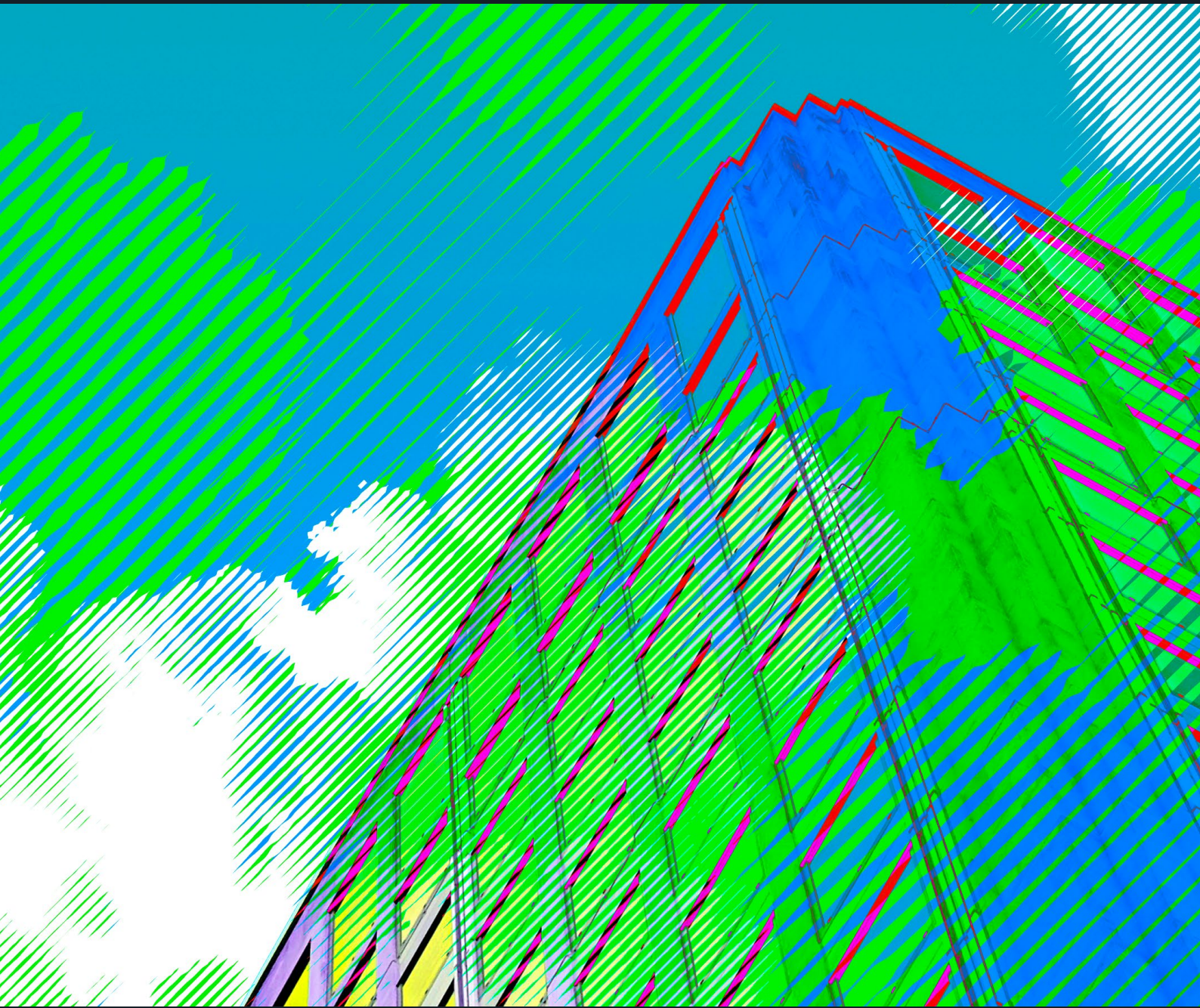


Cloud



in Financial Services

SECOND EDITION: AUGUST 2023



A report covering lessons learned from 1,200 cloud projects with financial institutions, along with a survey of more than 100 financial institutions in the EU, Switzerland, and the UK



Contents

Foreword	4
Acknowledgments	6
Authors	9
Introduction	12
Section 1	
Cloud adoption in financial services: progress since Q4/2021	16
The future remains cloud	18
Cloud's perceived benefits have changed	20
Financial institutions adopting the cloud continue to face challenges	23
Summing up	25
Section 2	
A cloud strategy enabling a business strategy	26
Ramifications of cloud implementation for financial institution strategy	28
The challenges of adopting cloud strategically	29
Aligning cloud strategy to business strategy	31
Summing Up	33
Section 3	
Cloud governance: a prerequisite for success	34
Cloud governance maturity in financial services	36

Maintaining a cybersecurity posture: automation is key	39
Risk management: bringing it all together with aggregation and operational resilience	40
Managing costs with FinOps: challenge or opportunity?	41
Cloud centre of excellence	43
Summing up	44
Section 4	
Cloud regulation: challenge and enabler	46
Primary concerns	48
Regulation of cloud service providers	52
Summing up	55
Section 5	
Enabling data capabilities	56
The maturity of enabling cloud data capabilities in financial services	58
Fortifying the unseen backbone: the less glamorous yet indispensable foundation	62
Unlocking business value, an outside-in approach	62
Summing up	63
Conclusion	64



Foreword

In a world shaped by rapid change and unprecedented challenges, cloud computing remains a steadfast driver of digital transformation across numerous industries. Nowhere is this more apparent than in the financial services industry where cloud adoption and digital innovation, fuelled by global shifts in consumer, employer and employee behaviour, find a thriving ally.

This year's publication builds on the previous report, diving deeper into how cloud computing is contributing to the financial services industry's digital evolution. The team of experts and thought leaders involved in the research brings extensive experience and knowledge to bear, offering insights and perspectives that are both informative and actionable.

At the European Banking Federation, we were delighted to collaborate closely with the authors of this insightful report. In particular, with Freddy Gielen, Executive Partner at Reply, Professor Nelson Phillips from the University of California, Santa Barbara, and Ian Haynes, Senior Adviser at Reply, along with colleagues at Insurance Europe, the European insurance and reinsurance federation.

The report covers topics and perspectives that speak to the challenges and opportunities facing financial institutions on their cloud journeys. From strategy and governance to technical implementation and innovation, the authors provide a comprehensive view of this dynamic and rapidly evolving landscape.

I'm confident this report will provide valuable insights and practical guidance to financial services business and technology leaders, as they navigate the opportunities and challenges of digital finance, and cloud's place in it. We look forward to continuing to explore the transformative power of cloud technology in the years to come.

I hope you find this report both informative and engaging.

Alexandra Maniati

Senior Director, Innovation & Cybersecurity
European Banking Federation



Acknowledgments

Our heartfelt appreciation goes to the industry experts and colleagues who volunteered their time and expertise to help shape this report.

We extend our deepest gratitude to the following for generously sharing their insightful perspectives:

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Their valuable contributions, along with the insights shared by numerous other senior executives in financial institutions and regulatory bodies, have profoundly enriched this report. We appreciate their willingness to take part, while respecting their anonymity.

We'd also like to extend our sincere appreciation to Reply's cloud experts, who have greatly enhanced discussions of the topics this report explores:

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- Vishwas Khanna, Avantage Reply, UK

As in the previous report, we've conducted this survey in close partnership with the European Banking Federation (EBF) and we're honoured Insurance Europe also took part in this year's edition. In particular, we'd like to acknowledge the significant contributions made by Alexandra Maniati, Anete Daukste, and Liga Semane of EBF, as well as Arthur Hilliard of Insurance Europe.

Our sincere appreciation also goes to the collaborative efforts of industry and academia, particularly Professor Markus Perkmann of Imperial College and Dr Cleo Silvestri, whose invaluable methodological contributions have enriched our study.

Lastly, our genuine thanks to the dedicated team at Reply who joined us on this meaningful journey. Their commitment, engaging discussions, and valuable expertise have greatly influenced both the report itself and the survey supporting it:

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- Tristan Sifantus, Airwalk Reply, UK
- Virginia Figuero, Reply, UK

We're deeply grateful to everyone who's helped with this report and the accompanying survey. Please note, the views and opinions expressed are strictly those of the authors and don't necessarily reflect the views of contributors or the position of their employers.

Authors



Freddy Gielen

Executive Partner, Reply

As Executive Partner (Financial Services), Freddy's dedicated to driving transformative change for Reply's financial services industry clients, harnessing the firm's robust technological and innovative foundations alongside its extensive industry expertise.

In 2006, Freddy co-founded Avantage Reply, a pan-European consultancy specialising in risk, compliance, and finance transformation in the financial services industry. Under his and his co-founders' leadership, Avantage Reply evolved from a London-based, four-person consultancy into an internationally acclaimed firm. It was acquired by Reply in 2011. Before co-founding Avantage Reply, Freddy spent five years at the World Bank Group in Washington, DC, focusing on financial sector regulation. Prior to that role, he held a senior management position at Ernst & Young in San Francisco, Salt Lake City, and Asia Pacific, marking a significant chapter in a journey that started at Arthur Andersen.



Ian Haynes

Senior Adviser,
Reply

Ian advises companies and organisations on cloud, DevOps and infrastructure architecture. He's the former Global Chief Technology Officer (CTO) for Cloud and DevOps at HSBC, where he led a transformative cloud-adoption initiative from 2018 to 2022. This role encompassed strategic partnerships with major public cloud providers, bolstering HSBC's operational capacities across Retail, Commercial, and Investment Banking globally.

Ian brings his extensive expertise to bear as a Senior Adviser, providing invaluable guidance to Reply teams and clients in the realms of cloud technology, DevOps practices, and infrastructure architecture.

Ian's influence extends beyond his HSBC tenure, having contributed as a member of the Google Cloud Platform (GCP) Customer Advisory Board and the AWS FSI Advisory Council. Before his pivotal cloud-focused roles at HSBC and Reply, Ian was Chief Infrastructure Architect for HSBC as well as its Head of Collaboration Technologies.

Ian has also played significant roles in technology at Credit Suisse and CS First Boston in both London and New York. His professional journey began at Logica Finance, where he contributed to the company's TIBCO market data practice.

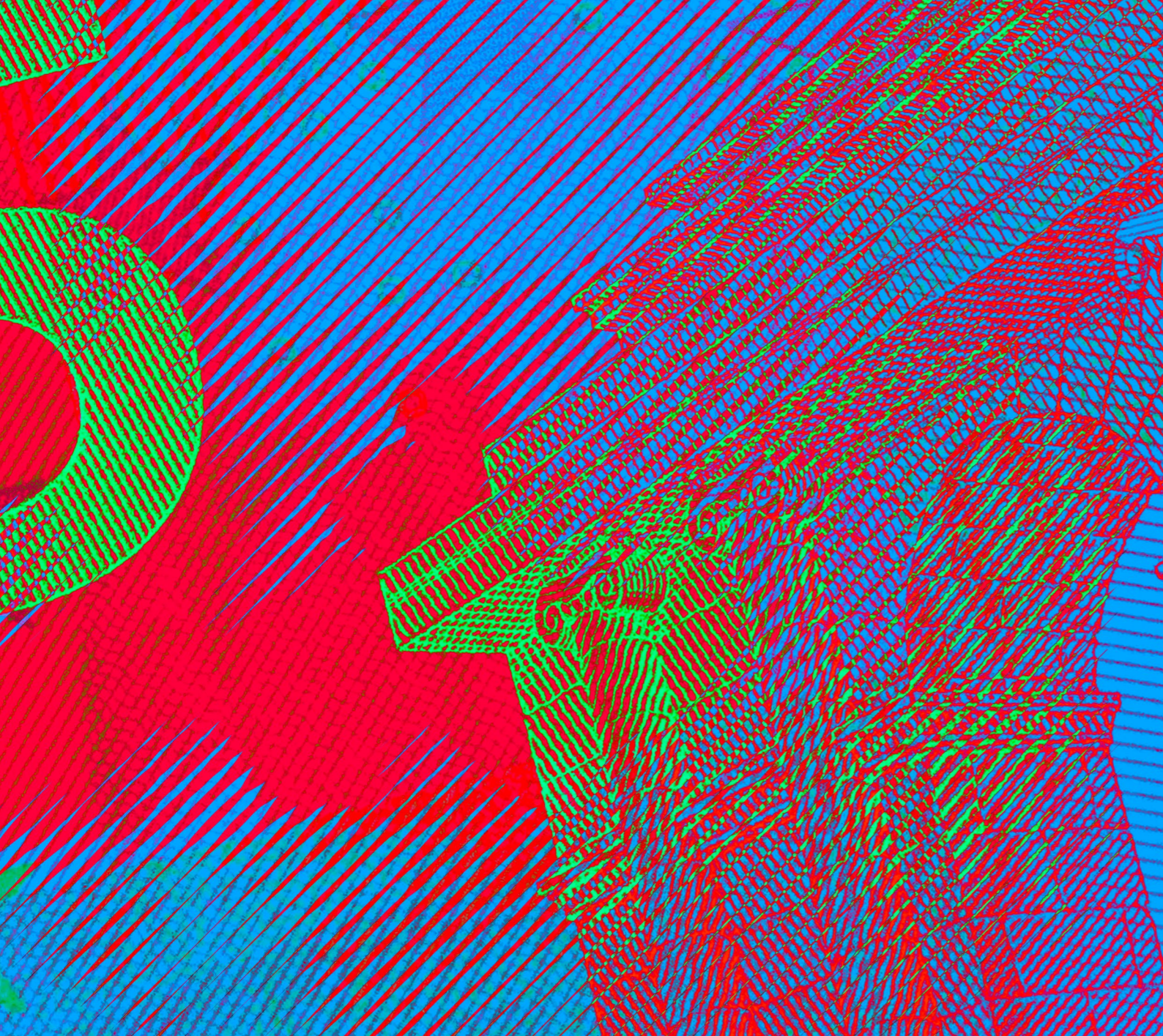


Professor Nelson Phillips

Professor of Technology Management,
University of California, Santa Barbara

Professor Phillips is currently Distinguished Professor of Technology Management at the University of California, Santa Barbara, and also serves as the Director of the Masters in Technology Management programme. Before joining the University of California, he was Professor of Innovation and Strategy, and Co-Director of the Centre for Responsible Leadership at Imperial College Business School and the Beckwith Professor of Management at the University of Cambridge.

