How to become a data-driven retailer

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Introduction

Turning raw data into actionable insights has a direct correlation to overall financial success in retail. From trend forecasting and inventory control to marketing strategy and customer behaviour, perhaps no industry relies more heavily on data.

The arrival of COVID-19 fast-tracked data-driven modernization initiatives for retailers in areas like customer support, order fulfillment, and inventory management. Shoppers want to know what's available before they visit stores, and they expect fulfillment options like curbside pickup. This has left many retailers asking how they can get smarter with their data, move faster to create new customer experiences, and do a better job of connecting their employees and customers—all reliably, at scale, and in a secure way.

The retail industry will not be returning to a pre-pandemic 'normal' anytime soon, if ever. While the atmosphere is less intense than at the beginning of the crisis, uncertainty remains a part of everyday life for consumers around the world. They are making daily decisions about how they want to live and what's important as they optimize for a 'new normal'.

For example, searches for "curbside pickup" grew 3000% globally year over year in 2020.[1] This reflected a behaviour change among shoppers worried for their safety but, as time progressed, some of these new behaviours turned into habits. In a Google survey, 61% of U.S. consumers reported that buying online and picking up in store will be a beneficial way for them to shop even when there are no restrictions.[2] More than ever, the ability to collect, process, access, and analyze data is crucial for retailers to respond to these shifts in consumer needs.

For data-driven retailers, knowing customers better, forecasting demand, and understanding operations—and being able to act on these insights in real time—is a capability that can drive market share and revenue growth in a rapidly evolving environment.
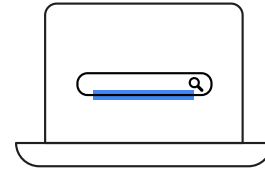
Searches for "curbside pickup" have grown 3000% globally year over year.[1]

61%

of U.S. consumers think buying online and picking up in store/ curbside will be a beneficial way for them to shop even when there are no restrictions.[2]

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While 57% of enterprise decision-makers report being challenged by siloed data managed by different teams across their organization, data-driven transformation is possible by adopting the right approach, combined with the right technologies.[3] New data analytics capabilities powered by artificial intelligence (AI) and machine learning (ML) technologies in the cloud can turn raw data into faster, smarter, actionable decisions at a granularity that has been historically challenging, if not impossible, for most retailers.

The MIT Tech Review found that companies that use AI and ML can drive 2x more data-driven decisions, make decisions 5x faster, and execute at 3x the speed.[4] And for retailers, Google commissioned research found that data-intensive AI/ML can deliver an estimated $230-$650 billion in value for the industry over the next three years.[5]

A data-driven retailer is able to leverage latent data across various systems (POS, CRM, marketing platforms, ERP, and more), reach a unified view of the truth, and drive real-time and predictive insights across the business, from marketing to merchandising to operations, instead of reviewing insights as a rear view of past business performance.

As an example, previously, to reach people most likely to purchase, retailers would build an audience of site visitors who had recently abandoned their website shopping cart and then reach them with a marketing campaign to bring them back to complete their purchase. Instead of determining what actions lead to purchase, this process can be automated with Google Marketing Platform and Google Cloud, using first-party data to predict future shopper actions with a purchase propensity model.

Retailers can then use the same model to build audiences in Analytics 360, share them to Google advertising platforms like Google Ads, and focus marketing efforts solely on shoppers with a higher propensity to purchase. This ability to target marketing can be game-changing in driving conversions. Similar scenarios exist across all parts of a retail business. Democratizing access to insights and data with a simple and automated path to action across the organisation is key.

57%

of enterprise decision-makers are challenged by siloed data managed by different teams across their organization.[3]
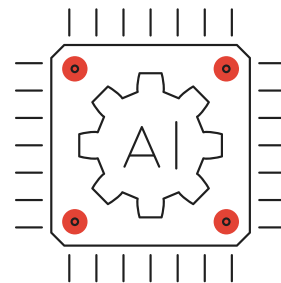
AI and ML technologies can deliver an estimated $230-$650 billion in value for many retailers over the next three years.[5]

By focusing on data-driven initiatives in the three areas highlighted in this ebook, you can begin answering questions like:

- How do I create loyal customers?

- How can I maximize revenue across channels?

- How can I understand inventory trends to make better assortment decisions?

- How do I manage supply chain and inventory better?

- How do I activate marketing promotions that increase sales?

How to use data to unlock success across your retail business

To help retailers operationalize data to unlock new and better ways to drive commercial success, we collated the latest insights from our in-house experts, best practices from leading brands, and innovative solutions from across the Google Cloud portfolio.

Read on to discover ways to harness the power of data in your retail business.

01 Improve customer acquisition and retention

02 Drive better merchandising and assortment decisions

03 Run operations and inventory more efficiently

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01: Improve customer acquisition and retention

Retailers often struggle with access to data insights, making data-driven customer acquisition and retention initiatives difficult to plan and execute. The problem is widespread: in a survey of more than 500 business executives, 83% recognized the importance of turning data into actionable insight, but only 22% felt their company could do it.[6]

Retailers need access to unified data sets to better understand and predict customer behaviors, data models and analytics to drive marketing personalization, and real-time insights to enhance customer support.

