full potential without compromising data security.

Anyone who has experimented with ChatGPT firsthand can probably attest that this technology is still young and that 2024 is unlikely to be the year that investment managers implement NLP tools at scale. That said, generative AI should be on everyone's radar as over the next decade as it could meaningfully impact nearly every area of investment management, from data management to distribution.

Experimentation will come before adoption

Many asset managers believe that the use of innovative and disruptive technologies (such as AI, distributed ledger technologies, and quantum computing) will add value to their firms and deliver better outcomes for their clients. Though excitement about technology innovation is growing, the standards, use cases, and applicability is still being debated and discovered.

In some cases, like quantum computing, we're far from seeing how progress might be mapped to investment management (we don't anticipate complex concepts like superposition or qubits crossing our desks in the next year) but in others, like robotic process automation (RPA), we've seen significant progress and acceptance. In the case of the latter, one major service provider announced this year that they expected to automate fund operations tasks for between 5-10% of its workforce.² Whether this will actually play out at scale remains to be seen, but it does suggest something about the potential of RPA and AI more broadly. To that point, in 2023, nearly

every service provider we've spoken to is currently using some form of AI in their operations—typically for rote tasks like error detection or reconciliation—and the term “AI-powered” is leveraged in nearly all platform marketing materials.

Existing in a gray area between experimentation and adoption is distributed ledger technology. In a recent report, asset tokenization was forecast to grow to \$16T USD by 2030³ and the market for digital assets was no doubt active in 2023. We've also seen client interest in distributed ledger technology grow over the last year. For those who have been brought up in traditional fund administration, there's nothing inherently new about the concept of DLT—it's simply an alternative word for unitization with the removal of barriers and operational headaches associated with it. However, we're advising our clients to deepen their knowledge, understand the implications of DLT on their business, and engage in industry partnerships and collaborations that assess and stay ahead of market impact.

² Swink, Sonya. “SS&C to Add Up to 15K Digital Workers in Five Years.” *Ignites*, November 23, 2023.

³ Kumar, Sumit; Suresh, Rajaram; Liu, Darius; Kronfellner, Bernhard; Kaul, Aaditya. “Relevance of on-chain asset tokenization in ‘crypto winter.’” BCG, ADDX. September 2022.

The talent shortage challenges innovation

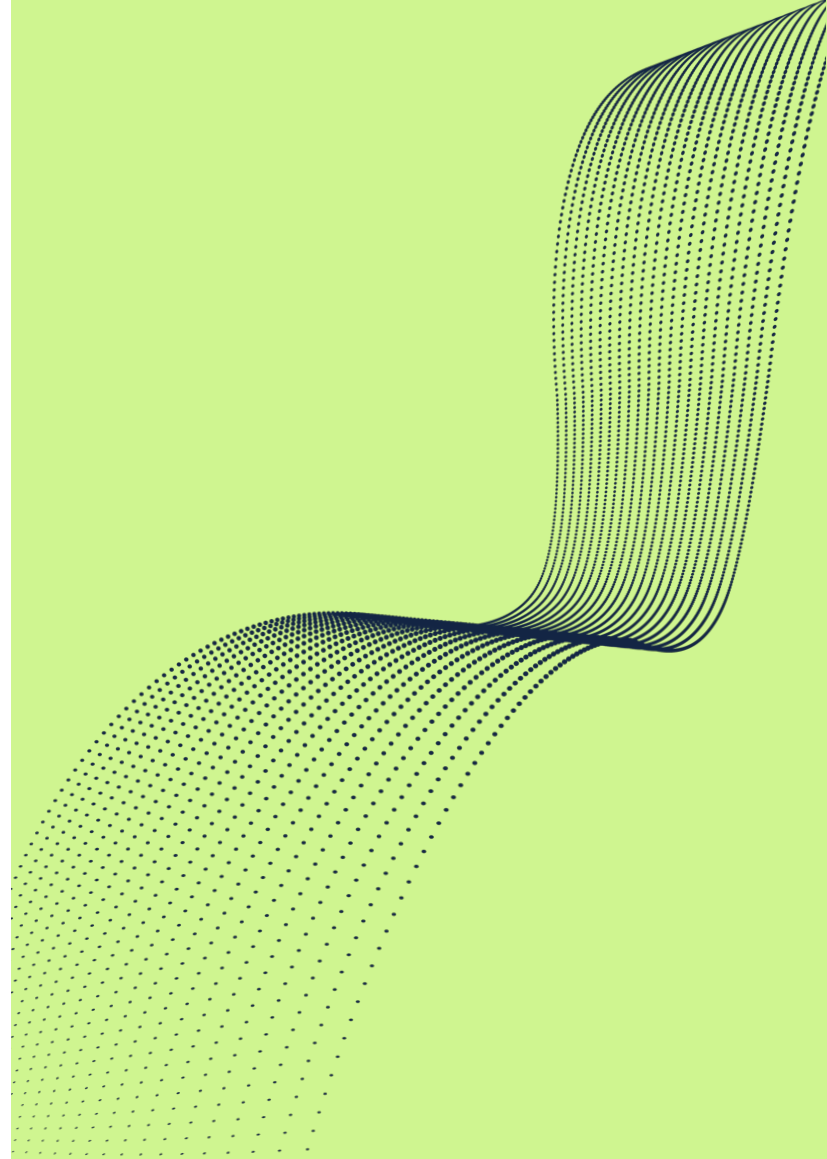
Talent, and the quest to acquire and retain it, has been a mainstay topic in our annual Outlook whitepapers dating back to 2011. By unofficial count, this will be the ninth year out of 14 in which talent has warranted not only a primary slot in our Outlook, but has also been a frequent Citisoft blog topic. Over those years, we've discussed millennials, Silicon Valley, and The Social Network, bridging the talent gap in our industry, winning the war for talent, the shifting talent landscape, and the "Patagonia Vest Recession." While talent demographics and strategies have shifted over the years, the need to find and retain the right resources to power business strategy has remained constant—however, when considering today's talent landscape, finding the right talent to drive innovation may be more difficult than ever.

