

Databricks Machine Learning

Built on an open lakehouse architecture, **Databricks Machine Learning** enables ML teams to prepare and process data, streamlines cross-team collaboration and standardizes the full ML lifecycle from experimentation to production.

Because Databricks ML is built on an open lakehouse foundation with Delta Lake, you can empower your machine learning teams to access, explore and prepare any type of data at any scale. Turn features into production pipelines in a self-service manner without depending on data engineering support.

Databricks SQL

Databricks SQL (DB SQL) is a serverless data warehouse on the Databricks Lakehouse Platform that lets you run all your SQL and BI applications at scale with up to 12x better price/performance, a unified governance model, and open formats and APIs. You'll be able to seamlessly work with your favorite BI tools like Tableau, Power BI and Looker. Analysts can use their favorite tools to discover new business insights on the most complete and freshest data. Databricks SQL also empowers every analyst to collaboratively query, find and share insights with the built-in SQL editor, visualizations and dashboards.

Streaming analytics

Online transactions, social networks, mobile devices, etc., all generate data that needs to be monitored constantly and acted upon quickly during customer interactions. Accordingly, the need for large-scale, real-time stream processing is more evident than ever before. With **Structured Streaming**, a data stream is treated as a table that is being continuously appended.



As public concern about security and the number of regulatory mandates continue to increase, financial services organizations will also need to consider solutions that can help deliver more personalized customer experiences while maintaining compliance and upholding public trust. With the proper measurement tool in place, organizations can shift their focus to the customer and remain competitive in the industry.

Databricks offers several solutions that fit this bill.

The Databricks Lakehouse Platform: How it works

The Databricks Lakehouse Platform combines the best elements of data lakes and data warehouses to deliver the reliability, strong governance and performance of data warehouses with the openness, flexibility and machine learning support of data lakes.

This unified approach simplifies your modern data stack by eliminating the data silos that traditionally separate and complicate data engineering, analytics, BI, data science and machine learning. It's built on open source and open standards to maximize flexibility. And its common approach to data management, security and governance helps you operate more efficiently and innovate faster.

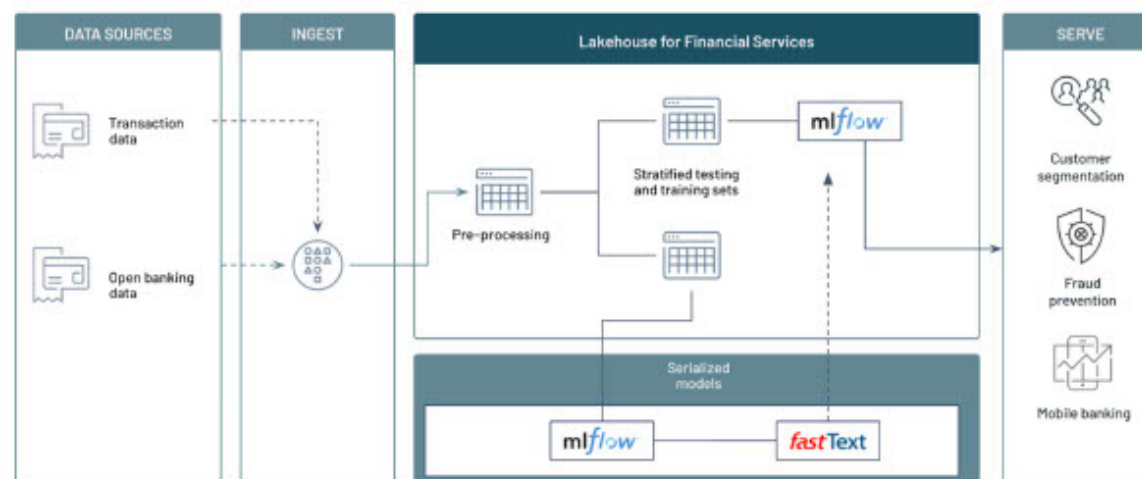


Figure 3: Sample reference architecture outlining how Databricks Lakehouse enables FSIs to deliver hyper-personalized experiences by harnessing the power of data, analytics and AI.



