



Enterprise Data Management for the Banking Industry



Introduction :

Picture this: a customer applies for a mortgage on their phone while waiting for coffee, an AI tool instantly flags a suspicious transaction halfway around the world, and a wealth manager makes personalized investment recommendations based on real-time market analysis. This is banking in 2024 – a far cry from the days of paper ledgers and waiting in teller lines.

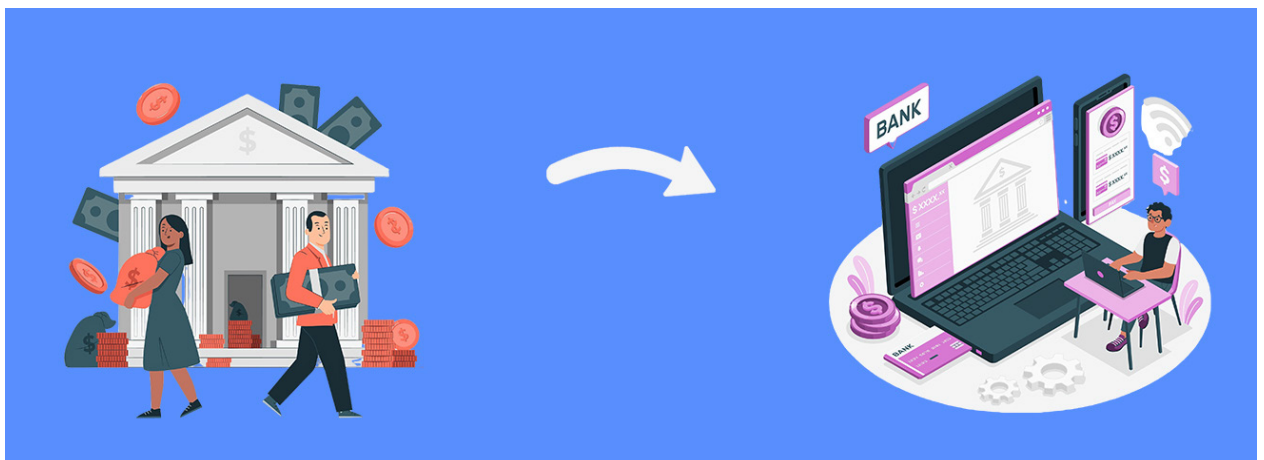
Banking has undergone a tremendous transformation. What began as a cautious digital transformation has evolved into a total data revolution, with financial institutions processing more information in a day than they once did in a whole year. Every digital transaction, every tap, and every click adds to this growing volume of data – creating both opportunities and challenges for banks and financial institutions.

While banks drown in data, many today struggle to generate actionable insights from their datasets. Whether it's managing legacy systems and applications, navigating regulations, or building data platforms – the path to becoming a truly data-driven bank is filled with critical decisions.

This guide cuts through the complexity. We'll explore how leading financial institutions are mastering their data landscape – from building scalable architectures and ensuring iron-clad compliance to implementing AI solutions that transform customer experiences. Whether you're a data architect, compliance officer, or banking executive, you'll find practical strategies to help your institution thrive in the age of intelligent banking.

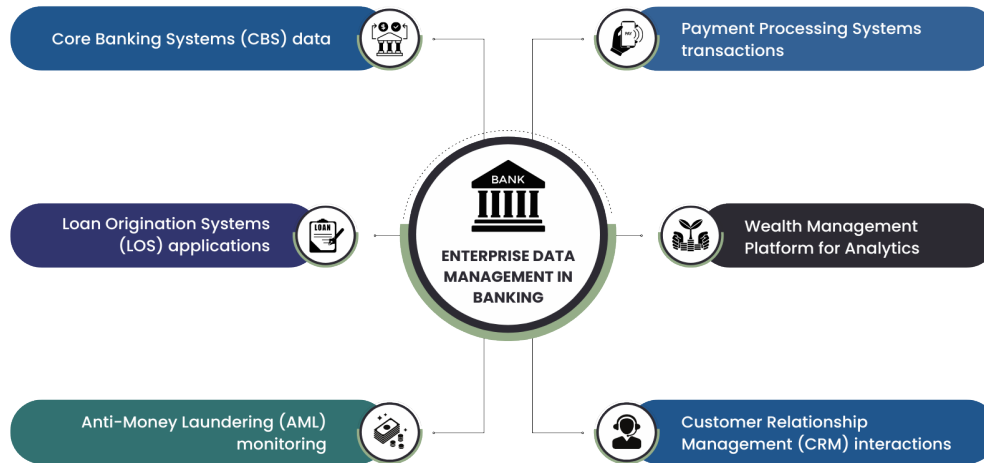
Modern Banking Landscape :

