



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



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



Companies in the BFSI are at a critical juncture, facing a myriad of challenges that span across technological, regulatory, and customer experience domains. As the sector strives to navigate these complexities, the need for robust, scalable, and secure technological solutions has never been more acute.

Here are some of the most pressing key 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 the adoption of new technologies. MongoDB offers a flexible data schema which 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 changes in real-time 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

In a time where 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 switched 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 is a modern, multi-cloud 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 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 faster transaction processing in a modern hybrid and multi-cloud environment.

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

Here's why:

MongoDB is the leading modern, multi-cloud database designed to support a wide range of applications with 6 of the top 10 Banks in the world being MongoDB customers.

Scale Up and Beyond: 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.

When Scalability Meets Cost Efficiency: Midland Credit Management boosts scalability 50x, cuts costs 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.

Legacy Modernization: Learn the secrets of Wells Fargo's mainframe modernization on how they made their make their payment platform more sustainable and flexible.

WELLS FARGO

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

Accelerated Development Cycles: Discover how Macquarie Bank built a real-time payments platform in weeks, not months



MACQUARIE

A Modern Database for Financial Services



MongoDB stands out in the database technology landscape with unique advantages that are especially relevant to the BFSI, making us 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 that already have multi-cloud strategies or are considering it as a future-proofing option.

On the business front, a full-fledged cloud database service means reduced cost and complexity when building out your database capabilities. Furthermore, since **MongoDB can run on-premises** or entirely in the cloud, it enables flexible scaling and rapid deployment, which in turn means 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

Apart from 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, a feature that 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 maintain 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 Atlas UI with your Atlas credentials or single sign-on. Atlas also supports multi-factor authentication.



Authorization: Atlas provides Role-Based Access Control (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 unauthorized 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, businesses can reduce the risk of breaches, maintain customer trust and data integrity.

Apart from the Rest: Key Differentiators of MongoDB



MongoDB sets itself apart from traditional relational databases through several key differentiators that cater specifically to the evolving needs of BFSI companies. Here, 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
Document model and powerful indexing capabilities enable incredibly fast data access and manipulation. This means high-performance applications, crucial for real-time financial transactions and analytics.	Automatic sharding, replication, and fault tolerance, MongoDB ensures high availability and disaster recovery. Financial services can depend on MongoDB for uninterrupted service, even in the face of hardware failures and maintenance events.	Dynamic schema allows for agile development and iteration. Financial institutions can 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 our 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 how they naturally use data as building blocks.

Artificial Intelligence-Enriched Applications

I am 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, 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 the functioning of AI-driven decision making.</p> <p>With 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 decision. Localisation is also important when providing transparency when developing models that work in 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 to support 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 make sure your models are trained on the most accurate and relevant data.</p> <p>MongoDB's document model helps future-proof businesses 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. Unify siloed data sources by leveraging MongoDB as the operational data store (ODS) to handle large amounts of data in real-time to make sure 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.The 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 adheres 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 Powerful Features for Financial Services



Build fast with a modern, multi-cloud database integrating all of the data services you need to build 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, analyze, visualize data with speed & 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	See 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	Atlas Fully managed MongoDB in over 100+ regions on AWS, Google Cloud, and Azure.	Atlas in the Multi / Hybrid Cloud Fully managed MongoDB on AWS Fully managed MongoDB on Google Cloud Fully managed MongoDB on Microsoft Azure	Enterprise Advanced Self-managed MongoDB for on-premises and private cloud environments.	Cluster-to-Cluster Sync Synchronize 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 its commitment to ACID compliance, deployment flexibility and support for multi-cloud strategies, positions it 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, visit the [website](#) for resources, documentation, and ways to get started.

See MongoDB in action, reach out to become part of our [Atlas for Industries](#) program and arrange an innovation workshop and more with industry experts where you can 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](#).