CLOUDERA

NAVIGATING AI AND DATA STRATEGIES IN FINANCIAL INSTITUTIONS UNDER DORA

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01 INTRODUCTION

▶ The European Union's landmark [Digital Operational Resilience Act (DORA)](#) entered into effect on 16 January 2023 and will apply from 17 January 2025. Designed to mitigate operational risks and ensure financial sector stability, DORA imposes stringent requirements for managing Information and Communications Technology (ICT) risks. Under this regulation, any financial institution operating in the bloc must establish robust governance frameworks, conduct comprehensive risk assessments, and implement measures to ensure critical operations' continuity during disruptions.

DORA's introduction comes amid a rapidly evolving technology landscape in the financial sector, with banking, financial services, and insurance (BFSI) firms increasingly integrating digital solutions and AI technologies. DORA's implications significantly shape data management and AI strategies within these institutions, which must be considered to avoid reputational and financial losses.

This whitepaper explores DORA's multifaceted impact on the financial sector, focusing on its role in modernising data architectures, enhancing analytics and AI deployment, and ensuring compliance with evolving regulatory standards.

02 UNDERSTANDING DORA IN THE CONTEXT OF FINANCIAL INSTITUTIONS

FIS MAY FACE FINES UP TO 10 MILLION EUROS OR 5% OF THEIR TOTAL ANNUAL TURNOVER, WHICHEVER IS HIGHER, FOR SERIOUS INFRINGEMENTS

▶ DORA's primary objective is to enhance financial entities' operational resilience by mandating rigorous controls over their ICT systems and services. Realising this vision demands comprehensive risk management, enhanced incident reporting, and robust governance mechanisms. Financial institutions must navigate these principles to ensure compliance with specific requirements, such as regular ICT system testing, third-party risk management, and maintaining incident response capabilities.

While initial compliance assessments are already underway, full compliance is expected within the next few years. The

EU has set a compliance deadline of 17 January 2025, but firms demonstrating progress towards compliance, even if not fully achieved, will likely receive greater leeway – though this is not guaranteed. This urgency to make progress stresses the importance for financial institutions to begin implementing the necessary changes and move beyond the planning phases.

Key DORA principles include establishing a comprehensive ICT risk management framework encompassing all aspects of operational resilience. Regular risk assessments must be conducted to identify potential vulnerabilities, and measures implemented to mitigate identified risks. Robust incident response plans are crucial to ensure institutions can quickly and effectively respond to ICT-related incidents, minimising disruption to critical operations.

Moreover, DORA emphasises the importance of governance in ensuring operational resilience. Clear governance structures with defined roles and responsibilities for managing ICT risks must be established, including appointing

a chief information security officer or an equivalent role to oversee the ICT risk management framework's implementation and ensure DORA compliance.

Third-party risk management is also a critical DORA aspect. Financial institutions must ensure their third-party service providers comply with the same stringent ICT risk management standards. Conducting thorough due diligence

when selecting third-party providers and regularly monitoring their DORA compliance is essential.

The stringent requirements for ICT risk management, incident response, governance, and third-party risk management laid out by DORA aim to ensure financial institutions can withstand and quickly recover from disruptions, safeguarding the financial sector's stability.

03 — THE IMPACT OF DORA ON DATA, ANALYTICS, AND AI STRATEGIES IN FINANCIAL INSTITUTIONS

▶ Financial institutions are rapidly adopting AI and advanced analytics to improve efficiency, decision-making, and customer experience. DORA, however, introduces new dimensions to data strategies, emphasising the need for trustworthy and high-quality data.

According to an industry professional survey by hybrid platform company Cloudera, 90 per cent of IT leaders believe unifying the data lifecycle on a single platform is critical for effective analytics and AI. The challenges are multifaceted, with issues such as data quality and availability, scalability, integration with existing systems, change management, and model transparency each cited by around 36 per cent of respondents.

The requirement for trustworthy data especially in AI applications underscores the importance of robust data governance

frameworks. However, financial institutions must ensure their data management practices align with DORA's stringent requirements, facilitating the deployment of AI solutions that are both effective and compliant. The convergence of AI and regulatory compliance presents unique challenges and opportunities for innovation in data management.

Adopting comprehensive data governance frameworks is essential to ensure data quality, accuracy, and integrity. Robust data validation and cleansing processes must be implemented to eliminate inaccuracies and inconsistencies. Clear data ownership and stewardship roles are vital to ensure accountability for data management practices.

