

CELENT

PEPPER INVESTMENT DATA PLATFORM

Serving up the essential data ingredients for private markets
operations

Cubillas Ding

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INTRODUCTION: WHY IT MATTERS



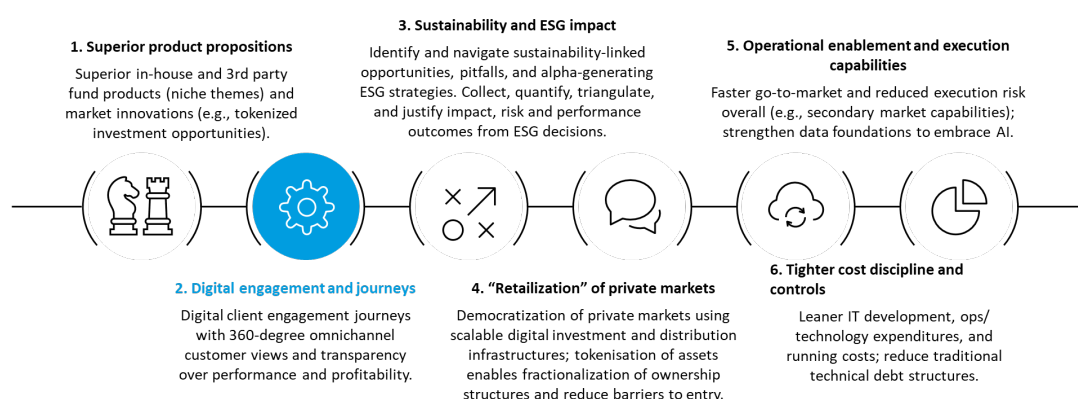
Private markets firms and investors are encountering new challenges due to a variety of factors, including quantitative tightening, asset price dislocations, ESG demands, and disruptions in the economic supply chain caused by sociopolitical pressures. With these headwinds and ongoing uncertainties, it is crucial for private markets firms to identify and adopt effective paradigms and solutions that are well suited to meet future demands.

Opportunities, Demands, and Risks from Macro Disruptions

Over the past decade, Institutional investors’ quest for higher returns and portfolio diversification in an era of low interest rates and favorable credit conditions fueled the growth of private markets and alternative investments. However, recent challenges such as quantitative tightening, asset price dislocations, and disruptions in the economic supply chain due to sociopolitical dynamics have created headwinds and a loss of momentum for private markets investments.

The financial industry is currently experiencing a significant inflection point, shaped by a confluence of macroeconomic forces, geopolitical repercussions, and renewed capital requirements in a post-pandemic environment. Stormy conditions aside, other future-oriented vectors are accelerating the ongoing transition to the sustainability/ESG agenda, digital assets, and the continued digitization of markets.

Figure 1: Alts and Private Markets: Market Themes and Imperatives for the Future



Source: Celent

In the longer-term horizon, despite the current down-throttling of private markets capital flows, we expect private markets to continue its expansion trajectory (albeit at a more moderate pace) and to take a larger share of total AuM driven by investor demand for higher real returns and the pressure on managers to deploy capital.

With institutional investor participation in private markets already well established, there is now growing interest in private assets by wealth managers, whose ultra/high-net worth segments clients represent a significant and generally untapped pool of capital with

respect to private assets, as well as from the broader retail segment through financial advisors. There are innovations in fund vehicles and new product propositions for private markets, such as hybrid public/private fund structures that can address the unique requirements of different types of investors. These new fund structures are designed to provide investors with greater flexibility and access to a wider range of investment opportunities, while also addressing the challenges of investing in private markets.

From an ESG and sustainability perspective, private markets stand to benefit from investor commitments to sustainable investing and formal net zero pledges, as they offer greater scope for targeting specific assets (e.g., sustainable infrastructure) as well as greater opportunities to engage with a portfolio company's management team on its decarbonization strategy.

With ongoing technology advancements, there are opportunities to employ advanced data analytics/AI, blockchain, and digital propositions to identify investment opportunities, improve transparency, democratize markets, and drive efficient collaboration throughout the investment value chain.