### Gain a 360° view of the customer with unified data sets

Customers are connecting to your products or businesses across a myriad of touch points ranging from your website and ads to customer service and support. The volume and complexity of the data being collected is compounded by consumer interactions on external platforms and systems, such as social media and online marketplaces, weather data, market data, location data, sensors, and more.

In a typical organization, the data from these interactions is collected in siloed operations, often using different systems and technologies. By unifying data—from online interactions to environmental factors—retailers can uncover hidden insights about customer behavior that can directly impact acquisition and retention.

Retailers can bring both internal and external data sources together for a holistic view of the customer via a customer data platform. By supplementing historical data from internal transactional systems with real-time context data from customer interactions like clickstreams and other log events, plus external sources, retailers can gain unprecedented insights into customer behavior.

22%

of business executives felt their company could turn data into actionable insight.[6]
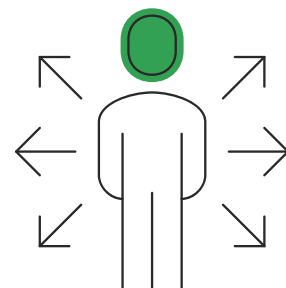
Unifying all your diverse data is important to understanding and predicting customer behavior.

Retailers can ingest all this data into an enterprise data warehouse like BigQuery, which is optimized for interactive analysis. Doing this unlocks the ability to rapidly query a single source of truth to produce accurate predictions quickly, get ahead of customer needs, and outpace the competition.

## Personalize marketing with data models and real-time analysis

In a recent Google survey, 83% of U.S. shoppers agreed the pandemic changed the way they shop.[7] Rapidly changing behaviors and preferences can create a challenge for older data models. According to McKinsey, existing analytic models may not be as accurate when predicting behaviors in the 'next normal', and they will need to be rapidly "trained" on how to best use new behavioral data.[8]

Retailers that can quickly and easily train data models and apply real-time analysis will be able to better understand user intent and context, which powers engagement and conversion improvements. For example, in periods of economic downturn, being able to measure a customer's affinity to full price or marked down merchandise—while the customer is actively shopping—means you can use that insight to decide what purchase recommendations to make next, or which ads to display. And, with access to analytics in real time, marketers can monitor the results of incentives or experiments running in-store or online, maintaining up-to-the-minute control of cross-sell and upsell.

Retailers that can aggregate and activate their own first-party data can share more useful predictive insights throughout the organization, using omnichannel marketing to reach consumers at key moments. The bottom line impact of this was measured by Boston Consulting Group (BCG). The study found marketers who can deliver relevant experiences to customers at multiple moments across the purchase journey achieve cost savings of up to 30% and revenue increases of as much as 20%.[9]

83%

of U.S. shoppers agreed the pandemic changed the way they shop.[7]
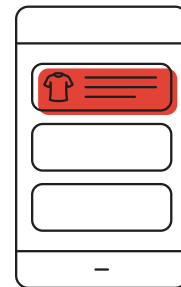
Delivering relevant experiences at multiple moments in the customer journey can reduce costs by 30% and increase revenue by 20%.[9]

Provide superior customer support with real-time data

Half of all consumers say they will switch to a different online retailer after just one bad experience. This number escalates to 80% if expectations are not met more than once.[10] With a digital storefront, there is no room for delivering anything less than stellar customer experiences. Dissatisfied customers don't usually tell online retailers what went wrong—they just walk away, never to be heard from again.

But timely engagement, enabled by real-time access to data, can turn poor ratings into customer loyalty. Conversational AI technology can elevate the ubiquitous chatbot to an effective customer experience that enables immediate self-service support, with the ability to streamline a seamless handoff to a live agent if needed.

Another way to use real-time data to improve customer retention and satisfaction is with a ratings dashboard and custom alerts. If a customer leaves a bad review, support team members are notified immediately, prompting them to reach out to address the concern in a proactive, individualized way.

50%

of consumers will switch online retailers after one bad experience.[10]

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## Take the next steps to improve customer acquisition and retention

Modernize your analytics strategy and migrate to a multi-cloud data warehouse designed for business agility. Move beyond traditional data warehouses, which capture a subset of data in batches and store data based on rigid schemas—making real-time analysis or responding to spontaneous queries a challenge. BigQuery, Google's highly scalable, flexible, and cost-effective multi-cloud data warehouse, solves these issues. Capture data, even when data volumes are growing exponentially, break down silos across public clouds, and use built-in machine learning to create actionable insights and increase customer-centricity.