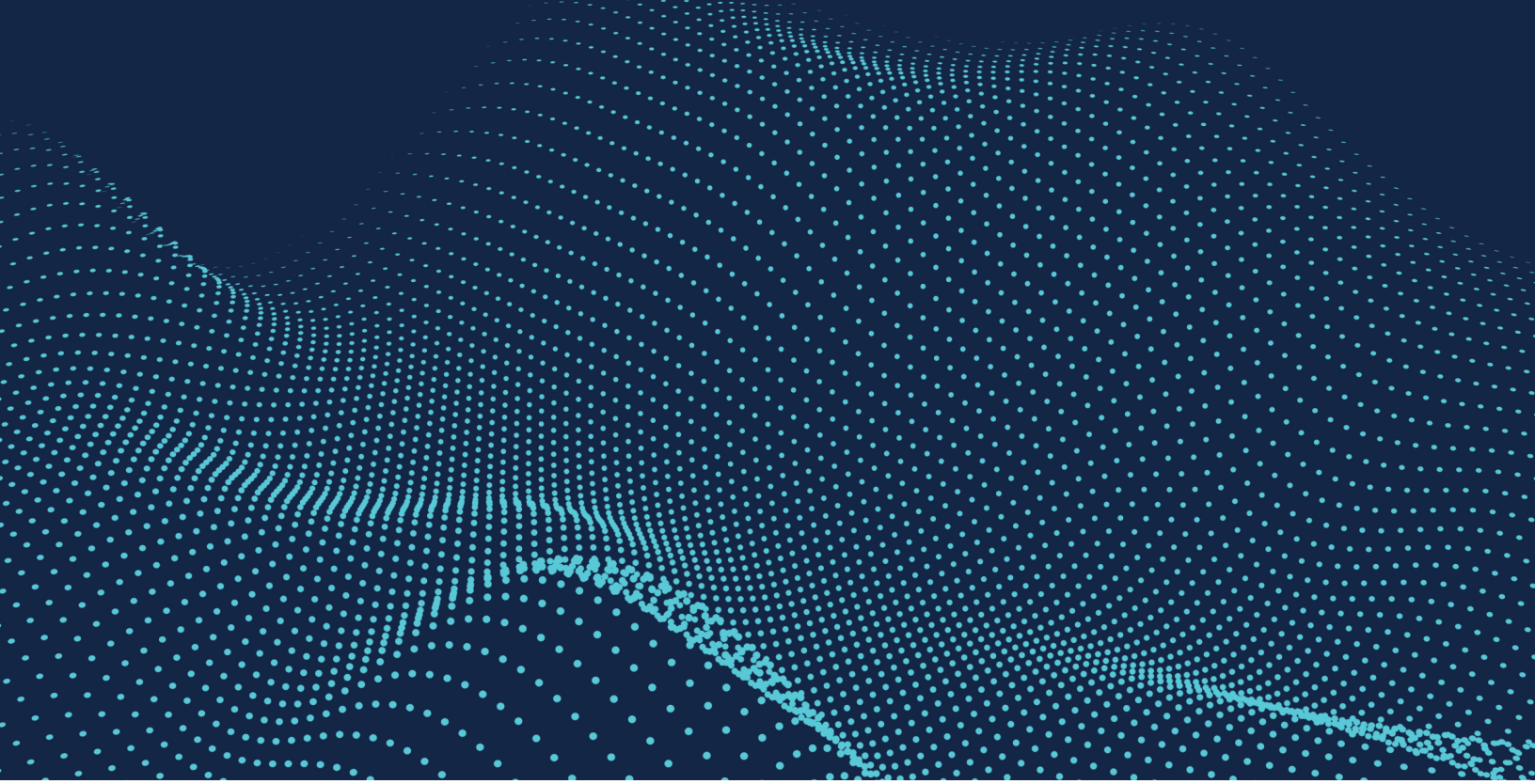
The industry does more with less

The recurrent talent theme as we've discussed over the last several years has been the quest to lure specific types of resources into our industry. For all of the talk around artificial intelligence and DLT, it has always come down to a subset of skilled individuals and teams that drive both investment alpha for our asset management clients, as well as the transformational programs that are Citisoft's hallmark. We have never come right out and labeled the talent conundrum as a talent shortage as we haven't wanted to sound alarmist. However it is worth positing that it is a lack of skilled resources that hamstring our industry's progress, both in terms of the elusive chase for alpha and

the technology and operational firepower necessary to enable business strategy.

There isn't a budget cycle that goes by in which we are not reading about extensive cost cutting, layoffs, and general headcount reductions within the largest and most visible organizations in our industry. We've also been hearing the mantra to "do more with less" for over a decade when it comes to running critical, multi-year initiatives that require immensely skilled resources in order to realize their strategic objectives. This thinking has impacted service providers, software vendors, asset managers and asset owners, and consulting firms in our space; all have endured "RIFs," some well publicized and some not. The irony in all of this is that resource constraints and an overall lack of bandwidth are typically the number one risk when it pertains to delivering projects on time, on budget, and within scope of the original goals.





Managers play the talent long game

The senior stakeholders and sponsors within our client base (comprised of COO, CIO, CTO, CDO) all have similar concerns when it comes to both a lack of talent and the retention of those suitably skilled resources that fall under their purview. These are common themes—there are simply not enough resources to deliver the change that is required, especially those that are contemplating or in the midst of major transformation programs.

While this may be a bit of welcome news for consulting firms to fill the gaps, we are all seemingly pulling from the same pool of resources, and what is a relatively “small” industry seems to be getting smaller. Acquiring, nurturing, and retaining well-rounded industry practitioners that can influence and lead change programs can certainly be a challenging exercise, and it takes a long view. The industry as a whole may talk a good game when it comes to technology disruptors, but when it comes to true adoption and upskilling, we continue to move at a comparatively glacial pace.