Solution Brief Context

This solution brief is part of our ongoing research into private markets technology and data enablement solutions. Across the investment industry, Celent observes primary use cases by firms to use and leverage data (and data enablement technology) to:

- Increase investment performance/alpha.
- Enhance operational efficacy in data lifecycle and operations.
- Facilitate higher client satisfaction and more personalized service.
- Improve product and content differentiation.
- Streamline and reduce tech/op costs.
- Monetize data as a direct revenue source.

To meet these aspirations, companies must upgrade their strategic data capabilities to remain viable in the digital age, while regulatory operations must become more efficient, predictable, and error-free. The ability to face off against market demands, adapt and respond to business imperatives, and capitalize on emerging opportunities is inevitably intertwined with core operational and technology capabilities.

This solution brief explores what differentiates Pepper's strategy from prevailing approaches, the potential for scaled expansions, and opportunities for continued impact on the financial industry from innovative methods and technologies. Through a combination of interactions, meetings, demos, and Q&A sessions held in 3Q23 and 4Q23, relevant subject matter experts and senior product management leaders from Pepper briefed Celent about their offering.

COMPANY AND SOLUTION OVERVIEW

Pepper Platform

Pepper's offering is a cloud-native investment data platform for Alternative Asset Managers and Allocators. As a private markets-aligned enterprise data environment, Pepper delivers a multifunctional suite of capabilities that enables investment managers to create a single golden source of data for all their functional requirements, investor reporting, compliance reporting, and analytics.

Figure 2: Pepper Overview

Solution and Product Overview

- Enterprise cloud-native investment data platform
- Specialist expertise and focus on Alternative Asset Managers and Allocators
- Full suite capabilities and functional areas:
 - CRM
 - Deal management
 - Portfolio management
 - Fund operations
 - Reporting and analytics
 - Investor management



Source: Pepper

Pepper's suite of applications offers a variety of modular options that are supported by Microsoft Azure's cloud technology ecosystem and an integrated data management framework. These include:

- **Data Warehouse:** Pepper's Data Warehouse is the foundation of its suite of applications, offering a unified perspective of data across all modules, ensuring consistency and reliability. It is designed to handle vast amounts of data from various sources, ensuring data quality and accuracy, and providing a single source of truth. It also stores historical data for trend analysis and predictive analysis, while enabling enhanced query performance and speed.
- **CRM:** A module that provides asset managers with client relationship management capabilities for the entire lifecycle of deals, contacts, and relationships across multi-asset, multi-strategy, multi-currency portfolios.

- **Deal management:** This module covers all aspects of the deal lifecycle, including deal pipeline tracking, evaluation, due diligence, and closing for complex deal and fund structures.
- **Portfolio management:** A module that enables firms to manage post-execution investment portfolios across the front, middle, and back office. It includes features such as post-deal setup, execution, and capture; investor onboarding; post-trade fund allocations; corporate actions; and regulatory disclosure duties.
- **Investor management:** This module has functional capabilities for fundraising, prospecting, and campaign management, including investor profiling and communications.
- **Fund operations:** This module is built upon Pepper's visualization of private asset management's data flows. It provides a specific format to ensure two outcomes: (1) the most up-to-date, clean, and comprehensive data required for fund accounting to create financial statements; and (2) that timely data delivered instantaneously to every business function for their business needs.
- **Reporting and analytics:** This module provides a framework for business intelligence (BI), visualization, and analysis to create dashboards and reports on deal pipelines, performance metrics, single/multi-portfolio positions, exposures, concentrations, regulatory obligations, and fund compliance/restrictions. It provides firms with an ability to aggregate and organize data across all modules, for more connected and comprehensive insights into the business.

From our perspective, Pepper's platform is a data-first, multi-tenant SaaS solution that represents a new breed of cloud-native solution for private market participants that has been built in the cloud and *for* the cloud. The longer-term play is to enable clients and other private market participants to fully leverage the benefits of a networked ecosystem that is optimized for data-driven collaboration.

