SingleStore™

The Future of Fintech

Building the real-time data foundation

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Executive summary

Fintech stands at a pivotal moment of transformation, projected to reach $1.5 trillion by 2030 (Source: Finextra), highlighting not just the digitization of traditional services, but the emergence of entirely new financial paradigms. The convergence of real-time payments, embedded finance and artificial intelligence (AI) is creating endless opportunities — while also highlighting the limitations of traditional, legacy tech infrastructures.

As autonomous AI systems reshape how financial decisions are made, the line between technology companies and financial institutions continues to blur. Success in this new era requires not just faster systems, but a fundamentally different data architecture that can handle real-time operations and autonomous financial systems.

This eBook explores how forward-thinking organizations are building that foundation—and why the right data infrastructure is critical to surviving and thriving in the age of intelligent finance.

Chapter 1: The transformation of financial services

The new financial landscape

Financial services are undergoing a seismic shift in how value is created and delivered:

- 24/7 global operations replace traditional banking hours
- Frictionless digital experiences supplant brick-and-mortar transactions
- Personalized, context-aware solutions adapt to evolving customer needs in real time

Multiple forces are driving competition among established banks, tech giants and fintech startups — and understanding these drivers is key for organizations navigating this dynamic environment:

1. **The rise of embedded finance**
   Financial capabilities are seamlessly embedded in non-financial products, enabling any company to become a fintech. This trend expands revenue streams and cements stronger user relationships across industries.
2. **The democratization of financial services**
   Digital platforms break down traditional barriers, making sophisticated financial tools accessible to micro-investors, small businesses and new demographics. This is not just about basic access, but about delivering institutional-level services and insights to the masses.
3. **The emergence of autonomous finance**
   AI-driven systems can now make complex decisions — like trading or lending — instantly and continuously. These systems far exceed human capabilities in speed and scope, promising both high-impact efficiency gains and new risk paradigms.
4. **Real-time everything**
   Top-performing fintechs prioritize real-time data processing to power instant transactions, continuous risk assessment and immediate settlement. In a fast-paced global market, delayed analysis just won't cut it.

These forces create extraordinary opportunities and intense competitive pressure. Organizations not only need to adopt new technologies, but rethink how they design and deliver services to keep pace with real-time expectations.

The data challenge

Modern fintech demands vast volumes of data be collected, processed, analyzed and acted upon in milliseconds. And legacy, batch-oriented architectures aren't designed to keep up with this — or other demands, including:

- High-volume transactions. Handling millions of requests per second with minimal latency
- Real-time analytics. Identifying risk and opportunity instantly, not hours or days later
- Personalization. Incorporating both historical records and live user behavior.
- AI-driven decisions. Powering continuous model updates and real-time scoring or inference
- Elastic scale. Growing on-demand to handle usage spikes without downtime

Traditional architectures that separate transactions (OLTP) from analytics (OLAP) create data silos and inherent delays. As volume and velocity skyrocket, fintechs need a fundamentally different solution that blends these capabilities into one platform.

Chapter 2: Breaking the legacy barrier

The hidden costs of traditional architecture

The gap between modern fintech requirements and legacy infrastructure is a strategic threat. Many fintechs market leading, innovative products but are hindered by backend systems that aren't designed for real-time demands.

Common pitfalls include:

1. **Performance bottlenecks**
   Legacy databases struggle to scale to thousands — or millions — of concurrent requests, leading to latency that damages user experience and revenue.
2. **Analytics delays**
   Siloed operational and analytical systems make real-time insights impossible. That means functions like fraud detection or personalization suffer when data is updated in hourly or nightly batches.
3. **Innovation hurdles**
   A patchwork of databases forces developers to juggle multiple data engines, fracturing innovation efforts and increasing maintenance overhead.

These inefficiencies hamper agility — the real cost is not just in compute and storage, but in missed market opportunities.