Professor Phillips is recognised for his diverse research pursuits across strategy, innovation, and leadership, and his emphasis on the coming together of digital technology and human interactions, and is also currently Co-Editor of *Innovation: Management & Organization*.



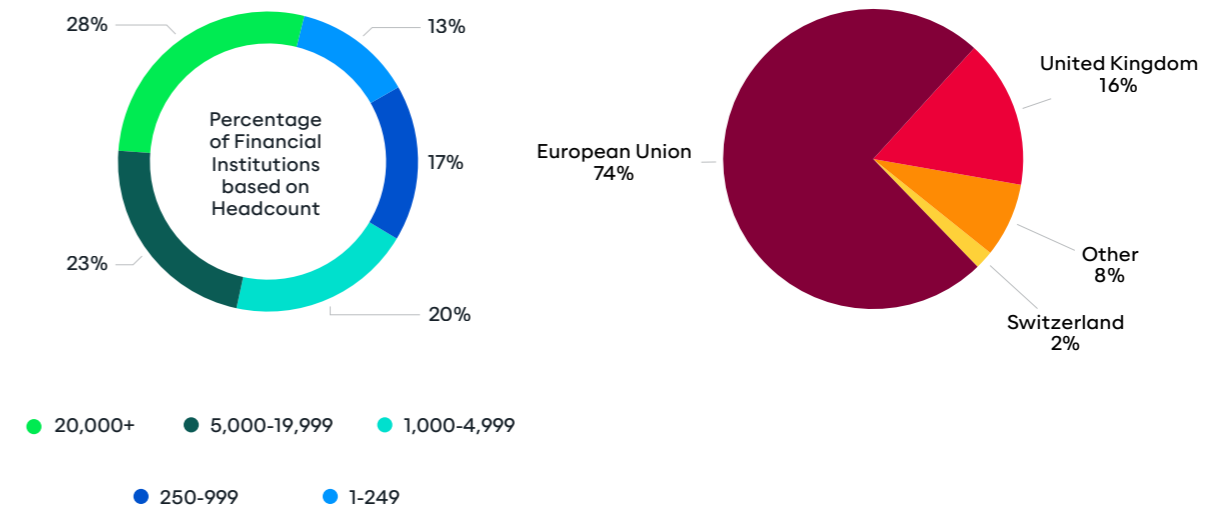
“Five years into our cloud adoption journey, we’re now able to run critical applications on the cloud. For example, our retail credit function currently operates on AWS, allowing us to leverage advanced data analytics capabilities. While we’re still in the process of upskilling and educating our teams on how to take full advantage of these new capabilities, we’re already seeing the benefits of cloud adoption. Initially, the catalyst for our transformation was an ‘end-of-life’ issue, but we’ve since realised the significant potential for our retail credit business strategy through cloud adoption. However, it took us five years to fully realise these benefits.”

Senior Business Executive, Large UK Bank, January 2023

We’re delighted to present the second edition of our report on Cloud in Financial Services. Building on the first edition, this year’s report delves deeper into the evolving landscape of cloud adoption to address the unique challenges and opportunities facing financial institutions in the EU, Switzerland, and the UK (the “Region”).

Survey demographics

Figure 1



Introduction



Undoubtedly, the pandemic accelerated digital transformation across organisations. The widespread shift to remote working has underscored the critical role cloud services played in enabling distributed, on-demand availability of data storage and computing. What was once a strategic choice is now a necessity, as organisations increasingly embrace a cloud-first approach to virtual organising.

Spearheading technological progress, financial institutions have long acknowledged the importance of adopting cloud technology. Nonetheless, most institutions in the Region now understand the imperative to see the cloud as more than a mere technical endeavour, and instead grasp its genuine potential to unleash transformative capabilities. This evolving mindset has echoed across the industry, with numerous financial institutions embracing the cloud as an integral cornerstone of their business strategies. As this report shows, this transition comes with challenges, especially for those shifting from a technology-driven cloud strategy to one centred on business imperatives.

Drawing on our experience in cloud projects spanning wide-ranging industries, including over 1,200 cloud projects delivered by Reply, we've grounded our insights in real-world observations and interviews with senior leaders in the field. We've also enriched our findings with a survey conducted between December 2022 and March 2023, under the methodological direction of professors from Imperial College Business School, London.

In the following pages, we'll provide a comparative analysis highlighting the changes since our first edition, before zooming in on four key areas:

- I. How a well-defined cloud strategy should align with the overall business strategy;
- II. The importance of robust cloud governance;
- III. The evolving landscape of cloud regulation; and
- IV. The transformative potential of leveraging cloud for new data capabilities.

To reacquaint yourself with fundamental cloud concepts (e.g., IaaS vs. PaaS vs. SaaS),¹ please revisit the first edition of the report.² This second edition assumes readers are familiar with these concepts.

¹ IaaS (Infrastructure-as-a-Service), PaaS (Platform-as-a-Service), and SaaS (Software-as-a-Service) are three cloud computing service models. Each provides varying levels of control and management of the underlying infrastructure and services.

² The first edition of the report is available at <https://www.reply.com/en/financial-services/cloud-adoption-in-financial-services>.

“We continue to assess outsourcing arrangements and an increasing number of proposals [by financial institutions] to move services to the cloud. As this work progresses, we’ll have a particular focus on firms’ exit strategies and their contingency planning for temporary and prolonged outages.”³

**Duncan Mackinnon, Executive Director for Supervisory Risk Specialist,
Prudential Regulation Authority, United Kingdom, May 2022**

Since our last edition in Q4/2021, cloud adoption in the financial services industry has changed significantly, challenging the previously held consensus. Although the 2019 *Future of Finance Review on the Outlook of the UK Financial System* suggested the “Bank [of England] should embrace cloud technologies,” the current discourse offers a more nuanced viewpoint. This is evident in the quote above and from recent initiatives from regulatory authorities. There’s a growing awareness of challenges associated with widespread cloud adoption in the financial services industry, shedding light on the potential risks and concerns.

It’s important to acknowledge that **while some financial institutions have achieved remarkable success in their cloud initiatives, a significant portion have yet to fulfil the business outcomes** initially promised by Cloud Service Providers (CSPs). This discrepancy has spurred a critical re-evaluation of the assumed benefits and implications of cloud technology in the financial services industry. Against this backdrop, this report explores the conditions contributing to successful cloud adoption, offering insights into what differentiates success from disappointment.

³ Source: Speech given at the City & Financial 9th Annual Operational Resilience for Financial Institutions Summit.

[Section 1](#)

Cloud adoption in financial services: progress since Q4/2021



The future remains cloud

Back in 2021, we titled this section “*The future is cloud.*” In 2023, it remains clear cloud adoption continues to dominate the financial services industry. However, what has changed significantly since our previous report is the industry’s maturity, and its increasing discernment about the strategic use of cloud technology. Financial institutions have become notably more deliberate and specific in assessing when to adopt cloud services and which cloud service models, such as IaaS, PaaS, and SaaS, best meet their requirements. They’re also more focused on making the most of a hybrid environment that combines on-premise infrastructure with cloud capabilities.

This shift reflects a deeper understanding of the complexities involved and recognises a tailored approach, rather than one-size-fits-all, is essential to maximise the benefits of cloud technology. This includes considerations such as technical debt for incumbents and the agility of new entrants. Through meticulous assessments of cloud suitability and the strategic blending of cloud and on-premise infrastructure, financial institutions can enhance operational efficiency and resilience, and strategically position themselves for future success.

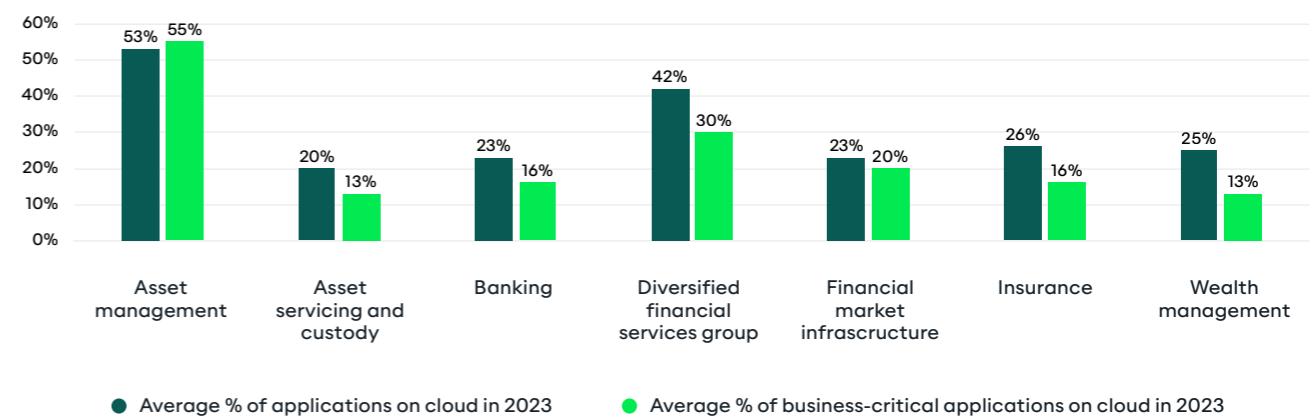
This year’s survey asked about **the extent of a financial institution’s non-critical and critical business applications running on the cloud**. The findings revealed a clear difference in the level of cloud adoption among various industry segments. Notably, the asset management sector displayed a remarkable adoption rate of cloud technology. This was likely due to the widespread use of SaaS solutions for investment management and risk analytics by asset managers, accelerating their cloud integration efforts.

However, **one of the survey’s most illuminating revelations concerns how few business-critical applications are currently hosted on cloud platforms**. Across industry segments, cloud

adoption for critical business applications ranges from a mere 13% in wealth management and asset servicing and custody, to 30% in diversified financial services groups – with asset management the notable exception. This finding underscores that, despite strides in cloud integration, most respondents still mainly employ the cloud for non-critical applications.

Percentage of applications vs. business-critical applications on the cloud

Figure 2



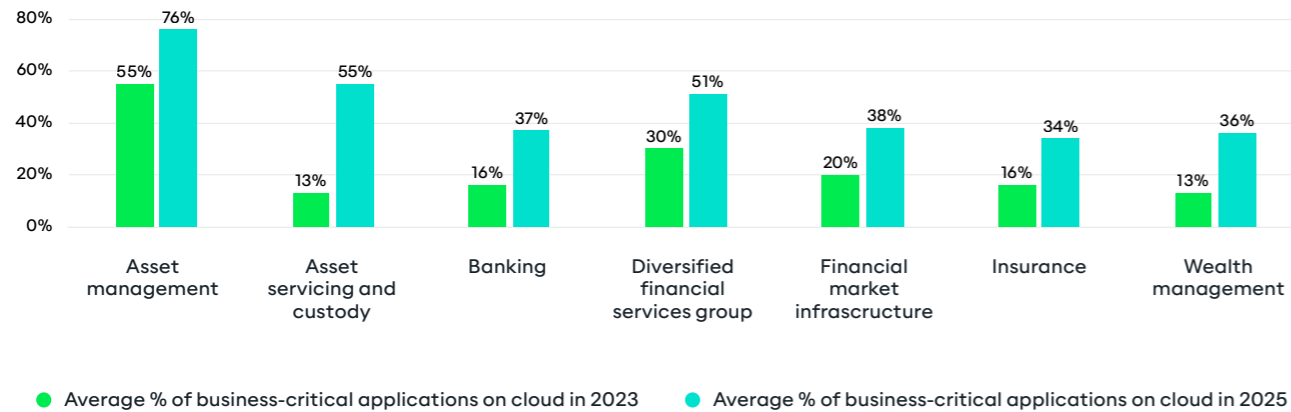
(Based on 118 valid responses to the Imperial College Business School & Reply Cloud in Financial Services Survey)

Will this change? We asked respondents about their projections for the future, specifically gauging their intent to increase cloud technology for business-critical applications by the end of 2025. The response, illustrated in *figure 3*, presents a compelling shift across all industry segments – with projected increases ranging from doubling (wealth management) to quadrupling (asset servicing and custody). This highlights a remarkable shift in mindset and strategy. Even acknowledging these forecasts might be overly optimistic, the general trend among all respondents is striking. Evidently, the cloud is the envisaged pathway to the future: ‘the future remains cloud’.