KEY BRIEFING ANALYSIS AND PERSPECTIVES

Pepper has taken a modular, unified, cloud-based, and data-centric approach to developing its next-generation private markets investment platform.

For private markets businesses and investors to successfully navigate the road ahead, we anticipate that leaders will need to adopt two-pronged strategies that are both offensive and defensive. These will involve proactively identifying and pursuing new opportunities while also taking measures to defend against risks and threats.

Embracing essential competencies and approaches to **manage and utilize data in a meaningful, multi-faceted, and efficient manner across the investment lifecycle** remains one of the key pillars for success.

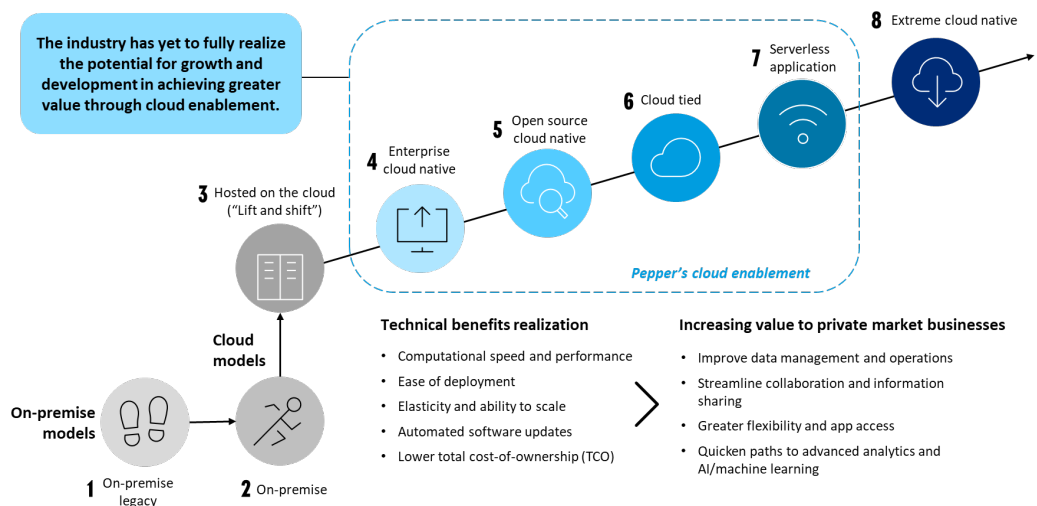
In this regard, we analyze Pepper’s platform offering and highlight the pertinent capabilities that we believe are worthy of mention:

1. Unlocking operational efficiency, collaboration, and data insights through a native cloud platform

Pepper’s offering was born and is built in the cloud. With such operational and data paradigms, firms benefit from tech lifecycle development changes around continuous dev/integration, API-centricity, and serverless technologies.

Centralized cloud-based data approaches allow firms to more effectively blend, manage, and optimize public and private market exposures and investment views; store and analyze large amounts of data, and more quickly deploy advanced analytics to drive better investment decisions. GPs and LPs can drive more productive collaboration and information sharing while facilitating access to data and applications more flexibly from anywhere.

Figure 3: Pepper: Fully Cloud-Native Platform



Source: Celent analysis

Celent perspective: While many investment technology vendors are migrating to the cloud, not all of them are fully taking advantage of the cloud's capabilities. Simply lifting and shifting software to the cloud can provide some benefits, such as improved scalability and reduced infrastructure costs, but to fully exploit the cloud's capabilities, firms need to redesign their software natively. This involves taking advantage of technologies such as horizontal databases, real time middleware, APIs/microservices, and containerization, which can provide greater flexibility, scalability, and efficiency.

When migrating to the cloud, it's important to adopt a holistic approach and consider all aspects of the technology environment. This includes identifying legacy components that may not be well suited for the cloud and developing a clear exit strategy for them. This can involve replacing these components with cloud-native solutions or finding alternative ways to achieve the same functionality in the cloud.