The real-time imperative

In today's economy, real-time data processing and analytics are non-negotiable. Fintechs need infrastructures that can:

1. **Unify OLTP and OLAP**
   Eliminate the artificial separation that delays decision making
2. **Scale horizontally**
   Grow via distributed clusters without forced downtime
3. **Support multiple data types**
   Handle structured, unstructured and time-series data seamlessly
4. **Enable AI/ML**
   Provide a robust platform for model training, feature engineering and millisecond-level inference.

Legacy OLTP and OLAP databases were not built to meet these requirements, prompting the rise of unified data platforms like SingleStore that deliver operational and analytical capabilities in a single engine.

Chapter 3: The rise of autonomous finance

Beyond automation

We're entering an era of agentic AI, where AI systems:

- Make independent decisions. Evaluate market signals and execute trades autonomously
- Learn and adapt. Continuously refine models in response to changing market conditions
- Work alongside humans. Escalate complex issues to experts while automating routine actions.
- Coordinate complex operations. From lending to fraud detection, multiple financial functions can operate in tandem

The real-time imperative

Autonomous systems don't merely enhance existing processes; they redefine how financial services are delivered:

- Trading and investment. AI trades around the clock, instantly adjusting strategies based on massive datasets

The real-time imperative (con't)

- Lending and credit. Automated approval processes harness alternative data for near-instant lending decisions
- Risk management. Real-time anomaly detection flags fraudulent behavior before it causes damag.
- Customer service. Intelligent chatbots and recommendation engines offer hyper-personalized advice 24/7

The secret to powering these advanced use cases? Data foundations designed to support massive, continuous, real-time analytics.

Chapter 4: Building the foundation with SingleStore

A unified approach

SingleStore offers a unified data platform that fuses transactional and analytical workloads in our Universal Storage,removing the need for separate OLTP and OLAP databases. Key capabilities include:

1. **Real-time performance**
   Handle millions of transactions per second at sub-millisecond latencies, essential for trading, payments and fraud detection
2. **Unified analytics**
   Analyze data in-flight, eliminating batch windows and powering instant insights
3. **Elastic scalability**
   Scale up or out as demands grow without application downtime
4. **AI/ML integration**
   Built-in support for vector data, real-time model inference and integration with data science frameworks.

By consolidating multiple databases into a single platform, SingleStore reduces complexity, cuts infrastructure costs and accelerates deployment cycles.

Advanced technical capabilities

Under the hood, SingleStore is built to perform in even the most extreme, demanding environments:

- **Vectorized query execution.** Speeds up CPU-bound analytics critical for AI use cases
- **Just-in-Time (JIT) compilation.** Dynamically compiles queries for optimal run-time execution
- **Distributed processing.** Spreads queries across clusters to maintain low latency and high throughput
- **Multi-model support.** Handles structured relational data, JSON documents and vector embeddings.

This technical foundation provides the throughput, flexibility and reliability that modern fintechs need to tackle real-time and autonomous workloads.

Chapter 5: Innovation in action

Made on SingleStore

Bitwyre: Powering next-generation crypto trading

- **Challenge**. Bitwyre's previous system suffered from high latency and data inconsistencies, undermining its institutional trading platform

- **Solution**. Migrated to SingleStore, enabling consistent sub-millisecond reads and writes at scale

- **Results:**
  - 1 million orders/second with 1ms latency
  - 18x faster execution vs. competing exchanges
  - Daily profitability exceeding $1.5 million
  - 100% uptime during volatile market spikes

As the Bitwyre CEO notes: "SingleStore has transformed our institutional crypto offering — both performance and reliability are game-changers."

Read full case study here

Digital Asset Research (DAR): Revolutionizing market intelligence

- **Challenge**. AWS Aurora couldn't handle DAR's exponential data growth, leading to frequent outages and lengthy ingestion times.

- **Solution**: Replaced multiple databases with SingleStore for real-time processing of live trade data.