Percentage of business-critical applications on the cloud in 2023 vs. 2025

Figure 3



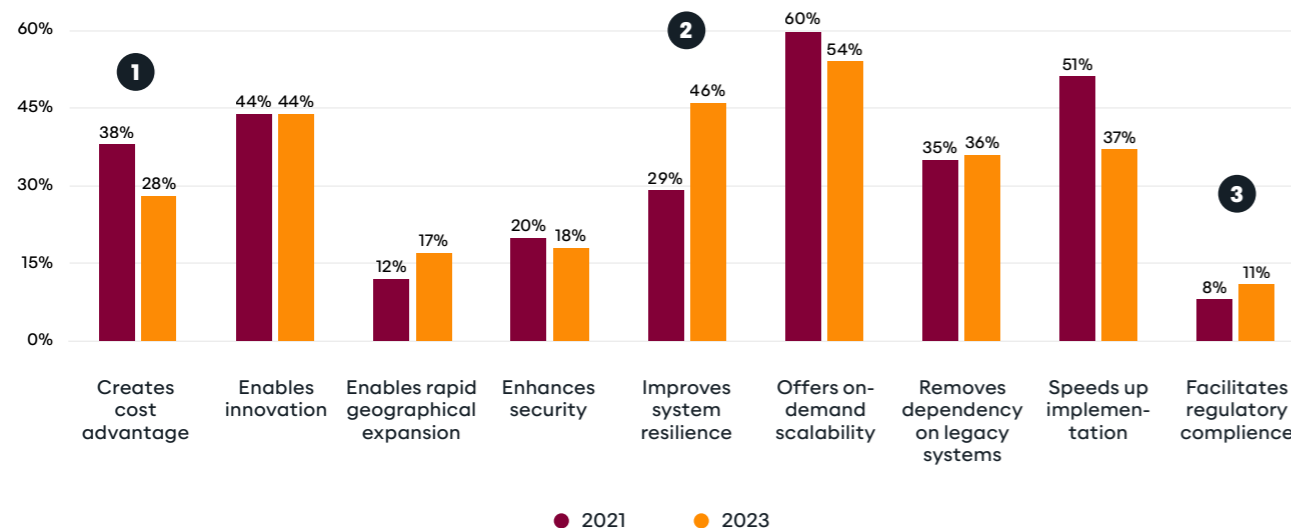
(Based on 118 valid responses to the Imperial College Business School & Reply Cloud in Financial Services Survey)

Cloud’s perceived benefits have changed

The understanding of the primary advantages of cloud in the financial services industry has changed significantly between 2021 and 2023.

Percentage of respondents who selected these benefits as one of the top three benefits of the cloud

Figure 4



(Based on 202 [in 2021] and 118 [in 2023] valid responses to the Imperial College Business School & Reply Cloud in Financial Services Survey)

- 1 First, there’s been a noticeable decline in financial institutions that view cost advantage as cloud’s primary benefit, from 38% in 2021 to 28% in 2023. This shift is rooted in an increasingly nuanced understanding of the total cost of cloud adoption. With advancing experience in cloud technologies, financial institutions grasp that while cost reductions exist, they may not meet initial expectations. Amid these considerations, financial institutions note risks of overspend, underuse, and unchecked expansion. In response to industry-wide concern about cost, we examine the matter further and offer insights in Section 3 of this report, *Cloud governance: a prerequisite for success*.
- 2 Second, it’s intriguing the notion of the cloud enhancing system resilience has risen markedly from 29% in 2021 to 46% in 2023. This aligns with the increased focus on operational resilience by regulatory bodies in the Region. Financial institutions acknowledge cloud technology, with its inherent redundancy and disaster recovery features, can bolster capacity to endure and rebound from disruption and safeguard continuous service provision to customers. Nonetheless, as the quote from the European G-SIB illustrates below, the intricacies of this matter merit further exploration.⁴

“We depended on a SaaS solution hosted on AWS for a vital process and experienced first-hand the inherent link between our operational continuity and the infrastructure and governance of our SaaS provider. While AWS proactively communicated upcoming changes to us and their clients, which we incorporated into our PaaS solutions, our SaaS provider failed to do so. This oversight led to a significant operational incident. Indeed, cloud technology can bolster resilience, but the intricacies of implementation are crucial.”

Senior IT Executive, European G-SIB, May 2023

⁴ For a valuable examination of the risks related to potential operational incidents, including those stemming from events originating at a CSP, see *The Financial Services Sector’s Adoption of Cloud Services*, a report by the US Department of the Treasury in February 2023.



3 Conversely, the shift in the perception of cloud speeding up implementation, decreasing from 51% in 2021 to 37% in 2023, reflects a nuanced prioritisation. While this doesn't necessarily imply a decrease in cloud's perceived agility, it suggests other aspects are more important in terms of value. Regulatory considerations, encompassing both cloud and data, are also acknowledged as potential factors impeding the swift transition to full-scale production systems. Acknowledging this is particularly relevant when moving beyond initial pilots and early-adopter phases, which often experience faster implementation.

"We observed that the first production implementations were often harder and slower, but subsequent ones, for instance, global deployments of SaaS solutions, once established in one country first were much faster."

Senior IT Executive, UK G-SIB, May 2023

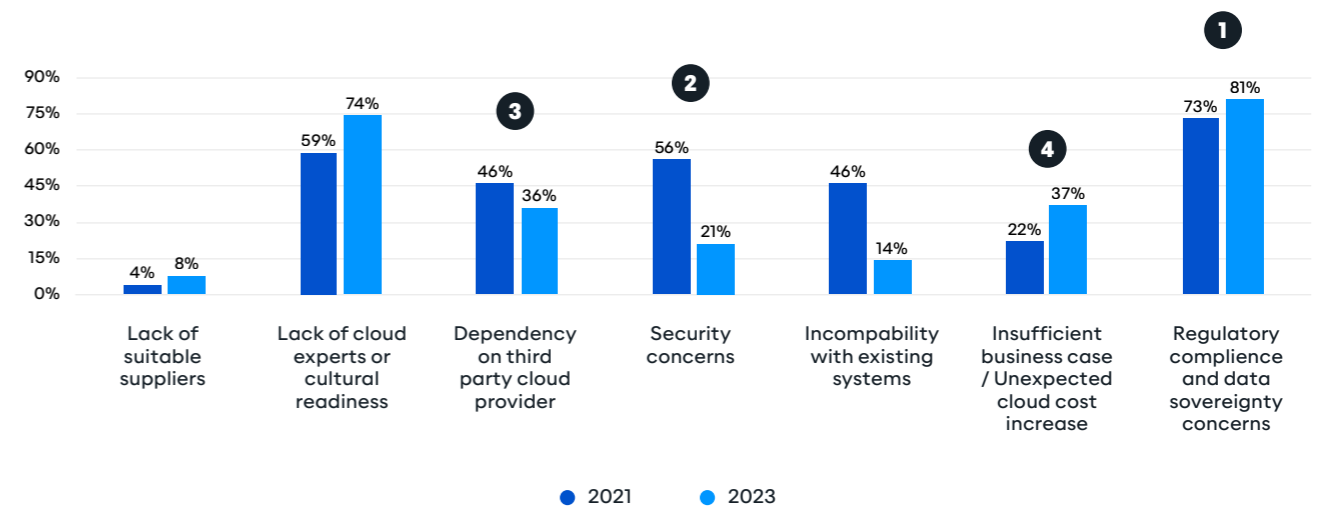
In summary, the evolution in financial institutions' perception of cloud's primary benefits between 2021 and 2023 reflects a deeper understanding of the complexities involved in cloud adoption. The industry's become more discerning and realistic about the advantages and challenges of cloud technology, aligning their expectations and priorities accordingly. This nuanced perception enables financial institutions to make more informed decisions about cloud adoption strategies and make the most of its benefits, while addressing specific organisational needs and regulatory obligations.

Financial institutions adopting the cloud continue to face challenges

As shown in figure 5, our 2023 survey confirms financial institutions continue to wrestle with many of the same challenges during cloud implementation as they did in 2021. An intriguing observation emerges in the spread of challenges: notably, regulatory concerns and lack of cloud expertise or cultural readiness stand out, while similar emphasis is placed on two challenges hovering around 35%, and two others in the 10-20% range. Together, this reflects the multi-faceted nature of the hurdles faced.

Percentage of respondents who chose these challenges as one of the top three challenges presented by the cloud

Figure 5



(Based on 202 [in 2021] and 118 [in 2023] valid responses to the Imperial College Business School & Reply Cloud in Financial Services Survey).

1 Remarkably, regulation is the most frequently mentioned hurdle with **81% of institutions highlighting regulatory compliance and data sovereignty issues** as a top three challenge. The survey corroborates our own experience, with financial institutions increasingly opinionated about where exactly to store their data.



“As a European financial institution, our cloud usage is heavily restricted by geopolitical factors such as US law extra-territoriality, which has caused concerns for our Group Executive Committee and Board. In response, we’re exploring the concept of a ‘sovereign cloud’ that provides a secure and compliant cloud environment that adheres to local regulations and data sovereignty requirements.”

Senior IT Executive, European G-SIB, December 2022

2 Another noteworthy shift is in the **decline of respondents identifying security concerns as a dominant challenge**, plunging from 56% in 2021 to 21% in 2023. This could signify an evolution in financial institutions’ perceptions, suggesting improved understanding has eased previous worries. It could also be down to the adoption of robust security measures and the maturing of cybersecurity frameworks tailored for cloud environments. This shift aligns with the industry’s growing pool of trained professionals equipped to navigate cloud-specific security challenges, as this report explores in more detail later.

3 Furthermore, the data highlights another notable shift: **a decline in the percentage of respondents who deem excessive reliance on CSPs a prominent challenge, dropping from 46% in 2021 to 36% in 2023**. This corroborates our own experience; financial institutions are more familiar with collaborative partnerships with CSPs, and are more adept at managing interdependencies.

A significant 66% of those surveyed now employ more than one CSP and, interestingly, 61% of them deliberately opt for multi-cloud strategies to mitigate the risk of vendor lock-in. However, it’s worth noting only a third (36%) indicated their multi-cloud strategy’s primary aim was to enhance operational resilience. Unsurprisingly, the multi-cloud strategy appears driven not only by risk mitigation,

but also a strong desire to access ‘best-of-breed’ services, with 59% of financial institutions employing a multi-cloud approach to tap into CSP’s proprietary capabilities.

Nonetheless, **this expansion into multi-cloud introduces its own complexities**, particularly those associated with managing multi-cloud environments. Around one in five institutions highlighted this challenge during interviews.

4 Lastly, is the **unexpected increase in costs associated with cloud services**. This fits with the declining percentage of financial institutions that consider cost advantages a primary benefit of cloud. It suggests some institutions experience unforeseen costs as they adopt cloud solutions. It also highlights how important it is to manage cloud environments effectively to optimise cloud technology’s benefits, while mitigating potential drawbacks.

“CxOs today must establish a cloud governance and FinOps strategy before the complexity of the cloud overwhelms their ability to realise its full value today and going forwards.”⁵

Spencer Izard, Research Director, PAC (Teknowlogy Group), December 2022

Summing up

The financial services industry has evolved to a point where complete migration to the cloud is no longer an inevitable step. However, the industry now has a deeper comprehension both of its benefits and challenges. While the cloud is highly advantageous for many workloads, the future trajectory points to a landscape encompassing multi-cloud and hybrid-cloud solutions, along with an increased emphasis on FinOps.

5 Source: Cloud Governance: Focus on FinOps, Reply, December 2022.

“Financial institutions should focus on a strategic and thoughtful approach to cloud adoption that aligns with their business goals and needs, rather than using it as a quick fix that could ultimately lead to disappointment.”

Head of Cloud Transformation, G-SIB, December 2022

In this section, we'll explore the critical intersection of **business strategy and cloud strategy**. Our survey and interviews show many organisations continue to embrace a 'cloud-first' approach, without really understanding the specific benefits they seek to achieve. In contrast, surveyed organisations that have extracted the most value from their cloud journey reveal a resounding endorsement of a 'business-first' strategy. One where the cloud strategy enables the overarching business strategy.

This strategic alignment highlights that while cloud implementation is frequently justified on the grounds of cost reduction and enhanced flexibility, its biggest impact on a financial institution's profitability is more likely driven by revenue enhancement rather than mere cost reduction.

First, when executed prudently, the strategic influence of cloud integration in business units fosters heightened competitive advantage in existing operations. It also enables more efficient entry into new areas of activity than traditional on-premise setups. So a strategic view of cloud implementation **focusing on enabling core business, rather than reducing IT costs, can potentially make much more difference** to an institution's financial performance in the medium and long-term.

Second, **the initial cost advantage of cloud over on-premise infrastructure tends to diminish as organisations go beyond the initial stages of cloud implementation**. A subtle interplay of factors contributes to this. While our findings show that, **under equivalent conditions**, approximately 50% of organisations experience cost reductions, practical observations from a majority of organisations

[Section 2](#)

A cloud strategy enabling a business strategy



surveyed reveal cloud expenses frequently escalate more than the corresponding reduction in on-premise costs. We can attribute this discrepancy to the inherent utility of cloud technology, which often drives a heightened demand for storage and computational resources, surpassing the usage patterns of previous on-premise infrastructure. Plus, challenges in retiring legacy applications and data storage, contrary to initial plans, also play a part.