The BigQuery Data Transfer Service automatically transfers data from external data sources like Google Marketing Platform, Google Ads, YouTube, and partner SaaS applications to BigQuery on a scheduled and fully managed basis. Users can also easily transfer data from Teradata and Amazon S3 to BigQuery. And with BigQuery Omni, you can securely and cost-effectively access and analyze data across Google Cloud, Amazon Web Services (AWS), and Microsoft Azure without having to leave the easy-to-use BigQuery user interface.
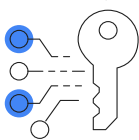
Democratize access to your data because what is better than getting all your data in one place? Making sure users across your organization have access to the data they need and are able to act and even automate actions in real time. Looker is an enterprise platform for business intelligence, data applications, and embedded analytics. For retailers, Looker Blocks provide reusable dashboards, reports, and exploration environments so you can achieve impact in a highly compressed amount of time. With Looker Blocks, measuring engagement, active users, creating custom cohorts, affinity analysis, A/B testing, and purchase funnels is easy. And with actions, you can quickly act on data right from Looker.

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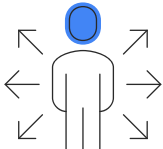
Get a holistic view of the consumer with a Customer Data Platform (CDP)
that connects your first-party, Google Marketing Platform, and third-party data
to reveal the full journey of your customers and how to optimize your interactions
with them. Google Cloud technology partners like Lytics, Exponea (acquired by
personalization platform Bloomreach), and Acquia offer retail-specific Customer
Data Platform box solutions with pre-built connectors to help produce value quickly.
For large enterprises and retailers with very specific requirements or who require
more flexibility, Google Cloud services partners like Deloitte, Atos, TCS, and HCL
can deliver custom solutions to more fully leverage BigQuery and Google's Ads and
Google Marketing Platform products.
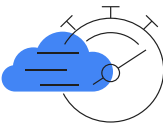
Bring together your Google ads and first-party analytics data in the cloud
for faster actionable insights with Google Marketing Platform and Google Cloud.
Move your Google media (Campaign Manager 360, Display & Video 360, Google
Ad Manager, Google Ads, Search Ads 360, YouTube) along with other first-party
(e.g. CRM) and third-party data into BigQuery and then use AI/ML to spot emerging
trends, segment customers, and drive personalized, predictive marketing actions that
increase ROI on your marketing investments and help build brand loyalty.

Deliver personalized experiences and improve conversions with Product
Discovery Solutions for Retail. Enhance consumer shopping experiences with
Recommendations AI that uses state-of-the-art algorithms to help you deliver
highly personalized product recommendations at scale. Make it easy for shoppers
across channels to search for products using an image from a mobile device with
Vision Product Search. And with Google Cloud Search for Retail*, you can deliver
high-quality search results across your website and mobile applications. It all starts
with a modern ecommerce website that reliably scales up and down to respond to
changing customer demands during peak shopping periods.

*In private preview

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Jumpstart your predictive forecasting and marketing analytics efforts with easily deployable templates that span several of the most common retail use cases. For example, build your own real-time website analytics dashboard, an ecommerce recommendation system to offer personalized, real-time cross sell, and upsell opportunities to customers, or use BigQuery ML machine learning templates to accelerate predictive forecasting and marketing analytics initiatives. Learn how to dynamically respond to customer actions by analyzing and responding to events in real time. Learn how to dynamically respond to customer actions by analyzing and responding to events in real time with an ecommerce sample application using streaming analytics and real-time AI.
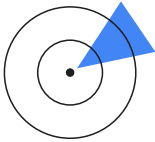
Ensure a consistent experience across channels (pricing, assortment, inventory, availability) by making data and digital capabilities available as APIs that are leveraged across all channels using Google Cloud's Apigee API management platform. A critical component is facilitating cross-channel sales and fulfillment—for example, 'buy online and pick-up in store'. Without API management, each channel has to be built with intricate knowledge of and coupling to your backend systems, driving up the cost and timeline for expansion into new channels and making backend changes prohibitively complex.
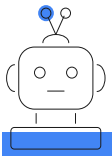
Leverage AI-powered virtual agents that can converse naturally with customers and expertly assist human agents on complex cases with Contact Center AI. Offer 24/7 contact with chatbots built using Dialogflow and give your stores a frictionless digital connection with Business Messages via Google Maps or Search.

Google Cloud

Customer success:
Offering a better recipe for modern analytics

The popularity of meal kit delivery services has surged in recent years as consumer attitudes toward home cooking and grocery shopping have shifted. As a pioneer in the category, Blue Apron helps its customers create incredible home cooking experiences by sending culinary-driven recipes with high-quality ingredients and step-by-step instructions straight to customers' doors. If that sounds simple, it isn't. Ingredients for the meal kits must be sourced at the right time, quality, and price. Orders must be packed efficiently and in exactly the right proportions. Most importantly, meal kits must be delivered to the customer fresh and on time.

