



# IT'S A NEW ERA IN ADVANCED ANALYTICS AND AI

Financial Services Companies



Now is the time for companies in financial services industries to advance to the next level in using big data, advanced analytics, machine learning and artificial intelligence (AI) to drive business transformation.

Financial organizations at the head of the curve in intelligently leveraging all of their data are achieving greater success in meeting customer and employee needs, creating new products and building new, innovative revenue streams.

These companies are using intelligence to reduce costs and effectively address fraud, cybersecurity, data governance, risk management and compliance issues. Research by Deloitte Insights shows that using AI and predictive analytics has given some firms “an early lead in realizing better business outcomes, especially in achieving revenue enhancement goals.”

For example, financial services AI front-runners have shown a 44% improvement in pursuing new markets versus 24% of followers and only 8% of companies just starting. In revenue enhancement, the figures show a 60% increase for front-runners versus 46% for followers and 42% for starters.<sup>1</sup>

The competitive edge gained by these financial services providers will widen if other companies don't move quickly to catch up. A survey of financial services companies under the aegis of the World Economic Forum revealed that 64% of respondents are planning to employ AI across key areas, including:

- Generating revenue through new products and services
- Process automation and risk management
- Customer service and client acquisition

However, as of January 2020, only 16% of respondents currently employed AI in all of these areas.<sup>2</sup>

The increase in remote work and online customer access, particularly in light of the COVID-19 pandemic, is hastening the need to move quickly and decisively. IBM characterizes the process as “a ladder to AI,” starting with building the right data and information architecture as the foundation and adding analytics, machine learning and AI systematically on top of that.<sup>3</sup>

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This industry brief discusses the urgency for financial services companies to reach the next level in advanced analytics, machine learning and AI. We explore key challenges, as well as innovative, open solutions that make the path forward faster and simpler. Finally, we discuss the benefits of using solutions from IBM and Cloudera for your next-generation enterprise data cloud.

## Big Data Opportunities

Big data, advanced analytics, machine learning and AI are essential to success and survival across the entire financial services sector, including banking, trading, credit cards, insurance and wealth management. Big data in financial services is nothing new. Companies in financial services are among the world's largest creators and aggregators of data.

To varying degrees of success, financial services have been able to exploit a treasure trove of information about their customers, including transaction data, banking records, insurance claims, credit histories, location data, spending patterns and financial assets. The list goes on and, increasingly, is being redefined by alternative data, including data produced by Internet of Things sensors, clickstreams, social media interactions and more.

Once you are able to harness and leverage the power of all your data, the business opportunities—to build new revenue streams, improve the customer experience, fight fraud, improve risk management, reduce costs and improve operations—begin to open up exponentially. Just a few examples:

**Develop new products and services:** Financial services companies can leverage a 360-degree customer view to expand their businesses to build new services based on a deeper understanding of their customers. This can be across any number of areas, including personal financial management, enhanced servicing via digital assistants, expedited loan approvals and personalized insurance powered by IoT sensors.

<sup>1</sup> “AI Leaders in Financial Services: Common Traits of Front-Runners in the Artificial Intelligence Race,” Deloitte Insights, Aug. 13, 2019

<sup>2</sup> “Transforming Paradigms: A Global AI in Financial Services Survey,” Cambridge Center for Alternative Finance at the University of Cambridge Judge Business School and the World Economic Forum, January 2020

<sup>3</sup> “Scaling the AI Ladder,” IBM, Feb. 23, 2018

**Mitigate risk and improve compliance:** Financial institutions are among the most heavily regulated companies in the world. Compliance requirements are continuously evolving to protect against financial crisis and to accommodate innovations such as open APIs, digital currencies and faster payments, while also addressing privacy and digital security considerations. To meet global requirements, financial services firms must eliminate silos and bring together all relevant data sources, using intelligence to power advanced risk models.

**Fight fraud:** Fraud prevention is most effective when you can act on potential fraud signals in real time and even in a predictive manner, anticipating where and when attacks might take place. With machine learning and scoring, you can generate more precise risk scores based on historical and real-time data feeds to enhance fraud detection platforms with new rules and better insights.

**Build a 360-degree customer view:** Customer interactions and expectations have changed quickly as remote work and online engagements become more critical. With advanced analytics and AI, financial services can evolve to a customer-centric business model, with personalized services using real-time, in-depth insights into customer behaviors, attitudes and experiences.

## Overcoming Data Challenges

While opportunities abound, there are also critical obstacles financial services firms must overcome. The predominant challenge remains how to aggregate and analyze all of their data to make it useful.

