



Atlas for Industries

Expanding Horizons: MongoDB's Role in Transforming Financial Services



Financial Services

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Introduction



Change is the only constant in the banking and financial services industry (BFSI) – and that constant moves fast. Brand-new challenges, from legacy systems and data security to scalability and agility, crop up even when solutions are being developed. To survive and thrive in the evolving landscape of financial transactions, BFSI companies need all the help they can get.

In this ebook, we highlight MongoDB's ability to address these key challenges by serving as a strategic partner for creating intelligent, unified, and seamless applications for banking and financial services institutions. Whether your institution is modernizing its data infrastructure or considering relational vs. non-relational databases, on-premises vs. cloud deployments, or a multi-cloud strategy, MongoDB offers the flexibility and capabilities needed to meet industry requirements.



A Critical Juncture: Key Challenges in the Banking and Financial Services Industry



The BFSI sector is currently at a pivotal point, grappling with significant challenges across technology, regulations, and customer experience. In their effort to overcome these hurdles, the demand for reliable, scalable, and secure tech solutions is more pressing than ever.

Here are some of the most pressing challenges.

Too Many Companies Are Still on Legacy Infrastructure

While BFSI companies understand the value of modernisation, many are burdened with legacy systems that are costly to maintain and disruptive to adopting new technologies. MongoDB offers a **flexible data schema** that easily incorporates all data types – in structure, format, or source – no matter how often it changes. This means businesses can easily integrate with third-party services via APIs, making real-time changes to create new value out of data. Also, having old and new systems working concurrently often leads to data silos, which in turn makes data management harder to handle.

Privacy and Security Remain Clear and Present Concerns

As data breaches are increasingly common, the BFSI has a two-fold challenge: Adhering to stringent data privacy and security regulations and changing regulatory requirements. Protecting sensitive customer information from cyber threats while ensuring compliance with global data protection laws, such as the General Data Protection Regulation (GDPR), Personal Data Privacy (PDP) regulations, Payment Card Industry Data Security Standard (PCI DSS), and Service Organization Control (SOC) 2 compliance, are paramount. Securing data across different and evolving data compliance protocols adds to the complexity.

Data Volumes Continue to Increase Exponentially

The digital transformation has led to an exponential increase in data volumes and transaction loads. To keep up with the times, companies have had to rapidly scale up their storage and computing capacities, all while maintaining performance, agility, and availability around the clock. The new volumes of generated data also impact risk management – making it harder to sift through for fraudulent transactions and activities. With customer expectations at an all-time high with little tolerance for compromised, slow, or interrupted services, companies must find ways to maintain their services even during peak periods and system failures.

The Need to Innovate

Innovation waits for no one, which is why large portions of resources are often dedicated to this nonstop endeavour. Today, the landscape is steering towards real-time payment processing and digital currencies, and BFSI companies must switch gears – if the gears have not been changed already – to make that a chief priority. Similarly, **core banking functions**, such as account management, loans, and credit processing, are being transformed by digital technologies. To maintain continued innovation, companies need highly responsive, reliable, and secure systems to manage the increasing volume and variety of transactions.

Hello World, Meet MongoDB



With unprecedented challenges come unprecedented opportunities – and we at MongoDB believe that we are up for the challenge. Built by developers, for developers, MongoDB's developer data platform is a database with an integrated set of related services that allow development teams to address the growing requirements for today's wide variety of modern applications, all in a unified and consistent user experience.

MongoDB brings architectural advantages to financial institutions by enabling them to securely unify application data (structured & unstructured operational data) and AI-related data (vectors) in a way that allows institutions to build rich, real-time AI applications for customers. MongoDB's developer data platform puts powerful AI and analytics capabilities directly into the hands of developers that enable financial institutions to seamlessly integrate with AI/ML technologies to enhance customer satisfaction, improve data-driven decision making, and accelerate transaction processing in a modern hybrid and multi-cloud environment.

More than half
of **Fortune 100**
companies use
MongoDB.

Here's why:

MongoDB is a leading, modern, general-purpose developer data platform designed to support a wide range of scalable applications. Six of the top 10 Banks in the world are customers of MongoDB.

Learn how Temenos Banking Cloud scaled to 150k transactions per second with MongoDB Atlas and Microsoft Azure.

temenos

We offer a document-oriented approach, providing high performance, high availability, and easy scalability.

Learn how Midland Credit Management boosted scalability by 50x and cut costs by 120x with MongoDB and AWS.



Midland
Credit
Management®

Our dynamic schema allows for the rapid iteration of applications by giving developers the flexibility to modify the database schema without downtime.

Explore the strategies behind Wells Fargo's mainframe modernization, revealing how they enhanced the sustainability and flexibility of their payment platform.

WELLS FARGO

We help businesses accelerate development cycles, handle diverse data types, and unlock the power of data to drive innovation.