Data-related challenges and the impact on customer experiences

Personalizing the financial industry, while as exciting as personalizing the retail space once was, is not without its challenges. For starters, the foundation for the successful deployment of any personalization effort is quality data. Without it, organizations can't consume it, analytics fail, models don't work — in short, bad data in is bad data out.

This becomes a major problem when you consider the proliferation of data sources, such as new consumer channels and an increasing number of devices, coupled with the fact that many traditional banks and FSIs still rely on legacy infrastructure that's impossible to scale and yet too ingrained to do away with entirely. Consumers' expectations leave little to no room for forgiveness when it comes to a lack of real-time access to their financial health information, and they won't be swayed to remain loyal without tailored engagements that resonate with their needs.

Additionally, poor team structure, a lack of team collaboration, and outdated skillsets all work against a company's progress. Along with siloed data, FSIs with traditionally rigid organizations also have siloed teams that don't have the means to efficiently share data, operationalize insights or collaborate on cross-organizational initiatives.

In order to succeed in the journey of digital transformation with a focus on personalization, FSIs must adapt to today's agile and data-driven times while modernizing their approach to data and analytics, including retraining analysts and engineers skilled in legacy systems to leverage the latest data and AI technologies.

Bringing together data, analytics and AI

Today's FSIs aren't just competing against each other when it comes to personalization. More than anything else, they're competing against each other's ability to harness the power of data. To keep pace with this changing environment, FSIs must revamp their approach to understanding customers. By using the right technology, strategies and insights, the financial services industry can enjoy increased loyalty and strong growth in market share.



Next-best offers/actions

E-commerce personalization trends, particularly since 2020, have leaned heavily on guiding consumer choices with the next-best offer or next-best actions that keep them engaged. Similarly, financial institutions are now applying AI/ML to move beyond the alerts, reminders and spend analyses we've come to expect.

With strong data at the core, FSIs can automatically determine — in real time — the next step that makes the most sense for a particular consumer. This immediate cross-sell/upsell strategy impacts long-term customer loyalty and results in a significant increase to conversion rates.



Propensity to buy

A propensity-to-buy model can predict when a customer is predisposed to make a purchase, based on their historical behaviors. FSIs can subsequently act on that information by engaging customers or creating a signal that is sent to downstream systems such as promotion management, email and mobile alert systems, recommendations, etc.

Depending on how advanced the model is and which alternative data sets are included, propensity-to-buy models can also identify trips to competing retailers, competitive scan data from receipts and causal data that helps to explain when and why customers make purchases.



Real-time recommendations

We all crave to be understood. Providing an experience that makes customers feel as if a business truly knows them will help FSIs stand out from the crowd and build loyalty. After all, there's no shortage of options and incentives for today's consumers to rethink their long-held accounts.

A **recommendation engine** uses a combination of data and ML technology to surface the next-best move for a customer in real time — be it applying for a loan, reading particular content related to a recent decision, getting some tax help, etc. Data is crucial here — the more data an engine has, the more efficiently it will be able to make relevant suggestions.

FSIs can and must deliver personalized experiences with the right data in order to achieve a boost in conversions and loyalty. Here are a few examples.



Hyper-personalization

While personalization has been an ongoing goal for businesses of all types and sizes, today it's hyper-personalization that's enabling them to tailor their marketing to individual customers across retail banking, wealth management and insurance. This level of personalization is achieved by creating custom and targeted experiences through the use of predictive analytics, AI and automation — all of which require powerful data. From claims analytics and transaction enrichment to next-best offers and investment recommendations, this extra-mile approach enables companies to send messages that are especially resonant for the recipient, as well as perfectly timed and delivered on the preferred channel.