To meet these criteria and make data meaningful and intuitive to its managers and enable faster business decisions about food inventory, Blue Apron built an analytics platform, named Kafka, using Looker and BigQuery. Blue Apron's applications publish event data to Kafka—approximately 140 million events per day—and data is then streamed into BigQuery, which performs lightning-fast queries on both streamed and static data. Now, business users and analytics teams can make decisions based on near real-time information in Looker, instead of waiting until the next business day for results.
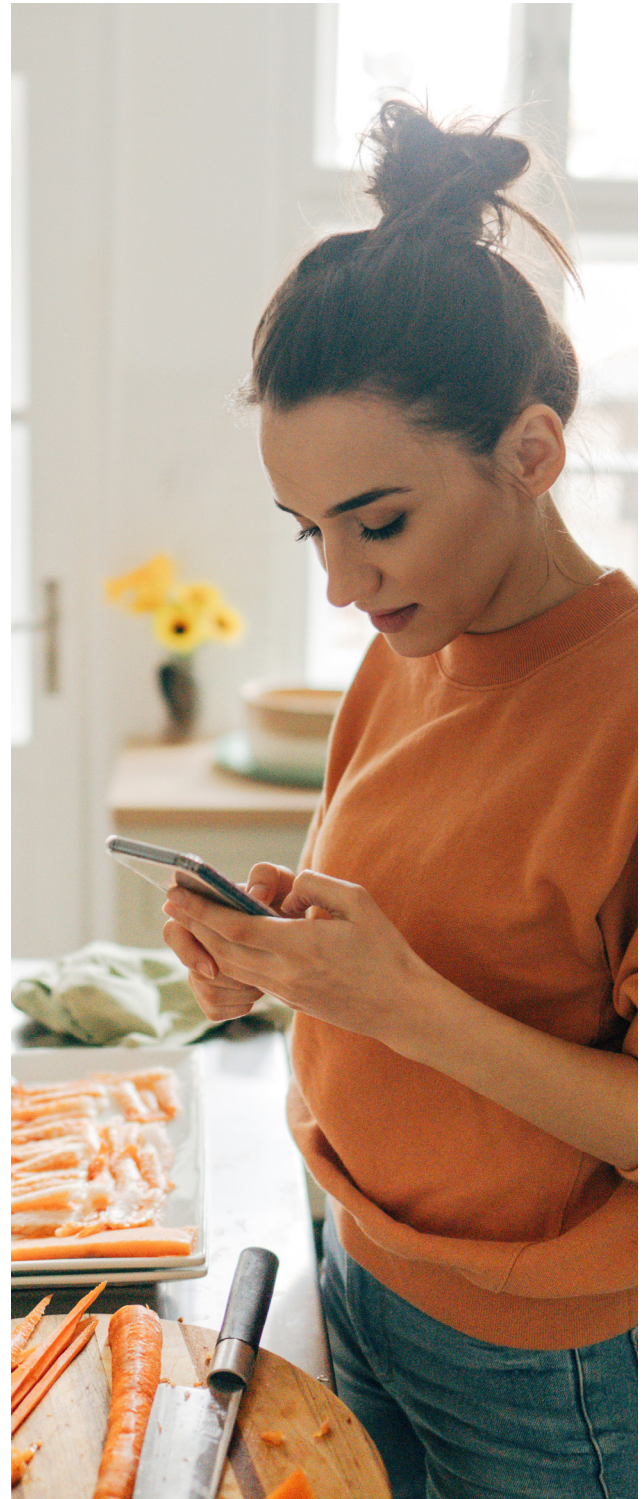
Blue Apron

Lightning-fast

queries on streamed & static data

140 million

events published per day

Blue Apron is also using Looker for BigQuery Data Transfer Service to provide actionable analytics for all of the company's Google marketing data from Google AdWords and Google Marketing Platform (now Google Marketing Platform) in one place to understand campaign performance across channels, saving its data operations team months of work.

Using Looker Blocks, marketers can quickly make sense of the data with reports and dashboards, and set alerts when campaign performance hits certain thresholds. Complex metrics such as ROI on ad spend, flexible multi-touch attribution, and predictive lifetime value empower marketers with a better understanding of their customers and where to spend their next dollar.

Source: Google Cloud

> "Everyone at Blue Apron is excited about using BigQuery with Looker. Business users and marketers are more empowered to look for answers, instead of waiting for analytics teams. Because users know they can get results rapidly, our business processes are evolving and improving."
>
> **Sam Chase,** Tech Lead, Data Operations, Blue Apron

Customer success: Increasing revenue and enhancing customer experiences with real-time analytics

Every day, zulily launches 9,000 new product styles—more than 1.5 times the volume most big-box stores stock in their warehouses. Quantities are limited, and items are typically only available for three days. This velocity of change and discovery is core to zulily's value proposition: "something special every day." More than 5.3 million customers come to the site daily because they know they will see new, unique items, driving more than $1 billion in annual revenue.