The banking industry in 2024 will be very different from its counterparts a decade ago. Core banking systems and applications form the foundation of a bank's IT infrastructure, managing everything from account management to regulatory compliance. Digital Banking Platforms have made mobile banking, digital payments, and real-time cross-border transactions the norm rather than an exception. Traditional banks now compete with newer fintech start-ups and tech giants, forcing the entire sector to rethink basic principles of business, with a focus on data-driven decision-making.



Enterprise Data Management in Banking

Data management in banking has evolved from a back-office support function to a strategic imperative that drives competitive advantage. This complex landscape requires sophisticated architectures to handle structured data and the growing volumes of unstructured data from digital channels, customer interactions, and external sources.



Data Architectures in Banking

The foundation of effective data management lies in a robust data platform that enables the data teams to effectively understand and manage their complete data lifecycle—from creating to finally archiving or purging the data. Managing your data lifecycle is important for both operational efficiency and regulatory compliance.

Active Data Management

Banks and financial institutions process millions of transactions daily for customer accounts and active portfolios in real-time. This data is typically stored across relational databases, data warehouses for analytics, and data lakes for storing unstructured data and machine learning projects.

Archiving and Data Lifecycle Management

Datasets that reach the end of their lifecycle are subject to one of two conditions: The data is unimportant, and hence, it can be purged, or retaining the data is important for analytics and legal-hold mandates. Based on each case, the data is either purged or archived in cold storage tiers, where it can be stored for defined periods before the purge. Maintaining compliance-driven archival policies and retention schedules is crucial to ensure compliant operations.

Storing data for analytics

Depending on the nature of analytics, banks and financial institutions typically use data warehouses, data lakes, data lakehouses, or a combination of the three based on the core use case.

Data Warehouses

Traditional data warehouses continue to excel in handling structured transactional data and reporting. They provide:

- Reliable performance for regular financial reporting.
- Strong data consistency for regulatory compliance.
- Optimized query performance for known business processes.
- Clear data schemas that align with banking operations.

Data Lakes

Banks have adopted data lakes to handle the explosion of unstructured and semi-structured data:

- Storage for customer interaction logs, voice recordings, and documents
- Raw data repository for advanced analytics and AI training
- Cost-effective storage for large-scale data retention
- Flexibility in data processing and exploration

Data Lakehouses

The emergence of lakehouses represents a hybrid approach that particularly benefits banking operations:

- Combines warehouse reliability with lake flexibility
- Enables both traditional BI and advanced analytics
- Supports real-time data processing for fraud detection
- Provides unified governance across structured and unstructured data

Cloud Adoption and Hybrid Approach

As banks modernize their data infrastructure, cloud adoption has become a strategic imperative driven by compelling benefits. The move to cloud platforms offers significant cost advantages through reduced physical infrastructure needs and pay-as-you-go models while enabling greater business agility through rapid service deployment and easier fintech integration.

However, most financial institutions opt for hybrid approaches to data management, balancing cloud benefits with regulatory requirements and operational realities. This hybrid model allows banks to keep certain data on-premises due to regulatory mandates while leveraging cloud capabilities where appropriate. The approach is customized based on each bank's needs, considering organizational size, geographic distribution, existing technology infrastructure, and security requirements. This flexibility enables banks to optimize performance and maintain business continuity while meeting diverse regulatory and operational demands across different jurisdictions.

Document Management in Banking

Banks deal with enormous volumes of paper and digital documents, from customer contracts to regulatory filings. Firms need to manage these documents efficiently to ensure they are usable and retrievable when needed. Document management extends beyond simple file storage, requiring sophisticated systems that balance accessibility with security.

