# The future of data in financial services

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Be SHAPING THE FUTURE

# Contents

# 1. Introduction

**Chief data officers (CDOs) in financial services (FS) face the complex task of managing an efficient and effective data team amidst heavy regulation while evolving the function to meet their organisations' rapidly changing future demands.**

We consulted FS CDOs and leaders responsible for data to describe their vision for the future, their plans to realise it, and their anticipated challenges. They were asked to articulate their thoughts across six key areas.

**1.DATA ARCHITECTURE**

**2. DATA QUALITY AND GOVERNANCE**

**3. DATA ANALYTICS AND ETHICS**

**4. AI AND AUTOMATION**

**5. CORE TECHNOLOGY AND INFRASTRUCTURE**

**6. TALENT, CULTURE, AND WAYS OF WORKING**

This publication reflects our interpretation of the collective consensus among the surveyed CDOs and senior data leaders. It aims to offer insight into FS CDOs' vision of data's future within their organisation and the measures they're implementing to achieve this. We earnestly hope it will furnish the data professional community with valuable new understandings, thought leadership, and the inspiration needed to utilise data more effectively. This report strives to deliver both value and direction for your future endeavours.

Note: CDO and senior data leaders will be used interchangeably within this article.

**Our heartfelt thanks go to our numerous friends, clients, and colleagues for sharing their precious experiences and future visions with us.**

# Background and status quo for FS CDOs

**The events of the last two to three decades have shaped how FS firms are organised today, presenting formidable challenges for CDOs and senior data leaders.**

During this period, FS firms expanded through acquisition and consolidation, driven initially by the desire for a more extensive capital base, customer growth, and the need to project financial security.

From the early 2000s, technological advancement became a key growth driver, with firms aiming to mitigate the rising costs of investing in technology through acquisitions that scaled top-line growth and leveraged new efficiencies. The 2008 financial crisis and subsequent stringent regulations marked a significant shift, leading to a slowdown in growth, increased rationalisation, and new strategies to navigate the new regulatory landscape.

The emergence of new financial instruments, growing cybercrime concerns, and recent technological advancements, such as improvements in mobile technology, internet speeds, connectivity, distributed ledger technology, APIs, and low-code automation, have further influenced the sector.

These developments have enabled technology companies to easily create FS applications or products that meet customer needs, thereby intensifying competition.


These events have consequently contributed to the following critical challenges for the CDO departments of those firms.

## 1. System and process fragmentation

The growth of FS firms, often through acquisitions and coupled with chronic underinvestment in back-office technology, has led to a proliferation of legacy systems performing overlapping functions. Firms have developed complex reconciliation and consolidation processes, predominantly manual, to manage this fragmentation. The challenge is achieving unified, globally consistent toolsets without significant investment, resulting in a costly and inefficient finance technology landscape that drains resources.

## 2. Exponential data growth

The rapid increase in data volumes and the diversification of data types and formats have overwhelmed existing infrastructures. Firms face the challenge of effectively creating scalable solutions to leverage this data for value.

## 3. Poor data management

Data is often not remediated or managed at its source, leading to downstream manual, labour-intensive efforts that are neither sustainable nor scalable. The expanding range of data-driven insights exacerbates this. The technological explosion has burdened firms with managing vast data volumes. With limited resources, strategic data management is often sidelined, leading to excessive time and costs spent on data validation and correction, which hinders valuable insight extraction for business growth.

## 4. Rise of frontier AI models

The advancement in AI technology presents a dichotomy of risks: the risk of falling behind due to adoption hesitancy and the risk of reputational damage from rushed, unsupervised integration.

## 5. Changing employee expectations and attitudes

Shifting employee expectations necessitates new talent strategies focused on capabilities and adaptability, aligning with employee values over predefined skill sets. The appeal of FS organisations as prime employment destinations has diminished due to a generational change in attitudes towards job satisfaction. With emerging trends in contribution to societal good and better work-life balance.

The global COVID-19 pandemic further shifted priorities away from career advancement, and fundamentally redefined what is valued in the workplace.

This paradigm shift has impacted CDOs within FS in three ways.

**a. Revising talent strategies**

CDOs are reassessing their methods for attracting and retaining talent, focusing on capabilities and adaptability rather than specific skill sets.

**b. Adjusting remote and office work balance**

A revaluation of the optimal remote and office work mix, driven by employee demands for flexibility while fostering a setting that promotes collaboration, upskilling, and development.

> "Remote working has been more inclusive as our international teams are now equally seen and heard."
>
> ***Head of data and AI, global universal bank***

**c. Aligning with ESG principles.**

CDOs coordinate with principal environmental, social, and governance (ESG) values, especially those significant to their employees.

Arguably, past events have guided FS towards a more regulated and meticulously managed system that benefits all. The data and finance functions stand at a crucial juncture in the evolution of FS organisations. While traditional data-led activities remain vital, continuing technological advancements are set to automate further and digitise routine tasks, boosting the need for prompt data-driven insights and active collaboration with the business to devise and implement strategies in an increasingly competitive market.

# Executive summary

**In the rapidly evolving digital landscape, CDOs are becoming increasingly pivotal within the corporate hierarchy. This report explores the transformative journey of CDOs, highlighting their growing strategic role in guiding organisations towards data-driven innovation and excellence. As businesses navigate through the complexities of digital transformation, CDOs are uniquely positioned to leverage the potential of big data, implement advanced analytics, and cultivate a culture of informed decision-making.**

Their role transcends conventional data management, now encompassing the leadership of initiatives aimed at gaining a competitive edge through actionable insights. They are tasked with ensuring regulatory compliance in an ever-tightening data protection landscape while also fostering sustainable growth.

Looking ahead, the scope and influence of CDOs within the corporate domain will significantly broaden. The rising significance of data as a strategic asset positions CDOs at the core of executive decision-making processes, necessitating close collaboration with other C-suite executives to devise and implement holistic data strategies. This evolution underscores the need for a diverse skill set, blending technical expertise with strategic foresight, leadership qualities, and a deep understanding of the business landscape to navigate the challenges and opportunities presented by the digital age.

## Critical pain points for CDOs in financial services

### 1. Integration and interoperability

As legacy and modern data systems converge in FS, CDOs face the challenge of ensuring seamless data flow and integration. Bridging the gap between disparate systems is crucial for a unified data environment.

### 2. Heightened data governance requirements

The rapid increase in data volume, along with a broader range of relevant data, demands CDOs to manage extensive and varied datasets. It is critical to ensure robust data traceability, understand data lineage, and establish extensive data quality metrics at scale.

> "Our data quality is good for data we measure, but the same can't be said for that we don't measure."
>
> ***Chief data officer, specialist UK bank***

### 3. Data accessibility

In FS, siloed business structures, often due to mergers and acquisitions, obstruct the comprehensive use of data across various platforms. CDOs must overcome these barriers to enable unified data access, vital for informed decision-making.

> *"The future dissipation of skills from the CDO office to the business will both democratise data access and improve data knowledge. This in turn will accelerate good data governance and increase accountability throughout the organisation."*
>
> ***Head of data governance, UK private bank***

## Chief data officers in FS today

CDOs currently play a crucial role in shaping the future of data, focusing on strategic responsibilities such as flexible data models, architecture, and governance. The importance of forward-thinking and proactive data management will continue.

Currently, CDOs prioritise integrating traditional and modern data sources to achieve a unified view. They often opt for external technology solutions to access specialised products and expertise, despite challenges like system interoperability and data silos. Real-time data access and unified platforms are seen as crucial components for the future of financial data.

Regarding data quality and governance, CDOs emphasise identifying intrinsic value pockets and extensive metadata usage while tackling challenges such as data ownership and completeness. They envision automation and enhanced metadata management as pivotal for achieving consistency and efficiency.

In the realm of data analytics and ethics, CDOs navigate advanced analytics while addressing ethical concerns such as privacy and fairness in algorithms. CDOs proactively address emerging ethical challenges, envisioning a future with integrated predictive analytics and embedded ethics.

CDOs drive paradigm shifts through Analytics Centres of Excellence (CoE), consolidating expertise and fostering collaboration. Centralised analytics pipelines and ethical considerations are foundational pillars of building trust in data-driven insights.

> "The Generative AI wave has created the new challenge of how to let people explore it in a safe and controlled way."
>
> ***Head of data and AI, global universal bank***

## The future role of chief data officers in FS

In the future, when most data-led activities will be automated, FS CDOs will no longer spend the same time reviewing and approving data outputs. Instead, they will rethink traditional approaches and adapt to emerging trends.

Adaptive data architecture is essential for future-proofing the FS sector. It necessitates flexible and scalable data frameworks capable of accommodating new tools and platforms emerging from rapid technological evolution. This flexibility will ensure FS can integrate new advancements efficiently and effectively, maintaining its competitive edge while satisfying evolving regulatory demands.

The importance of CDOs increasing their business engagement cannot be overstated in this context. Sharpening the alignment between business needs and data tooling will become a focal point in the future. Ensuring the desired data capabilities align with the overall business strategy. This alignment is crucial as it ensures investments in data architecture and tools directly support the strategic objectives of the business.

Moreover, the advent of emerging technologies necessitates a comprehensive approach to education for all stakeholders and CDOs alike. Educating future data leaders about the possibilities and potential ramifications of new technologies becomes imperative. The educational effort will address the growing focus on ethical considerations in data use. The future CDO will be tasked with upholding relevant data use and ethical understanding of the data, particularly when considering the rapid advancements in AI. AI introduces an additional level of complexity for future CDOs, a terrain that current CDOs are currently grappling with.

Consequently, future CDOs will need to navigate the ramifications of these unsupervised technologies meticulously. This is not only considering the impact on their business operations but also on societal norms, ethical standards, and reputation.

## Chief data officers of the future

While there are core skill sets that an FS CDO will always require (e.g. technical expertise, strong leadership, vision, risk and control focus, familiarity with regulations, commercial mindset, strategic thinking), there are some additional skills CDOs believe they need for the future.