For zulily, it's like launching a new business every day, for each member, 365 days a year. Optimizing revenue and inventory on such a massive scale requires real-time intelligence, and that means analyzing constantly growing streams of clickstream data. The ability to track site visitors' behavior, including the pages they visit and deals they click on, is vital to the company's success. Just as important is diving deep into that data to understand visitors' behavior to personalize, as well as customize, offers and notifications.

zulily

5.3 million

customer visits per day

9,000

new product styles launched per day

By using fully managed cloud services—Google Cloud Dataproc for a dynamic, on-demand Hadoop engine for clickstream processing, and BigQuery for big data analysis—zulily frees its engineers from infrastructure management tasks.

The company runs thousands of processes every day on Google Cloud Platform to analyze clickstream data in real time and better understand customer behavior, funneling that information to the marketing team and merchants. It's also using the data to enable more satisfying customer experiences and drive more profitable interactions. For example, if a customer is watching an item but has not yet purchased it, zulily sends "community signals" to indicate the number of inventory remaining, helping the customer decide if and when to purchase. zulily's merchants now have real-time visibility into sales performance for the products they're responsible for, enabling them to quickly add inventory for popular items and increase overall sales.

Source: Google Cloud

"By collecting more data, and empowering our team with the information, we're innovating faster and making smarter decisions. Using real-time analytics on Google Cloud enabled us to drive a significant increase in sales conversion in just a few weeks. Without Google Cloud, we would never have been able to scale clickstream data collection 100-fold."

Bindu Thota, Director of Product Management, zulily

Google Cloud

02: Drive better merchandising and assortment decisions

The proliferation of technologies like the Internet of Things (IoT), digital shelf tags, and proximity sensors are giving retailers new data points that can provide greater insight into their products and stores. Retailers able to process and analyze this data unlock opportunities to make intelligent, real-time decisions around resource planning, inventory replenishment, shelf stocking, and fulfillment.

### Modernize systems to foster collaboration and innovation

In order to leverage the many new data sources available to them, retail organizations need to agree and execute on a data platform strategy. Applications, and their data, are increasingly being stored across multi-cloud environments. A study from TechRepublic found that 81% of organizations reported taking a multi-cloud approach in 2020, up from around two-thirds in 2019.[11]

This new reality requires multi-cloud analytics, enabled through a data warehouse that can operate across clouds from a single control plane. With such a warehouse in place, retailers can continue to cherry-pick the solutions that best meet their business needs, with more efficient costs and without vendor lock-in.

For vital retail functions like merchandising and assortment, multi-cloud analytics simplifies the process of cross-business collaboration. A modernized system makes sharing analytical insights within an organization as datasets, queries, spreadsheets, and reports just a few clicks away. With public and external read-only datasets, retailers can also expand knowledge sharing, collaboration, and innovation to external business stakeholders.

81%

of organizations report taking a multi-cloud approach.[11]
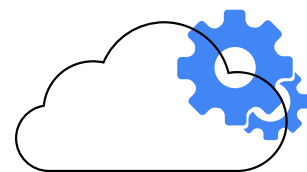
Multi-cloud collaboration simplifies the process of cross-functional working practices.

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Forecast demand quickly and accurately

The desire to use data to understand demand is a priority among retailers, with 'demand forecasting' coming out on top in a survey of the five most important areas of analysis.[12] It is also a function that has faced new and previously-unforeseen levels of difficulty in the COVID-19 era as demand for some product categories hit record highs, while others flattened entirely.

The ability to forecast demand quickly, plan inventory accurately, integrate with enterprise systems, and operate smoothly with a streamlined supply chain could mean the difference between success and failure.

Retailers need to be able to predict sales—with and without sales history—and do it on a granular level. They need to be able to see the effect of adjusted price promotions on the forecast. They need seamless integration with existing ERP systems, whether they are on-premises, in the cloud, or in hybrid environments, and have a flexible data layer to add a variety of signals. And they need to be able to rapidly query data, enabled by a data warehouse in the cloud with built-in machine learning and analytics, to provide real-time insights and new and improved consumer behavior models to both business users and data scientists.

Select and price products dynamically across all channels

Pricing is tied closely to a retailer's profitability, and getting it right has been made trickier by the extreme fluctuations in demand due to the COVID-19 pandemic and challenges across the supply chain.

There has been an increase in product and brand switching as factors like availability and affordability take on new precedence. A third of U.S. shoppers who purchased a brand that was new to them during COVID-19 say they will continue to buy from that brand.[13]

Fast, accurate demand forecasting relies on a data warehouse in the cloud with built-in machine learning and analytics.

33%

of U.S. shoppers plan to buy again from a brand that was new to them before the pandemic.[13]

Retailers that can react dynamically—across all channels—have the potential for significant new revenue and market share opportunities. Research from Deloitte found that more than half of consumers are willing to pay more for convenience, as defined by inventory availability.[14]

With a data platform capable of processing both internal and external sources and turning them into insights, retailers can reduce the time it takes to understand changes in demand and act to stock and price goods in a way that will retain customers and attract new ones. And with real-time analytics, the process of determining a product's success is shorter and less resource intensive.

