

Top 3 Ways Big Data Impacts Financial Services



The Big Data Dilemma for Financial Services

Today's firms are looking for new ways to solve Big Data challenges. From front-office risk management to back-office trade operations, new infrastructure is needed to handle the explosive volume, velocity, and variety of data. Firms must be able to collect, store, and analyze rapidly changing, petabyte-scale data to maximize profits, reduce risk, and meet increasingly stringent regulatory requirements. According to research firm IDC, this Big Data dilemma is significantly impacting three challenge areas to financial sector health this year: operational efficiency, new product development, and compliance¹.

The Operations Challenge

Big Data is hitting at a time when global financial services companies are attempting to consolidate and streamline inefficient operations spawned from mergers. With anticipated growth, now is the time to upgrade the variety of systems spanning these vast multi-national entities to a "future-proof" platform. The challenge comes from uniting disparate data from a variety of third party systems designed to meet the diversity across regions regarding language, regulations, currency, time zone, and more. This disparate nature of systems, devices, and data makes it difficult to aggregate and extract business value.

For example, the trading desks of global firms "follow-the-sun"—when one exchange closes, another opens. Leveraging this constant flow of data in real time is critical to make the right trading decisions. To maintain efficient and cost-effective operations, firms need to manage not only an explosive volume of data, but also more types of unstructured data than ever.

Firms that cannot perform real-time analysis across all data stores create a potentially devastating knowledge gap,

which consequently increases risk. Data warehousing and new technologies all promise to stem that gap, but with high cost. Operational managers worry about the costs of long-term data storage and the impracticality and expense of migrating from existing systems. They also do not have time to consolidate all data into a single model.

The Product Development Challenge

To offset flat or declining revenue streams, financial services firms need to develop new products while also targeting existing products to new audiences. The ability to analyze the full spectrum of data is critical to discover the patterns, trends, and relationships that are the source of innovation. At the root of the problem are data silos which prevent firms from gaining insights on customers, products, and sales channels. In a recent poll by Capgemini, eight-five percent of executives said the issue is not about volume but the ability to analyze and act on the data in real time. Organizations face a Big Data challenge which requires new business intelligence sourced from social media surveillance and predictive analytics.

The Compliance Challenge

The financial services industry continues to face heavy regulatory burdens. Across the globe, existing regulations change and new regulations emerge. It is a constant struggle to avoid fines and penalties. Recently, regulations have expanded beyond simple reporting to include liquidity requirements for capital reserves to cover exposures. Without a complete picture of institutional exposure, too little capital reserve could result in regulatory penalties while too much in reserve reduces leveraged investments. Global firms have to tackle the even bigger challenge of multiple regulatory bodies, laws, and enforcement rules.

¹ "The Cure for Your Top 3 Big Data Headaches" webinar, IDC and MarkLogic, January 24, 2012.

To quickly and accurately comply with new regulatory requirements stemming from Dodd-Frank, Basel III, and Solvency II (for insurers), as well as various Know-Your-Customer laws and unanticipated/unforeseeable future regulations, firms need a flexible data infrastructure and a proactive strategy to maintain compliance. In a highly competitive global financial services market, differentiation is the key to gaining the competitive advantage. Firms can differentiate themselves by reducing operational costs, developing new revenue streams, and adopting a proactive strategy for compliance.

Overcoming These Challenges

When trends change by the second, agility counts. Gaining agility starts with an assessment of existing processes and systems. Firms must identify what existing practices will not support the progress they need. Incremental enhancements to their current environment will only lead to marginal gains. To get the significant advantage firms seek in today's competitive landscape, they should pursue technologies that can support new, innovative practices.

A Proven, Innovative Technology to Support Future Growth

One such technology, MarkLogic Server, is proven to handle today's data challenges. Designed for petabyte scalability and high transaction volume, MarkLogic Server unifies the data located in disparate systems. Structured, unstructured, and geospatial data are combined in a single document-centric database with powerful, real-time search and analytics capabilities.

Tier-1 banks, derivatives trading operations, and front office commodity traders are using MarkLogic Server to ingest and analyze massive volumes of data in real time. As a result, these firms can make proactive decisions based on market trends and conditions, minimize operational cost and risk, develop innovative new products, including critical, decision support tools, and meet compliance requirements.