### 1. Influencing and interpersonal skills

Influencing and interpersonal skills are paramount for future CDOs, who will need to adopt a consultative and advisory-based approach. They will play an even more crucial role in positively influencing staff, directors, and executives, guiding, and pioneering innovative strategies to accelerate digital transformation within their organisations. To effectively navigate the complex data landscape, CDOs of the future should develop robust storytelling and communication skills. These capabilities will be essential for articulating the value of data and making strategic decisions to foster a culture of data-driven innovation successfully.

### 2. Comfort with emerging technology

Another critical competency for future CDOs will be extracting commercial and strategic value from emerging technology. They will be technology-savvy, with a deep understanding of current technology and an innate ability to predict emerging trends and remain ahead of the curve. This is essential for maintaining a competitive edge. This proactive approach ensures FS firms will not miss out on crucial products or trends that could potentially impact their operations and strategic positioning within the market.

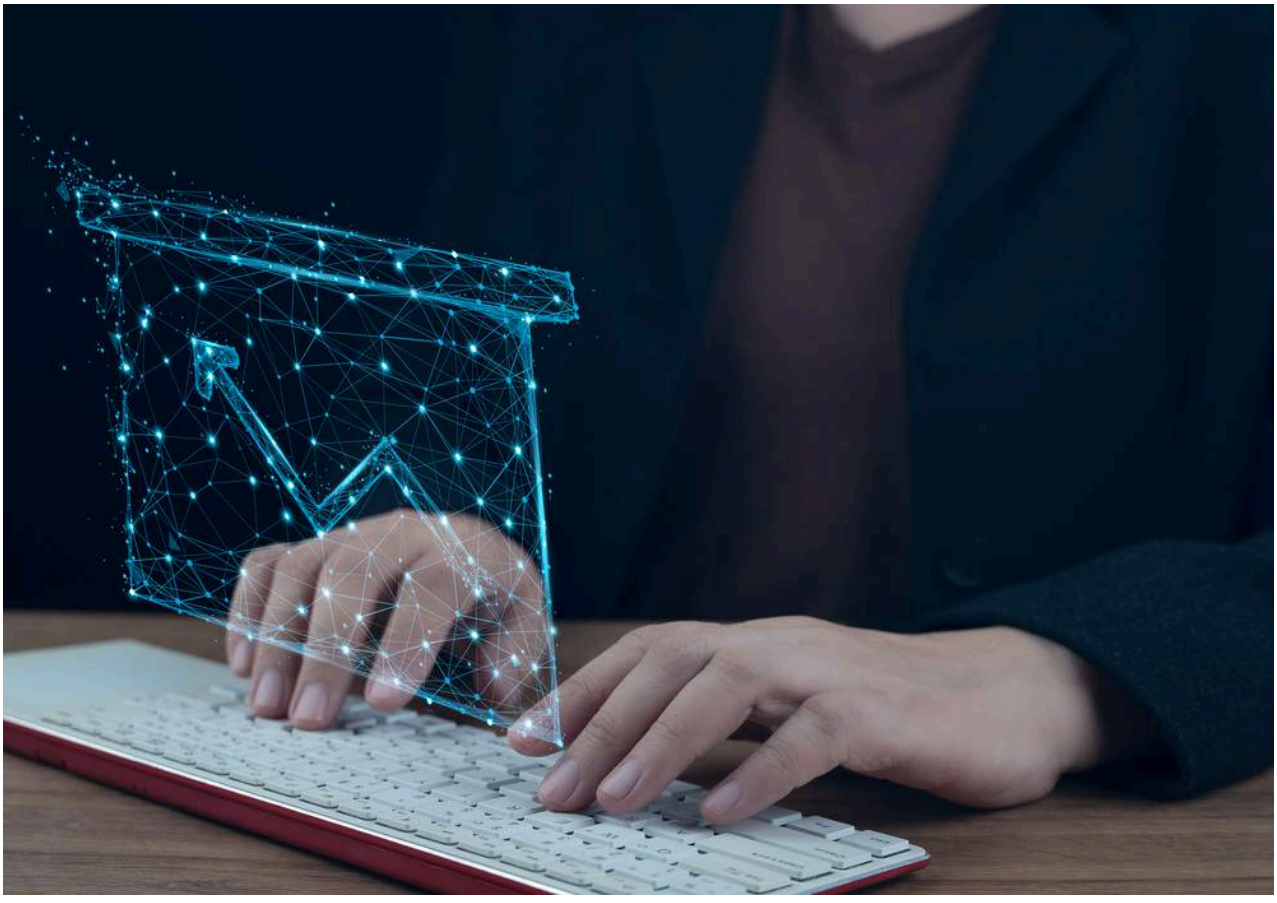
### 3. Commercial creativity

Commercial creativity will be vital for future CDOs. They will be expected to generate innovative ideas, explore new possibilities, and solve complex problems aligned with the firm's data strategy. Thinking and acting like a business involves creating new opportunities, streamlining processes, and enhancing decision-making processes. By doing so, future CDOs will drive growth and increase operational efficiencies. This strategic approach to data and technology positions future CDOs as critical drivers of value and transformation in the FS industry.

## Executive conclusion

The role of CDOs is undergoing a significant transformation, evolving from guardians of data management to strategic visionaries within the corporate ecosystem.

- This report underscores the critical importance of CDOs in driving data-centric innovation, regulatory compliance, and competitive differentiation.
- As organisations traverse the complex terrain of digital transformation, expertise and leadership of CDOs will be paramount in unlocking the true potential of data assets.
- Their ability to meld technical prowess with strategic planning and cross-functional collaboration is crucial in steering businesses towards data-informed decisions, strategic direction, and innovation.
- Future presents challenges and opportunities in equal measure, with CDOs at the helm of data strategy.
- The evolution of the CDO's role reflects a broader recognition of data's strategic value across all facets of business operations.
- CDOs' influence will only continue to grow, marking a new era of data-driven excellence in the corporate world.
- Journey from data stewards to strategic leaders, a testament to the transformative power of data in shaping the future of business.



# 2. Data architecture

**The foundation of any data-driven organisation lies in its data architecture, a critical component dictating the efficiency, scalability, and flexibility of data management and utilisation strategies. As businesses amass increasingly vast volumes of data, the importance of a robust, well-designed data architecture becomes paramount.**

**This section delves into the core principles and emerging data architecture trends essential for organisations aiming to harness the full potential of their data assets. It emphasises the need for architectures that are not only resilient and secure but also adaptable to the ever-changing technological landscape and business requirements.**

Emerging trends such as cloud computing, data fabric, and federated data systems are reshaping the traditional data architecture paradigms, offering new pathways for innovation and efficiency. The adoption of these trends requires a strategic approach that balances the immediate needs of the business with long-term scalability and agility.

This section will explore how CDOs are pivotal in navigating this delicate balance, guiding their organisations through the complexities of modern data architecture. It will highlight the role of CDOs in ensuring that data architectures support not just current data management needs but also future-proof the organisation against emerging challenges and opportunities in the data landscape.

## Data architecture themes and observations

### Increased data variety

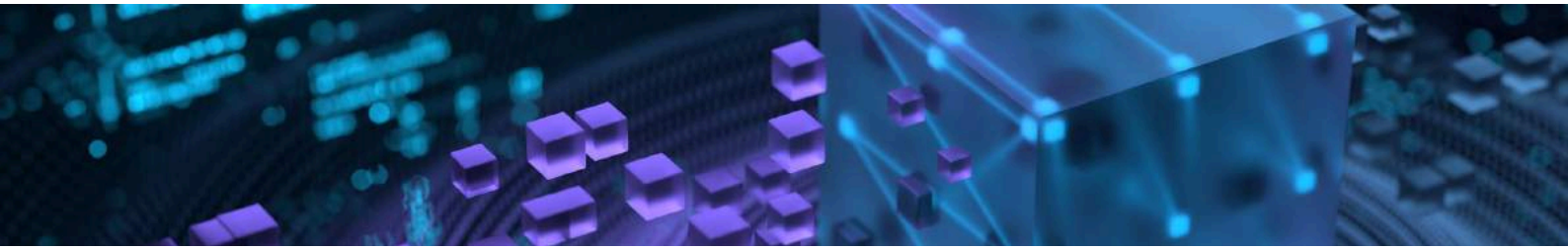
CDOs recognise there is an increase in data variety due to the inconsistencies that exist in the way data is gathered across the organisation–in varying formats, across different business units and with differing organisational structures. Consequently, the ongoing integration of both traditional and modern data sources continues to be of paramount importance to enable a more single and unified view of data.

### Vendor tech vs in-house

To address these challenges effectively, CDOs are increasingly favouring the procurement of technology solutions from external vendors over pursuing in-house development.

This strategic preference is driven by the need for quick access to specialised products, subject matter expertise, and the additional resources that external vendors can provide.

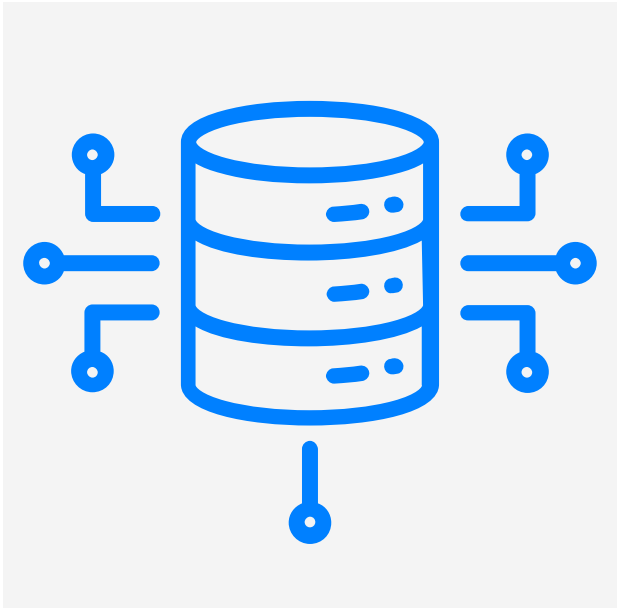
Opting for vendor solutions, which often come with comprehensive support and maintenance services, helps mitigate the potentially high costs associated with in-house development. Moreover, the pre-built nature of vendor technologies enables faster implementation times, offering a pragmatic approach to technology adoption that prioritises speed and efficiency.