Behavioral segmentation

The ability to segment your customers based on behavior is key to driving hyper-personalization in financial services. You need to be able to track customer preferences against both historical and real-time data in order to provide marketing messages and offers catered to the specific desires of each customer. With 55 million underbanked people (having a bank account but relying on alternative financial services such as money orders, check-cashing services and payday loans) in the U.S. in 2018, such an approach could pave the way toward a more customer-centric and inclusive future for retail banking.



Geospatial analytics

Large financial services institutions need access to real-time GPS coordinates, social media and satellite imagery in order to understand location-based preferences as well as what constitutes normal behavior. Once the standard is set, it becomes possible to identify abnormal patterns that could indicate fraud or compliance risks.

Modern fraud prevention strategies within personalization goals (and business goals in general) must be agile at the core and combine a collaborative, data-centered operating model with an established delivery strategy of code, data and machine learning (ML) such as DataOps, DevOps and MLOps.

Leaders are to the right of the Data Maturity Curve

From hindsight to foresight



Figure 2: Databricks Data Maturity Curve

In this guide, we'll shed some light on what that looks like through our various solutions, as well as common challenges our own customers have faced and how they've leveraged the Lakehouse to overcome them.

Key personalization use cases in financial services

Personalization was, in the not too distant past, an exciting promise for marketers and consumers alike. Today, however, it's a baseline expectation for those of us who are continuously connected and short on time. In fact, [a recent survey from NRF](#) found that 50% of participants reported seeing the brands they buy as extensions of themselves — undoubtedly a primary driver for experiences that feel like they were tailored to our specific wants and needs.

The recent examination and acceleration of digital innovation in banking, insurance and beyond have only highlighted the urgency for financial leaders to provide data-driven, personalized experiences that stand out from the crowd and deliver greater revenue.

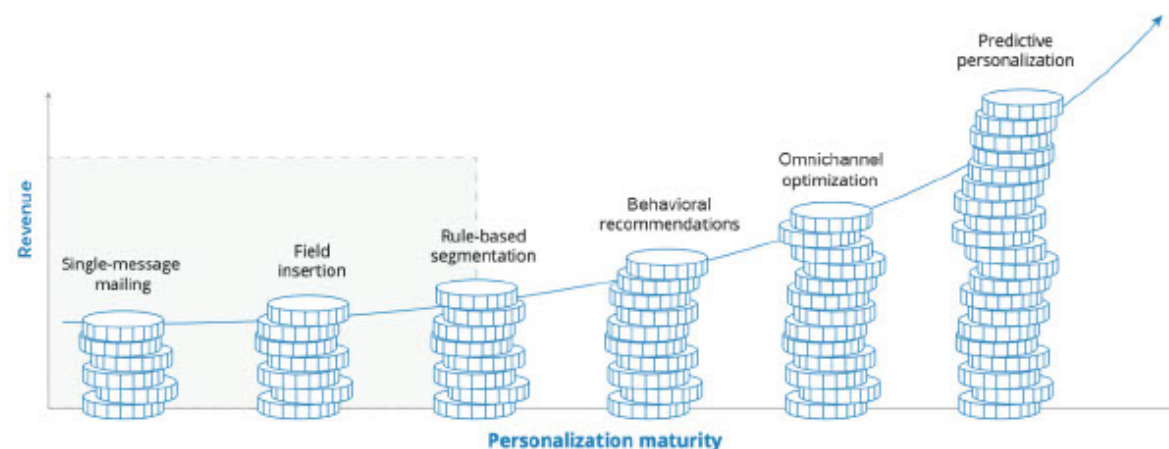


Figure 1: Deloitte's Personalization Maturity Curve shows there is a strong revenue and valuation argument to be made in favor of personalization. This closely mirrors the Databricks Data Maturity Curve (figure 2), which emphasizes how innovators use data to react in real time and use predictive analytics to improve the customer experience and gain a competitive advantage.