Discover how Macquarie Bank built a real-time payments platform in weeks, not months.



MACQUARIE

More Than a Database: The Developer Data Platform



MongoDB stands out in the database technology landscape with unique advantages that are especially relevant to the BFSI, making it the preferred choice for modern financial institutions.

Because We are a One-Stop-Shop for Developers

MongoDB Atlas is an advanced cloud database service that incorporates an entire suite of data services to accelerate and simplify how developers build with data. MongoDB also comes with multi-cloud support right out of the box, which is perfect for companies with multi-cloud strategies or considering it as a future-proofing option.

From a business perspective, MongoDB Atlas is a game-changer. It significantly reduces costs and complexity when expanding your database capabilities. Whether you choose to run **MongoDB on-premises** or in the cloud, it offers flexible scaling and rapid deployment, leading to faster time-to-market for new financial products and services.

Because We Run on a Highly Flexible Data Model

MongoDB stores documents polymorphically, making it easier to model data of any structure and adapt as requirements change. This flexible **JSON-based data format** is key to solving many of today's data problems, where semi-structured and unstructured data are required to meet the growing customer demands for artificial intelligence-centric products and services. By

keeping institutional data assets in a flexible format, BFSI institutions ensure data assets can comply with evolving regulation requirements and be used for prioritised lines of business. This is key to new product developments and strengthening services for customers.

Because We Can Manage Data Volume Growth Without Disruptions

Besides offering the same key strengths as traditional RDBMS (relational database management systems), such as expressive query languages, secondary index, **ACID compliance**, and **scaling**, MongoDB's architecture facilitates easy horizontal scaling through native sharding. This feature is particularly beneficial for businesses experiencing rapid data growth. Native replica set **clusters** also ensure sufficient data redundancy and high availability for continuous access. Higher data volumes can be managed efficiently while maintaining high performance, uptime resilience, and quick service recovery amid sudden disruptions.

By leveraging MongoDB, businesses can adapt to growth dynamically, ensuring their data infrastructure scales and maintains operations seamlessly alongside their expanding needs.

Because We Facilitate Faster Financial Transactions for Positive Customer Experiences

MongoDB's flexible document model streamlines banking operations by making third-party connectivity, intercommunication, and data flows speedy. The speed and efficiency provided by MongoDB not only improve transaction times but also offer applications that are more responsive, serving as a crucial competitive edge in the fast-moving financial sector. This ensures customers experience consistency and updated personal financial data across in-person banking services and digital touchpoints, all in real time.

Discover how Temenos Banking Cloud scaled to 150k transactions per second with MongoDB Atlas and Microsoft Azure.

Because We Have Advanced Security Built-in

MongoDB's **strong security features**, most significantly supporting 100% encryption at all three levels – at rest, in-transit, and in-use. Customers can use automatic encryption of key data fields like PII, PHI, or any data deemed sensitive – ensuring data is encrypted throughout its lifecycle. Data is encrypted client-side with customer-controlled encryption keys before being sent, stored, or retrieved from the database. MongoDB has two features for encryption in-use to meet data protection needs:

- **Client-Side Field Level Encryption:** Enables a client application to encrypt sensitive data before storing it in the MongoDB database.
- **Queryable Encryption:** Introduces a first-in-industry fast encrypted search algorithm that enables an application to encrypt sensitive data from the client side, store the encrypted data in the MongoDB database, and run expressive queries on the encrypted data.

MongoDB's built-in security controls and enterprise-grade security features also include:



Authentication: Authenticate to an Atlas UI with your Atlas credentials or single sign-on. Atlas also supports multi-factor authentication.



Authorization: Atlas provides role-based access controls (RBAC) to manage all cloud resources, including MongoDB deployments.



Auditing: MongoDB offers granular auditing that monitors actions in your MongoDB environment, designed to prevent and detect unauthorised access.



Network Security: Atlas offers many options to securely access your data with dedicated clusters deployed in a unique virtual private cloud (VPC).



Data Sovereignty: Atlas databases are available in 100+ regions across AWS, Google Cloud, and Azure.

These technical capabilities are vital for ensuring data security and aiding compliance with regulations. By leveraging MongoDB's security features, businesses can reduce the risk of breaches, as well as maintain customer trust and data integrity.

Apart from the Rest: Key Differentiators of MongoDB



MongoDB sets itself apart as the developer data platform for modern applications through several key differentiators that cater specifically to the evolving needs of BFSI companies. Below, we explore these differentiators in detail, offering insights into why MongoDB is a leader in its field.