## External tech procurement

This trend towards external technology procurement reflects a broader shift within the industry, as organisations aim to accelerate their technological capabilities, remain competitive, and improve efficiencies without the overhead of developing, maintaining, and updating complex systems internally. By leveraging the latest technological advancements through external vendors, CDOs ensure their organisations are better positioned to navigate the rapidly evolving digital landscape, thus reflecting a pragmatic and strategic approach to managing the complexities of modern data architecture.

There is a discernible trend towards external technology procurement. Sourcing external technology solutions over in-house development enables the organisation to develop technological capabilities at a faster pace, remain competitive and improve efficiencies.



> "In the future I would prefer seeing more pre-built integrations, allowing us to more readily pick and choose solutions for specific use cases."
>
> ***Head of data and AI, global universal bank***

## Data architecture challenges

### System interoperability

Ensuring seamless interoperability and compatibility between legacy and contemporary data systems is widely accepted as the most significant challenge. Legacy systems rely on outdated, proprietary data formats and standards. At the same time, contemporary systems adhere to newer, more accepted formats. Bridging the gap between these diverse data structures is challenging. Legacy systems, built with outdated technologies, are often incompatible with modern protocols and communication standards. Integration with contemporary systems requires careful planning and consideration. Managing firm-wide data systems spanning multiple generations of technology is a burning issue for large corporations.

### Clear consistent standards

Establishing clear and consistent standards for data categorisation and taxonomy can future-proof current systems from this issue in the future. Data is dynamic and evolves over time. New data types will emerge, and modern standards will inevitably require updates to remain relevant. Maintaining a standard that accommodates change without downtime is a complex but necessary consideration. This reality reflects the fluid nature of data and emphasises the importance of adaptable, scalable approaches to data management.

### Data silos

Departments within large firms often operate in silos, making it challenging to establish firm-wide standards. The prevalence of data siloes, and other rigid structures, causes bottlenecks, impeding efficient data access. To keep pace in the digital age, swift access to data across the organisation should be a high priority, underpinning our recommendation to break down silos and instead foster a culture of collaboration and data sharing. Allowing organisations to enhance data governance and accessibility and ultimately drive more informed decision-making processes.

> "Usually, data owners are risk adverse on providing data access, and this kills off innovation possibilities."
>
> ***Data innovation lead, global investment manager***

> "Data is still very siloed across larger organisations. Some siloes, like KYC and AML, are legitimate but others are less so."
>
> ***Head of data and AI, global universal bank***

## Data architecture in the future

### Real-time data

A pivotal aspect of the future vision involves access to real-time data. The goal is to empower FS with immediate business decision-making capabilities based on up-to-the-minute insights, necessitating agile and responsive architectures capable of handling and processing data in real-time.

### Unified data platforms

Data architectures in the future will progress towards unified data platforms which seamlessly amalgamate structured and unstructured data, providing a holistic view of data, breaking down traditional silos and creating a more comprehensive understanding of information. Unified data platforms provide a foundation for advanced analytics, which will enable FS to extract meaningful insights from diverse sources, bolstering innovation and strategic decision-making.

### Pre-built integrations

EmbrEmbracing the future, FS are increasingly leaning towards pre-built integrations, favouring solutions equipped with built-in connectors tailored for specific use cases. This approach streamlines the integration process, reduces complexity, and accelerates the time to value for data-driven initiatives. The future of data architecture involves a landscape where FS can easily connect various systems and applications to create a cohesive data ecosystem.

## Achieving the future of data architecture today

Forward-thinking CDOs are steering FS towards a future defined by flexibility, recognising the importance of modular architectures. By prioritising flexibility, CDOs can lead efforts to design effective and scalable data architectures that seamlessly adapt to change. This proactive approach will ensure FS remains agile and responds smoothly to dynamic landscapes.

To future-proof data architectures, CDOs should prioritise implementing systems with real-time data capabilities. This capability was a recurring theme in our study. The strategic importance of timely insights cannot be underestimated. It is often the deciding factor in market capitalisation. This proactive approach enables FS to make informed decisions at the speed of business while remaining responsive and agile. CDOs are spearheading real-time data initiatives to improve their appeal to industries where timely decision-making is paramount.

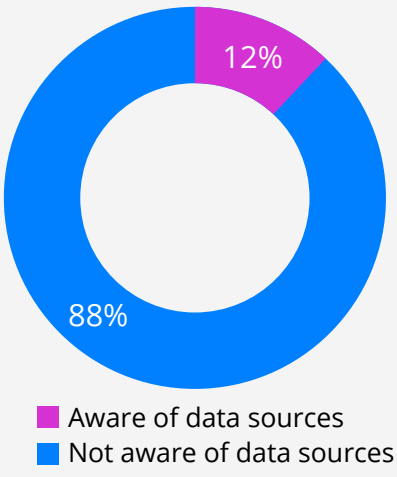
CDOs should proactively address the issue of data silos by integrating disparate data sources and encouraging collaboration across the organisation. Implementing advanced data management technologies, such as data virtualisation and cloud-based data warehouses, allows siloed data to be consolidated, improving accessibility and analytical capabilities. Essential to this effort is the establishment of comprehensive data governance policies that define clear data ownership, access controls, and quality standards. This approach tackles the challenges posed by siloed data and prepares the organisation for future data-driven opportunities, ensuring agility and a competitive advantage in the evolving digital arena.

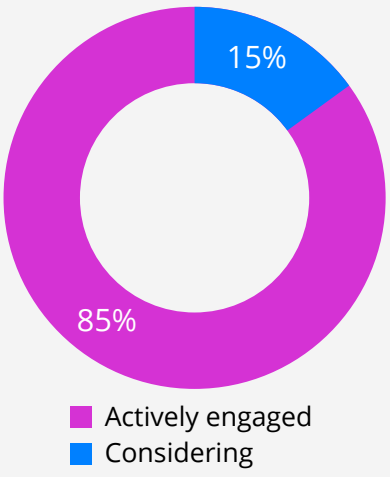
## Key data architecture insights

**88%** of CDOs are **not aware** of their **data source formats.**

**85%** of CDOs are **actively engaged** in **improving** their data architecture.

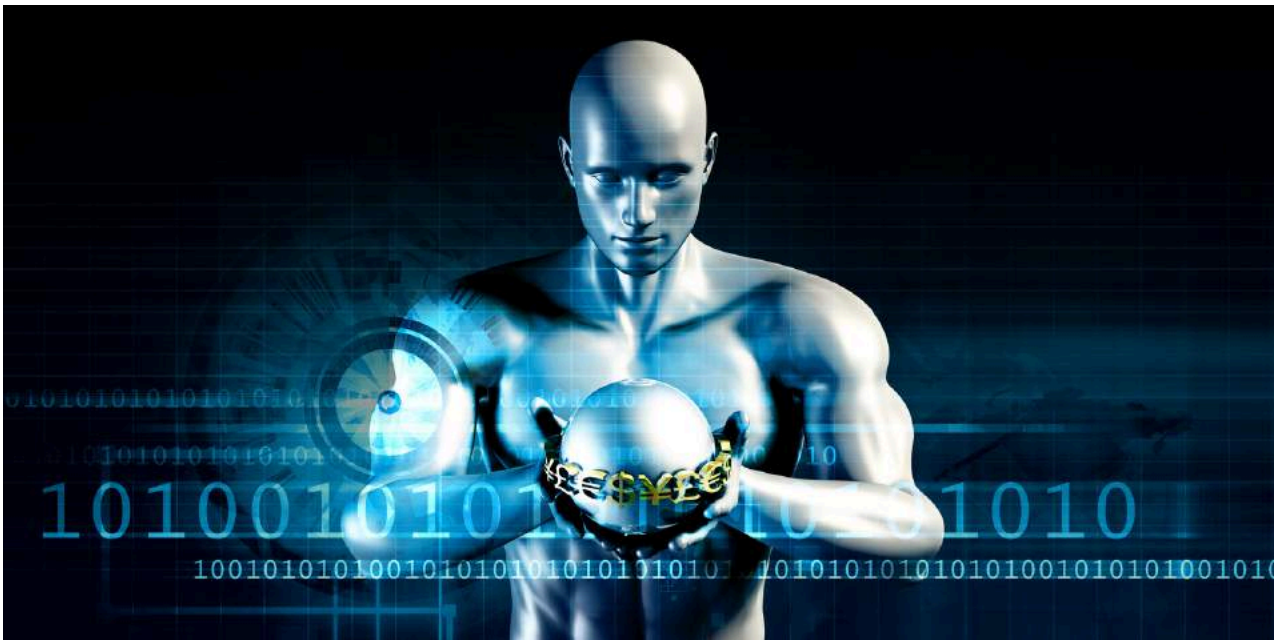
**100%** of CDOs **understand** the way their organisation **uses data.**



## Data architecture summary

- CDOs are guiding FS firms towards adaptable and dynamic data architectures in the evolving data management landscape.
- The main themes and observations underscore the increasing variety of data and the crucial need to integrate diverse data sources.
- CDOs emphasise staying at the forefront of technology adoption, often opting for external technology procurement to enhance capabilities quickly.
- Issues such as system interoperability, maintaining consistent standards, and overcoming data silos are acknowledged as central to future financial strategies.
- An envisioned future includes instant data access, cohesive platforms, and ready-made integrations.
- Leading CDOs address such challenges by favouring modular architectures, emphasising flexible frameworks, and focusing on real-time data integration for analytics.