Introduction



Consumers' expectations and the demands on their financial providers have changed significantly in the last decade. As consumers ourselves, we have little patience for experiences that aren't frictionless or seemingly tailored to our preferences, whatever they may be at the moment. Across industries, personalization is transforming the way businesses engage with customers — from highly targeted omnichannel retail experiences to movie selections curated to meet every customer's viewing preferences. And with the rise of fintechs and mobile banking enabled by the Internet of Things (IoT), customers' expectations of their bank, wealth manager or insurer, and how they digitally manage their finances, have also dramatically shifted.

Personalized experiences use customer data and understanding to anticipate, frame, guide, extend and enhance interactions based on that customer's history, preferences, context and intent.

FORRESTER

The ripple effect of technological innovations and social media, both of which rely on a strong data core to operate successfully, has driven this change and touched most areas of our lives. Some long-established institutions have, however, taken extra time to figure out their footing in this new climate. While most financial firms are well aware that personalization on this level is now table stakes, for example, some clearly stand out with their initiatives over others. Those that have managed to fuel their growth trajectory have prioritized offering digital self-service via mobile and web over in-branch experiences — an approach that's been further fueled by open banking, open insurance and digitally native companies like Robinhood and Venmo.

Beyond easy and frictionless service, we also want financial services institutions (FSIs) to understand which personalized offers would best fit our current circumstances. Bain supported this idea in a recent study that highlighted how **half (50%) of customers would buy a product from their bank if it were personalized**. Further, according to Boston Consulting Group, **for every \$100B in bank assets, it can achieve as much as \$300M in revenue growth by personalizing its customer interactions**. Similarly in the insurance sector, McKinsey claims that a **"personalized insurance engine" will revolutionize the industry** over the next decade, but there is still a ways to go — to enable true end-to-end automation that is powered by the personalized insurance engine.

About Databricks

Databricks is the data and AI company. More than 7,000 organizations worldwide — including Comcast, Condé Nast, H&M and over 40% of the Fortune 500 — rely on the Databricks Lakehouse Platform to unify their data, analytics and AI. Databricks is headquartered in San Francisco, with offices around the globe. Founded by the original creators of Apache Spark™, Delta Lake and MLflow, Databricks is on a mission to help data teams solve the world's toughest problems. To learn more, follow Databricks on [Twitter](#), [LinkedIn](#) and [Facebook](#).

[Sign up for a free trial](#)



Capgemini's solution for migrating legacy cards and core banking portfolios on Databricks enables rapid conversion from external source systems and provides a fully configurable and industrialized conversion capability.

Leveraging public cloud services, this solution provides a cost-efficient conversion platform with predictable time to market. Now you can rapidly complete ingestion, ease development of ETL jobs, and completely reconcile and validate conversion up to 50% faster.

Ready to personalize? We're here for you.

To get ahead of the increasingly demanding personalization curve, FSIs will need to turn to solutions that are purpose-built for innovation. Based on open standards and open source technologies, Databricks Lakehouse for Financial Services provides the tools necessary to deliver a range of business solutions, from hyper-personalized customer experiences to AI-driven risk management and data governance practices.

Learn more about the Databricks Lakehouse for Financial Services at dbricks.co/fiserv.