Modern banking operations demand centralized repositories with robust version control, comprehensive audit trails, and seamless integration with business processes. These systems must support strict regulatory compliance while enabling efficient search and retrieval with clear retention policies and archival procedures. Effective document management underpins critical banking functions, from customer service and compliance to risk management and innovation, making it a foundational element of successful banking operations.

Data Compliance in Banking

Data Retention :

Banks face intricate data retention requirements across multiple jurisdictions and regulatory frameworks. These mandates, enforced by the SEC, Federal Reserve, and various international regulators, ensure financial institutions maintain accurate records for audit, compliance, and legal purposes. Here are the typical retention periods as mandated by key regulations:

- Transaction records (typically 5-7 years) – Bank Secrecy Act (BSA)
- Customer identification documents (5+ years after account closure) – USA Patriot Act
- Financial statements and reports (7-10 years) – Sarbanes-Oxley Act
- Trading and investment records (minimum 6 years) – SEC
- Communication records (3-7 years, depending on jurisdiction) – FINRA

Note: Requirements may vary by jurisdiction and specific business context. Financial institutions should consult their legal and compliance teams for precise requirements applicable to their operations.

By adhering to proper retention policies, banks can streamline audits, effectively address customer disputes, gain valuable insights from historical data, mitigate legal and regulatory risks, and optimize storage costs through efficient data lifecycle management.

Data Privacy and Security Regulations

With the banking industry handling large volumes of highly sensitive information daily, ensuring that all data operations are safe without compromising data security is crucial. Preventing unauthorized access and securing data environments from internal and external threats must be top priorities for data teams across financial institutions. This allows enterprises to duly protect sensitive stakeholder data while staying away from large fines and lawsuits that come with non-compliance of data privacy regulations.

Here are a few key data privacy regulations that regulate data management:

- **General Data Protection Regulation**

Mandates data protection by design and default, right to be forgotten, data portability, and notification of data breaches.

Non-compliance can lead to fines of up to €20 million or 4% of annual global turnover, whichever is higher.

- California Consumer Privacy Act (CCPA) – United States**
 Mandates the right to know, the right to delete, the right to opt-out of the sale of personal data, and the right to opt-in for the sale of minors' data.

 Non-compliance can lead to fines of up to \$2500 per violation and additional penalties for willful negligence.
- Personal Data Protection Act (PDPA) – Singapore**
 Mandates adequate protection of data, accountability, and notification of data breaches.

 Non-compliance can lead to fines of up to S\$1 million or 10% of annual turnover, whichever is higher, of severe infringements.
- Data Protection Act 2018 (DPA) – United Kingdom**
 Mandates adequate protection of data, accountability, and notification of data breaches.

 For serious infringements, non-compliance can lead to fines of up to £17.5 million or 4% of annual global turnover, whichever is higher.

Data Governance in Banking

Data governance in banking institutions encompasses the overarching strategies, policies, and procedures that ensure effective data management throughout the organization. It provides the foundation for how financial institutions collect, store, process, and utilize data assets while maintaining regulatory compliance and operational efficiency. A robust data governance framework is essential for managing risk, ensuring data quality, and deriving value from data assets in an increasingly complex financial landscape.

Data Stewardship, Ownership, Federation, and Control Mechanisms

Data stewardship in banking involves assigning specific responsibilities to individuals or teams that oversee data assets. These stewards ensure that data is accurate, consistent, and accessible while also maintaining compliance with regulatory requirements. Data ownership, meanwhile, defines who has the ultimate responsibility and authority over particular data assets. In large financial institutions, data is often federated, meaning that responsibility and control are distributed across departments or geographies, requiring clear control mechanisms to ensure consistency and alignment with the organization's governance policies.

Key control mechanisms include:

- Data Quality Management:** Ensuring accuracy and completeness of data.
- Access Controls:** Restricting data access based on roles and responsibilities.
- Audit Trails:** Maintaining records of who accessed or modified data is crucial for compliance.
- Federated Governance Models:** Enabling decentralized data ownership while maintaining oversight at the enterprise level.

Master Data Management for Financial Data

Master Data Management (MDM) is crucial in banking to ensure that core financial data—such as customer records, product information, and account details—is consistent, accurate, and centralized

across the institution. In a highly transactional industry, disparate systems can result in data silos, leading to inefficiencies and compliance risks. MDM addresses these challenges by creating a single, authoritative source of truth for critical financial data.