Databases and Document-Oriented Data Models Fit for Banking and Financial Services

Speed	Resilience	Flexibility
MongoDB's document model and powerful indexing capabilities enable incredibly fast data access and manipulation. This means high-performance applications that are crucial for real-time financial transactions and analytics.	Automatic sharding, replication, and fault tolerance are provided, ensuring high availability and disaster recovery. Financial services can depend on MongoDB for uninterrupted service, even in the face of hardware failures and maintenance events.	MongoDB's dynamic schema allows for agile development and iteration. This enables financial institutions to easily adapt to changing market demands and regulatory environments without the need for extensive database redesign.

Adaptable Deployments: On-Premises, in the Cloud, and More

Whether the focus is on fortifying database environments, developing new innovative products, or revamping databases to meet today's hyper-personalised banking and financial services, MongoDB ensures that system integration, data security, regulatory compliance, and comprehensive risk management are accounted into deployment options. With **multi-cloud capabilities**, MongoDB integrates with existing systems to make unified, intelligent banking a reality.

Artificial Intelligence-Enriched Applications

MongoDB Atlas unifies operational, analytical, and generative AI data services to streamline building **AI-enriched applications**. The core MongoDB Atlas platform allows developers to create new generative AI-enriched applications and traditional AI-enriched applications. From chatbots to hyper-personalised recommendations, MongoDB makes full use of diverse data sets so that developers can build solutions just as naturally as how they use data as building blocks.

Artificial Intelligence-Enriched Applications

Are you having difficulty building AI-enriched applications due to...

Adapting legacy systems to integrate with AI/ML models.	Data privacy and security when AI applications are put into production
<p>Banks often have outdated and complex legacy systems that may not be compatible with modern AI technologies. To seamlessly integrate AI systems with existing ones, banks will have to invest in modernisation and integration projects.</p> <p>By leveraging MongoDB's flexible document model, financial institutions can handle large amounts of data in a flexible schema to effortlessly integrate with AI/ML platforms. This enables teams to develop models that are trained on the most accurate and relevant data available to automate manual workflows, leverage virtual assistants, and more.</p>	<p>A big challenge of AI in financial services is the quantity of data collected that contains sensitive and confidential information which requires additional security measures to be implemented.</p> <p>MongoDB is dedicated to securing and protecting your data through state-of-the-art technical and organisational security controls, numerous regulatory and compliance resources, and a growing collection of third-party attestations and certifications like SOC2, PCI, and others.</p> <p>MongoDB's built-in security capabilities include authentication (e.g. SSO and MFA), role-based access controls, and data encryption (in-transit, at-rest, in-use), which all help secure sensitive financial data and prevent unauthorised access from third parties.</p>
The explainability of AI models with greater transparency and adhering to localisation needs	Lack of data quality
<p>AI is based on algorithms, and people who are not familiar with these might find it difficult to grasp how AI-driven decision-making functions.</p> <p>With the use of explainable AI techniques coupled with the strength of large language models (LLM) that excel in summarising complex descriptions and providing strong reasoning, banks must provide more transparency in the AI decisions being made. When developing models, localisation is also important when providing transparency across different markets where language, culture, and demographics must be considered.</p> <p>MongoDB's fast operational data store is ideal when building an online feature store aligned to AI/ML models, enabling you to compute variables instantly and provide decisions quicker with greater transparency in areas like fraud detection or credit scoring decisions. The adaptability of the document model is key to this as a single collection can have multiple documents carrying different fields that adapt to different markets. Financial institutions can offer greater transparency with RAG systems using vector store capabilities with MongoDB.</p>	<p>Adequate quality data is essential to ensure that the algorithm can perform optimally in real-world scenarios. If data is not in a machine-readable format, it may cause unexpected behaviour in the AI model.</p> <p>It can be difficult to overcome data quality issues when supporting AI models with different data sources and types. By complementing your AI/ML models with a variety of data, for example, alternative data in credit scoring to reduce bias, you can ensure your models are trained on the most accurate and relevant data.</p> <p>MongoDB's developer data platform future-proofs your business with a flexible data schema that can easily incorporate any kind of data—any structure, any format, any source—no matter how often it changes. By unifying siloed data sources with MongoDB as the operational data store (ODS), you can handle large amounts of data in real time to ensure your data models have access to the best data available.</p>

Fully ACID-Compliant

A common misconception about MongoDB, especially in the context of non-relational databases, is its lack of adherence to ACID properties — Atomicity, Consistency, Isolation, and Durability. This clarification is critical for all matters related to banking and financial services where real-time transactions and dynamic accounting are core to an institution. Transactions in MongoDB feel just like transactions developers are familiar with in relational databases. **Multi-document and distributed ACID transactions** make it easier than ever for developers to address the full spectrum of transactional use cases.

Misconception	Fact
<ul style="list-style-type: none">Non-relational databases like MongoDB do not support ACID-based transactions. This misconception often stems from early comparisons with traditional relational databases, where ACID compliance was a well-established concept.	<ul style="list-style-type: none">MongoDB has built-in support for multi-document ACID transactions in its version 4.0 and later.The ACID transaction support allows for complex operations and consistency across distributed systems.This feature allows operations across multiple documents to be executed in a fully ACID-compliant manner.