By doing so, firms can fully leverage the benefits of the cloud, such as scalability, flexibility, and cost savings, and position themselves for long-term success in the rapidly evolving investment technology landscape. Additionally, it's important to ensure that any new solutions implemented in the cloud are designed with interoperability in mind, such that they can easily integrate with other systems and tools both in the cloud and on the premises—for instance, taking into account the continued use of spreadsheets for cash flow forecasting and interfacing with accounting systems and outsourced providers.

2. Modular, integrated apps for private markets deal lifecycle

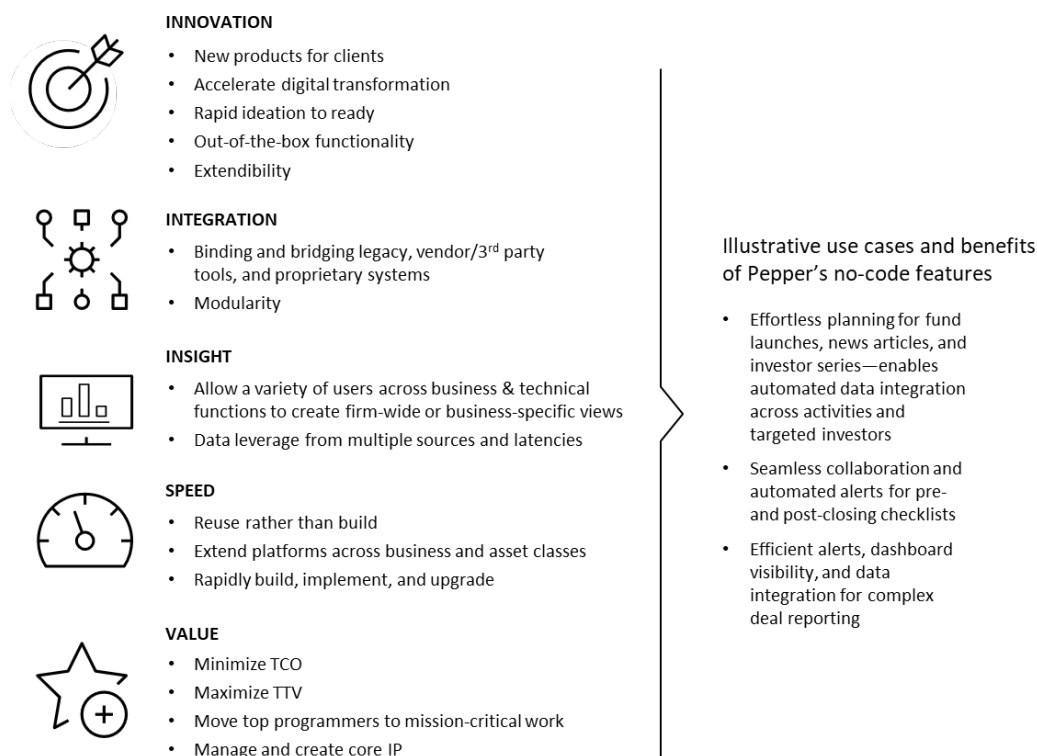
The Pepper platform is designed to be an investment book of record (IBOR) and is built around a centralized cloud data model. It includes a range of tools for managing private market investments, including deal flow management, due diligence, and portfolio monitoring. Additionally, it includes features for managing investor relations, such as investor reporting and communication tools.

The platform is specifically designed for private market workflows—including private equity, private credit, and secondaries—facilitating collaborative research management, knowledge capturing, and information distribution for both structured data and unstructured documents.

Celent perspective: While the platform may not (yet) be front-to-back from a functional perspective, its centralized approach to data enablement allows firms to capture, access, manage, and report data across the entire deal lifecycle. This can help improve efficiency, reduce the risk of errors, and provide deeper insights into private market investments.

3. Flexible, in-built low-code/no-code features

Pepper's platform contains fully embedded low-code/no-code development features that can be used to define and manage database structures, metadata, and fields, allowing users to create and manage custom databases with little to no coding skills. These enable users to define custom tables, fields, and relationships; create custom forms and reports for managing data; and tailor custom workflows to automate business processes.