This is vital in today's era of intelligence, whereby real-time analytics, predictive analytics, machine learning and AI are dependent on the quality and quantity of the data. The whole point of big data analytics is to leverage accurate, clear, timely and actionable information and insight. The underlying data must be complete, trustworthy and easily accessible.

To move up the ladder in leveraging advanced analytics, machine learning and AI, financial services companies must typically overcome these issues:

- Too many silos—data, systems, platforms and operations.
- Inability to gain insight from all data, particularly unstructured and semi-structured data.
- Inability to get a unified view of sources and types of data.
- Lack of tools and technologies to handle much larger data sets.
- Need for solutions that stretch across the enterprise from data center to edge to cloud.
- Pressure to reduce costs and move to an IT platform that is cloud-driven, consumption-based and service-oriented.



## Real-World Success Stories

Advanced analytics and AI are already delivering real-world successes for financial institutions all over the world. Here are several examples:

- A bank in Asia has increased its conversion rate by 300% and experienced a 30% reduction in the number of fraud incidents.
- A bank in England identified 7,000 new corporate customer prospects, reduced expenditures by nearly \$4 million and freed up \$5.2 million it had put aside for healthy accounts originally miscategorized as high risk.
- A global insurance leader uses a single, comprehensive 360-degree view of unstructured and structured data to improve planning, analytics and delivery of customer solutions.
- A financial services firm in Canada reduced the time to value for big data analytics by 90%.





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- Inability to manage differing security and governance needs depending on the type or source of data.
- Inability to manage different user views of sensitive data, which is particularly relevant in financial institutions.

## Unlock the Power of Your Data

By embracing a hybrid cloud solution, financial firms can scale infrastructure on demand, shift to a consumption-based model and offload some of the expense of data management. They can reach across the environment, wherever the data sits, and pull together all data types and sources into a data lake that eliminates silos.

With a hybrid cloud model, financial services firms can adopt a new approach to data management and advanced analytics—without having to rip and replace investments already in place, such as data warehouses and other on-premises solutions.

The key is to move to a platform model that gives the organization the ability to ingest, process, store and analyze any type of data regardless of where it was created—at the edge, on premises, in the data center or in any public, private or hybrid cloud. It is also important that the cloud platform uses an open architecture and gives customers the ability to connect to and aggregate data from existing data sources.

Key characteristics to demand of this next-generation intelligent data platform include:

**Optimized for hybrid and multicloud environments**, delivering the same data management capabilities across data centers and private and public clouds.

**Enabled for multiple analytics functions to work together** on the same data at its source, eliminating costly and inefficient data silos.

**Secure, resilient, agile and cost efficient**, maintaining strict enterprise data security, governance and control across all environments.

**100% open source**, with open compute and open storage, zero vendor lock-in and maximum interoperability. Open source projects also benefit from increased speed to innovation.

## Embrace Machine Learning

Advanced Analytics, Machine Learning and AI can significantly improve insights with better predictions, more automation and lower costs. This helps drive optimizations of business processes in every organization—making them even more efficient, competitive and innovative.

However, deploying and scaling AI/ML can be long and cumbersome with many obstacles along the way. Many projects don't make it into production because of model inefficiencies that slow down or halt the entire process. Or, in many cases, organizations fail to adequately adopt production models because of a lack of internal knowledge on how they work and other cultural/business impediments.

## Production ML Operations (MLOps) At Scale

The diagram below depicts the ML workflow highlighting functional capabilities to implement production MLOps at scale. It includes the technology infrastructure and tooling necessary to deploy ML algorithms and data pipelines reliably so as not to destabilize other parts of the workflow. MLOps extends from the data science tools used to select and train ML algorithms down to the hardware that those algorithms use to process data. It also includes the databases and message queues used to store, move, monitor, and track technical and mathematical metrics.

Functional capabilities include:

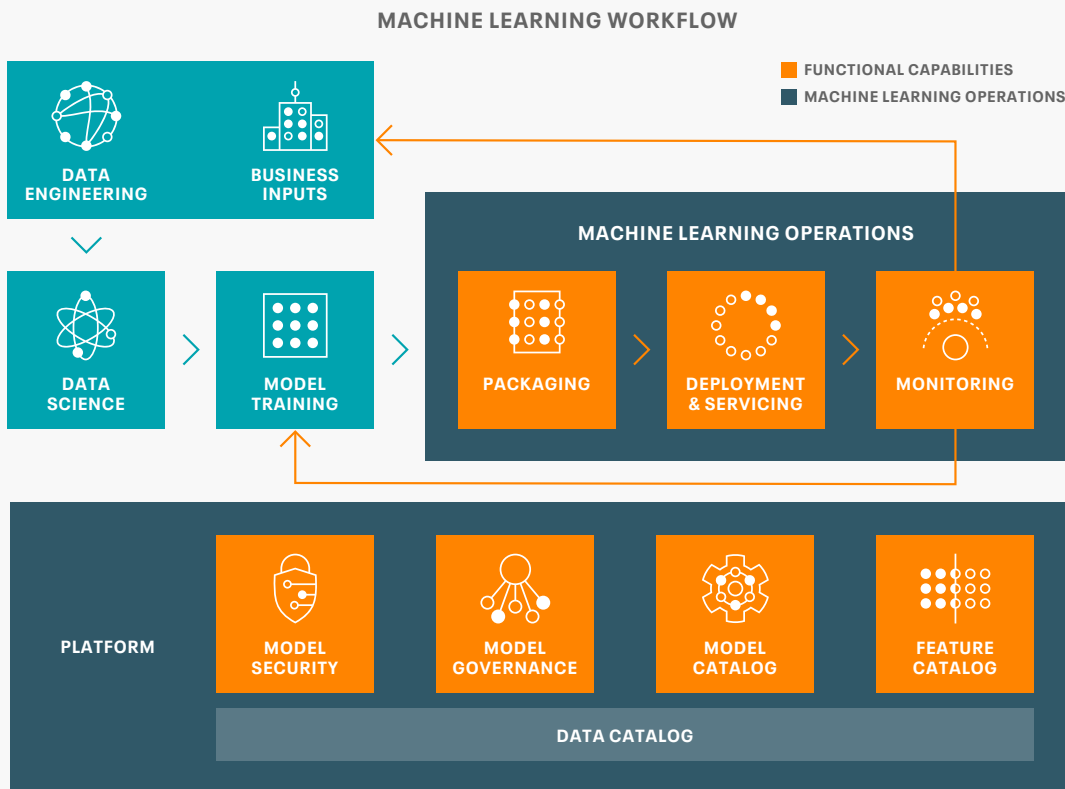
**Packaging, deployment and serving:** The right packaging is necessary for automated deployment of production models and to address multiple deployment

patterns such as Batch, Function-as-a-service and Edge. In addition, enterprise level deployments need high availability, autoscaling and strong authentication features. Serving makes a trained model available to other software components. Models can be served in batch or real-time modes.

**Monitoring:** Monitoring is done at various stages of the lifecycle: check input and output distribution, look for skew, drift and accuracy change, add custom thresholds, send emails with results and trigger pager systems as needed.

**Model security, governance and cataloging:** This is a basic requirement for model governance and enables teams to understand how ML is being applied in their organizations. It requires a centralized catalog of models and features which facilitate tracking models and their features throughout their lifecycle to understand these features and their relationship with the data catalog. In addition, catalogs facilitate authorization and tracking access to models thereby maintaining end-to-end security of the environment.

The Cloudera Machine Learning (CML) platform provides these functional capabilities to drive faster time to value for production AI/ML at scale.



# Cloudera Machine Learning (CML)

Built on Cloudera’s open data platform (Cloudera Data Platform – CDP), CML drastically reduces time to value for production ML models. It enables data scientists, ML engineers, and operators to collaborate in a single unified platform that is purpose-built for agile experimentation and production ML workflows with enterprise-grade governance capabilities built in. Unlike ML point solutions, which compromise security and require complex, costly workflows for production models, CML is the only end-to-end ML platform that enables standards-driven model and feature monitoring, cataloging, and ongoing governance at enterprise scale.

## The Solution: The Enterprise Data Cloud

All of these features and capabilities are embedded in the enterprise data cloud solution that is available through the tightly integrated partnership between IBM and Cloudera.

The enterprise data cloud enables financial organizations to use machine learning and AI to deliver actionable intelligence such as relevant and personalized credit offers and financial advice, churn analytics, predictive risk modeling, improved regulatory reporting and timely fraud detection—all with the robust security, resiliency, governance, data protection and management capabilities that regulated organizations require.

The enterprise data cloud is a secure, open, cloud-based, resilient solution that eliminates silos and enables the application of advanced analytics, machine learning and AI

to all data from the data center to the edge to the cloud. It is built on the industry-leading **Cloudera Data Platform (CDP)** and enables organizations to ingest, process, store and analyze all data at every stage of its lifecycle.