Retailers can also simplify uploading prices to in-store pricing systems. Previously a manual and burdensome process fraught with errors and irregularities, a modernized infrastructure offers the ability to instantly make pricing changes and synchronize them across stores—even when systems are offline.

More than 50% of consumers will pay more for the convenience of product availability.[14]

Google Cloud

# Take the next steps to drive better merchandising and assortment decisions
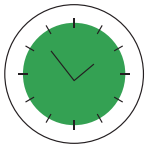
Reduce the time it takes to query and produce actionable insights with BigQuery—and potentially save your data operations team months of work. BigQuery offers retailers a secure, cost-efficient, and agile route to data warehouse, database, and data lake modernization that also delivers a lower total cost of ownership (TCO). Research by analyst firm ESG found that BigQuery had 52% lower TCO compared with legacy data warehouses running on-premises or in the cloud.[15] With BigQuery you can:

- **Use historical sales data for demand forecasting** using BigQuery ML and sample code available via Google Cloud's reference patterns.

- **Better predict customer demand and maximize revenue** by preemptively filling gaps in your portfolio and optimizing product distribution, promotions, and pricing with Build Your Own (BYO) Assortment & Allocation using BigQuery and AutoML Tables.

- **Understand and act on seasonal trends** with the results of time series models run in BigQuery.

Unlock new business models, new channels, and drive revenue growth by creating a partner and developer ecosystem with Apigee. Expose your products and services via APIs to developers to drive additional sales. Fastrack a marketplace strategy, quickly on-board sellers, and easily manage inventory and transactions.
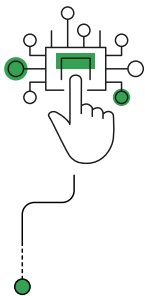
Develop an omnichannel merchandising strategy with Looker by creating a unified surface to access the truest, most up-to-date version of product, store, and supplier data. Looker democratizes data, enabling you to build a data experience to understand store performance in near real time, accelerate time to insight for optimizing spend, and monetize supplier data to generate new value streams. With built-in technology, Looker helps retailers to gain insight into purchasing patterns across various channels and enables retail businesses to pull various points of data across channels into one centralized location and compile them into actionable insights.
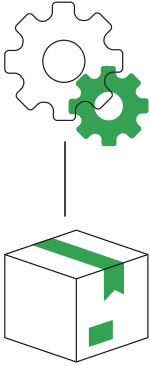
Synchronize the "state" of systems instantly across all of your store locations, cloud providers, and on-prem services leveraging Google Cloud's unique ability to handle real-time events data and share that information across the retail organization.[*] This includes real-time inventory and pricing systems, product search and personalization, and a core suite of ecommerce management services.

Enable the ability to influence inventory needs at the store level and online with Demand Forecasting. Build your own solution using BigQuery and our AI platform offerings or leverage out of the box solutions from Google Cloud partners like o9 to drive improved forecasting, while better managing the supply chain to deliver the right products to the right channels.

*Private preview. Available for select customers only.

Customer success: Helping doers get more done through a data-driven approach

The Home Depot (THD) is the world's largest home-improvement chain, growing to more than 2,200 stores and 700,000 products in four decades. Much of that success was driven through the analysis of data. However, to compete in today's business world, THD has taken this data-driven approach to an entirely new level of success on Google Cloud, providing capabilities not practical on legacy technologies.

The pressures of contemporary growth that drove much of the work are familiar to many businesses. In addition to everything it was doing, THD needed to better integrate the complexities in its related businesses, like tool rental and home services. It needed to better empower teams, including a fast-growing data analysis staff and store associates with mobile computing devices. It wanted to better use online commerce and artificial intelligence to meet customer needs, while maintaining better security.