Key benefits of MDM in banking include:

- **Consistency:** Ensures uniformity of data across multiple systems.
- **Efficiency:** Streamlines processes by reducing duplication and inconsistencies.
- **Compliance:** Improves the accuracy of reporting and auditing by centralizing key data assets.

Importance of Data Lineage and Traceability

Data lineage and traceability are essential in banking, where it's critical to understand the origin, movement, and transformation of data throughout its lifecycle. Data lineage clarifies how data flows across systems, from initial creation or ingestion to final reporting or archiving. This transparency is not only vital for compliance but also for mitigating operational risks and improving the quality of decision-making.

In a regulatory context, having a clear view of data lineage ensures that banks can demonstrate how data has been processed and transformed, which is crucial for audits and regulatory inquiries. Traceability is equally important for addressing customer disputes, resolving transaction errors, and identifying the root cause of system issues.

Sensitive Data Detection, Privacy, and Security

Financial institutions handle vast amounts of sensitive data, including personally identifiable information (PII), transaction histories, and financial records. Ensuring the privacy and security of this data is paramount in maintaining customer trust and complying with regulations such as the GDPR, CCPA, and PCI DSS.

Key strategies for protecting sensitive data include:

- **Data Masking and Encryption:** Protecting sensitive data at rest and in transit by rendering it unreadable without proper authorization.
- **Access Management:** Implementing role-based access controls to ensure that only authorized personnel can view or modify sensitive data.
- **Data Loss Prevention (DLP):** Deploying technologies that prevent unauthorized sharing or exposure of sensitive information.
- **Anonymization and Tokenization:** Using techniques to remove or obscure personally identifiable information while retaining the utility of the data for analysis.

In addition to these techniques, banks must also implement comprehensive security measures, including multi-factor authentication, intrusion detection systems, and regular security audits. Privacy-by-design principles should also be integrated into new banking services and systems, ensuring privacy is a foundational component from the outset.

By embracing robust data governance, privacy, and protection practices, banks can comply with stringent regulatory requirements and build stronger, more secure relationships with their customers.

D&A Use Cases in Banking

Modern banks are leveraging data to transform their internal operations and customer experiences. Here's how analytics is reshaping banking across key areas:

Internal Banking Operations

Data, with effective analytics engines and AI, can have several benefits to a bank's internal processes, here are a few top use cases:

- **Risk Management and Compliance:**
Banks employ advanced analytics and machine learning across critical risk functions, from real-time fraud detection and AML pattern analysis to credit risk modeling and automated regulatory reporting. These systems enable continuous capital adequacy and market risk monitoring while ensuring regulatory compliance through automated processes and stress testing.
- **Operational Efficiency:**
Banks leverage data analytics to optimize operations through process automation, resource allocation, and performance monitoring across branches and cost centers. Advanced analytics enables predictive maintenance of infrastructure and ATMs while tracking employee productivity to maximize operational efficiency.
- **Financial Management:**
Banks employ sophisticated analytics for comprehensive financial management, from revenue forecasting and cost attribution to detailed profitability modeling by products and customers. These tools enable optimization of investment portfolios and treasury operations while maintaining effective balance sheet risk management, ultimately driving more informed financial decision-making and improved bottom-line performance.

Customer Experience Use Cases

Apart from the numerous use cases for making internal processes more streamlined, banks analyzing customer data can significantly help improve customer experience while making the entire process easier. Here are a few examples:

- **Customer Understanding and Engagement:**
Data-powered insights empower banks to create personalized experiences, deliver targeted marketing campaigns, and effectively retain valuable customers. By leveraging analytics, banks can gain deep insights into customer preferences, behaviors, and needs, enabling them to tailor their offerings and communications to individual customers. This personalized approach fosters stronger customer relationships, increases customer satisfaction, and drives revenue growth.
- **Digital Banking Experience:**
Digital-first banking can enhance the customer experience and drive engagement. Banks can optimize their digital channels by leveraging data, personalizing interactions, and providing a seamless and convenient banking experience. This focus on digital innovation helps banks attract and retain customers in today's competitive market.
- **Product and Service Enhancement:**
By analyzing customer data, banks can identify areas for improvement, develop new products and

services, and optimize existing offerings. This data-driven approach ensures that banks provide products and services that resonate with their customers, increasing customer satisfaction, loyalty, and revenue.