# 3. Data quality and governance

Data governance is a crucial pillar in managing organisational data, ensuring accuracy, privacy, and security. This section outlines the importance of data governance, highlighting its role beyond regulatory compliance to enhance data quality and operational efficiency. With data privacy laws evolving and data's value as a strategic asset increasing, a robust data governance framework is vital for maintaining trust and integrity and unlocking valuable insights.

The data governance landscape is shifting towards integrated, intelligent systems capable of managing data across various platforms. CDOs are at the forefront, advocating for governance practices that are compliant and adaptable to future changes. This involves data classification, quality management, and lineage tracking strategies, ensuring data remains a reliable and secure resource. Effective data governance enables organisations to leverage their data entirely, supporting informed decision-making and fostering innovation.

## Data quality and governance themes and observations

### Data quality prioritisation

FS exhibits a value-driven strategy, acknowledging the intricate link between data quality and its significance in analytics. CDOs prioritise data quality efforts based on the value the data brings to business insights. This targeted approach efficiently allocates resources, resulting in higher data quality in specific areas where the insights are of greater importance. For example, the data quality for insights provided to your trading floor will be significantly better than the data used to track employees entering the building. CDOs strategically direct resources to enhance accuracy, completeness, and consistency, focusing on areas with the most profound impact on analytical outcomes. This ensures data quality challenges are addressed optimally, maximising overall value.

> "There are diminishing returns in trying to get to 100% DQ."
>
> ***Head of data and AI, global universal bank***

> "Business insights is the most valuable use case for data analytics."
>
> ***Global finance CDO, universal investment bank***

### Wider use of metadata

CDOs strategically utilise metadata to provide comprehensive insights into data characteristics, origins, and transformations. They are improving their understanding of data lineage to make informed decisions regarding data usage, quality, and compliance. Metadata acts as a catalyst, offering enhanced visibility of their data landscape by cataloguing diverse datasets. CDOs equip data stewards, analysts, and decision-makers with the necessary information to navigate complex data environments. Consequently, it creates a transparent, well-documented ecosystem, contributing to effective data governance.

> "Many people spend too much time on data management and data engineering, without having clearly defined their data usage requirements."
>
> ***Divisional head of data and analytics, global insurance broker***

### Greater transparency

A crucial theme in contemporary data governance is the drive towards greater transparency in data usage and processing. CDOs champion initiatives that open the black box of data operations, providing stakeholders with clear insights into how data is collected, processed, and utilised. This transparency instils trust and aligns with regulatory requirements, ensuring that data practices adhere to compliance standards. This also allows to improve accountability, allowing stakeholders to comprehend the data journey from source to insights.

> "Regulators have realised that data is the organisation's soft underbelly, and increasingly regulators are waking up and seeking the raw excel dataset as opposed to the traditional regulatory report."
>
> ***Global finance CDO, universal investment bank***

### Data ownership

Poorly defined data ownership detrimentally affects a company's ability to address data quality issues at their source. Ambiguity in ownership leads to situations where no one assumes responsibility for data quality problems, resulting in neglect, inaction, and a lack of accountability.

> "Engaging solely in activities at the top of the data pyramid, such as analytics and high-value endeavours, is akin to reaping the fruits of a poisoned tree. To establish a solid foundation, the focus should instead begin at the bottom of the pyramid, to prioritise the enhancement of high-quality data and robust data governance practices."
>
> ***Head of data governance, UK private bank***

> "When it comes to data ownership, people are much more comfortable to tell you what they use, not what they own, demonstrating the complexities surrounding data ownership."
>
> ***Head of data governance, UK private bank***

### Data completeness

The primary challenge in data quality is not the inherent quality of the data but the lack of data completeness. Incomplete data impedes accurate and meaningful analysis. Data gaps prevent a thorough understanding of a topic, making it difficult to draw reliable conclusions or make informed decisions.

### KPI inconsistencies

Although data owners commonly bear responsibility, consistent implementation is absent, leading to a lack of standardised Key Performance Indicators ('KPIs') for data quality. Standardised KPIs offer a benchmark for assessing data quality performance across different teams, projects, or business units. Without these standards and clear benchmarks, it is almost impossible to clearly identify best practices and areas that require improvement.

> "Data management KPIs are focused on data quality. KPIs that help identify the value of data need to evolve over time, to facilitate Data leaders weave effective and understandable business cases."
>
> ***Chief data officer, global investment bank***

## Data quality and governance challenges

### Poor data quality

Our study found that CDOs consistently highlighted maintaining high data quality across vast and varied datasets as a significant problem. The challenge of ensuring data accuracy, consistency, and reliability in real-time becomes more pronounced with the increase in data volume and variety. CDOs pointed to the integration issues with legacy systems and disparate data sources as critical contributors to data inconsistencies and errors. The need for robust data quality management processes and standards was emphasised as critical for mitigating these risks and ensuring data's reliability as an asset for decision-making.

> "Just because you input the data does not mean you are the owner. The right data owners are the people who care and understand most about that data across the entire organisation."
>
> ***Chief data officer, global commercial bank***

### Lack of data governance

Furthermore, our research revealed that embedding data governance into organisational culture presents a notable challenge, as reported by CDOs. Achieving widespread adherence to data governance policies and procedures often meets resistance, requiring shifts in behaviour and practices across departments. CDOs in our study stressed the importance of fostering an environment where data governance is regarded as a collective responsibility, crucial for organisational success. This involves significant efforts in training, communication, and demonstrating the value of governance in enhancing data quality and ensuring compliance.

### Emerging technology

Additionally, CDOs identified the rapid pace of technological change as a continuous challenge to data governance frameworks. The adoption of emerging technologies such as artificial intelligence, machine learning, and the Internet of Things necessitates that data governance strategies be agile and forward-thinking. CDOs underscored the need to not only grasp the capabilities and risks of new technologies but also to revise governance policies to cover new data types, privacy issues, and ethical considerations. Balancing the drive for innovation with the imperatives of compliance and data protection remains a pivotal concern for CDOs navigating this dynamic environment.

## Data quality and governance in the future

### Data quality automation

The future of data management lies in the widespread adoption of automation tools designed for efficient data validation and cleansing.

These automated tools are critical prerequisites for identifying, rectifying, and preventing data quality issues and providing high-quality information for analytical insights. CDOs will need to remain at the forefront of integrating these tools in the future, continuing to improve consistency in their data quality efforts. Speeding up the data preparation phase and reducing the risk of manual error will remain a burning issue in the future.

> "The data governance of the future would have a directory for data much like we currently have directories for people today. The UI would need to be good enough for people who don't understand data, and the directory would make clear for all data catalogued not only who owns that data but also how that data can be used, including whether that data is of a sufficient quality to be used in decision making."
>
> ***Chief data officer, global commercial bank***

> "We turn out good data analytics, however we're not great on its governance."
>
> ***Head of data governance, UK private bank***

### Data lineage and metadata

CDOs will employ comprehensive data lineage to offer visibility into the data's journey, improving understanding and control. Concurrently, metadata will become an essential tool for describing and cataloguing data, ensuring correct use, contributing to strong governance practices in the future. This data lineage and metadata focus will drive future data quality initiatives designed to support effective governance and compliance. CDOs will strategically utilise these elements to increase transparency, accountability, and traceability in their future data ecosystems.

> "In the future I'd expect data to provide positive assurance, and all the controls, descriptions, and assurance to be embedded in the metadata, so that the data can self-describe."
>
> ***Global finance CDO, universal investment bank***

### Reduced manual oversight

A noticeable trend is moving towards more automated data quality checks, lessening the dependence on sizeable manual oversight teams. This will continue as automation becomes an even more pivotal force in conducting routine data quality validations and inevitably freeing future resources to focus on more complex and value-added tasks. Led by CDOs, this move towards automation will significantly improve the speed and scalability of data validation processes, allowing for rapid and accurate identification of discrepancies or anomalies in large data sets, which is currently a consistent pain point in the industry.

## Achieving the future of data quality and governance today

### Employing AI

CDOs can harness modern AI capabilities to enhance human data quality evaluations. AI algorithms can analyse vast datasets, identifying patterns and anomalies more swiftly and broadly than ever. Using AI for data quality can provide a more thorough and precise assessment, minimising the chance of missing subtle discrepancies. Additionally, AI can be tactically deployed to bolster human expertise. Automating mundane tasks will enable your data team to focus on complex data quality management aspects. This symbiotic strategy can significantly boost the performance of your data quality department.

### Cross-functional committees

CDOs should drive collaborative governance models, initiating the adoption of cross-functional committees to unite experts from various departments. These committees can collaboratively address data quality challenges, ensuring data governance strategies align.

## Key data quality and governance insights

**10%** of CDOs are **unaware** of their organisation's **underlying data quality**


**92%** of CDOs report their **data quality is good or better** for their key data


**Nearly half** of the CDOs interviewed **do not have** direct **visibility** over their **data controls**

**83%** of CDOs are looking to use **new data storage** processes **to improve data**

## Data quality and governance summary

- CDOs view data as a valuable asset and lead in establishing best practices for its quality enhancement.
- They emphasise focused data quality improvement efforts and comprehensive use of metadata for effective governance.
- Challenges such as data ownership and completeness are recognised.
- A future vision includes widespread implementation of data quality automation and diminished manual intervention through AI integration.

# 4. Data analytics and ethics

The intersection of data analytics and ethics is becoming increasingly critical for organisations navigating the digital age. CDOs acknowledge the immense potential of data analytics in driving strategic decisions and operational efficiencies. However, they also highlight the ethical dilemmas arising from data collection, analysis, and use. The responsibility to ensure that data analytics practices do not infringe on individual privacy rights or perpetuate biases is a significant concern. Ethical data usage, safeguarding privacy, and ensuring transparency in how data is collected and analysed are emerging as foundational principles that guide the deployment of analytics strategies.