THD's existing on-premises data warehouse was under stress as more data was required for analytics and data analysts were utilizing the data with increasingly complex use cases. After careful consideration, THD chose BigQuery for its cloud enterprise data warehouse.
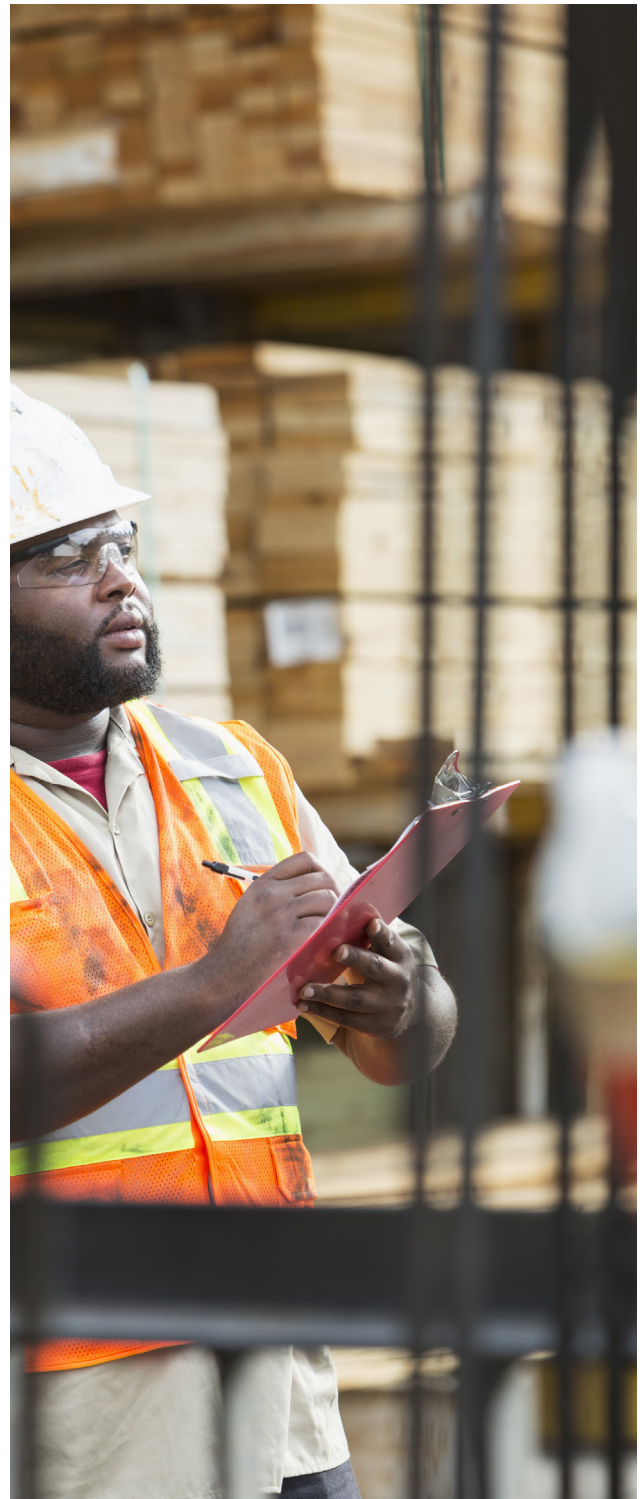
700,000

products

15+ petabytes

of data in BigQuery

While THD's legacy data warehouse contained 450 terabytes of data, the BigQuery enterprise data warehouse has over 15 petabytes. That means better decision-making by utilizing new datasets like website clickstream data and by analyzing additional years of data.

With the cloud EDW migration complete analysts now execute more complex and demanding workloads that they would not have been able to complete, before, such as utilizing Datalab for orchestrating analytics through Python Notebooks, utilizing BigQuery ML for machine learning directly against the BigQuery data (no movement of large datasets), and AutoML to help determine the best model for predictions.

Additionally, engineers at THD have adapted BigQuery to monitor, analyze, and act on application performance data across all its stores and warehouses in real time, something that was not practical in the on-premises system.

Source: Google Cloud

**"**Our query performance is down from hours and days to seconds and minutes."

David Narayan, Distinguished Engineer, Infrastructure Team, The Home Depot

Google Cloud

Customer success:

Accelerating omni-always transformation and better serving customers

Bed Bath & Beyond initially partnered with Google Cloud in 2017, leveraging Google Cloud's BFCM (Black Friday Cyber Monday) planning and support service to accommodate the surge in traffic during peak shopping moments and ensure revenue-critical systems were up-and-running. After pivoting rapidly to meet the sharp rise in digital demand throughout the COVID-19 period, Bed Bath & Beyond is expanding its partnership with Google Cloud, in conjunction with Deloitte, to focus on and enhance the following core areas:

Data-driven, customer-centric decision-making
Bed Bath & Beyond will utilize BigQuery to grow its machine learning and analytics capabilities. The company will operate these new capabilities to garner unique insights and expertise in its core markets to enhance the company's ability to project future sales trends and, based on those projections, to make instant, customer-centric decisions with real-time data, better serving the market with improved demand prediction and optimized inventory and merchandise planning.