- **Results:**
  - 1,000x ingestion improvement
  - 50% lower infrastructure costs
  - 1 billion daily trades processed
  - Real-time analysis of 120+ billion historical trades

As Digital Asset Research (DAR) Chris Brodersen reflects, "We now deliver insights to institutional clients faster and at lower cost. SingleStore is a key part of our competitive edge."

Read full case study here

IEX Cloud: Democratizing financial data access

- **Challenge.** Managing massive time-series data for millions of API requests was costly and complex with traditional systems.

- **Solution.** Consolidated three databases into one SingleStore instance, simplifying operations and cutting response times.

- **Results:**
  - 2.5+ billion daily API requests
  - 125,000+ global users
  - 8ms average response time
  - Seamless scaling to handle dynamic demand

According to the IEX Cloud CTO, "SingleStore lets us serve a global user base with ultra-low latency — crucial for real-time market data."

Read full case study here

Voice of the customer

"SingleStore has transformed our institutional crypto offering — both performance and reliability are game-changers."

— CEO, Bitwyre

"We now deliver insights to institutional clients faster and at lower cost. SingleStore is a key part of our competitive edge."

— COO, Digital Asset Research

"SingleStore lets us serve a global user base with ultra-low latency — crucial for real-time market data."

— CTO, IEX Cloud

Chapter 6: Security, compliance and operational excellence

Keeping pace with regulations

In an industry defined by stringent standards, SingleStore's features help fintechs maintain compliance while innovating at speed:

- **Encryption at rest and in transit. Protects sensitive financial data end-to-end.**
- **Role-Based Access Control (RBAC) + auditing. Tracks user actions and maintains an audit trail for regulators.**
- **High availability + disaster recovery. Minimizes downtime and ensures data integrity across regions.**science frameworks.

SingleStore's built-in security and compliance features — combined with robust governance frameworks — help organizations address evolving rules,from PCI-DSS to GDPR and beyond.

Chapter 7: Preparing for the future

Building for tomorrow

The pace of fintech innovation shows no signs of slowing. McKinsey research suggests that financial institutions adopting an AI-first approach will outpace competitors in both customer satisfaction and profitability. As fintech evolves, firms must plan for:

- More sophisticated AI. Automated risk scoring, robo-advice and dynamic pricing
- Growing data diversity. Integrating real-time feeds, user interaction data and third-party APIs
- Heavier throughput. Handling transactions and streaming analytics at explosive scale
- Tighter regulation. Meeting new compliance standards while delivering uninterrupted performance

Taking action

A phased approach helps mitigate risk and ensure organizational buy-in:

1. **Assess current infrastructure**
   Identify bottlenecks, siloed systems and compliance gaps
2. **Quantify total cost of ownership**
   Factor in not just licensing but maintenance overhead, and lost opportunity from slow development cycles
3. **Define a migration strategy**
   Start with a high-value pilot (e.g., real-time fraud detection) and scale from there
4. **Implement + iterate**
   Leverage SingleStore's horizontal scaling to grow seamlessly
5. **Enable AI/ML**
   Embed advanced analytics into real-time workflows for continuous innovation

By following a systematic approach, fintechs can modernize data infrastructure while retaining business continuity and regulatory alignment.

Conclusion: Next steps

The future of financial services belongs to organizations capable of capitalizing on real-time data and autonomous AI. Achieving this vision demands more than incremental upgrades to legacy systems — it requires a new data foundation capable of delivering speed, scale and intelligence in a single, unified platform.

SingleStore empowers fintechs to unify transactions, analytics and AI/ML in one engine, driving faster innovation and more compelling customer experiences. Don't let outdated technology hold you back — start building your real-time fintech ecosystem today.

Ready to learn more?

- Contact SingleStore: Request a demo
- Dive deeper: Explore our technical resources
- Build with SingleStore. Start a free trial today

Get in touch with our team at SingleStore (or start a free trial) to learn how your organization can begin its journey toward real-time data excellence.