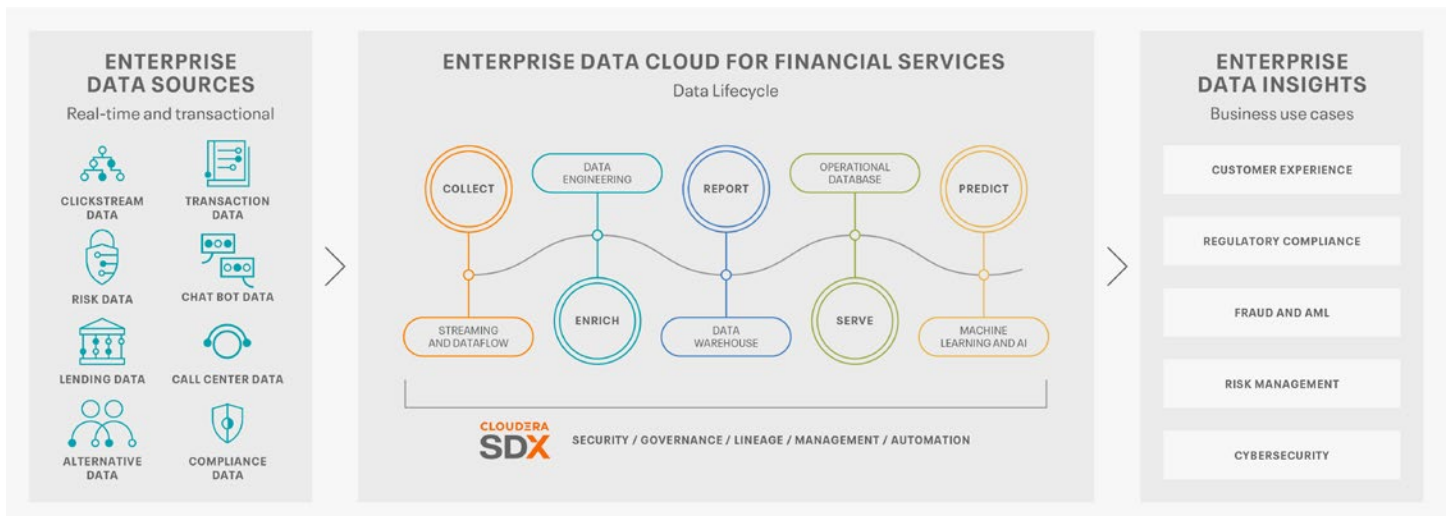
This includes a wide range of alternative data sources from IoT sensors, satellite images, geo-locations, social media, ATM history, call center history and more. The CDP manages data in any environment and uses machine learning to intelligently auto scale workloads up and down for more cost-effective use of cloud infrastructure.

This data can be valuable in enhancing the customer view and developing services that use correlations to help predict and anticipate customer needs and market activity. Extracting this value requires machine learning and AI capabilities and a comprehensive data platform to execute in one place.

## The Benefits of IBM and Cloudera

With the enterprise data cloud, customers benefit by working with two companies that have a long history of leadership in providing advanced data analytics, machine learning and AI solutions to leading enterprises across the world—and specifically leaders in the financial services market. With IBM and Cloudera, customers get:

**Faster ROI**, with end-to-end capabilities to enable financial services companies to reach the next level in adopting advanced analytics, machine learning and AI, from data lakes and connecting clouds with traditional infrastructures.



**Industry expertise** in building an integrated vision to deliver specific opportunities for financial services companies, from Customer 360 to fraud prevention to creating new revenue streams.

**Security and governance**, leveraging Cloudera's Shared Data Experience to ensure that all data is secure and governed at all times, anywhere, from the edge to AI.

**Speed to innovation**, with the largest number of contributions to the open source community, ensuring increased availability and interoperability across all vendors.

**One-stop support** to reduce costs, eliminate finger-pointing and maximize availability and agility.

**Freedom of choice**, which means flexibility to modernize existing on-premises infrastructure as well as leverage next-generation hybrid cloud and multicloud platforms.

Is your organization ready to climb the AI ladder and reach the next level in using big data, advanced analytics, machine learning and artificial intelligence to drive business transformation? It's time to find out what IBM and Cloudera can do for you. Please visit [cloudera.com/IBM](https://cloudera.com/IBM).

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# CLUDERA

At Cloudera, we believe that data can make what is impossible today, possible tomorrow. We empower people to transform complex data into clear and actionable insights. Cloudera delivers an enterprise data cloud for any data, anywhere, from the edge to AI. Powered by the relentless innovation of the open source community, Cloudera advances digital transformation for the world's largest enterprises. Learn more at [Cloudera.com](https://cloudera.com).

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IBM builds data management products with the AI, hybrid, and multicloud future in mind. Its enterprise-grade solutions are designed for robust integration across security-rich environments. To assist with your data lake needs, IBM provides value-added offerings that bring these same benefits to Hadoop implementations like those created by Cloudera.