We don’t profess to know the solution or have access to the golden ticket that will alleviate the talent and resourcing gap that is currently confronting our industry. The one thing we are sure of is that there are no shortcuts. Curing the talent shortage is a sea change that will take time. If our industry is going to take advantage of the cloud-based solutions that are beginning to present themselves as viable alternatives to legacy applications, there will need to be a concerted industry effort to rapidly develop those hybrid skillsets that bring together domain expertise with advanced technology proficiency.

While we expect to continue addressing the importance of industry talent in future editions of Citisoft’s Outlook paper, hopefully it takes on a lighter tone and speaks to an industry that has finally begun to take advantage of promising technology and has the requisite influx of resources that are able to deploy it.

Looking to 2024 and beyond

As we look to 2024, we're excited for the changes that new technologies, data strategies, and transformation initiatives will bring. We keep a close pulse on the vendor and solutions market, and in our conversations on the year ahead, every provider is incorporating innovative technologies in their roadmaps while also balancing evolving client needs and investment strategies. We're at an interesting crossroads where the potential of available technologies is capturing significant mindshare but the reality of most operating models does not provide the groundwork to harness them—yet.

In advising our clients on their plans for transformation, we find that the underlying strategy behind people, process, and technology has never been more important. As many asset managers undergo transformation initiatives, it's critical to keep a core focus on the operating model. While most managers have undertaken change programs with the goal of doing more with less, we are not there yet. In the year ahead, balancing innovation with the reality of people, process, and technology will be the driving force behind tomorrow's success.



About Citisoft

Since 1986, we've solved complex technology and operations challenges for the investment management industry. With a team of over 100 dedicated consultants in North America and EMEA, we're committed to working with asset managers and asset servicers globally on projects of every scope. From guiding complete business transformation programs to on-the-ground delivery, our team is equipped to fulfill any strategic or tactical need.

To learn more about our Advisory and Delivery Services, contact us at insights@citisoft.com or visit us at www.citisoft.com.

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