Here's how MongoDB ensures transactions adhere to each of the ACID properties:

Atomicity: MongoDB ensures that all operations within a transaction are completed successfully before committing. If any operation fails, the transaction is aborted, and no changes are made to the database.

Consistency: By ensuring transactions are atomic, MongoDB also ensures that the database remains in a consistent state before and after transactions. Consistency rules defined in the schema are enforced throughout the transaction execution.

Isolation: Transactions in MongoDB provide snapshot isolation, allowing concurrent transactions to occur without leading to dirty reads, non-repeatable reads, or phantom reads. This is crucial for financial institutions where transaction integrity is paramount.

Durability: Once a transaction is committed, changes are persisted in the database, ensuring data is not lost in the event of a system failure. MongoDB's replication and journaling features further enhance data durability across distributed environments.

Learn more about MongoDB's multi-document and distributed ACID transactions.

Explore MongoDB's Developer Data Platform



Build fast with our Developer Data Platform, integrating all of the data services you need to build modern applications with a unified developer experience. **For a full list and details of products, visit the official MongoDB product page.**

Model, build, and interact with data	Explore developer tools Define document schemas, write queries, and interact with your data in MongoDB.	Compass Free GUI for querying, optimizing, and analyzing MongoDB data. Query your data using natural language in Compass.	Atlas CLI Command-line interface for managing MongoDB Atlas locally and in the cloud.	
Search, analyse, and visualise data with speed and scalability	Explore MongoDB Atlas Design engaging end-user applications, unlock AI-powered experiences, and discover insights from your data in MongoDB.	Compass Free GUI for querying, optimizing, and analyzing MongoDB data. Query your data using natural language in Compass.	Atlas Search Native full-text search in MongoDB Atlas.	Atlas SQL Interface, Connectors, and Drivers Interface for querying and analyzing data in MongoDB Atlas with SQL-based tools.
	Atlas Vector Search Build intelligent applications powered by semantic search and generative AI over any type of data.	Atlas Charts Native data visualization tool for MongoDB Atlas.	Atlas Stream Processing Transform building event-driven applications by continuously processing streams of data with a familiar developer experience.	
Migrate to MongoDB	Migration Options Move your data from an existing database to MongoDB with tools and fully managed services.	Relational Migrator Migration tool for relational databases to MongoDB.	Atlas Live Migration Migration tool for self-managed MongoDB to MongoDB Atlas.	Professional Services Consulting services for migrating to MongoDB.
Run MongoDB in the cloud or hybrid cloud environments	Atlas Fully managed MongoDB in over 100+ regions on AWS, Google Cloud, and Azure.	Atlas in the Multi / Hybrid Cloud Fully managed MongoDB on <ul style="list-style-type: none">• AWS• Google Cloud• Microsoft Azure	Enterprise Advanced Self-managed MongoDB for on-premises and private cloud environments.	Cluster-to-Cluster Sync Synchronise data between MongoDB clusters in the same or hybrid environments, including Atlas, private cloud, on-premises, and at the edge.
Manage MongoDB programmatically	Kubernetes Operators for managing MongoDB the same way as applications running in Kubernetes.	Atlas Administration API Administration API for programmatically managing MongoDB Atlas resources	Atlas CLI Command-line interface for managing MongoDB Atlas locally and in the cloud.	
Have near real-time AI decisioning	Atlas Stream Processing Make stream data processing more efficient and simpler with MongoDB.	Kafka connector Natively integrate MongoDB data within the Kafka ecosystem.	Atlas Search Provide fast, relevant searches for your users with native full-text search in MongoDB Atlas.	Atlas Vector Search Build intelligent applications powered by semantic search and generative AI over any type of data.

Next Steps with MongoDB



MongoDB's unique blend of speed, flexibility, and robust security offers a compelling proposition for modern financial institutions facing a rapidly evolving landscape. Our ability to provide a scalable, resilient, and efficient data management solution coupled with the commitment to ACID compliance, deployment flexibility, and support for multi-cloud strategies position us as a leader in database solutions.

The conversation about leveraging MongoDB within the banking and financial services sector doesn't end here. We invite you to delve deeper into MongoDB's capabilities and discover how it can drive your institution's digital transformation.



Let's Keep the
Conversation
Going

To further explore how MongoDB can transform your financial services institution, visit the [website](#) for resources, documentation, and ways to get started.

See MongoDB in action, contact us to become part of our [Atlas for Industries](#) program, and arrange an innovation workshop with industry experts to discuss the art of the possible.

[Contact us](#) today and [read here for MongoDB solutions](#).

To engage with MongoDB's vibrant community of developers, join our [forum](#).