Moreover, our study reveals that CDOs are proactively seeking to embed ethical considerations into their data analytics frameworks. There is a clear recognition of the need for ethical guidelines that can steer the application of analytics and artificial intelligence in a manner that respects individual rights and promotes fairness. Developing these guidelines involves a complex balancing act between leveraging data for competitive advantage and adhering to ethical standards. CDOs emphasise the importance of establishing robust governance structures that include ethical oversight, ensuring data analytics practices align with broader societal values and organisational integrity.

## Data analytics and ethics themes and observations

### Emerging ethics focus

Data ethics comprehension and integration are in their nascent stages. As data analytics increasingly impacts decision-making with real-world impacts, FS firms are confronting the ethical aspects of their data practices. Ethical consideration ensures data is used responsibly and transparently. This emerging focus on ethics involves tackling issues in data collection, processing, and analysis. FS firms are starting to acknowledge the significance of ethical considerations in developing responsible data practices and reducing potential risks.

> "There's an question over whether we need to refresh our data ethics after the new wave of generative AI, in part linked to the lower barrier to using AI."
>
> ***Head of data and AI, global universal bank***

> "Data ethics isn't just about training the models to remove biases, but also educating people on that data's inherent limitations."
>
> ***Chief data officer, specialist UK bank***

### Hub and spoke model

A hub and spoke model is an optimal approach for analytics oversight, striking a balance between centralisation and decentralisation. A central hub manages data governance, strategy, and coordination, while decentralised spokes align with specific business functions. This model ensures strategic oversight and business-centric execution, tailoring analytics solutions to specific needs. It fosters collaboration between central governance and business units, optimising data use for strategic decision-making.

> "The right model for data analytics is a hub and spoke model. If you only centralise you then lose business knowledge, and equally if have only federate to the businesses, they then don't have the scale and knowledge to do all that is needed."
>
> ***Data innovation lead, global investment manager***

### Broad ethical considerations

In FS, data ethics encompasses more than privacy, including aspects often not considered like fairness in decision-making algorithms and data selection. It challenges the premises of data collection and its use in decisions affecting individuals and communities. FS examine algorithmic fairness to reduce biases to achieve transparency and fairness albeit in a rather unrobust way. Ethical considerations also cover careful data selection, using reputable, unbiased sources that meet ethical guidelines to avoid causing harm or discrimination.

## Data analytical and ethical challenges

### Analytics immaturity

A significant challenge is the overall analytics maturity within FS. Most are still at an initial stage, focusing on diagnostic and descriptive analytics. Although passive dashboards are common, the progression towards more complex analytics, such as predictive and prescriptive analytics, remains in its infancy. The absence of advanced analytical capabilities restricts FS from deriving deeper insights and value from their data, limiting their progression beyond historical analysis to more advanced, forward-looking analytics that could enhance strategic decision-making.

> "Everyone wants to jump onto using prescriptive analytics, yet we're still faced with the 'why invest in data management'?"
>
> ***Chief data officer, specialist UK bank***

### Data dependency

The effectiveness of analytics greatly depends on the quality and availability of data. FS encounter obstacles with disparate data sources, inconsistent data quality, and data silos. These issues often stem from the underlying data architecture and ownership structures. Maintaining data quality, accuracy, and accessibility presents continual challenges. Poor data governance practices can result in unreliable insights, undermining confidence in analytics-driven decisions. FS must implement strong data governance frameworks to overcome these obstacles and lay the groundwork for ethical analytics.

### Subjective ethics

Data ethics is inherently subjective and constantly evolving. What is deemed ethical today may not align with evolving societal norms and expectations tomorrow. This dynamic nature makes it challenging for FS to establish concrete ethical guidelines that stand the test of time. The interpretation of ethical principles can vary across stakeholders, adding complexity to ethical decision-making. Balancing competing interests, perspectives, and interpretations requires a nuanced approach to apply ethical considerations across analytics practices consistently.

> "On data ethics, different things will be appropriate to different business areas. So the decision making on data ethics could align well with the data owner model. However we're not yet at this stage in maturity."
>
> ***Data innovation lead, global investment manager***

> "Data ethics is a difficult topic to address. Not only as data ethics is subjective, but also as the view on what is ethical changes."
>
> ***Global finance CDO, universal investment bank***

## Data analytics and ethics in the future

### Advanced analytics

Advanced analytics will continue its strong positive trend, signalled by the current shift towards a broader adoption of predictive and prescriptive analytics in the FS sector. Advancing beyond traditional descriptive analytics, FS will employ predictive models to forecast trends and utilise prescriptive analytics to recommend the best action. This strategic progression will enable businesses to craft proactive strategies based on foresight, moving from reactive to proactive responses and gaining a more competitive advantage through informed predictions and advice. Such advancements will herald a new era in FS, where data-driven decision-making becomes even more nuanced and forward-looking - empowering organisations to navigate future challenges and opportunities with greater confidence.

### Self-serve and real-time analytics

Moreover, the future of FS anticipates the advent of self-serve, real-time analytics. Underpinned by a robust data infrastructure and comprehensive training. This democratisation of data will allow business users to independently access, analyse, and understand data, diminishing the dependency on specialised teams. Real-time analytics will be essential for quick decision-making in dynamic market environments. Self-serve features promote flexibility in addressing new opportunities and obstacles, marking a shift towards greater autonomy and agility in data analysis and interpretation within FS. This trend is set to revolutionise how data is used within organisations, making it more accessible and actionable for all levels of decision-makers.

### Embedded ethics

A core pillar of the future vision entails embedding ethics into every aspect of data processes. The industry will prioritise the integration of ethical considerations from data collection through to analysis and interpretation. This approach ensures ethical principles will soon be embedded in all end-to-end data processes. The future landscape will highlight a proactive "ethics by design" approach. It is incorporating ethical considerations into the design and execution of data systems, algorithms, and decision-making processes. It symbolises a continued dedication to responsible data practices, transparency, and reducing potential biases in the future. FS is committed to better ethical practices, recognising the importance of trust and integrity in the future. Building sustainable, customer-centric data strategies to respect privacy promoting fairness.

## Achieving the future of data analytics and ethics today

### Analytics centre of excellence (CoE)

Innovative CDOs are instigating a paradigm shift by centralising analytics workflows by establishing CoEs. These serve as hubs for consolidating expertise and encouraging collaboration among data experts. By leading the promotion of analytics within CoEs, sharing best practices, and advocating for a unified approach, CDOs are strategically streamlining analytics process improvements and preparing for the future. This strategy facilitates efficient data processing, analysis, and the sharing of insight knowledge. This will immediately enhance resource efficiency and boost collaboration. CDOs should move towards more integrated and coherent data management practices to maximise the value derived from data analytics.

> "When it comes to data analytics the CDO should be creating a centre of excellence (CoE), which provides a central capacity to support departments that do not have either the skills or the leadership to drive the effective use of data analytics."
>
> ***Chief data officer, global commercial bank***

### Sound data foundations

Furthermore, CDOs should continue to emphasise the importance of solid data foundations. This foundational work is the cornerstone for effective data analytics. Ensuring new analytics initiatives are grounded in reliable and secure data, by considering data governance a critical support structure for analytics efforts. CDOs should implement strong governance models to address data quality, metadata management, and data lineage. This approach to strong data foundations will achieve high-quality analytical outcomes. CDOs should make targeted efforts to drive these initiatives forward.

### Growing ethics emphasis

Prominent CDOs are leading a shift towards prioritising ethics in data management. Actively addressing the evolving ethical challenges, these leaders integrate ethical considerations throughout the data lifecycle, from collection to analysis. CDOs should spearhead initiatives to identify and counter potential ethical risks in data analytics, committing to ensuring fairness in algorithms, transparency in decision-making processes, and ethical compliance. CDOs should focus on ethics to foster trust in data-driven decisions and advertise their commitment to responsible data practices, representing themselves as forward-thinking. Thus, displaying that they understand data ethics is not only for compliance but also integral to building trust and credibility in data analytics.

> "Data ethics is broader than a focus on direct access and private data risk. Organisations also need to consider whether they are presenting data insights in a way that makes the decision less fair."
>
> ***Chief data officer, global commercial bank***

## Data analytics and ethics insights

On average, CDOs think they could use their **data analytics twice as effectively** as they do now

**<5%** | **of CDOs have put data ethics measures in place when using AI-powered solutions**

**50%** | **CDOs believe they are achieving about 50% of the maximum potential offered by data analytics**

## Data analytics and ethics summary

- CDOs advocate for advanced analytics while navigating ethical implications.
- A hub and spoke model addresses a growing emphasis on ethical considerations.
- Challenges like analytics immaturity and data dependency are acknowledged.
- The future vision includes embracing advanced analytics and enabling self-serve real-time analytics while fundamentally incorporating ethics into all data processes.
- Leading CDOs establish CoEs, focus on robust data foundations, and enhance ethical considerations.
- The statistics provided reflect CDOs' insight into their firms' data landscapes and recognition of opportunities presented by advanced data analytics.
- Overall, CDOs' proactive approaches and strategic initiatives signal their intent to actively direct data management towards seamless integration of advanced analytics and ethical considerations, setting the stage for a data-driven and ethically responsible financial future.

# 5. AI and automation

By combining AIs promises with automation's efficiency, CDOs are driving an FS revolution. Notwithstanding challenges in knowledge gaps and evolving AI perceptions amid the noticeable heightened senior-level enthusiasm. Emerging trends include leveraging the potential of written data, accelerating automation with new AI tools, and AI collaboration. The hub and spoke model and the emerging frontier model promote decentralised yet coordinated AI innovation. CDOs lead strategic AI exploration, aligning C-suite expectations and are investing in new training initiatives.