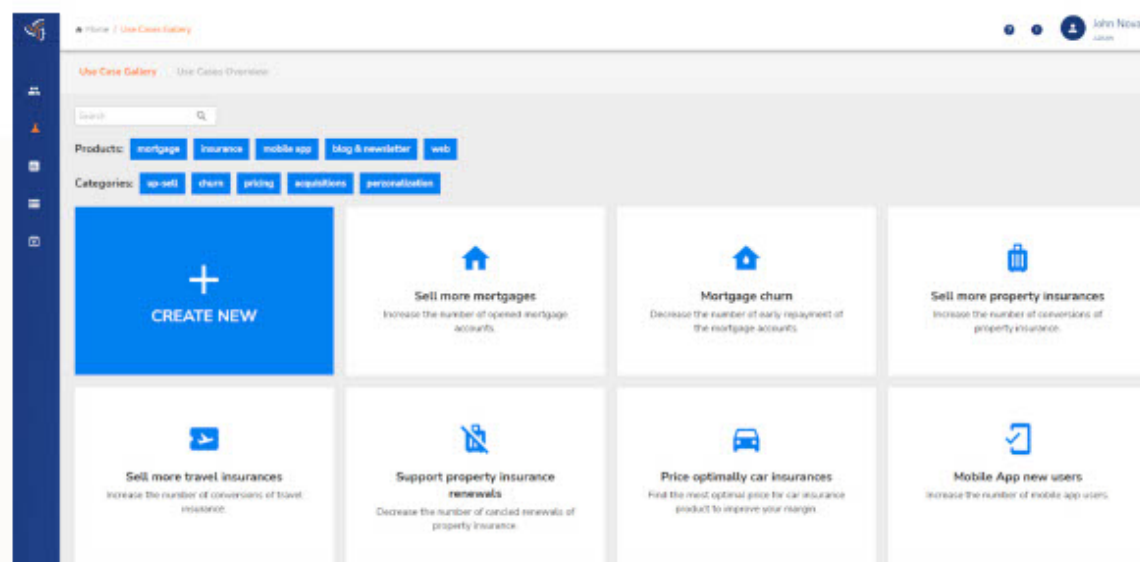


Figure 4: DataSentsics Persona 360 provides pre-built customer 360° data model information and 1,695 attributes to understand the differences between customer segments in banking and insurance.

Capgemini legacy cards and core banking portfolios modernization: reduce legacy cards and core banking portfolio migration efforts by 50%

Across the retail and corporate lending segments, banks need to create agile business models in order to meet the challenges of changing customer experience demands and an ever-expanding ecosystem. The ability to migrate and integrate monolithic mainframe systems into modern tech stacks on the cloud is critical for retail banks in today's competitive market. By transforming their digital future with legacy cards and core banking modernization solutions, banks realize benefits such as a reduction in the total cost of ownership, boosts in operational efficiency and flexibility, and confidence that their IT platform is future-proofed.

Customer segmentation for personalization: Learn from the customer experience vanguards in the retail and consumer goods industry as they create advanced customer segments to drive better purchasing predictions based on behaviors. Using sales data, campaigns and promotions systems, this solution helps derive a number of features that capture the behavior of various households. As a result, **successfully personalizing digital experiences is cited as driving 5% to 15% higher revenues and 10% to 30% greater returns on their marketing spend, according to McKinsey.**

Brickbuilder Solutions: Leverage partner-led industry solutions built on the Lakehouse

Brickbuilder Solutions are data and AI solutions expertly designed by leading consulting companies to address the unique requirements for financial services institutions.

DataSentics Persona 360: unify, understand and activate your customer financial services data

FSIs can collect a great deal of information about the behavior of customers and how to communicate with them, just by analyzing the data they know about them. We know that personalized communications and campaigns grow customer engagement and conversion rates, but keeping up with thousands or even millions of customers is no easy feat. If financial services institutions are able to identify personas from their data, either from static data, live call center interactions or even their social media activities, a **"feature store"** can be built containing information about the customers. This helps financial institutions make data-driven decisions, create targeted campaigns and identify customers with a higher propensity to engage.

Built on the Databricks Lakehouse Platform and available on multiple cloud services providers, Persona 360 by DataSentics, an Atos company, supplements basic profile information with insights from digital behavior and unstructured data like call center recordings. With **Persona 360**, banking and insurance institutions can utilize pre-built customer 360° data model information and 1,695 attributes to understand the differences between customer segments. They can also leverage insights from advertising, marketing and other platforms (e.g., Facebook, Google, Salesforce) to get reliable insights about customers, leading to personalization that drives better business performance and customer satisfaction.