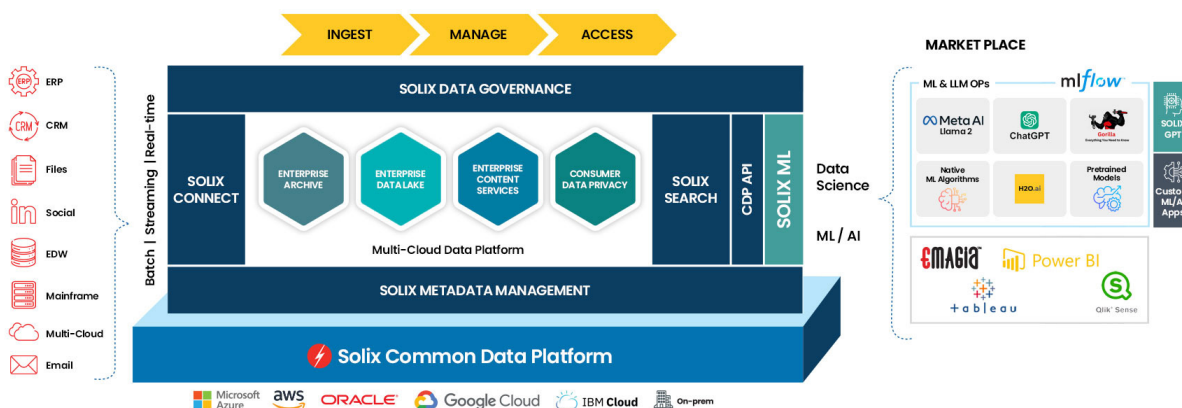
Final Thoughts

Enterprise Data Management has become a strategic necessity for banks today. Banks need robust data architectures and governance frameworks to stay competitive with the rapid growth of data from customer interactions, transactions, and regulatory requirements. Cloud adoption, hybrid models, and technologies like data lakes and lakehouses enable banks to manage structured and unstructured data efficiently while ensuring compliance with complex regulatory mandates. Managing data effectively allows banks to optimize operations, enhance customer experiences, and drive innovation.

Moreover, strong data governance and privacy protocols are crucial for maintaining customer trust and ensuring data integrity. Banks implementing advanced analytics and AI-driven solutions can streamline internal operations, mitigate risks, and personalize customer services. By leveraging data effectively, banks can meet regulatory obligations and unlock new opportunities for growth and differentiation in an increasingly competitive market.

Solix for the Enterprise:

Solix is a provider of data management solutions for the data-driven enterprise. Powered by the [Solix Common Data Platform \(CDP\)](#), Solix empowers organizations to manage, protect, and leverage their data effectively. With a suite of solutions, including [Enterprise Archiving](#), [Enterprise Data Lake](#), [EAI](#), [Data Masking](#), [Sensitive Data Discovery](#), and [Consumer Data Privacy](#), SOLIX offers a unified approach to data governance, security, and compliance. From archiving legacy data to enabling real-time analytics and AI applications, SOLIX provides the tools and infrastructure needed to unlock the full potential of enterprise data.



**Solix Technologies, Inc.**

4701 Patrick Henry Dr, Bldg 20
Santa Clara, CA 95054

Toll Free: +1.888.GO.SOLIX (+1.888.467.6549)
Telephone: +1.408.654.6400
Fax: +1.408.562.0048
URL: <http://www.solix.com>

Copyright ©2024, Solix Technologies and/or its affiliates. All rights reserved.

This document is provided for information purposes only and the contents hereof are subject to change without notice.

This document is not warranted to be error-free, nor subject to any other warranties or conditions, whether expressed orally or implied in law, including implied warranties and conditions of merchant- ability or fitness for a particular purpose.

We specially disclaim any liability with respect to this document and no contractual obligations are formed either directly or indirectly by this document. This document may not be reproduced or transmitted in any form or by any means, electronic or mechanical, for any purpose, without our prior written permission.

Solix is a registered trademark of Solix Technologies and/or its affiliates. Other names may be trademarks of their respectively