As the financial services sector evolves, CDOs continue to harness the synergy between AI and automation, redefining customer experiences and operational efficiency. This transformation is particularly evident in the personalisation of FS, where AI-driven insights are used to tailor products and services to individual customer needs, enhancing customer satisfaction and loyalty. Moreover, risk management has seen substantial advancements, with predictive analytics enabling more accurate forecasting of financial risks and fraudulent activities.

AI and automation technologies are on the rise in the realm of compliance, aiming not only to streamline compliance procedures but also to bolster the sector's defences against evolving threats. The integration of AI with blockchain is beginning to offer unprecedented levels of transparency and security. As the industry navigates this digital transformation, CDOs must continue fostering a culture that embraces change, ensuring their organisations remain agile in the face of technological advancements and competitive pressures. This entails investing in cutting-edge technologies and cultivating a workforce adept at leveraging these tools. Further underscoring the critical role CDOs play in ongoing education and cross-disciplinary collaboration in sustaining innovation and growth in the FS sector.

## AI and automation themes and observations

### Integration with business processes

The allure of advanced analytics, predictive capabilities, and operational efficiencies has fuelled interest in utilising AI to revolutionise business processes. However, the reality of AI implementation often falls short of expectations, remaining nascent due to complexities such as data quality, integration challenges, and the need for specialised talent. Many organisations within FS are still navigating the learning curve, experimenting with various applications, refining their strategies to match AI's promising prospects better. This situation reflects a common challenge across the industry: the gap between the potential of AI technologies and the practical difficulties of integrating them into existing business processes.

### Importance of text data

Text data, scattered across different sources, holds valuable insights into customer sentiments, market trends, and internal operations, yet it remains largely untapped. Acknowledging the importance of this data broadens the scope of AI applications, presenting opportunities for significant competitive advantages. Utilising textual information can be particularly impactful for sentiment analysis, customer feedback interpretation, and trend forecasting. As a result, FS organisations are increasingly investing in text mining and natural language processing techniques to derive actionable insights from this underexploited data source. Thus, exemplifying a strategic shift towards more comprehensive and informed data analysis practices.

### Advanced AI tools

The emergence of advanced AI tools and enhanced machine learning capabilities has significantly fast-tracked automation in the sector, automating tasks at unprecedented scales and speeds. These tools are promoting a culture of innovation and inclusivity by empowering diverse teams to engage with and benefit from AI's transformative impact. The accelerated pace of automation boosts operational efficiency while opening new avenues for strategic thought and creativity. This advancement signifies a critical evolution in the FS sector, where the integration of AI-driven automation is becoming a key driver of both efficiency and innovation.

> "Automation efforts need to shift from 'how do I automate this task like for like' to "if automating how would I re-design this process front to end."
>
> ***Chief data officer, global commercial bank***

> "The buildings we now sit in are the "factories of the past". Automation and improved data transformation is important in delivering a smaller but more value-add organisation."
>
> ***Global finance CDO, universal investment bank***

> "Tools like ChatGPT demonstrate potential, but we need to understand the data security implications first."
>
> ***Global finance CDO, universal investment bank***

> "The key barriers to automation are culture, legacy systems and technical debt."
>
> C***hief data officer, specialist UK bank***

> "One of the most valuable AI use cases is in operationalising the smaller things, such as moving unstructured data to structured data."
>
> ***Chief data officer, specialist UK bank***

## AI and automation challenges

### Lack of specialised talent

The enthusiasm for AI in the FS sector often overlooks the critical shortage of specialised talent necessary for spearheading successful implementation projects. The scarcity of professionals adept in AI and machine learning ('ML') presents a significant barrier to innovation. FS organisations struggle to recruit, train, and retain specialised talent capable of managing the complexities of AI implementation. Moreover, there is an underlying assumption that automation will inherently boost operational efficiency, without a corresponding acknowledgement of the need for workforce reskilling. This gap in knowledge and skills underscores the challenge FS faces in realising the full potential of AI technologies, highlighting the need for a strategic approach to talent development and management.

### Emerging technology

AI development's swift and exponential progression poses a continuous challenge for FS organisations aiming to keep their AI systems cutting-edge and performing optimally. Staying abreast of the latest advancements in AI is crucial, demanding ongoing learning, adaptation, and investment in research and development. The exponential pace of growth can be daunting, as it requires FS organisations to keep up with rapid technological changes and foresee and prepare for future innovations. This dynamic environment necessitates a proactive and agile technology management approach, ensuring FS organisations can leverage AI advancements to maintain competitive advantages.

> "A limiting factor for data innovation is meeting data security, where the default is to not try anything new. For example, ideally, we want to be trialling different use cases for Chat GPT, but it's difficult to get approval from a security perspective."
>
> ***Data innovation lead, global investment manager***

### AI misconceptions

Another prevailing challenge within the FS sector is the inclination to view AI as conventional software, leading to misconceptions about its deployment and management. Unlike traditional software applications that are static, AI systems are dynamic, continuously learning and adapting to new data. This fundamental difference means that AI cannot simply be coded, deployed, and left to operate without further intervention. Dispelling these misconceptions is essential for aligning expectations with the actual capabilities and limitations of AI and automation technologies. Understanding the unique nature of AI systems is critical for leveraging their potential effectively, necessitating a shift in perception and approach towards AI integration and management in the FS sector.

## The future of AI and automation

### AI misconceptions

FS organisations will continue developing a collaborative AI ecosystem.

Seamlessly integrating AI tools into existing workflows, providing intuitive interfaces for ease of use, and encouraging an ethos of continuous learning among employees. Training programmes specifically designed to enhance employees' AI competencies will create a more robust culture of continuous education. Thereby preparing the workforce to navigate the evolving technological landscape confidently. AI integration within workflows not only boosts productivity but will also allow teams of the future to concentrate on tackling more complex issues, speeding up task completion rates without sacrificing the quality of outcomes. This shift towards a collaborative AI ecosystem signifies a transformative approach in the sector, enabling a more efficient, innovative, and agile working environment.

### 'Hub and spoke' model

Looking to the future, the implementation of a 'Hub and spoke' model is anticipated to further revolutionise AI adoption in the FS sector. In this model, designated AI champions act as central hubs, taking on the strategic role of identifying and assessing new AI applications. These champions will collaborate with a decentralised network of spokes spread across various business functions, facilitating a comprehensive evaluation of AI applications. CDOs should establish the necessary controls and frameworks before adopting these technologies on a broader organisational scale. The 'Hub and Spoke' model promises to enhance the strategic deployment of AI, ensuring that innovative technologies are integrated effectively and responsibly across the enterprise.

### The frontier model

The frontier model was identified as a critical element of future strategies. This innovative model will leverage pre-built data controls and integrate proprietary company data to enhance efficiency, standardisation, and data management practices. The 'Frontier Model' is positioned at the forefront of innovation in the dynamic data landscape, ready to leverage the latest technological advancements to drive growth and competitive advantage. This approach underscores the importance of advanced data management strategies in the future. Harnessing the full potential of AI and related technologies marks a significant step towards future-ready, data-driven organisations.

## Achieving the future of AI and automation today

### Further AI exploration

CDOs are at the forefront of AI exploration in the financial sector, leading strategic experiments with AI to uncover new applications and opportunities. They should launch pilot projects and proofs of concept to evaluate the feasibility and impact of AI technologies. Identifying innovative AI applications can propel the sector forward. CDOs should adopt a balanced approach to embracing AI's potential, conscientiously navigating its complexities and challenges, and ensuring that innovation does not come at the cost of ethical considerations or data integrity.

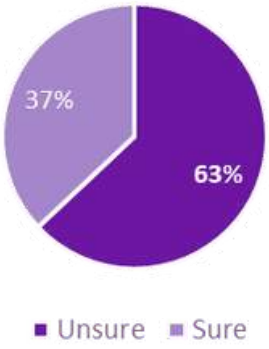
> "How do you put guardrails around AI, so it meets your use cases, such as maintaining consistency in regulatory reports, etc."
>
> ***Global finance CDO, universal investment bank***

CDOs should continue bridging the gap between the expectations of C-suite leaders and the realities of AI, translating technical complexities into strategic business insights. Unifying understanding and alignment on AI initiatives across leadership teams will accelerate successful AI integration in modern workflows. CDOs should promote AI literacy among C-suite executives through workshops, seminars, and informative resources. Thus, enabling them to make informed decisions on AI adoption. This effort cannot be understated, as the importance of clear communication and education will drive the successful integration of AI technologies within strategic business frameworks. Continued commitment to training initiatives designed to develop a workforce proficient in AI can unlock the potential of AI today. These initiatives should encompass the basics, best practices, and risk management components of AI, with the goal of equipping employees to leverage AI technologies responsibly. By fostering a culture of awareness and accountability, these training programs will empower employees to make positive contributions to their organisations' AI endeavours, thereby accelerating growth in this field.

> "The volume of data used for training an AI influences whether it's used for decision making. Without sufficiently high volumes of data, AI should not make decisions and only be used in a recommendation capacity."
>
> ***Chief data officer, global commercial bank***

## Key AI and automation insights


CDOs believe they **can/should automate over** **85%** of the current data processes




**63%** of CDOs are **unsure** which data processes they should **automate first**

**79%** of CDOs are **unaware** of which data related **processes are already automated**

## AI and automation summary

- Senior-level excitement for AI and machine learning sets a promising scene.
- The practical application of AI and machine learning is in its infancy, revealing complexity in meeting high expectations.
- Untapped text data has the potential to broaden AI applications and offer valuable insights.
- The introduction of advanced AI tools is speeding up and democratising automation.
- Gaps in knowledge and skills remain key obstacles to realising AI's full potential.
- Firms strive to stay updated, challenge misconceptions, and foster a collaborative approach to AI.
- Initiatives in FS range from complete business automation to targeted modernisation and forming dedicated teams for cybersecurity.
- This reflects a commitment to agility and resilience in navigating a complex environment.