Databricks Solution Accelerators: Deliver personalized experiences, faster

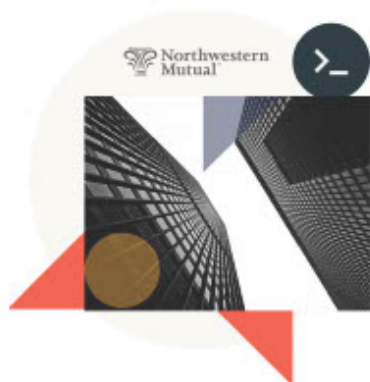
Ready to get started but strapped for time and resources? You can save hours of discovery, design, development and testing of personalization use cases with Databricks Solution Accelerators. Our purpose-built accelerators — fully functional notebooks and best practice guides — speed up results across your most common and high-impact personalization use cases. With these, you'll be able to go from idea to proof of concept in as little as two weeks.

Hyper-personalization: This Solution Accelerator offers a hyper-personalization data asset strategy that goes beyond traditional demographics (income; product and services) to transactional behavior and shopping preferences. As a data asset, it can be applied in the same way to many downstream use cases, such as loyalty programs for online banking applications, fraud prevention for core banking platforms or credit risk for “buy now pay later” (BNPL) initiatives.

Transaction enrichment with merchant classification: These Solution Accelerators show how our Lakehouse platform enables banks, open banking aggregators and payment processors to address the challenge of merchant classification. They also show how to use ML to enrich transaction data with contextual information — including store brand and category for downstream use cases, such as customer segmentation or fraud prevention.

Identify fraud with geospatial analytics and AI: Learn how geospatial data, machine learning and a lakehouse architecture enable organizations to better understand customer spending behaviors and detect abnormal credit card transaction patterns in real time. Geospatial analysis can enhance fraud prevention, mitigate losses and build customer trust.

Regular payments: Consider a novel approach to consumer analytics by combining core mathematical concepts with engineering best practices and state-of-the-art optimization techniques to better model customers' behaviors and provide millions of customers with personalized insights.



Driving transformation at Northwestern Mutual (Insights Platform)

Northwestern Mutual is a 160-year-old company going through a massive digital transformation to help its 10,000 advisors and its millions of customers to have a more holistic, personalized financial services experience across in-person and digital touchpoints. NWM's Client 360 platform is now leveraging Databricks to provide insights from aggregating transactional and behavioral data, in addition to core attributes, to provide business users with next-best action recommendations when interfacing with customers, enabling a seamless experience. It's also being used to create a digitally enabled, end-to-end underwriting experience. Results: 50%-75% faster time to market, from 4-6 weeks down to 1-2 weeks; 10,000+ users performing ad hoc analysis with Databricks SQL.

[Read more](#)

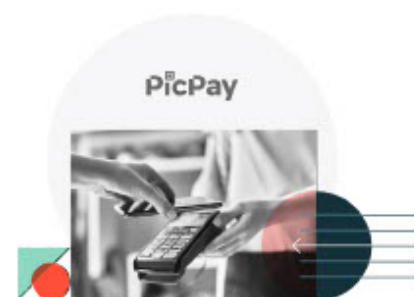


ABN AMRO: Financial services digital transformation at a global scale

ABN AMRO is the third-largest bank in the Netherlands, with 100 branch offices and more than 30,000 employees. Its mission statement, “Banking for better, for generations to come,” is embodied by the way it uses digital services and data to support customers during key life moments.

With Azure Databricks, ABN AMRO better manages analytics workflows by enabling collaboration, AI insights, and advanced, automated machine learning capabilities. This means that not only are functional teams able to process data more efficiently, they’re also empowered to use that data in ways that simply weren’t possible before.