Ramifications of cloud implementation for financial institution strategy

Our survey and interviews confirm that achieving truly strategic cloud implementation is challenging, and demands senior management has a wide-ranging grasp of cloud’s potential, alongside the needs and prospects of individual business units. **Despite the challenges, our research confirms institutions can realise substantial gains if cloud implementation is executed strategically.**

The survey (figure 6) underscores the crucial role cloud can play in supporting business growth. 54% of participants pointed out that the cloud’s capability to offer on-demand scalability is one of its top three benefits and 37% noted its relevance in accelerating the implementation of their business strategy.

Percentage of respondents who chose this as amongst the three most important benefit of the cloud

Figure 6

	MOST IMPORTANT	SECOND MOST IMPORTANT	THIRD MOST IMPORTANT	TOTAL
Offers on-demand scalability	20%	22%	12%	54%
Enhances system resilience	14%	10%	22%	46%
Accelerates implementation of business strategy	14%	15%	8%	37%

(Based on 118 valid responses to the Imperial College Business School & Reply Cloud in Financial Services Survey)

Financial institutions we surveyed noted that cloud infrastructure provides a flexible environment for exploring new business initiatives, without requiring substantial infrastructure investment. This not only reduces the risk of business failure, it also avoids, if successful, complications of rapid expansion. In essence, **cloud establishes a robust platform for experimentation, fostering the incubation of new business initiatives and new financial products.**

Cloud integration enables financial institutions to intertwine deeply with the technological fabric of society, enhancing access to new business opportunities. We can see a compelling example of this in the strategic business transformation of one financial institution we surveyed. Through its transformation, it reshaped its entire financial service delivery, particularly how it interacted with business-to-business (B2B) partners. This transformative journey harnessed the power of cloud to seamlessly integrate the institution’s range of financial products – from consumer financing to insurance – into the B2C digital platforms of its B2B partners. The outcome was remarkable: a significant boost in partner engagement, accompanied by a rapid and efficient distribution channel for their financial institution’s financial products through partner platforms.

The challenges of adopting cloud strategically

The financial services industry has seen many cloud adoption programmes, but **only a fraction have implemented cloud technology strategically to drive tangible business value.** Regrettably, this suggests many implementations fall short of their potential to achieve substantial value for firms. While those treating cloud as a mere IT project have realised certain cost savings and operational efficiencies, a considerable trove of potential value in business units remains untapped. This missed opportunity stems from various challenges that have proven difficult to overcome.

First, many organisations prioritise a ‘lift and shift’ to the cloud to achieve cost savings and/or manage expiring data centre contracts. Typically, this means aligning cloud strategy with the broader business strategy takes a back seat. So focusing on cost reduction and addressing the challenges of legacy on-premise systems can inadvertently cap the potential impact of cloud implementation.

Second, our research clearly shows the strategic implementation of cloud requires senior executives and board members to deeply understand a cloud operating model. An in-depth grasp of the technical intricacies is not crucial, but familiarity with cloud’s fundamental concepts and potential to drive business transformation is. Although technical knowledge of cloud is improving among IT professionals, there remains a significant gap among senior management. This extends to board members – both executive and non-executive – who took part in our survey. Among them, 79% rated their level of cloud technology expertise as either 1 (no expertise), 2 (limited awareness), or 3 (moderate understanding), where the scale ranged from 1 (no expertise) to 5 (expert).

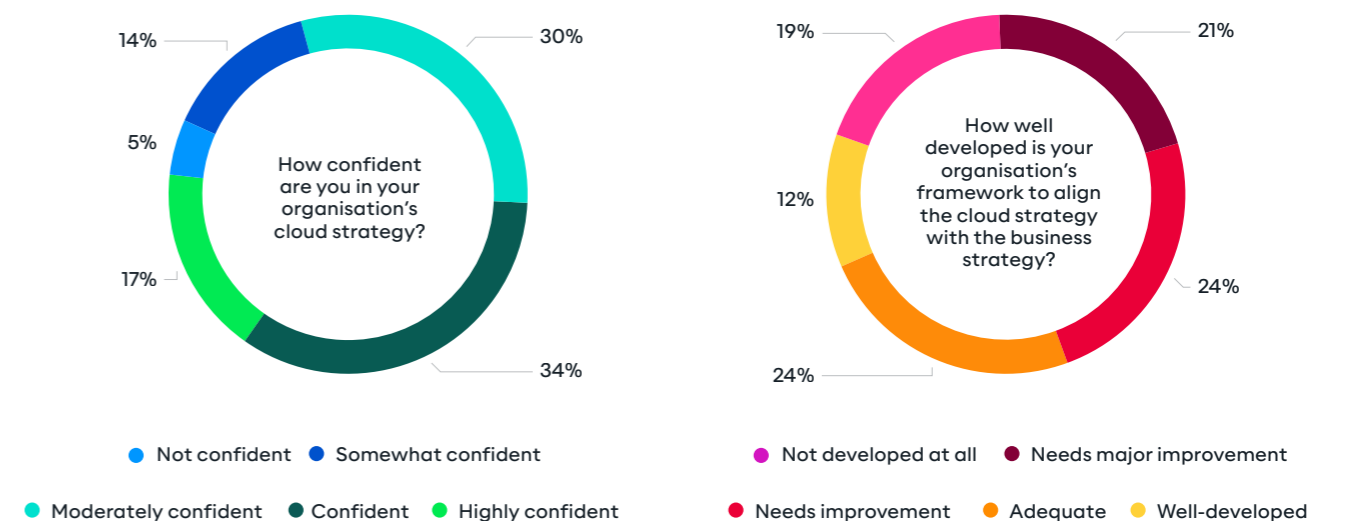
Third, and potentially more important, is that the strategic implementation of cloud hinges on business heads understanding cloud technology. This aspect of cloud adoption is perhaps the hardest to overcome. Business heads wield an intrinsic understanding of their domains, positioning them to discern how cloud technology could unlock fresh business avenues and enhance existing operations. Despite this, a significant disconnect often prevails as business heads often marginalise cloud as an IT-oriented concern. In so doing, they significantly impede the realisation of outcomes that genuinely align with strategic objectives.

Aligning cloud strategy to business strategy

Figure 7 succinctly depicts the extent of the challenge facing the industry. While 51% of respondents are ‘highly confident’ or ‘confident’ in their cloud strategy, a significant 40% feel their strategy is ‘not developed at all’ or ‘needs major improvement’. Moreover, the percentage of respondents believing their organisation has an ‘adequate’ or ‘well-developed’ framework to align their cloud strategy with their business strategy has declined from 59% to 36% since our last survey. This paradox highlights the complexities of harmonising cloud technology with business strategy, and the persistent challenge to seamlessly integrate these two critical areas.

The business vs. cloud strategy paradox

Figure 7



(Based on 118 valid responses to the Imperial College Business School & Reply Cloud in Financial Services Survey)

Today, most organisations’ cloud strategies describe the direction and approach for cloud adoption, the technology benefits, and how it supports the business strategy. More advanced organisations, however, turn this approach around. They evaluate where their business strategy is constrained and how cloud technology can help them overcome these constraints. Unfortunately, many



organisations are confined to a technology-driven, 'cloud-first' strategy that lacks a clear perspective on the business benefits they want to achieve. The agility and rapid deployment potential of cloud technology provide a unique opportunity for businesses to guide technology investment more strategically than ever.

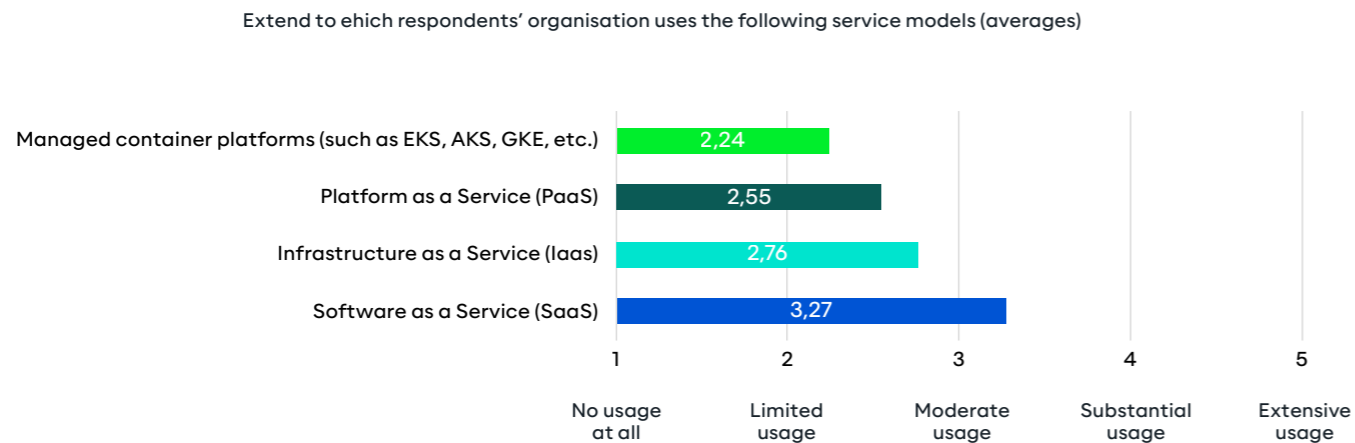
Based on our experience, cloud strategies frequently concentrate on IaaS and PaaS usage with major CSPs. However, SaaS applications usage is expanding in scope and importance across various critical business functions (as Figure 8 illustrates), and this aspect of cloud adoption needs incorporating into the strategy. Organisations are realising the value of a deliberate, enterprise-wide approach to cloud adoption that determines when to 'lift and shift', when to transform, and when to re-architect. Such an approach pays dividends and helps prevent programmes stalling after a few successful pilot projects.

Summing Up

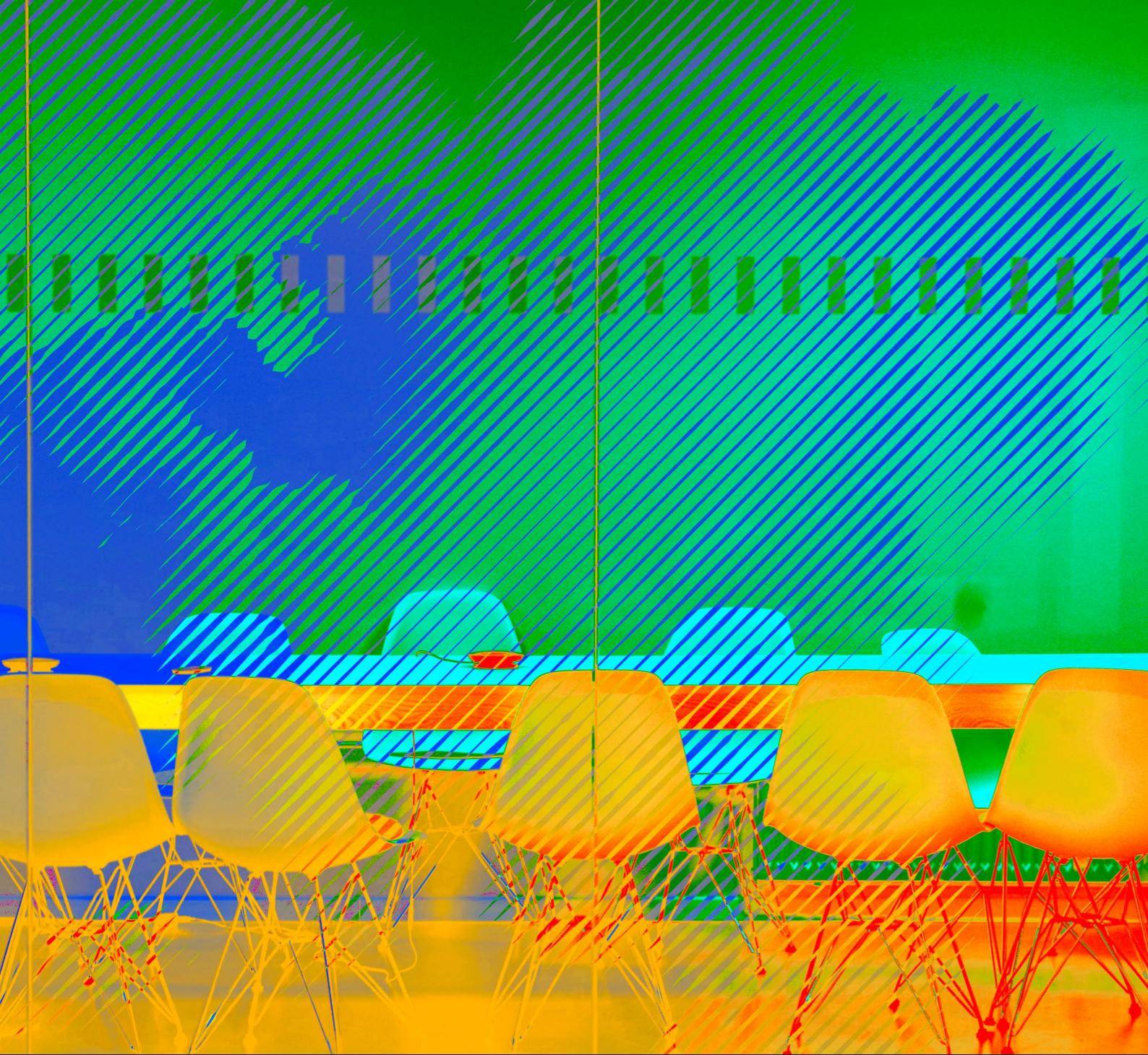
Aligning business strategy and cloud strategy highlights an often overlooked aspect in cloud discussions: that **cost and flexibility issues are much less important in terms of the potential financial impact of cloud than the strategic implications of cloud for business units**. Implementing cloud should not be thought of as an "IT project", but rather a "strategic change programme". One that enables business units to do what they already do better, as well as completely new things.