# 6. Core technology and infrastructure

In the landscape of core technologies that are shaping modern organisations, cloud computing emerges as a fundamental pillar. Its importance lies in providing businesses with the agility, scalability, and efficiency required in today's digital era, enabling a more flexible approach to remote and hybrid working models. The cloud's ability to offer on-demand computational resources reduces the necessity for significant upfront investments in infrastructure, paving the way for more innovative and responsive operational strategies.

Beyond cloud computing, technologies like blockchain and the internet of things (IoT) are at the forefront of digital transformation. Blockchain is revolutionising secure, transparent, and decentralised data management across various sectors, extending its influence beyond the realm of cryptocurrencies. Concurrently, IoT is expanding digital connectivity, embedding intelligence into daily objects, and allowing for the collection and analysis of data like never before. These advancements not only enhance operational efficiency and customer experiences but also foster the development of new business models, marking a shift towards a future where digital and physical worlds increasingly intersect, offering rich opportunities for innovation.

## Core technology and infrastructure themes and observations

### Phasing out old legacy systems

The drive for ongoing modernisation in FS focuses on phasing out outdated legacy systems. This move was motivated by the high maintenance costs and scalability limitations associated with these systems. Adopting agile development methodologies is pivotal in facilitating the breakdown of monolithic structures into more manageable modular components. Targeted modernisation efforts that do not necessitate complete system overhauls provide a more efficient and less disruptive path to updating IT infrastructure. However, challenges such as migrating critical data from old to new systems necessitate the implementation of robust risk and change management strategies to ensure a smooth transition and maintain data integrity and security.

> "Most systems today have gone through a level of aggregation that does not facilitate the granular transaction level of detail that is now needed. As a result, reporting infrastructure needs to be revised to meet these granular requirements."
>
> ***Chief data officer, global commercial bank***

### Collaboration of systems

Modernisation is the focus of integration. This emphasis includes the utilisation of built-in connectors. Ensuring smooth communication across various applications aids application programming interfaces (APIs). It is crucial for efficient collaboration between systems. The emergence of low-code and no-code platforms represents a significant advancement in this area, empowering business users to actively participate in integration efforts. The democratisation of technology enhances collaboration and adaptability, enabling organisations to respond more swiftly to changing market demands and opportunities.

### Expansion of cloud

Cloud maturity is a pivotal theme in the FS sector, with firms expanding their use of cloud services from infrastructure as a service (IaaS) to software as a service (SaaS). This adoption provides a versatile and scalable foundation for innovation, allowing rapid deployment of new services and efficient data processing and analysis. The cloud's scalability supports dynamic resource adjustment, enhancing operational efficiency and cost-effectiveness. As FS firms progress in their digital transformation, leveraging cloud services is crucial for achieving business agility, customer satisfaction, and a competitive edge.

> "Cloud provides a lot of scalabilities. You are no longer limited by your own on-prem server capacity and only pay for surge capacity when used."
>
> ***Chief data officer, global investment bank***

## Core technology and infrastructure challenges

### Modular approach to transition from legacy systems

Transitioning from outdated, expensive legacy systems to modern, agile alternatives is complex. Achieving such a transition necessitates a comprehensive approach that includes:

1. Strong risk management to anticipate and mitigate potential issues,
2. Effective change management to guide and support all stakeholders through the transition
3. The adoption of modular approaches to system updates.

These modular approaches allow for incremental updates that minimise operational disruption and provide a manageable and sustainable pathway to modernisation.

### Regulatory challenges

Regulatory challenges also pose a significant issue for FS firms adopting cloud technology. These include navigating concerns around concentration risk, which requires a careful balance between leveraging cloud technologies' advantages and adhering to regulatory requirements. A comprehensive understanding of data protection, privacy, and compliance standards is essential for aligning cloud computing strategies with regulatory expectations.

However, the transition from legacy systems to the cloud is challenging. Significant hurdles are navigating complex cloud-related regulatory issues and ensuring systems are future-ready.

Employing phased migrations and adopting multi-cloud strategies are effective measures for mitigating risks associated with cloud adoption. Additionally, scalable architectures are critical to accommodating the growing data needs of financial services firms, maximising the benefits of cloud computing while ensuring agility and compliance in a rapidly evolving digital landscape.

### Cloud adoption risks

Employing phased migrations and adopting multi-cloud strategies are effective measures for mitigating risks associated with cloud adoption. Additionally, scalable architectures are critical to accommodating the growing data needs of financial services firms, maximising the benefits of cloud computing while ensuring agility and compliance in a rapidly evolving digital landscape.

## The future of core technology and infrastructure

### Solid technology infrastructure

Technology infrastructure will be required to address growing demands in the future. This includes managing larger data volumes, improving process efficiency, and incorporating varied and new data types. Scalable infrastructures that accommodate technological progress and business expansion will be an ever-more pressing issue. Establishing a solid base for ongoing innovation and operational superiority will be at the forefront of CDO planning in the future.

### Cloud-centric strategy

In the future, FS data infrastructures will be more modular, scalable, and predominantly cloud-based, facilitating effortless updates and maintenance. The future cloud-centric strategy in FS will utilise a range of cloud services. By emphasising scalability, FS infrastructures will adapt better to changing market requirements and effectively cater to dynamic business needs. This approach will integrate innovative technologies smoothly and provide a sturdy platform for innovation.

### Core technology

Driven by the adoption of advanced technologies, FS will move towards more comprehensive core technologies. This vision of the future points towards a transformed FS landscape, where core technology will play an even more pivotal role in shaping business operations and strategies.

## Achieving the future of core technology and infrastructure today

### Scalability

The cornerstone of future-ready data infrastructure is scalability. As FS faces an exponential increase in data volumes, the infrastructure must be designed to handle growth seamlessly without compromising performance or efficiency. This necessitates the adoption of cloud-based solutions that offer elastic scalability - allowing resources to be dynamically adjusted based on real-time demands. Cloud environments also facilitate the deployment of advanced analytics and computational resources, enabling data processing and analysis at unprecedented scales.

### Interoperability

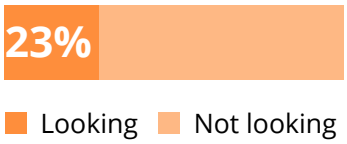
Interoperability is the second principle, ensuring diverse systems and applications within the FS ecosystem can communicate and exchange data effortlessly. A future-focused CDO will design data infrastructure with solid foundations in standardised APIs and data formats. Enabling seamless integration across different platforms, tools, and services enhances operational efficiency now and fosters innovation in the future.

### Advanced security measures

The data infrastructure of the future must incorporate advanced security measures, including encryption, access controls, and regular audits to protect against data breaches and cyber threats. CDOs should focus on the infrastructure's ability to adapt to changing regulatory requirements globally. Implementing a comprehensive data governance model today is essential for ensuring data is managed, stored, and processed per legal and regulatory standards now and in the future.

> "Data owners should be responsible for not only dealing with data issues but also bringing data opportunities to the table."
>
> ***Head of data strategy, UK building society***

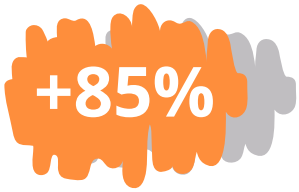
## Key core technology and infrastructure insights




only **23%** of CDOs are actively looking at **increasing the level of data controls automation**

**100%**

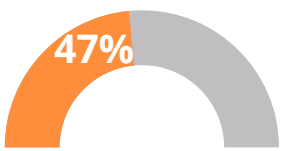
of those exploring automation agree it has a **significant role in the future**




of CDOS are currently **discussing cloud-based** data solutions

**82%**

**chance** data related processes will **migrate** to the **cloud in the future**




**AI** is only deployed in **47%** of its **identified use cases**

## Core technology and infrastructure summary

- Modernising legacy systems is a crucial focus for CDOs and their technology infrastructure.
- A priority aim is to best integrate innovative technologies and fully leverage cloud computing's potential.
- This transition involves moving away from outdated infrastructures to modular, scalable, and cloud-centric systems.
- It is not just about embracing new technology, but also reengineering business processes to optimise advancements.
- The shift towards digital strategies enhances both agility and innovation to meet market demands and regulatory requirements.
- The move towards future-proofing infrastructures reflects growing data demands and ensuring future flexibility.
- This reflects a careful balance of ambition and practicality in shifting from static systems to adaptable and efficient solutions and be capable of handling increasing complexity and volume of data.
- CDOs must stay current with digital trends and ensure their infrastructures can swiftly adapt to new challenges and opportunities.
- Prioritising these aspects guides technology development in financial services to remain ever competitive and innovative in a rapidly changing landscape.

# 7. Talent, culture, and ways of working ('TCWW')

A profound transformation is reshaping the role of data professionals, turning them into strategic decision-making partners. This shift requires a blend of technical skills and business insight, moving beyond traditional roles. Data professionals now serve as interpreters of insights, applying their comprehensive skills to strategic objectives.

The need for a culture of continuous learning is evident. Lifelong learning is crucial for data professionals to keep pace with constant innovation. The future is built on multidisciplinary teams, combining expertise from data science, business strategy, and technology. This collaboration is crucial to innovation, integrating varied skills to tackle challenges comprehensively and infuse data insights into the broader business strategy.

CDOs play a crucial role in guiding businesses through this transformation. They drive innovation, create spaces for experimentation, and champion a risk-taking culture. Their focus on hiring for adaptability and capability, rather than just skills, is pivotal in navigating the evolving data landscape.

## TCWW themes and observations

### Data professionals becoming strategic partners

Data professionals now blend technical skills with business savvy, evolving into strategic partners. They do more than analyse. They translate data insights into actionable business strategies, armed with a comprehensive skill set vital for success.

### Continuous learning

Continuous learning is imperative, not optional. Data professionals must commit to lifelong learning to stay abreast of rapid innovations. This commitment is critical for adapting to innovative technologies and methodologies, ensuring they can tackle challenges and capitalise on opportunities with agility.