Data security is another critical DORA aspect regarding analytics and AI. Implementing robust security measures to protect sensitive data from unauthorised access and breaches is paramount. These include encryption technologies, access controls, and continuous monitoring of data access and usage. Furthermore, institutions must ensure compliance with data privacy regulations, such as the EU's General Data Protection Regulation (GDPR), to protect customer data privacy.

Scalability poses a significant challenge for financial institutions adopting advanced analytics and AI. As data volume and complexity grow, institutions must ensure

90%
OF IT LEADERS BELIEVE UNIFYING THE DATA LIFECYCLE ON A SINGLE PLATFORM IS CRITICAL FOR EFFECTIVE ANALYTICS AND AI

80%

OF ENTERPRISES WILL ADOPT GENAI APIS AND MODELS OR DEPLOY GENAI-ENABLED APPLICATIONS IN PRODUCTION ENVIRONMENTS BY 2026 – GARTNER
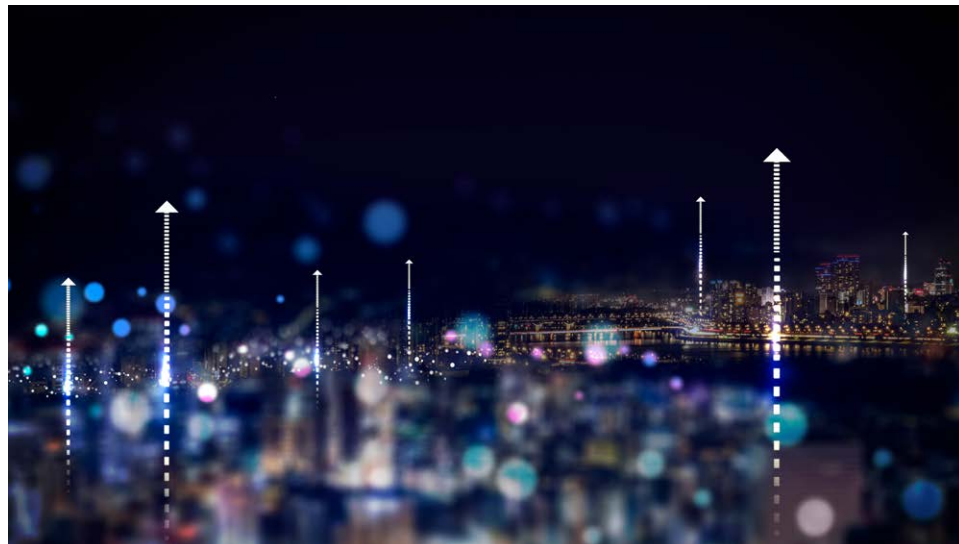
their data management infrastructure can scale to meet these demands. Thus, adopting scalable storage and processing solutions to handle large volumes of structured and unstructured data is crucial. Scalable data integration and transformation processes are vital to ensure data accessibility and usability for AI model development.

Integrating AI and advanced analytics solutions with existing systems is another DORA-highlighted challenge. Financial institutions must ensure seamless integration of their analytics and AI solutions with their existing IT infrastructure. Developing interoperable systems and adopting standardised data formats facilitate data exchange and integration. Implemented AI solutions should be easily integrated with existing business processes and workflows to maximise impact.

Change management is critical for successfully adopting AI and advanced analytics in DORA compliance. Financial institutions must foster a culture of continuous improvement and innovation, encouraging employees to embrace new technologies and processes. Providing training and support ensures employees have the necessary skills and knowledge to effectively use analytics and AI

technologies. Clear communication channels are essential to ensure employees understand the benefits and challenges of adopting AI and advanced analytics technologies.

To remain compliant with DORA, model transparency will be a key aspect of AI adoption. Financial institutions must ensure their AI models are transparent and explainable, allowing stakeholders to understand how decisions are made. Developing models that provide clear and interpretable outputs and implementing processes to monitor and validate model performance is crucial. Additionally, institutions must ensure their AI models comply with emerging ethical and legal standards such as the EU's Artificial Intelligence Act, and avoid unintended biases and discrimination.

In summary, DORA presents significant challenges and opportunities for financial institutions adopting AI. By implementing robust data governance frameworks, ensuring data security, scalability, and integration with existing systems, and fostering a culture of continuous improvement, institutions can leverage analytics and AI to enhance efficiency, decision-making, and customer experiences while ensuring compliance with regulatory standards.

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DORA AND THE IMPORTANCE OF A MODERN DATA ARCHITECTURE

▶ A modern data architecture is pivotal for achieving DORA compliance and leveraging AI and advanced analytics capabilities. Cloudera's survey highlights that a single data platform, seamlessly integrated across cloud and on-premises environments, is essential. This approach simplifies data and analytics processes, enabling institutions to handle diverse data types with greater flexibility. Approximately 40 per cent of respondents identified simplified processes as a key benefit, while 38 per cent emphasised the flexibility gained in data handling.