Use of PaaS, IaaS, and SaaS in financial institutions (from 1 – Not at all, to 5 – Extensive use)

Figure 8



(Based on 99 valid responses to the Imperial College Business School & Reply Cloud in Financial Services Survey)



[Section 3](#)

Cloud governance: a prerequisite for success

“Public cloud is not just about new forms of hardware and tools. It should also enable an entirely new operating model for technology. But this shift requires new approaches and a shift in mindset when it comes to governance – not just to manage risk, but to ensure efficiency, to make sure the right outcomes and solutions are emerging, and that the organisation is changing alongside the technology.”

Alex Hammond, Partner, Airwalk Reply, May 2023

Cloud computing delivers faster, more agile responses to changing business demands than previous technology platforms. It can also bring scalability, access to innovative technology, and a positive impact to sustainability and green credentials. However, **financial institutions are finding it’s more than just a technology change. It needs strategic business engagement, with enterprise-wide cloud governance and strong cloud management and operations.**

Without these foundational frameworks, organisations are vulnerable to losing control, security breaches, data leaks, excessive financial outlays, sub-optimal cloud resource utilisation, and failing to meet regulatory requirements. Financial institutions with successful cloud adoption programmes that exploit cloud’s benefits invest as much in governance and change programmes as they do in cloud technology. Successful cloud governance relies on proactive participation across the organisation – from executive management, board of directors, and technological teams to risk functions and front-line businesses.



“As a key market infrastructure institution, it’s essential we have proper control over the way we use cloud technology as we gradually shift to the cloud. We began by transitioning our development environment, and then moved on to our IT and business testing environments, which involved 65 applications. A key factor we need to consider from a governance standpoint, is the security implications of operating across both on-premise and cloud environments (e.g., when it comes to transferring data between the two environments).”

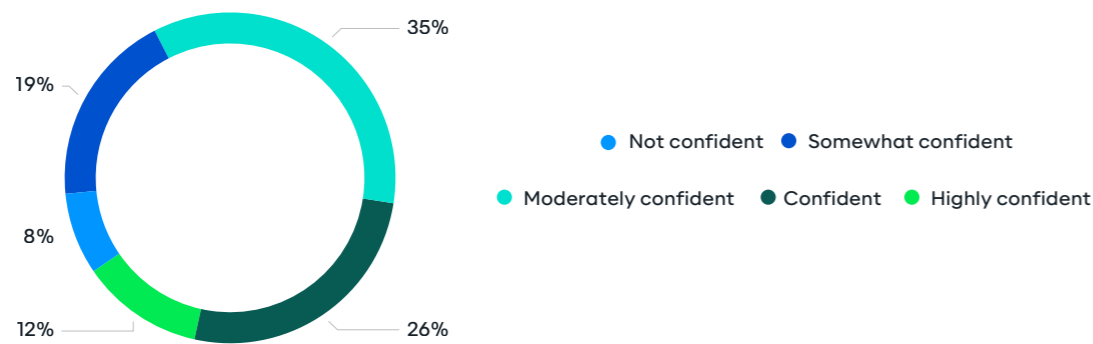
Stephen Holden, IT Director, Clearstream, January 2023

Cloud governance maturity in financial services

Our survey highlights the enduring significance of cloud governance as a linchpin for organisational success, capable of either propelling or impeding the trajectory of a cloud adoption initiative. As figure 9 shows, while 38% of respondents are ‘confident’ or ‘highly confident’ in their cloud governance, and an additional 35% are ‘moderately confident’, a deeper look reveals financial institutions are increasingly recognising major gaps in their cloud governance capabilities.

Cloud governance maturity

Figure 9



(Based on 129 valid responses to the Imperial College Business School & Reply Cloud in Financial Services Survey)

In this context, our survey delved further into cloud governance across five dimensions to uncover varying degrees of proficiency. As cloud deployments have grown in size and complexity, all five areas show a decrease in confidence in their adequacy compared to our 2021 survey. As figure 10 shows, the responses highlight:

- I. the perceived adequacy of a financial institution’s **Information Security (“InfoSec”)** framework to increased cloud technology usage has declined from 64% in 2021 to 43% in the current survey (i.e., only 43% of the respondents deem the InfoSec framework ‘adequate’ or ‘well developed’).
- II. the perceived adequacy of **Identity Access Management (IAM) and Role-based Access Management (RBAM) frameworks** have also dropped from 53% in 2021 to 38%. This underlines the tricky challenges firms face aligning existing IAM and RBAM frameworks with cloud environments.
- III. a significant decrease in the perceived adequacy of a financial institution’s **cost control framework pertaining to cloud expenditure and its FinOps practices**, from 43% in 2021 to 20% in 2023. This reflects a substantial decline, leaving **only a fifth of financial institutions confident they have control** of cloud spend.
- IV. **a reduction in the perceived adequacy of the data governance framework, from 41% to 30%**. Notably, this shift could be attributed to more awareness among institutions about data residency concerns. This may also indicate a shift to evaluating an institution’s data governance framework based on its ability to address these data residency requirements, rather than solely focusing on its capacity to enable new data insight capabilities through cloud data analytics.



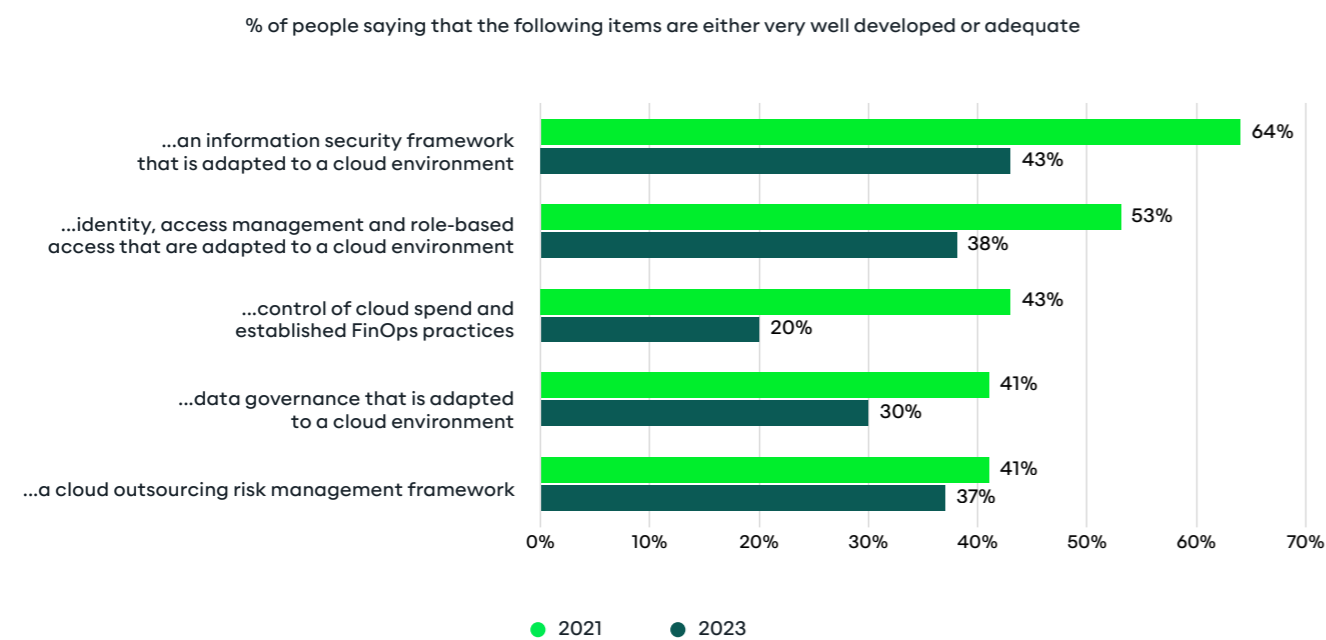
V. Lastly, nearly two-thirds of financial institutions identify outsourcing cloud management as a critical area for improvement. Once again, the survey emphasises this ongoing challenge and how it's gained significant attention, particularly as a top priority for the Region's financial sector supervisory authorities. Elizabeth McCaul, a Member of the Supervisory Board of the European Central Bank, highlighted this concern in a recent blog post.

“Almost all banks are using some form of cloud and application programming interface. [...] However, as they open up their IT infrastructure to these types of arrangements, there are increasing risks around third-party dependency. [...] As part of our supervisory priorities for 2023 to 2025, we plan to continue our work on digital transformation, with targeted reviews [focusing on answering a number of questions, including:] How do banks manage their third-party risk?”

Elizabeth McCaul, Member of the Supervisory Board of the ECB, 10 March 2023

Five dimensions of cloud governance

Figure 10



(Based on 177 [in 2021] and 101 [in 2023] valid responses to the Imperial College Business School & Reply Cloud in Financial Services Survey)

Maintaining a cybersecurity posture: automation is key

As highlighted earlier, more and more financial institutions have identified their cybersecurity posture, encompassing InfoSec, IAM, and RBAM, as inadequately aligned with the demands of cloud technology. This shift in perception likely results from institutions increasingly recognising cloud technology's significance in various operational aspects, rather than from degraded security capabilities.

Recognised industry frameworks for cloud InfoSec, IAM, and RBAM have matured. While most organisations adopt and integrate these frameworks with their existing security practices, **the next stage in maturity involves acknowledging the cloud's dynamic nature.** Its vibrant environment provides an opportunity for greater granularity in roles, permissions, and configurations. As a result, maintaining an effective security posture becomes a challenging, yet vital endeavour that needs automating whenever possible.

Based on our experience and our interviews for this year's survey, cutting-edge cloud programmes incorporate security measures into the development process, seamlessly embedding them into their DevOps release pipeline – often referred to as DevSecOps. Furthermore, several institutions are turning to advanced technologies like machine learning and artificial intelligence to identify potential vulnerabilities among users or resources.

“How do you know that teams are doing what you've asked, or even what they've submitted as an architectural design?”

The short answer – you don't.

And in our experience, project teams won't hesitate to go off-piste to get their service out of the door to meet their business deadline.



The only real way to manage this and assure your management (and maybe even the regulator) that your cloud estate is genuinely secure, is through automation.”

Cloud Operating Model: Part 2 – Security, AirWalk Reply, March 2020

Given the high-profile nature of security incidents, particularly data breaches, on cloud platforms, customers and supervisory authorities demand swift action from executive management and boards. The most advanced financial institutions we surveyed this year anticipate such scenarios and develop comprehensive playbooks to identify potential risks quickly. They also prepare precise briefing materials to manage such incidents.

Risk management: bringing it all together with aggregation and operational resilience

Most financial institutions in the survey recognised **the need to update their risk and controls framework to encompass the unique risks posed by cloud technology**. Often initiated at the outset of a cloud adoption programme, this involves adapting the framework to account for the distinct operating model of cloud computing and the shared responsibility model with CSPs

A major focus now for boards, regulators and supervisory authorities is **operational resilience** and how services to customers continue to operate during technology incidents. This requires good knowledge of systems, their criticality, and how they combine to provide a service.

Another emerging area of interest relates to **concentration risk**, and what the aggregated impact of a service, cyber, or data incident with a cloud provider is – especially bearing in mind that more and more SaaS providers also use the same CSPs.

Managing costs with FinOps: challenge or opportunity?

“As we move more applications to the cloud, we’re working to better understand the cost drivers involved and to develop a mature FinOps capability to help manage costs effectively. This is particularly true when utilising IaaS, as the ease of spinning up new infrastructure can lead to unexpected and potentially significant cost implications.”

Eric Mansuy, Group CTO, Quintet, December 2022

As previously highlighted, **managing cloud costs and developing FinOps capabilities rank among our respondents’ top concerns**. Interestingly, confidence in this area has declined since the last survey. This coincides with the exponential growth of cloud adoption, along with the prevailing economic climate and the pressure to manage expenses effectively.

However, **cloud cost management** represents more than just a challenge; it’s **a significant opportunity for businesses to directly oversee their technology expenditure like never before**. The unparalleled transparency and granularity of billing, down to metrics as specific as CPU seconds, megabytes stored, or queries used, together with the ability to promptly adjust or minimise usage to impact billing, provide unmatched control. Similarly, the freedom to invest more in cloud applications delivering tangible business value, without needing to artificially limit volumes while waiting for technology to catch up, further highlights the potential to make the most of the cloud cost model.