Figure 4: Pepper: Composable Technology Features

Source: Pepper, Celent analysis

- Users can employ the low-code/non-programmatic GUI used to create customized projects, task sheets, screen templates, ancillary data tables/fields, and tailored reports on an ad hoc basis.
- At a higher level, users can also mobilize task packages associated with deal lifecycles—e.g., deal-closing checklists, compliance reporting calendaring and requirements milestones, campaign launch to-dos for new funds.
- Spreadsheet-like features make it more straightforward for users familiar with Excel (found at many alternatives and private markets firms) to transition to, embrace, and use the platform's capabilities.
- More ad hoc workflows and task automations that do not require a full-fledged application can be built using this low code paradigm; mini-apps can be built and localized tasks solved without engaging in complex programming efforts.

Celent perspective: User-friendly “composable technology” features and paradigms that enable business users to build mini-apps and create ad hoc workflows and task automations without engaging in complex programming requirements are the way of the future. By empowering users, these platforms can help organizations to innovate and respond quickly to changing business needs. This approach to platform development represents a significant shift away from traditional software development methods, empowering users to build custom solutions using visual and intuitive interfaces that lower the barrier to entry for non-technical users.

However, there will likely still be situations where spreadsheets or other off-system tools are necessary. In these cases, it will be important to be able to integrate with these tools and maintain interoperability across different modes of operation. This

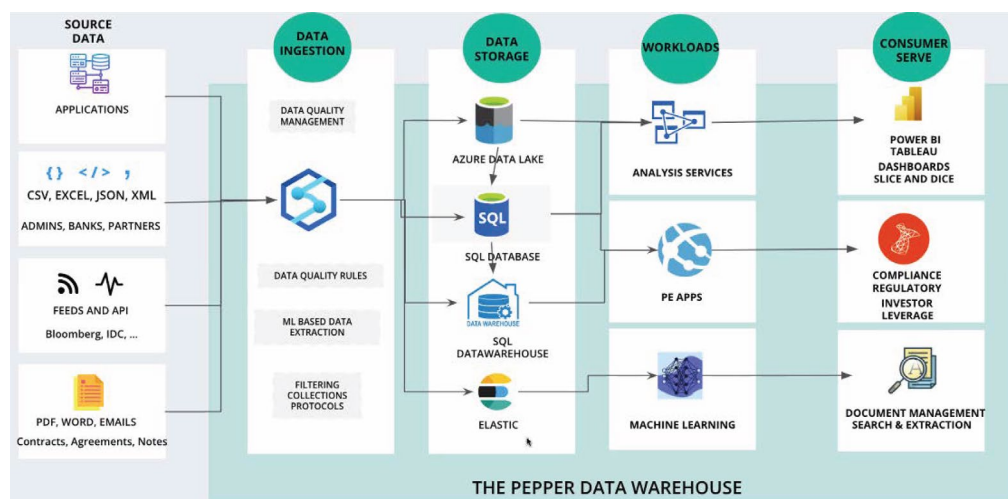
will ensure that data can be easily shared and accessed across different systems, and that workflows can be streamlined as much as possible. Additionally, it will be important for solutions with low-code/no-code features to be flexible enough to adapt to changing needs and requirements, so that they can continue to provide value even as the technology landscape evolves.

4. Data foundations and ML-readiness

The Pepper proposition is positioned as an enterprise-wide data convergence and warehousing platform. In the specific context of private markets businesses, it can be deployed as the authoritative data source and book of record for the lifecycle of investment flows, funds/holdings, and CRM/GP-LP interactions. Here, we see one of the differentiating characteristics of the model is their “data-first, built in the cloud” paradigm.

Underpinned by a flexible data model and extensibility, the platform is designed in such a way that it can be more readily extended to support new data types, workflows, and user interfaces without requiring significant changes to the underlying code or architecture. Built natively on an Azure cloud stack, the technical ecosystem and architecture comes with the necessary application and data management building blocks to prepare and evolve towards more sophisticated AI/ML-enabled capabilities. With the necessary linkages into “official book of record” data structures and enterprise information, Celent anticipates that Pepper can also act as a conduit for users and data scientists to leverage a broad ecosystem of data objects.