Modern data architectures, such as data lakehouses, offer a blend of data lakes' flexibility and structured data warehouses' performance. They facilitate data management unification, providing a robust foundation for AI model training and inferencing. This architectural evolution is crucial for financial institutions striving to meet DORA's compliance mandates while advancing their analytics and AI initiatives.

A data lakehouse combines the best elements of data lakes and data warehouses, providing a unified platform for storing and managing both structured and unstructured data. This allows financial institutions to efficiently manage large volumes of diverse data types without having to resort to duplication of data to various processing engines, facilitating analytics and AI model development and deployment. Data lakehouses support real-time data processing and analytics, enabling institutions to quickly derive insights from their data.

Implementing a modern data architecture also involves adopting cloud-native technologies that provide scalability, flexibility, and cost-efficiency. Cloud-native data platforms enable financial institutions to scale their data storage and processing capabilities on demand, ensuring they can handle increasing data volume and complexity. Such platforms offer flexible deployment options, allowing institutions to choose the most suitable environment for their data management needs, whether cloud, data center, or any combination or multiple of each.

Robust data integration solutions are critical to ensure data from various sources can be easily accessed and used for AI model development. Adopting standardised data formats and protocols facilitates data exchange and integration. Additionally, implementing data integration processes that support real-time data ingestion and processing ensures data is always up-to-date and accurate.

Data governance is a key component of modern data architecture. Establishing clear data governance frameworks ensures data quality, accuracy, and integrity. Robust data validation and cleansing processes eliminate inaccuracies and inconsistencies. Clear data ownership and stewardship roles ensure accountability for data management practices.

In summary, a modern data architecture is essential for financial institutions seeking to achieve DORA compliance and leverage their data for insight and value through advanced analytics and AI. By adopting a unified data platform, implementing cloud-native technologies, and establishing robust data integration and governance frameworks, institutions can efficiently manage their data and develop and deploy analytics and advanced analytics and AI models that enhance efficiency, decision-making, and customer experiences.

67%
OF IT LEADERS AGREE THAT DATA LAKEHOUSE ARCHITECTURE REDUCES THE COMPLEXITY OF DATA PIPELINES

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05

UNIFIED DATA MANAGEMENT FOR EFFECTIVE AI IN COMPLIANCE WITH DORA

63% OF DATA PRACTITIONERS AND DECISION-MAKERS FIND THAT USING A LARGE NUMBER OF TOOLS WITH VARYING LEVELS OF INTEGRATION TO MANAGE THE DATA LIFECYCLE CREATES DIFFICULTY IN MEETING COMPLIANCE AND GOVERNANCE STANDARDS

For financial institutions to effectively deploy AI, they need flexible and scalable cloud management technologies that can convert information into actionable insights, aligning with DORA's requirements. Cloudera's survey highlights significant barriers to end-to-end data management, including the volume and complexity of data (62 per cent), data security (56 per cent), and governance and compliance issues (52 per cent).

Overcoming these challenges demands robust data management frameworks that prioritise data quality, security, and compliance. Therefore, financial institutions must adopt technologies that seamlessly integrate advanced analytics and AI models throughout their lifecycle, from development to deployment, while adhering to DORA's regulatory standards. This integrated approach unlocks AI's full potential within a compliant and resilient operational framework.

Unified data management revolves around implementing a single platform that consolidates data from various sources, ensuring it is easily accessible and usable for AI model development. Adopting data integration solutions that support real-time data ingestion and processing is crucial, ensuring data remains up-to-date and accurate. Furthermore, institutions must implement data management processes that uphold data quality, accuracy, and integrity, facilitating the development of trustworthy AI models.

Data security is a critical pillar of unified data management. Financial institutions must implement robust security measures to safeguard sensitive data from unauthorised access and breaches. Encryption technologies, access controls, and continuous monitoring of data access and usage are essential. Compliance with data privacy regulations, such as GDPR, is vital for protecting customer data privacy.

Governance and compliance are equally critical aspects of unified data management. Establishing clear data governance frameworks is vital to ensure data quality, accuracy, and integrity. Implementing robust data validation and cleansing processes eliminates inaccuracies and inconsistencies. Defining clear data ownership and stewardship roles fosters accountability for data management practices.

Moreover, financial institutions must ensure their data management infrastructure can scale to meet the growing volume and complexity of data. Adopting scalable storage and processing solutions that can handle large volumes of structured and unstructured data is essential. Implementing scalable data integration and transformation processes ensures data can be easily accessed and used for AI model development.