“The primary aim of FinOps is not reducing costs. Instead, the focus is on the best possible use of the cloud. The aim is to optimally use the variable cloud cost model to promote the company’s innovations and business development faster.”

Max Körbächer, Associate Partner and Co-Founder, Liquid Reply (Germany)

Among the financial institutions surveyed, **those with advanced FinOps capabilities collaborate with all stakeholders** in a dedicated FinOps function. In this collaborative framework, they meticulously fine-tune every lever of cost management. This ranges from optimising CSP contracts and enterprise discounts – carefully selecting savings plans, reserved instances, and spot pricing – to strategically orchestrating power scheduling, rightsizing, and potentially re-architecting applications. Their success is underpinned by effective tagging, real-time reporting, interactive dashboards, tactical cost optimisation campaigns, and strategically implementing gamification strategies.

Those ahead on the maturity curve are looking at three other areas:

- I. Managing SaaS costs, often billed on a variety of diverse metrics, using their own proprietary dashboards and billing systems.
- II. Blending the OpEx costs of public cloud usage, with the CapEx costs of existing systems in data centres to provide a total cost of ownership for hybrid systems.
- III. GreenOps to understand the sustainability and emissions impact of a cloud adoption programme. Measuring and tracking a cloud platform’s carbon emissions and comparing it to on-premise counterparts, often contributes significantly to an organisation’s sustainability commitments at board level.

“By leveraging cloud technology and advanced data analytics, our clients are increasingly able to gain greater visibility into their energy consumption and carbon emissions, and make data-driven decisions to reduce their environmental impact while still achieving their financial objectives.”

Christos Myrsakis, Senior Manager, Cluster Reply (United Kingdom)

Cloud centre of excellence

Figure 11 illustrates a notable trend, with **60% of surveyed financial institutions strategically implementing a Cloud Centre of Excellence (CCoE) to amplify their cloud governance capabilities**. In these organisations, this strategic move serves as a cornerstone for consolidating diverse cloud-related expertise and practices, uniting them in a cohesive framework that ensures more robust oversight and meticulous control over cloud initiatives.

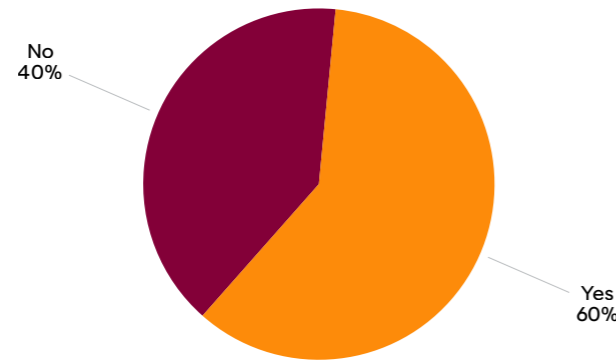
These CCoEs’ mandates extend to shaping standardised governance policies, enforcing compliance measures and fortifying security protocols across various business units. Beyond this, they function as hubs, perpetually monitoring, evaluating, and refining cloud governance practices, thus cultivating a proactive and responsive operational environment.

However, it’s crucial to acknowledge the varied journeys of setting up CCoEs. Interviews with some institutions shed light on the nuanced challenges, with a few opting to dissolve their CCoEs because of slower decision-making due to centralised authority, or resistance to change, or the risk of misaligning with the business units’ strategic objectives.

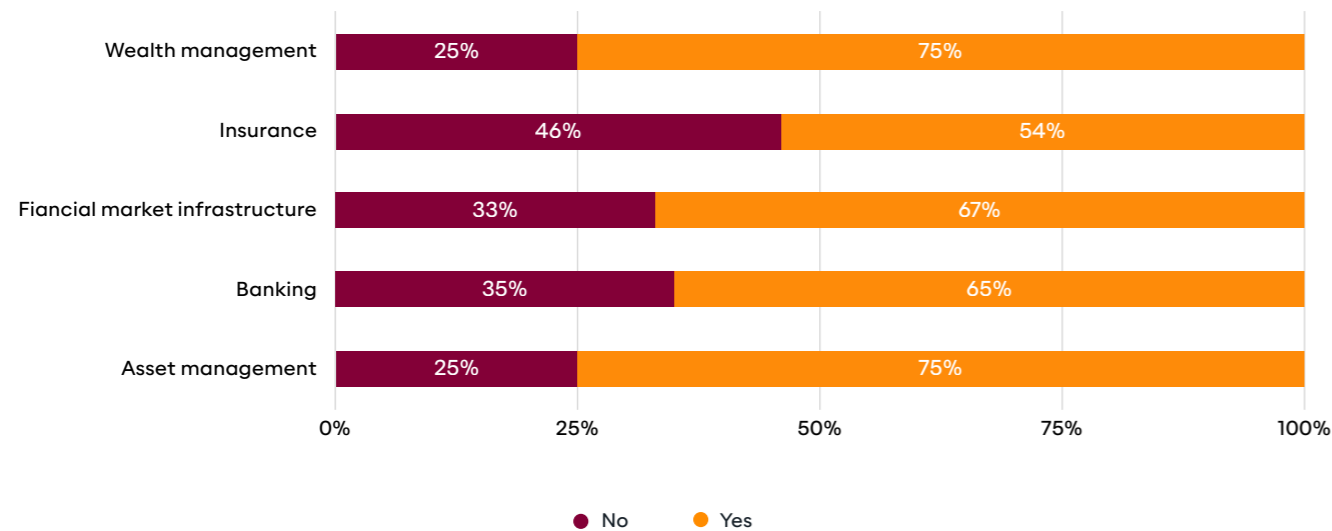


Percentage of institutions that have implemented a cloud CoE

Figure 11



When broken down by sub-segments within the financial services industry, the distribution is as follows:



(Based on 72 valid responses to the Imperial College Business School & Reply Cloud in Financial Services Survey)

Summing up

The shift to the cloud requires recalibrating governance frameworks, spanning from security and access management to cost control and risk mitigation. The journey to efficient cloud governance is not without challenges as institutions grapple to align evolving technology with dedicated strategies, manage complex cybersecurity postures, and oversee complex cost dynamics. Yet, these challenges are not

insurmountable. Rather, they highlight the critical juncture currently facing financial institutions who have the opportunity to forge robust governance structures that safeguard their cloud initiatives and catalyse their potential for innovation.

As financial institutions harness the power of cloud computing, they unlock an gateway to unprecedented innovation, where breakthroughs like GPT-3 models, blockchain, and AI are a few clicks away. But the allure of innovation must be tempered with responsible governance. The imperative to balance innovation with ethics, privacy, and compliance highlights governance's indispensable role. A well-structured governance framework becomes the bedrock on which institutions can confidently experiment, explore, and embrace novel technologies.

“Most vendor solutions now offer a cloud option that seems simple at first glance, but in reality, we’ve found the process is more complex than it was just a few years ago. There are now many formal governance requirements to navigate, such as outsourcing notification, privacy impact analysis, and risk analysis. These requirements have also shifted the role of our IT team, as we now must focus more on governance aspects rather than just engineering and implementation.”

Eric Mansuy, Group CTO, Quintet, December 2022

In our 2021 report, we identified the dynamic evolution both of cloud technology adoption and the regulatory landscape governing it, noting a lack of harmonisation in the regulatory framework. This remains highly relevant. Our 2023 survey highlights a remarkable continuity, with **an astounding 81% of respondents still deeming regulatory compliance and data sovereignty as substantial challenges (compared to 73% in 2021)**. Significantly, among these respondents, a striking 34% pinpointed these concerns as the foremost challenge to embracing cloud solutions in their financial institutions. Furthermore, respondents identified regulatory compliance and data sovereignty as the second (32%) and third (34%) most significant challenges. *Figure 12* provides a breakdown of regulatory and compliance concerns versus data sovereignty concerns, specifically.

[Section 4](#)

Cloud regulation: challenge and enabler



Concerns about regulatory compliance and data sovereignty among respondents

Figure 12

	MOST SIGNIFICANT CONCERN	SECOND MOST SIGNIFICANT CONCERN	THIRD MOST SIGNIFICANT CONCERN	TOTAL % OF RESPONDENTS FOR WHICH THIS IS ONE OF THEIR TOP THREE CONCERNS
Regulatory and compliance concerns	20%	22%	12%	54%
Data sovereignty concerns	14%	10%	22%	46%

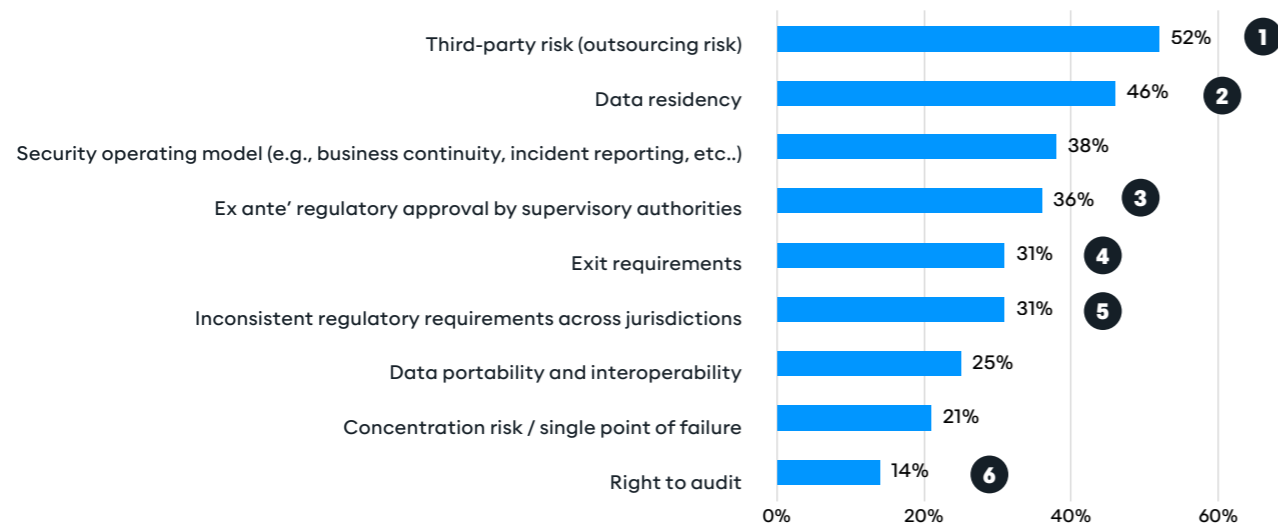
(Based on 118 valid responses to the Imperial College Business School & Reply Cloud in Financial Services Survey)

Primary concerns

Dig into the granular analysis of regulatory compliance and data sovereignty challenges financial institutions face, and the survey tells an intriguing story. As depicted in figure 13, each regulatory challenge carries a distinct weight, highlighting the varying degrees of significance for respondents.

Percentage of respondents who chose these challenges as one of the top three regulatory challenges presented by the cloud

Figure 13



(Based on 85 valid responses to the Imperial College Business School & Reply Cloud in Financial Services Survey)

Among the specific regulatory challenges identified by financial institutions, two stand out prominently: third-party risk and outsourcing regulatory requirements and data residency regulatory requirements. These challenges have frustrated respondents, who struggle to discern clear and applicable regulatory requirements while grappling with the evolving and disharmonised expectations of supervisory authorities:

- 1 More than half of respondents cited third-party risk and outsourcing regulatory requirements as a primary regulatory challenge. In our experience, financial institutions now fully recognise the risks of relying on third-party CSPs and are establishing robust risk management frameworks. However, providing effective third-party risk management requires a consistent and continual knowledge of third-party policies, standards, and operations, plus visibility of regular independent audits and transparency through operational incidents and root cause analysis. This level of detail can be challenging across the vast operations of the hyperscale cloud providers, and across the wide variety of SaaS providers.
- 2 Compliance with data residency regulations poses another significant challenge for financial institutions, and is a primary regulatory challenge for 46% of the financial institutions we surveyed. In particular, storing and processing specific data in designated jurisdictions creates complexities when adopting cloud solutions globally. This issue appears across the industry (asset managers, bankers, insurers, market infrastructures all highlighted this issue) and across jurisdictions. Indeed, this issue was raised by financial institutions headquartered in, among others, Denmark, France, Italy, Luxembourg, Spain, Switzerland, and the UK.
- 3 The need for 'ex ante' regulatory approval from supervisory authorities before a financial institution can use cloud technology for a specific application adds an extra layer of



complexity. However, we can see that while **over a third of respondents saw this challenge as significant**, institutions with the skills to navigate this landscape can handle this regulatory challenge better than a few years ago.

- 4 Another **notable discussion is around exit requirements, with nearly a third of respondents expressing concerns** about migrating data and applications between CSPs or reverting to on-premise systems. However, this landscape has evolved in line with the maturing stance of regulators, who increasingly stress managing operational resilience for business services. This shift reflects a broader focus that extends beyond exit considerations to acknowledge the importance of maintaining operational stability and continuity.

“Embracing cloud adoption in financial services comes with inherent regulatory risk and concentration risk. As there are only three or four major global providers, it’s not possible to simply switch between them at will. This is a fallacy, and it’s important to recognise that changing providers requires significant time and resources.”