Figure 5: Pepper: Data Management Building Blocks



Source: Pepper

Celent perspective: As financial and investment firms move toward embracing their current ambitions for more advanced data analytics and eventual AI/machine learning, the imperative to establish strong data foundations is critical for AI/ML readiness.

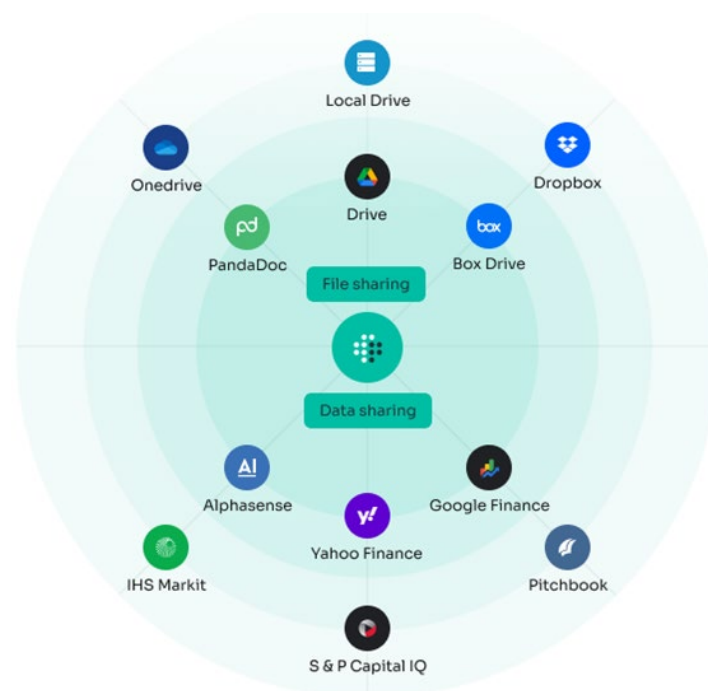
Across the investment industry, Celent observes primary use cases to leverage modern data enablement technology and AI/advanced analytics to increase investment performance/alpha generation, enhance operational efficiency in data lifecycle and operations, and facilitate personalized differentiation of advice, content, products, and services.

Current challenges and deliberations around the efficacy of data quality, governance, and analytical capabilities at firms are becoming more pronounced (not less) in the light of these ambitions. Firms must make more directed decisions to embrace modern data engineering and data science approaches to lay fit-for-purpose foundations for the future. By adopting a cloud-based solution that is ready to use and fully integrated, firms can access a range of tools to address common challenges related to manual data handling and processing of non-digitized information sources prevalent in private markets organizations. These tools include automated information extraction from unstructured documents, images, and media; machine-augmented document translation; and latent insights mining. By leveraging these tools, firms can simplify their path to more advanced capabilities, such as developing machine learning algorithms to research, identify, and analyze new investment opportunities; create/test fund product propositions; and match potential investments with investor profiles and ESG criterion.

5. Ecosystem-centric, designed for coexistence, cocreation, and collaborative user experience

Pepper includes an internal app marketplace framework that provides a flexible and secure technical foundation to support a firm's ability to incorporate, mold, and interoperate safely using the most common commercial and open-source tools and value-added datasets available in the market.

Figure 6: Efficiently Weave Workflows and Synchronize Data Across External Apps



Source: Pepper

Although still in early days in terms of delivering a full-fledged marketplace of “permissioned capabilities,” the Pepper platform has demonstrated that it can function as the connective tissue to seamlessly create a mosaic of collaboration-centric and data-connected apps with the end goal of achieving an integrated experience for users while promoting innovation and collaboration across the various stakeholders.

Celent perspective: Looking forward, ecosystems-led approaches are opening more avenues for firms to both buy and build on top of platform offerings, enabling firms to benefit from an amalgam of organic and inorganic routes to market. Firms can take full advantage of the vendor ecosystem and aim for more optimal outcomes related to build-versus-buy and standard-versus-best of breed procurement decisions.