MarkLogic is the foundation of many leading financial services operations, powering:

- The trade store of one of the world's top derivatives trading banks, enabling real-time monitoring, analyses, and actions.
- The authoring and delivery solution for the equities research division of a global Tier-1 investment bank.
- The front-office commodity trading operations of a Global Fortune 500 energy corporation, giving their traders a powerful decision support tool to predict demand and to forward trade against it.
- A financial market information intelligence firm that relies on MarkLogic to create its Mood Index, which quantifies the social mood of surrounding global securities.

MarkLogic Server: Swiss Army Knife of Big Data

To create a powerful platform for a variety of financial services applications, MarkLogic Server combines three critical technologies:

- Document-centric OLTP database
- Enterprise-grade search
- Application server

The document-centric database uses XML (eXtensible Markup Language) as its data model. This data model, which is both software- and hardware-independent, enables MarkLogic to easily ingest all types of content—from structured and semi-structured trade messages to unstructured customer onboarding data, contracts, news, and social media updates, etc.—bringing it all together in a single operational database.

MarkLogic has the power and speed to handle the thousands of data transactions per second that are common in trading operations. As data volume increases, performance can be maintained with easy scaling through the addition of affordable commodity hardware servers.

Unlike a traditional relational database, MarkLogic is schema-less. It is not necessary to know the attributes of the data up front, and attributes can be added without amending the database. To ensure accuracy, MarkLogic can enforce strict data typing to validate these attributes. This flexibility is especially important in an industry where data is always changing and volume is always growing. Financial services firms do not have the time or money to waste tuning traditional databases that are buckling under increasing data volumes, or updating schemas to comply with the latest regulations and ever evolving business requirements. With MarkLogic, these resources can be redirected to a more important objective—creating new products.

Search is built into the core MarkLogic database instead of being a separate, bolted-on application. The secret behind MarkLogic's search capabilities is the universal index, which indexes the full text as well as the entire document structure, including elements, attributes, and hierarchy. By indexing the full text of the data, MarkLogic enables users to compose meaningful queries that are executed in milliseconds.

As new data flows into MarkLogic, a fully transactional update of the index is created in real time. Query results are always based on what is currently in the database, eliminating the downtime (often hours or even days) required by typical systems when the index and database synchronize. This gives firms a broader and deeper view into data that has an immediate impact on risk exposure and financial performance.

In addition to user-initiated searches, MarkLogic provides an alerting framework that enables high performance, real-time query processing on live, incoming data streams. This framework enables instantaneous alerts when critical, relevant information arrives. Some examples of

dynamic queries that a commodities trader might use include:

- “When any ship deviates from its projected course by 5 miles and is carrying Brent Crude oil greater than ‘x’ tonnage, email me an alert.”
- “Text me when a story about labor unrest in Italy impacts my positions.”
- “Send me an alert when long-term forecasting predicts hurricane-force winds in Galveston, Texas.”
- “Email me State Department updates about the status of hostilities at a specified port.”

MarkLogic also has a built-in application server, which enables firms to build powerful financial applications—such as next-generation trade stores, research portals, and customer onboarding systems—delivered through secure web services. The service-oriented architecture provides simple integration with existing systems, so you can avoid the time and cost associated with replacement. The MarkLogic application server gives you the agility needed for valuable and complex data analysis, while simplifying the overall complexity of your infrastructure, reducing total cost of ownership (TCO) and time-to-market.

Like the dependable Swiss Army Knife, MarkLogic combines an extensive array of capabilities, giving you a multi-use technology tool that helps you solve your toughest challenges: maximizing operational efficiency, increasing revenue, and complying with industry regulations.

Big Data Successes in Financial Services with MarkLogic

A Tier-1 Derivatives Firm Relies on MarkLogic for “Single Source of Truth”

One highly successful MarkLogic client is a credit, interest rate, and equity derivatives trading operation that executes one-third

of the world's total derivative trades. The firm replaced 20 disparate systems with a single MarkLogic-based, trade lifecycle-processing engine that captures trades across all asset classes in real time. The new trade store enables the firm to effectively manage market and counterparty credit positions with sub-second updating and analysis response time. The firm can now add new data sources in a matter of hours—a process that used to take days or weeks.