Senior IT Executive, Large UK Bank, January 2023

“In response to the specific exit regulatory requirements, we’ve developed a scenario-based approach to proactively address the challenges associated with potentially exiting a cloud relationship. This involves meticulously simulating various exit scenarios, such as changes in service provision, termination of services, or CSP insolvency.

We systematically evaluate the potential implications of each exit scenario on our operational continuity, data access and security, regulatory compliance, and overall business continuity. This allows us to identify vulnerabilities and dependencies in our cloud infrastructure and applications. We’ve developed comprehensive contingency plans and strategies to mitigate disruptions that may arise due to an exit.”

Senior IT Executive, Large UK Bank, May 2023

- 5 **Inconsistent regulatory requirements** across jurisdictions also concerned over a quarter of respondents. This concern relates, among others, to matters such as defining ‘critical’ services or the specifics needed in a ‘cloud register’ for reporting purposes. Financial institutions operating globally face added complexities and compliance burdens when navigating divergent regulatory frameworks. The US Department of the Treasury noted this issue in a recent report: *“Some global financial institutions reported that because of differences in regulatory and supervisory approaches across the globe, consistent adoption of cloud in different jurisdictions is practically impossible.”*⁶

- 6 Surprisingly, the **‘right to audit’** isn’t considered a top priority in comparison to the more pressing issues discussed above, with under 15% of respondents identifying it as a major challenge.

⁶ The Financial Services Sector’s Adoption of Cloud Services, U.S. Department of the Treasury, February 2023, page 60.



Regulation of cloud service providers

In this year’s survey, we introduced a new line of enquiry exploring the evolving regulatory landscape surrounding CSPs. This is driven by the profound regulatory developments in the EU and the UK, specifically the Digital Operational Resilience Act (DORA) and the UK’s legislative initiatives for critical third-party services. These regulatory developments, as noted in figure 15 on page 54, show the increasing systemic importance and potential risks of CSPs, particularly in the financial services context.

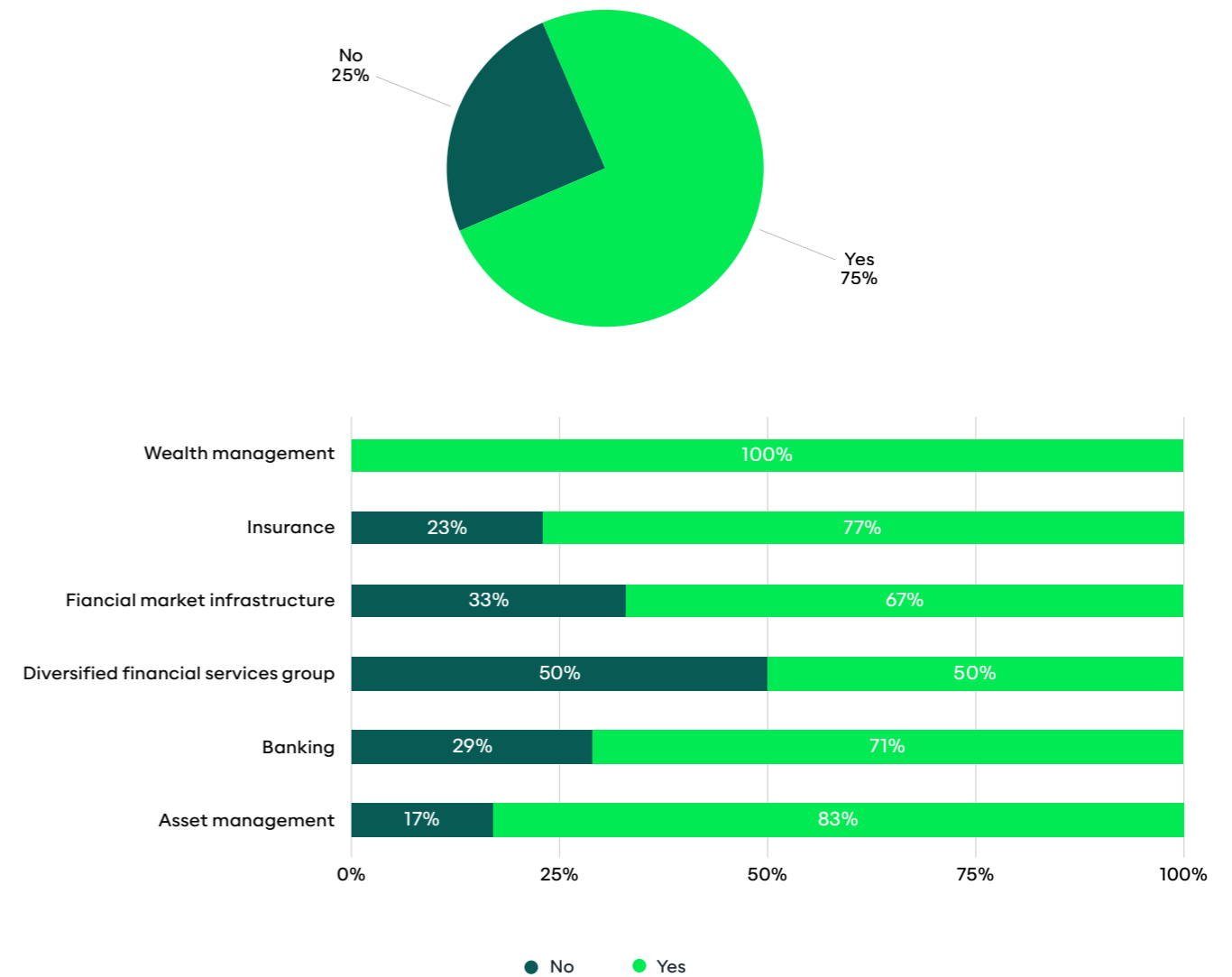
Three quarters of the respondents believe ‘regulatory oversight’ of CSPs would positively impact the utilisation of cloud technology in financial services (figure 14). Notably, during our interactions with various financial institutions in the Region, a prevailing sentiment favoured the ‘regulatory oversight’ of CSPs. This stems from the belief that regulatory oversight instils confidence in the reliability and security of cloud solutions. Furthermore, implementing such regulatory oversight is perceived to significantly smooth the approval of cloud technology by executive management and board members.

“Regulating CSPs would help us for two reasons. On the one hand, the services provided by the CSPs would in essence be ‘vetted’ by supervisory authorities, providing greater assurance to our executives and board members. On the other hand, it would provide us with leverage that we sometimes lack vis-à-vis the CSPs.”

Chief Risk Officer, Global Insurance Company, February 2023

Percentage of respondents who believe the proposed regulatory oversight of CSPs will smooth the adoption of cloud technology in their organisation

Figure 14



(Based on 64 valid responses to the Imperial College Business School & Reply Cloud in Financial Services Survey)



Overview of the regulation of cloud services in the EU and the UK

Figure 15



In December 2022, the EU finalised the **Digital Operational Resilience Act (DORA)**⁷ to address a gap in EU financial regulation. Before DORA, operational resilience had not been thoroughly addressed. With DORA, financial institutions “must also follow rules for the protection, detection, containment, recovery and repair capabilities against ICT-related incidents.”⁸

Significantly, in the context of this report, **DORA extends its scope to subject ‘critical’ ICT third-party service providers (CTPPs), including CSPs, to a specific oversight framework from January 17, 2025.** Notably, DORA was developed based on recommendations from European Supervisory Authorities (ESAs)⁹, due to increased concerns about the concentration risk linked to CSPs.

One ESA is expected to be named ‘Lead Overseer’ for a CSP, assessing the adequacy and effectiveness of its rules, procedures, mechanisms, and arrangements to manage ICT risk. ESAs will be authorised to request information, conduct investigations on and off-site, make recommendations and, in some certain circumstances, impose fines.



In the UK context, there have been parallel efforts to ensure the effective integration of cloud technology in the financial services industry, while addressing regulatory considerations. Acknowledging the dynamic landscape, the UK introduced the Financial Services Act 2023, a landmark legislative initiative, to fortify regulatory vigilance of critical third-party service providers to the financial services industry. This includes CSPs designated as ‘critical’ by HM Treasury.

Once a CSP is designated ‘critical’, the Bank of England, Prudential Regulation Authority (PRA), and Financial Conduct Authority (FCA) have powers to ensure compliance with certain requirements, as well as powers to supervise and enforce compliance with new rules.

In July 2022, the FCA and PRA published a joint discussion paper¹⁰ on this subject, with an extensive third-party survey conducted in April 2023, marking another stride towards comprehensive understanding. One more consultation stage is expected later in 2023, where the FCA and PRA are set to deliberate on proposals relating to the oversight of critical third-party entities.

(Information provided for general informational purposes only, should not be construed as comprehensive legal advice)

“[Under DORA], CTPPs are subject not to regulation or to formal supervision but to oversight. And oversight in this context is a new concept with its specific features and components. [...] These include the registers of outsourced services that financial entities will be required to maintain. [...] Secondly, it will be necessary to establish the criteria for determining which third-party providers are in fact critical. [...] Finally, it will be necessary to put in place the operational arrangements [...] to implement the new oversight arrangements.”¹¹

Gerry Cross, Director of Financial Regulation, Policy & Risk, Central Bank of Ireland, March 2023

Summing up

In summarising our exploration of cloud regulation, it’s clear the transformative shifts present challenges and opportunities for financial institutions. **The survey data underlines the ongoing complexity and relevance of regulatory compliance and concerns about data sovereignty in the financial services industry.**

The regulatory evolution, exemplified by DORA in the EU and the Financial Services Act 2023 in the UK, signifies a move to more oversight and accountability. These frameworks seek to **address operational resilience and concentration vulnerabilities tied to CSPs, signalling a new era of regulatory engagement.**

7 [Regulation \(EU\) 2022/2554](#) of the European Parliament and of the Council of 14 December 2022 on digital operational resilience for the financial sector and amending Regulations (EC) No 1060/2009, (EU) No 648/2012, (EU) No 600/2014, (EU) No 909/2014 and (EU) 2016/1011.
8 Quoted from *The Digital Operational Resilience Act (DORA) - Regulation (EU) 2022/2554*.
9 ESAs are regulatory bodies established by the EU to oversee and regulate specific sectors of the financial industry. ESAs include the European Banking Authority (EBA), the European Securities and Markets Authority (ESMA), and the European Insurance and Occupational Pensions Authority (EIOPA).
10 Refer to DP3/22, *Operational resilience: Critical third parties to the UK financial sector*, 21 July 2022
11 Remarks from an event organised by Amazon Web Services, Insurance Ireland, and the European Fintech Association in Brussels on 28 March 2023.



[Section 5](#)

Enabling data capabilities

“Data propels insights, steering innovation and informed choices. Among the financial institutions we collaborate with, cloud adoption to harness this potential is paramount. Cloud-empowered data capabilities redefine these institutions, democratising access, and fostering transformative decisions.”

Fabio Ardossi, Data Reply (UK), May 2023

All public cloud providers’ data capabilities continue to thrive and grow and are a key ‘super power’ that financial institutions can exploit in their cloud adoption journeys. The volume of data being generated by organisations is growing exponentially and the cloud has the capacity and scale to manage this. This is giving access to an ever-expanding portfolio of native services and third-party providers to sort, process, and analyse data. Data-driven financial institutions are using these technologies to enable new business insights and new business models. Good foundational data is also underpinning effective machine learning and artificial intelligence model building.

Many financial institutions have begun this journey. Some have highlighted their accomplishments in the public domain (see figure 16), while others have grappled with challenges like data governance, quality assurance, regulatory comprehension, and transforming insights into actions, not mere information. In this regard, our survey indicates a diminished confidence in being ready to make the most of public cloud data capabilities. Nonetheless, the determination to seize these benefits remains resolute.



Figure 16



In its 2021-2022 Integrated Report, Société Générale underlined data's pivotal role in achieving strategic goals, highlighting an estimated "€200m in annual value creation through data and artificial intelligence," along with the fact "80% of [its] IT servers are in the cloud."

Frédéric Oudéa, the then Bank's CEO, elaborated: "our goal is to strengthen our business model, make it more balanced and resilient and generate more sustainable and profitable growth. This will take place [...] by [...] activating three cross-business levers: our strong focus on customer satisfaction, our digital transformation and the use of data, and our leading role in sustainable finance."