[Read more](#)



PicPay: Transforming mobile payments into a finance super-app

Brazilian fintech PicPay is using Databricks Lakehouse on AWS to expand its operations to become the country’s first finance “super-app.” PicPay has been able to unify their data — from customer interactions and sales metrics to financial and log activity — creating a common data layer that is not only delivering optimized mobile payments, but also expanding their capabilities into transportation, gaming, and more. Results: \$10M in savings from smarter cash-back rewards, 50% lower analytics and visualization platform costs, and 25% increase in self-service business analytics users.

“Our goal is to leverage data and AI to create an end-to-end experience that extends far beyond payments. This is the first step in achieving our vision of becoming Brazil’s first super-app, and Databricks Lakehouse is core to making that a reality.”

— Raphael Dayan, Head of Data Analytics at PicPay

[Read more](#)



Voice of the customer: Personalization wins with Databricks

HSBC: Reinventing mobile banking with ML

As one of the largest international banks, HSBC is ushering in a new way to manage digital payments across mobile devices. They developed PayMe, a social app that facilitates cashless transactions between consumers and their networks instantly and securely. With over 39 million customers, HSBC struggled to overcome scalability limitations that blocked them from making data-driven decisions. With Databricks, they are able to scale data analytics and machine learning to feed customer-centric use cases including personalization, recommendations, network science and fraud detection.

[Read more](#)



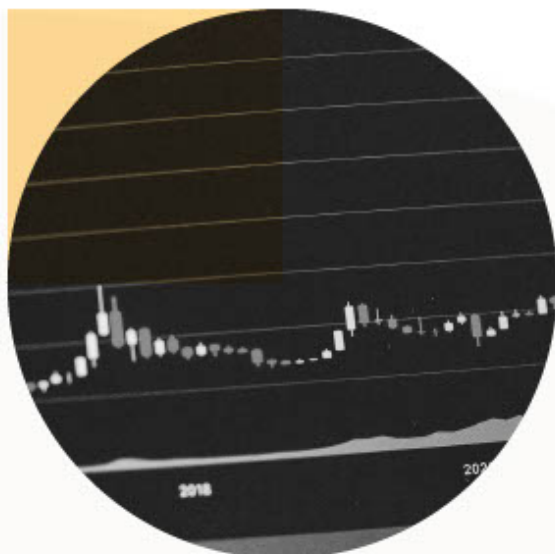
TD Bank: Modernizing the data environment to drive value for customers

Since 1955, TD Bank Group has aimed to give customers and communities the foundation to thrive in a changing world. While that order has grown taller and more complex with each passing decade, TD has consistently risen to the challenge.

This Q&A — between Junta Nakai, Global Head – Financial Services & Sustainability GTM at Databricks and Jonathan Hollander, Vice President, Enterprise Data Technology Platforms at TD Bank — highlights TD's technology transformation journey and why they are transitioning to a new, modern data estate with Delta Lake and the Azure cloud, designed to boost analytical capabilities to help power enhanced customer experiences.

Through this transformation, TD has been able to simplify their technology stack and position themselves to extract the most value from their data for the betterment of their customers.

[Read more](#)



Design patterns for real-time insights in financial services

Streaming ingestion is critical, and the core requirements to get started are: data freshness for reporting, data quality to maintain integrity, change data capture (CDC) ingestion and ML-ready data stores. In Databricks, these map directly to Delta Live Tables, Databricks SQL and Feature Store. Since reporting and AI-driven insights depend upon a steady flow of high-quality data, streaming is the logical first step to master.

Consider, for example, a retail bank wanting to use digital marketing to attract more customers and improve brand loyalty. It is possible to identify key trends in customer buying patterns and — in real time — send personalized communications with exclusive product offers tailored to the exact customer needs and wants. This is a simple but invaluable use case that's only possible with streaming and CDC — both capabilities required to capture changes in consumer behavior and risk profiles.

[Read the full blog](#)

eBook

Personalization Strategies for Modern Financial Services

Five fundamental accelerators to drive and improve the customer journey