With MarkLogic as the foundation of its trade store, the firm has improved performance, increased scalability, and achieved a much lower total cost of ownership. The firm has also cut development time for future implementations and requirements, such as new regulations (see sidebar). With trade data aggregated accurately across the firm's derivatives portfolio, risk management stakeholders can:

- Assess the true enterprise risk profile
- Conduct predictive analyses using accurate data
- Adopt a forward-thinking approach

A Global Research Group Achieves “First-to-Market” with MarkLogic

A team of 400 analysts, located across 20 countries, conducts equity and fixed income research as well as product-specific analysis for individual and institutional clients. To stay ahead of the competition, the bank needed to achieve faster time-to-market, improve research quality, reduce duplication of effort, and meet client demands for mobile content delivery and alerting.

The bank built an equity research authoring and delivery solution based on MarkLogic Server, replacing a patchwork of disparate systems around the globe that lacked the flexibility to quickly add new features. The bank can now offer clients up-to-date research on global developments, ahead of the competition, in their preferred delivery method. The solution has enabled analysts to conduct searches at a component level for more efficient reuse of historical research. New features and functionality can be developed in 3-4 weeks instead of 6-12 months, reducing the total cost of ownership by at least 50 percent. With

Why The Bank Chose MarkLogic

The derivatives and securities firm dealt with 100,000 trades that result in about 32 million live deals in the system at any moment in time, generating live cash flows of about \$100 million. Each trade amendment generates a multitude of workflows that range from how the bank accounts for a trade to generating and dispatching new advice settlement confirmations. The firm chose MarkLogic Server to be the operational data store that powers its derivative and securities processing platform.

Because of acquisitions, data sprawled across many silos create complexity and increased infrastructure costs. Prior to the MarkLogic platform, two independent trading desks at different parts of the country might see Asia-Pac is up and decide to act. Since neither knows of the other's trade, the company's exposure would have doubled. “Finance is about hedging risk – we shouldn't be doubling down blindly,” described one investment executive.

By consolidating onto MarkLogic the firm was able to eliminate more than 20 Sybase and Oracle systems worldwide, and reduce the number of database administrators from 10 to 1. This significantly reduced the cost per trade, and created a level of transparency never experienced before.

While some data architects might view this deployment as a type of data warehouse, this firm chose MarkLogic specifically for its transaction capabilities. This distinction was a critical one. While there are many Big Data technologies and warehouse vendors, none provided the level of transaction processing for small, individual atomic reads and “write-throughs” that are possible with MarkLogic.

MarkLogic, the bank has achieved first-to-publish status, boosting revenue and its reputation as the “go-to” research firm.

A Global Fortune 500 Energy Commodities Trader Transforms Decision Support

With value of cargo tied to market demand, traders would predict the value based on their knowledge of when that cargo would arrive at port. But their models were thrown when unknown forces such weather, political strife, or pirates at sea caused delays. By building an agile system that allows the real-time aggregation of a variety of content sources—structured, geospatial, and unstructured data including news feeds, market, and shipping information—analysts could now adjust pricing forecasts on the fly, enabling them to more accurately predict demand and make profitable trading decisions.

These financial powerhouses chose MarkLogic for its ability to handle high-speed, high-volume financial transactions and real-time data analysis without burdensome database changes. MarkLogic lets them gain the agility they need to compete and succeed in today’s market.

Summary

Big Data is making a big impact on financial services firms. Exponential growth in data volume and variety has created new information management challenges. Traditional database technologies cannot keep pace with the rate of change in the industry. And most firms spend too much time, money, and resources to maintain inflexible legacy systems—when they could be innovating with new decision-support and real-time analytics tools. The value in Big Data is in being able to aggregate all these new information sources into a unified platform to gain new insights and knowledge.

MarkLogic Server enables financial services firms to gain competitive advantage in a global marketplace. By providing a single unified platform for all your data, MarkLogic transforms a complex environment into an agile business operation. With MarkLogic, financial services firms can:

- Reduce risk by acquiring real-time visibility into transactions and complying with current and future regulations
- Cut costs by simplifying IT infrastructure and quickly building Big Data applications
- Increase revenue by spotting trends before competitors and developing new products that meet customer demands

Most important, businesses can accomplish these objectives at a lower cost and in a fraction of the time compared to other technologies. MarkLogic makes it possible to extract maximum value from your Big Data. With a robust, flexible data infrastructure, firms are looking for ways to innovate by finding new ways of rolling up different types of data to impactful decision support tools for tomorrow.



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