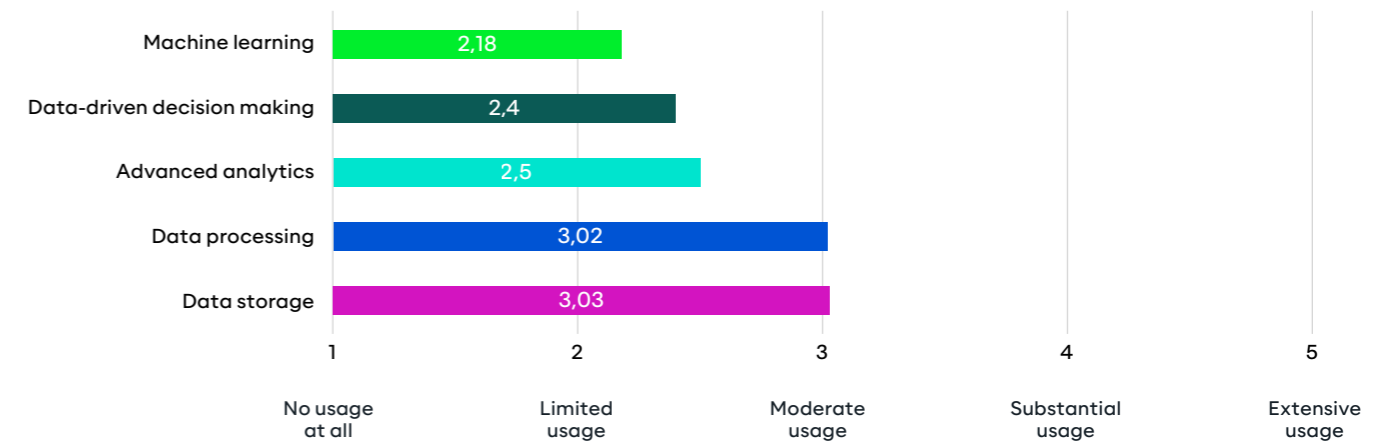
The maturity of enabling cloud data capabilities in financial services

The survey highlights that integrating data capabilities into cloud infrastructure remains a vital cornerstone of successful cloud adoption initiatives. To delve deeper into this, we introduced five extra questions this year to identify the most frequently employed and impactful data capabilities that use cloud technology in financial services: data storage, data processing, data-driven decision-making, advanced analytics, and machine learning.

The results (figure 17) reveal a widespread uptake of data storage and processing capabilities. However, leveraging cloud data capabilities into decision-making processes, analytics, and machine learning proves more complex.

Average usage of cloud-enabled data capabilities by financial institutions

Figure 17

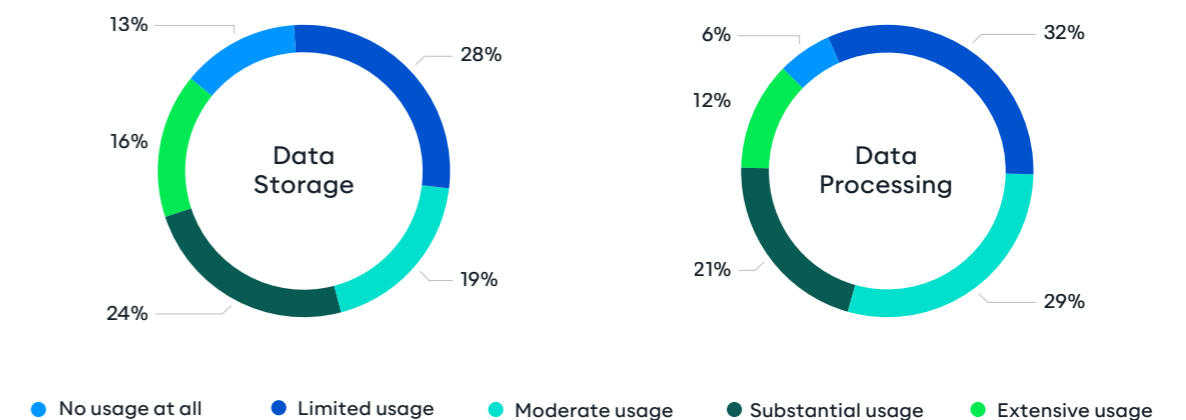


(Based on 88 valid responses to the Imperial College Business School & Reply Cloud in Financial Services Survey)

Delving deeper into the responses (figure 18), it's interesting that even for the simplest data capabilities, a significant 13% of respondents don't use cloud data for storage at all. 28% and 19% of the respondents, respectively, only use cloud for data storage to a limited or moderate extent. Turning to data processing, a mere third of respondents indicate substantial or extensive use of cloud.

Usage of cloud for data storage and processing by financial institutions

Figure 18



(Based on 118 valid responses to the Imperial College Business School & Reply Cloud in Financial Services Survey)



Among the surveyed financial institutions (figure 19), a notable 27% report they don't use their cloud infrastructure for advanced analytics at all. Additionally, 31% and 17% respectively indicate limited and moderate usage. In contrast, a relatively modest 16% report substantial adoption, while the leading 10% have extensively integrated advanced analytics capabilities.

“Enhanced cloud-driven data capabilities have enabled us to help a large financial institution streamline its billing processes by providing more accurate and timely data (‘asset under management’ (AuM), as well as transaction data) to billing systems. Additionally, we’ve leveraged cloud-based data analytics tools to provide greater visibility into billing processes, enabling the client to identify areas to improve and optimise their operations.”

Sebastian Butz, Associate Partner, Go Reply (Germany), May 2023

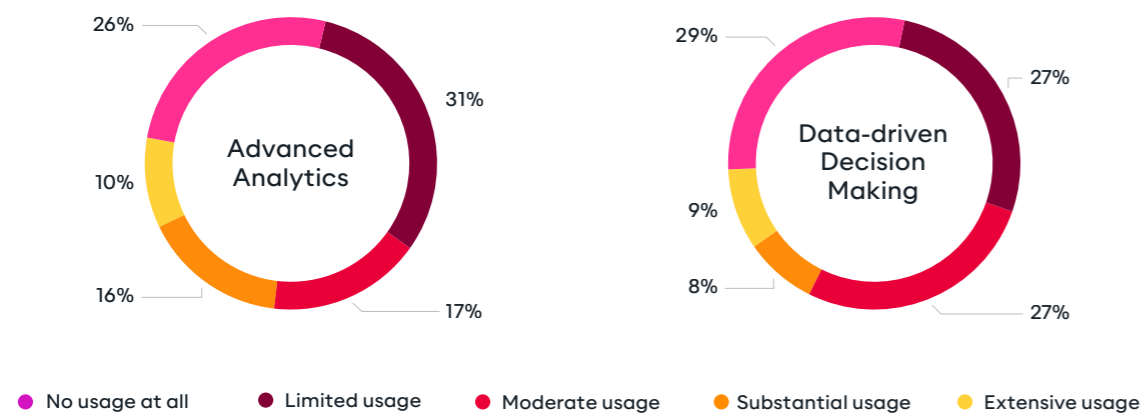
Our survey uncovers a similar trend in data-driven decision making. A considerable 29% of institutions reveal no usage of cloud technology for this capability at all. Meanwhile, 54% express limited or moderate usage.

The financial institutions we engaged with highlighted a key realisation: as their data presence expands in the cloud, the challenges of data governance and regulatory compliance, particularly data storage locations and sovereignty, become more intricate. This complexity, which we explored on page 49, partly contributes to the modest adoption of cloud-empowered data capabilities. However, within these challenges lies a substantial opportunity for financial institutions to leverage these capabilities, provided they address the current obstacles.

Fascinatingly, despite the widespread buzz around machine learning, the findings from the financial institutions we surveyed paint a different picture. A substantial 29% confirm no usage at all of machine learning capabilities using the cloud, while a considerable 38% and 17% respectively, reveal limited and moderate usage. In contrast, a modest 11% indicate substantial adoption, while a mere 5% integrate machine learning functionalities extensively. This data insightfully juxtaposes the anticipation of machine learning empowered by the cloud (see figure 20) with its actual implementation. Optimistically, the outlook suggests a promising trajectory that expects increased adoption both of machine learning and artificial intelligence capabilities in the near future.

Usage of cloud for advanced data analytics and data-driven decision making by financial institutions

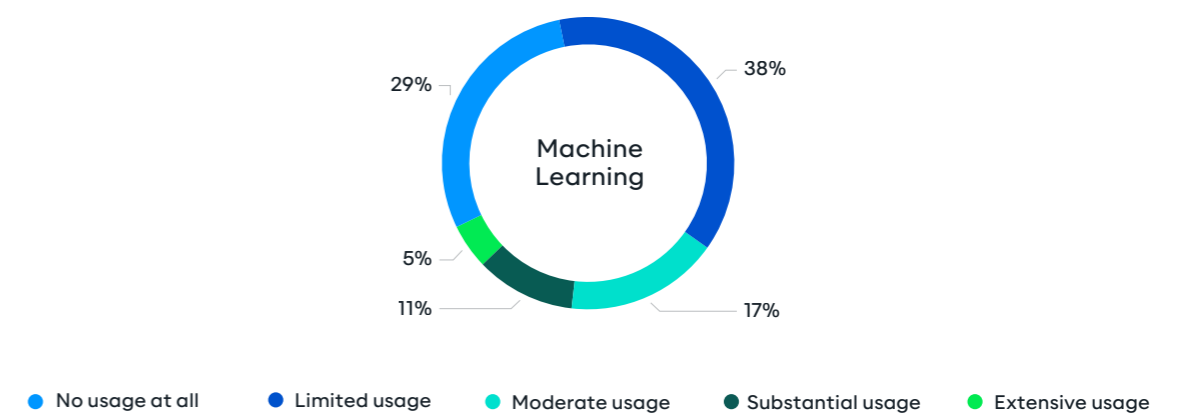
Figure 19



(Based on 88 valid responses to the Imperial College Business School & Reply Cloud in Financial Services Survey)

Usage of cloud for machine learning by financial institutions

Figure 20



(Based on 88 valid responses to the Imperial College Business School & Reply Cloud in Financial Services Survey)



Fortifying the unseen backbone: the less glamorous yet indispensable foundation

As financial institutions store more data in the cloud they can use readily available tools to explore and analyse it in ways that perhaps weren't possible before, or were harder or less cost-effective. It's an opportunity for many to start again and build a comprehensive data store, organised against an agreed data model and taxonomy, that draws from approved and governed data sources.

Yet, in our experience, this progression can simultaneously unearth questions about data quality and lineage, while also challenging existing data ownership and governance protocols. The outcome often highlights the need for strong foundational data governance processes to be in place to fully harness the potential of cloud's data capabilities.

Amidst the excitement of machine learning and artificial intelligence, the pivotal role of robust data governance might seem less captivating. However, as the survey and our own experience confirm: **it's imperative to recognise the soaring ambitions of machine learning and AI remain unrealised without a steadfast data governance foundation.** In essence, data governance lays the unglamorous yet essential groundworks on which modern data-driven advancements are constructed.

Unlocking business value, an outside-in approach

It's attractive for an organisation to see a public cloud implementation as an opportunity to take a greenfield approach to data management. And develop a plan for a comprehensive

set of data repositories covering all customers, business areas and transaction types, ingested from approved 'golden sources' and eliminating duplication and redundancy. However, often this is not cost-effective and the time-to-value is too long to make a viable business case.

Instead, **an outside-in approach** may be better. This requires establishing an ongoing process to create sets of key business questions, which can be analysed to determine what data is required to inform and answer each set of questions. That data is then sourced and used as the building blocks of the new cloud-based data repository. This achieves an **incremental approach with a much faster time-to-business value** and unlocks more immediate benefits from accessing and enabling the cloud data capabilities.

Starting with a set of corporate data principles and a structured data governance taxonomy and framework ensures that as individual data stores come into existence, they collectively evolve into an enterprise-wide asset of substantial value.

Summing up

Our survey spotlights the vast potential the cloud holds for harnessing financial institutions' data, serving as a catalyst for innovation and strategic decisions. Adopting cloud technology to unlock this potential provides a first step to a transformative paradigm shift. Yet, the survey highlights the industry's advancement is embryonic, with challenges such as data governance and regulatory compliance still requiring comprehensive solutions. While select institutions showcase achievements, the wider industry treads carefully, recognising the immense potential of integrating cloud-enabled data capabilities that lie ahead.



Conclusion

In conclusion, disruptive technological shifts continue to shape the financial services industry's dynamic landscape, with the advent of cloud computing proof of this ongoing transformation. As the journey into the cloud unfolds, boardrooms and executives must remain alert to cloud's potential for change and how to use it – i.e. a move from hosting applications in the cloud (migration) to using cloud-enabled capabilities to unlock business value.

The emergence of hyperscale CSPs, such as Amazon Web Services, Microsoft Azure, and Google Cloud Platform, and the proliferation of SaaS providers have introduced a new dimension to the business strategies of financial institutions. These technological titans have undoubtedly impacted various facets of the industry, including customer engagement, supply chains, workforce dynamics, and competitive dynamics. This report stresses how past disruptions highlight the continued and inevitable acceleration in cloud-enabled innovations in the financial services industry.

Our research and survey results clearly confirm cloud services are entrenched in the fabric of financial services. Yet, each institution's cloud journey is unique and based on its strategic own aspirations and contextual challenges. As such, its decision-making process must be as strategic as the goals it seeks to achieve.

While technical hurdles are evident, this report underlines the strategic and organisational complexities demanding attention at the highest levels of leadership. Success in cloud adoption hinges on navigating these multi-faceted challenges.

Furthermore, it's vital to recognise today's cloud landscape is not static, but evolving. Our research reinforces the idea that a financial institution's cloud strategy encompasses more than just server ownership or deployment models. It's an ongoing conversation that has to evolve as technology advances. The choices made today must stand the test of time, adaptability, and changing market dynamics.



Looking at the future of financial services, we can't underestimate the cloud's significance. Like its predecessors – personal computers, the internet, and smartphones – the cloud has ushered in an era of transformation that calls for visionary leadership and adaptive strategies. As in the past, where those embracing change thrived, financial institutions navigating the cloud landscape adeptly will be in a position to achieve maximum value and stay ahead in a rapidly evolving industry.



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