As an integrated data platform, we expect Pepper to be positioned to become a hub for a more prolific ecosystem of services. Within different private markets asset classes and business ecosystems, this is especially critical as Pepper continues to engage other tech companies, data providers, AI and machine learning vendors, and other service providers that have expertise in areas the firm is looking to complement.

It is important to note that expanding a universe of ecosystem partners may not be a straightforward process. It is crucial to ensure that potential partners have similar capabilities in areas such as cloud enablement, multi-tenancy, and data interactivity to ensure a seamless integration and collaboration within the ecosystem.

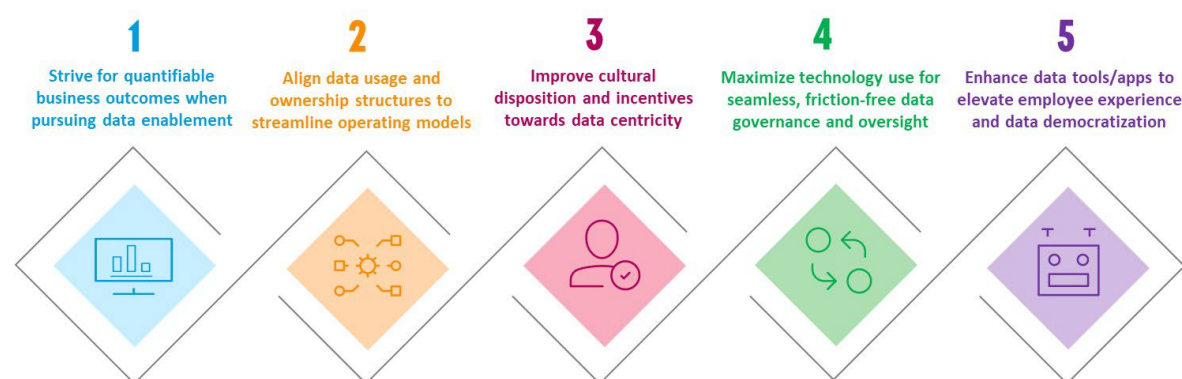
In the longer term, however, as components, applications, and platforms¹ become more networked and interoperability becomes increasingly friction-free toward an open (but permissioned) environment, we expect these secular dynamics to continue to manifest in a way that will profoundly change investment management operations and IT ecosystems.

¹ Celent's definition of a modern platform proposition is one where network effects operate, connecting buyers and sellers as well as users and suppliers. Direct commercial and revenue generation opportunities exist on the platform, and developers can use platform resources to develop their own offerings. Apps, services, and data are dynamically provisioned. Different platform propositions already exist in one form or another but can be enhanced with modern technology and paradigms through cloud-enablement, machine learning, robotic automation, agile/DevOps methods, and blockchain-based consortium networks.

STRATEGIC DATA ENABLEMENT CONSIDERATIONS FOR PRIVATE MARKETS

As we consider next-generation operational capabilities, we see competitive, regulatory, and investor pressures continue to drive the industrialization agenda around private markets and its operational underpinnings, with enhanced requirements for infrastructure and platform capabilities to meet new standards for the future. This dynamic is already upon us, but firms overall still need to address maturity gaps in many parts of the information delivery value chain. Without a consistent and sustained approach to data enablement across the lifecycle of a deal, firms will not be able to currently employ data and insights to their full potential.

Figure 7: Strategic Data Enablement: Critical Considerations and Decision Factors



Source: Celent

The following are executive takeaways and considerations when embarking on next-generation changes in private markets data enablement efforts. These are based on Celent’s research and advisory experience of helping clients.