In summary, unified data management is indispensable for financial institutions seeking to deploy AI effectively while complying with DORA. By adopting a single data platform, implementing robust security measures, and establishing clear governance and compliance frameworks, institutions can efficiently manage their data and develop trustworthy AI models that enhance efficiency, decision-making, and customer experiences.

06

DORA-COMPLIANT VERSATILE AND SECURE DATA PLATFORMS FOR THE FUTURE

The future of data management in financial institutions lies in embracing a hybrid approach under DORA, encompassing both on-premises and public cloud deployments. Cloudera's survey underscores the importance of multi-cloud/hybrid capabilities for adapting to change, with 93 percent of respondents acknowledging its significance. Such versatility is critical for ensuring compliance, scalability, and innovation in data and AI and advanced analytics strategies.

Financial institutions must invest in secure data platforms that offer robust governance, consistent data quality, and the scalability required to support sophisticated AI models. These platforms will empower institutions to navigate the evolving regulatory landscape, ensuring operational resilience and a competitive advantage in the digital era.

Hybrid data management involves adopting a data platform that seamlessly integrates on-premises and cloud environments, providing financial institutions with the flexibility to choose the most suitable deployment option for their data management needs. This approach enables institutions to leverage the scalability and cost-efficiency of public cloud while maintaining control over sensitive data in on-premises environments. Hybrid data platforms facilitate seamless data integration and migration between on-premises and cloud environments, ensuring data is always accessible and up to date.

Security is a critical aspect of hybrid data management. Financial institutions must implement robust security measures to protect data across on-premises and cloud environments. Encryption technologies, access controls, and continuous monitoring of data access and usage are essential. Ensuring compliance with data privacy regulations, such as GDPR, is paramount to protecting customer data privacy.

Another key component of hybrid data management is governance. Establishing clear governance frameworks ensures data quality, accuracy, and integrity. Implementing robust data validation and cleansing processes eliminates inaccuracies and inconsistencies. Defining clear data ownership and stewardship roles fosters accountability for data management practices.

A final aspect in hybrid data management is scalability. Financial institutions must ensure their data management infrastructure can scale to meet the growing volume and complexity of data. Adopting scalable storage and processing solutions capable of handling large volumes of structured and unstructured data is crucial. Implementing scalable data integration and transformation processes ensures data can be easily accessed and used for AI model development.

In summary, hybrid data management is essential for financial institutions seeking to navigate the evolving regulatory landscape and leverage advanced analytics and AI capabilities. By adopting a versatile and secure data platform, implementing robust security measures, and establishing clear governance frameworks, institutions can achieve compliance with DORA and enhance their operational resilience and competitive advantage in the digital era.

93%
OF RESPONDENTS TO CLOUDERA'S SURVEY ACKNOWLEDGE THE IMPORTANCE OF MULTI-CLOUD/ HYBRID CAPABILITIES FOR ADAPTING TO CHANGE

07 | CONCLUSION

▶ Achieving top-line results from a DORA-compliant data strategy is essential for financial institutions aiming to supercharge their data and AI-driven initiatives without prohibitive costs. Rapidly developing and deploying modern data platforms and analytics and AI architectures are crucial for supporting institutional missions and complying with DORA. As the digital operational resilience landscape continues to evolve, future trends will likely witness a deeper integration of regulatory frameworks like DORA with advanced data management, analytics, and AI strategies.

By adhering to DORA's stringent requirements, financial institutions can enhance their operational resilience while unlocking new opportunities for innovation and growth. Adopting modern data architectures and unified data management frameworks will enable institutions to effectively manage their data, develop trustworthy AI and analytics models, and ensure compliance with regulatory standards. As financial institutions continue navigating the evolving regulatory landscape, the importance of a robust and versatile data strategy cannot be overstated.

The future of the financial sector hinges on the seamless integration of data management, analytics and AI, and regulatory compliance. By embracing DORA's principles and investing in modern data architectures, financial institutions can achieve operational resilience, drive innovation, and maintain a competitive edge.

ABOUT CLOUDERA

Cloudera is the only true hybrid platform for data, analytics, and AI. With 100x more data under management than other cloud-only vendors, Cloudera empowers global enterprises to transform data of all types, on any public or private cloud, into valuable, trusted insights. Our open data lakehouse delivers scalable and secure data management with portable cloud-native analytics, enabling customers to bring GenAI models to their data while maintaining privacy and ensuring responsible, reliable AI deployments. The world's largest brands in financial services, insurance, media, manufacturing, and government rely on Cloudera to be able to use their data to solve the impossible—today and in the future.

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