### Multi disciplinary teams

The future is built on multidisciplinary teams, combining expertise across data science, business strategy, and technology. This collaboration unlocks innovation, enabling a holistic approach to complex challenges and ensuring data insights contribute to broader business objectives.

### Diversity

Emphasising diversity, the FS is moving towards more inclusive cultures. Diverse teams bring varied perspectives, enhancing innovation and problem-solving capabilities. FS are championing diversity, creating equal opportunities, and breaking down biases for a more inclusive work environment.

## TCWW challenges

### Internal resistance to change

Tackling internal resistance requires strategic communication and engaging employees in change initiatives. It is also essential to address fears and cultural shifts associated with data-driven changes. By emphasising the benefits of change for individuals and businesses, FS can mitigate resistance.

### Retention of skilled talent

In a competitive landscape, retaining skilled talent demands more than attractive salaries. Focus on professional growth, a positive work environment, and clear career progression. The dynamic nature of data technology necessitates ongoing learning opportunities, which are vital in retaining high-calibre talent.

### Rapid pace of advanced technology

The pace of technology, particularly in computational power, is advancing far more rapidly than previously observed, with some sectors experiencing a doubling in a matter of months. This swift progression challenges universities to design relevant degree programs amidst rapidly evolving technological landscapes. Consequently, the emphasis on continuous professional development has intensified, shifting the career paradigm from the traditional expectation of a job for life to a dynamic journey of lifelong learning. Adapting to and evolving with the latest technologies and methodologies has become essential for career sustainability in this fast-paced tech environment.

> "The value of a degree has become more diluted."
>
> ***Head of data strategy, UK building society***

## The future of TCWW

### Diverse skill set

Embracing a diverse skill set is paramount in the data-driven future. Teams combining technical, business, and creative talents are better equipped to enhance their problem-solving abilities and innovate. To support this diversity, FS will create clear career paths for various skills, ensuring that all specialisations are recognised and valued. Future FS firms will offer continuous training opportunities, such as cross-functional programmes and workshops, to enable employees to meet the industry's evolving needs. The future workforce will encompass a broad range of skills and perspectives.

> "I hope in the future professional data skillsets will become more prominent and increasingly embedded in the wider organisation."
>
> ***Head of data strategy, UK building society***

### Alignment of personal and organisational values

Beyond the technical skills, aligning personal and organisational values will be even more crucial. Cultivating a culture where individual goals reflect the organisation's mission will enhance commitment and imbue employees' work with a sense of purpose. This approach helps build a unified sense of purpose across the organisation, reinforcing the importance of shared values in achieving long-term success.

### Emphasis on soft skill set

The increasing complexity of the financial landscape places a premium on soft skills such as creativity, critical thinking, and adaptability in the future. Teams equipped with these abilities are better positioned to navigate uncertainties, cultivate innovation, and quickly adapt to changes in the market or regulatory environment. Soft skills are invaluable, driving value by enabling innovative solutions, informed decision-making, and flexible responses to new challenges. As the FS sector continues to evolve, fostering these skills will be essential for staying competitive and responsive to market demands.

## Achieving the future of TCWW today

### Collaborative work culture

Leading CDOs are at the forefront of cultivating a culture of self-driven innovation within the financial services (FS) sector. They inspire employees to explore, take calculated risks, and present innovative ideas, fostering an environment of continuous improvement and experimentation. This culture effectively breaks down departmental barriers, promoting cross-functional collaboration and embracing diverse viewpoints. By promoting agility, CDOs prepare their organisations to swiftly adapt to innovative technologies, market shifts, and internal transformations, ensuring that they remain competitive and responsive to the evolving business landscape.

## Innovation hubs

Prominent CDOs establish dedicated areas within their FS to support and nurture this innovative culture, known as innovation hubs. These hubs provide the necessary infrastructure, tools, and resources for teams to develop, prototype, and evaluate new ideas in a supportive environment. The operational model of these hubs is designed to encourage risk-taking and learning from both successes and setbacks, aligning innovative projects with the company's overarching strategic objectives. This approach not only stimulates creativity and experimentation but also aligns innovation efforts with the strategic goals of the organisation, maximising the impact of new initiatives.

## Continuous learning culture

Top CDOs also place a significant emphasis on recruiting for potential and flexibility, valuing these qualities alongside specific technical skills. Recognising the dynamic nature of the industry, they commit to the continuous development of their workforce. This commitment is evidenced through the provision of training sessions, workshops, and mentoring schemes designed to encourage skill enhancement and professional growth. By nurturing a culture of learning, CDOs drive curiosity and foster a proactive stance towards keeping up with industry trends and technological advancements. This focus on capability and continuous learning ensures that the organisation not only attracts but also retains talent capable of driving innovation and adapting to the rapid changes in the financial sector.

## Key TCWW insights

**12%**

of CDOs think that a **university degree** will be **critical** for a member of their future team

**100%**

of CDOs employ a **hybrid working** model

**All** CDOs believe their staff fully **will never fully return to the office**

## TCWW summary

- The future of data extends beyond technological advancement, heralding a significant shift in culture and collaboration.
- FS are evolving to accommodate increased responsibilities, champion continuous learning, and cultivate multidisciplinary teams.
- This requires a fusion of varied skills, lifelong learning, and teamwork to propel innovation in the data-centric world.
- Data professionals are expected to possess a comprehensive skill set marrying technical prowess with business insight.
- Lifelong learning is crucial for teams to stay abreast of a rapidly changing data environment.
- Multidisciplinary teams must be adept at devising holistic solutions and weaving data insights into business strategies.
- Diversity sparks innovation, with FS championing equality and inclusivity.
- Obstacles like cultural inertia and talent retention necessitate deliberate strategies.
- The envisioned future includes a culture enriched with diverse skills, shared objectives, and consistent upskilling.
- Chief data officers (CDOs) are at the forefront of nurturing an innovation-centric culture.
- Prioritise adaptability and collaborative spirit.
- The future of data signifies cultural metamorphosis, emphasising continuous learning, diversity, and collective effort.
- The essence of data's future lies in fostering a culture championing ongoing education, diversity, and teamwork.
- Empowers individuals and FS to fully leverage data's capabilities in the ever-changing landscape.

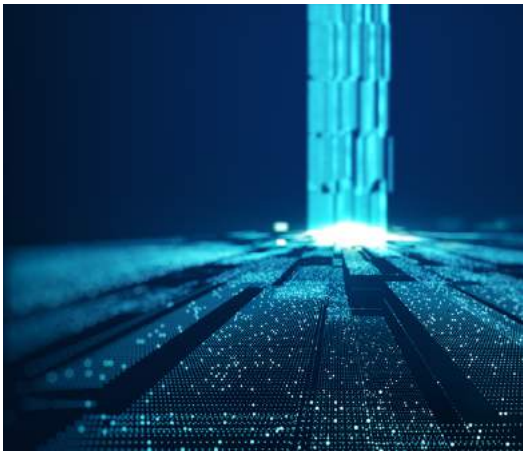
# 8. Conclusion

As we look towards the future, the role of CDOs is undeniably pivotal in steering organisations through the rapidly evolving digital landscape. CDOs have the unique opportunity to harness the convergence of data ethics, analytics, and architecture to foster an environment of innovation and trust. By embedding ethical considerations into the fabric of their data strategies, they ensure that the organisation adheres to regulatory standards and champions transparency and fairness in data usage. This ethical stance, coupled with a commitment to safeguarding privacy, positions organisations as trustworthy data stewards in the eyes of consumers and regulators alike, creating a solid foundation for sustainable growth.

The integration of advanced analytics into decision-making processes marks another frontier for CDOs to lead their organisations toward. By leveraging the power of data analytics, CDOs can unlock actionable insights, drive strategic initiatives, and offer personalised customer experiences that set their organisations apart. The key lies in adopting a forward-thinking approach to data architecture, ensuring that the infrastructure is not only robust and scalable but also agile enough to adapt to new technologies and market demands. This agility is crucial in a landscape where technological advancements and data volumes are expanding at an unprecedented pace.

Furthermore, the emphasis on core technologies and governance illustrates the dual focus required for CDOs to succeed: operational excellence and strategic foresight. Adopting cutting-edge technologies and frameworks allows CDOs to enhance efficiency and innovation, while a robust governance structure ensures data integrity and accessibility. By fostering a culture that values data-driven decision-making and cross-functional collaboration, CDOs can break down silos and promote a more integrated approach to data management.

Looking ahead, the future of CDO roles is bright, with vast opportunities for those ready to embrace the challenges and lead their organisations with agility and insight. By taking proactive steps in areas such as data ethics, analytics, architecture, and governance, CDOs can position their organisations to gain competitive advantages. This requires a mastery of data and technology and the vision to see beyond the horizon, anticipating changes and preparing the organisation to thrive in the dynamic digital era. Through their leadership, CDOs can transform challenges into opportunities, driving their organisations towards a future where data is not just an asset but a catalyst for innovation and growth.



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Bash drives change and innovation on behalf of the C-suite and senior management across the financial services industry. Bash spent the first half of his career leading teams in global multinational investment banks, followed by a delivering complex transformative change as a management consultant. Bash focuses on developing the strategy, design, implementation roadmap and transition plan for data management in complicated regulated financial services businesses. He is passionate about combining digital and cultural levers to allow the chief data office to develop data driven insights, predictive capabilities and real-time analysis that will benefit the entire organisation.


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David is a Retail and commercial banking consulting partner, specialising in digital transformation, data and innovation. David has working within financial services and consulting for over 25 years, working with some of the worlds most successful and dynamic brands. He has designed, built and managed multiple data innovation labs for large banking institutions to identify new use cases and business opportunities through data science and AI to generate new revenue, reduce costs and risk. He has additionally led the adoption of AI solutions for global firms within financial services, telco and technology. He has been at the forefront of many industry firsts and his work has been highly commended by both the Management Consultancy Association and the British Banking Authority for digital and customer innovation.


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