- 1. Strive for quantifiable business outcomes when pursuing data enablement.** While data management is a central focus for most firms, many are still working to effectively align the “how” — the processes and mechanics of data management activities— with the “why” of data enablement, which revolves around addressing strategic business questions and objectives. In this regard, firms should aim for measurable business outcomes that are aligned with **business expectations** for enterprise data enablement improvements, rather than solely focusing on technical metrics—for instance, in terms of new investor, fund, and asset data onboarding targets (i.e., in days or even hours), or **measures of efficiency** for data operations and processing such as for data governance (e.g., person-hours spent on NAV oversight/validation activities).
- 2. Align information usage and data ownership structures to streamline operating model design.** As a general guide, private market firms should look to **ensure that data ownership is closest to its constituents** within business lines, horizontal functions (e.g., legal, compliance, risk, finance), or within shared service entities.

- To attain a leaner, fit-for-purpose operations, firms must recognize the **differences between centrally managed datasets versus those aligned by function or business unit** when designing operating models, processes, and data governance structures.
 - Ensure that **executive-level sponsorship and elevation promote accountability** closest to the “areas of information use” by clearly delineating data ownership across parties and making sure escalation paths are explicitly defined.
- 3. Improve cultural disposition and day-to-day incentives toward data-centricity.** Firms must look to weave the promotion of data-centricity ambitions into their day-to-day cultural fabric.
- Efforts to shape a data-centric culture must be visible and **reinforced by appropriate metrics, training, and tangible cultural incentives in a joined-up manner.**
 - Sustaining these efforts also means ensuring that data management stakeholders and constituents have access to **flexible and business-friendly data/metadata management tools** across the data lifecycle (e.g., with low-code/no-code features natively embedded) to facilitate the implementation of an incentive framework.
- 4. Maximize use of technology and automation to enable seamless, friction-free data governance and oversight.**
- **Data governance “by design”:** Data governance is often cited in our surveys as a pain point, illustrating the challenges of achieving robust oversight and assurance. Depending on functional domain, governance processes are generally manual, reactive, and often based on (less predictable) “sampling” approaches. Solutions employed are typically disjointed and, if nothing else, highly manual and spreadsheet-centric. This stems from **governance considerations being implemented as a retrofit rather than by design.**
 - Instead, **timeliness, efficiency, and effectiveness should be considered up front** (not merely as an afterthought) in enterprise data operating models. For example, when leveraging automation tools, firms can look to reimagine or untangle complex data pipelines to deliver improved data quality and lineage visibility.
 - Firms can look to raise automation levels related to core oversight and validation functions to improve oversight, staff productivity, and process monitoring. Leading firms are investing and proactively focusing on **maximizing technology-enabled improvements** rather than preserving suboptimal oversight functions.
- 5. Enhance data tools/apps to elevate employee experience and data democratization.**
- Emphasize **“experiential features”** to enhance usability, information search/discovery, and data accessibility to accelerate broader **democratization of data and insights** for business and less tech-savvy users.
 - Fragmented data tools in different parts of the value chain (e.g., ETL, data lineage, data cataloguing / metadata management, data governance) can create complexities that hinder operational efficiency and responsiveness. Firms must **consolidate and make trade-offs between best-of-breed and standardized capabilities around data tools** to ensure the appropriate balance.
 - Integrating AI/machine learning (such as generative AI) into the data lifecycle has the potential to enhance the user experience for employees while also providing contextual assistance for data users and stewards in discovering, managing, comprehending, and utilizing data relevant to their distinct areas of responsibility.

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Business practice evaluations. We spend time evaluating your business processes, particularly in policy administration, rating, and claims. Based on our knowledge of the market, we identify potential process or technology constraints and provide clear insights that will help you implement industry best practices.

IT and business strategy creation. We collect perspectives from your executive team, your frontline business and IT staff, and your customers. We then analyze your current position, institutional capabilities, and technology against your goals. If necessary, we help you reformulate your technology and business plans to address short-term and long-term needs.

Support for Vendors

We provide services that help you refine your product and service offerings. Examples include:

Product and service strategy evaluation. We help you assess your market position in terms of functionality, technology, and services. Our strategy workshops will help you target the right customers and map your offerings to their needs.

Market messaging and collateral review. Based on our extensive experience with your potential clients, we assess your marketing and sales materials—including your website and any collateral.

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