BED BATH &
BEYOND®
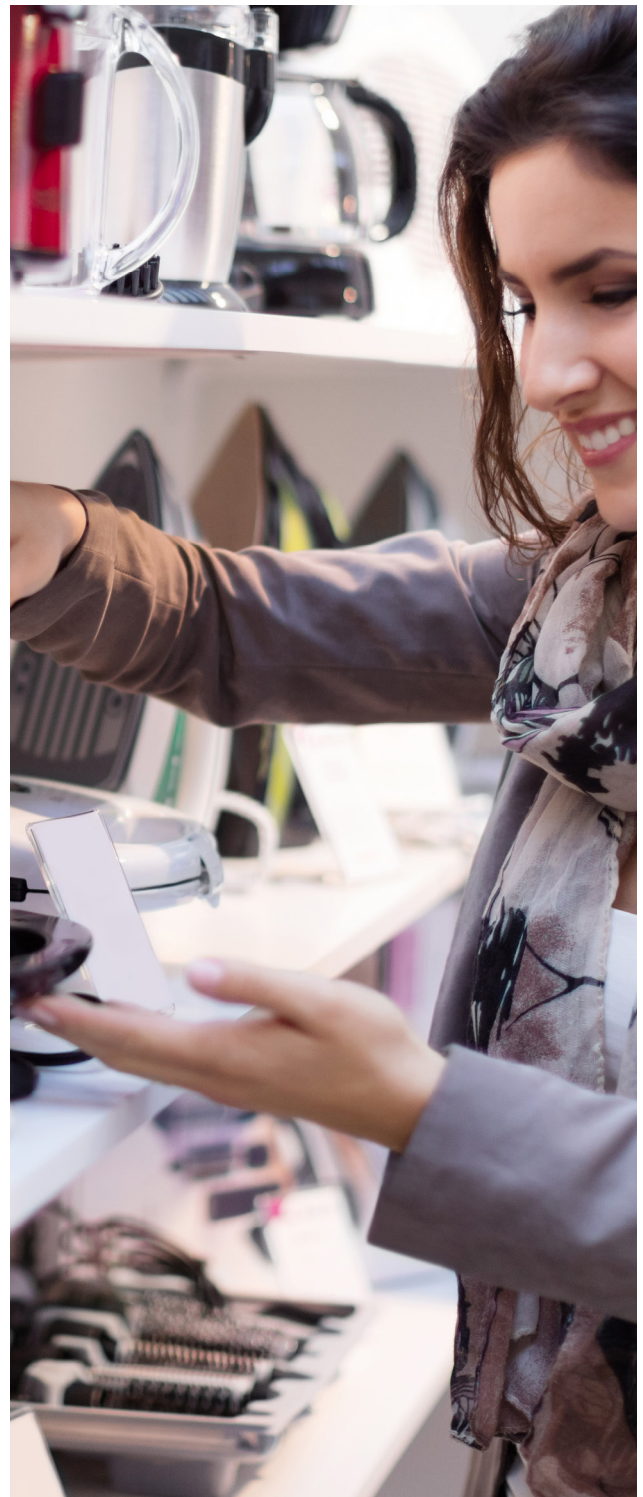
Google Cloud

One customer
data view

Omni-always
shopping experiences

Delivering a seamless, omni-always customer experience:
Google Cloud will also help Bed Bath & Beyond meet the needs of its customers by creating a truly personalized, omni-always shopping experience with a more agile and predictive ecommerce platform. The company will also be able to use Google Cloud's AI-powered solutions to support the customers' entire shopping experience, from search navigation and checkout to delivery or pickup.

Optimizing fulfillment strategy:
Bed Bath & Beyond will be able leverage Google Cloud's technology to harness its data and drive smart allocation to enhance management of fulfillment and cost. The partnership provides enhanced fulfillment capabilities at a massive scale to optimize every aspect of the business, from demand forecasting to supply chain logistics and the customer experience.

Source: Google Cloud

"
From day one, Google Cloud has leaned in, showing true partnership and a desire to help us grow, be more efficient and effective as a business. I welcome the opportunity to expand our relationship, supported by Deloitte, creating a unique combination of expertise and authority to deliver a truly omni-always, personalized shopping experience for our customers."

Mark Tritton, President & CEO, Bed, Bath and Beyond

03: Run operations and supply chain more efficiently

Data-driven retailers can increase operational and supply chain efficiency in both reactive and proactive scenarios, reducing costs while more accurately meeting consumer demand.

In reactive scenarios, visibility is the key to efficiency. Being able to understand the complete supply chain, and pivot before an internal issue becomes a customer issue, depends on the processing of real-time streaming data from sources across the business.

Data is also enabling retailers to take more proactive steps toward operational efficiency and what McKinsey has termed "digitally enabled omnichannel fulfillment".[16] This refers to the rise of curbside pickup and 'buy online, pick up in store' capabilities—but the potential is far greater.

Using technology, stores can become an extension of a retailer's cloud environment with live connections between point of sale, inventory tracking, and store associate enablement solutions. Along with efficiency improvements, retailers can enhance and personalize the customer experience in the store, helping to reinvent the relevance of brick-and-mortar locations in the COVID-19 era and beyond.

Drive inventory visibility and connected, intelligent, cross-business operations

When inventory logs don't reflect the shop floor, at best you have a sales associate who can find an alternative item for a disappointed customer. At worst, you have an unhappy customer, a lost sale, wasted employee time, and damage to your brand. In fact, today's customer might not even visit the store at all. A Google survey of U.S. shoppers found that more than two-thirds will confirm online that an item is in stock before venturing out to buy it.[17]

The complexity of inventory management has risen in line with new fulfillment models. Global searches for "click + collect" are up by

67%

of U.S. shoppers will go online to check an item is in stock before visiting a store to buy it.[17]

Global searches for "click + collect" are up by 600% year-on-year.[18]

600% year-on-year, indicating an unprecedented level of demand for new ways to shop.[18] Retailers need to manage inventory data from multiple sources and analyze it at scale to ensure customers and store associates have access to the most accurate and up-to-date product availability information.

Using a big data platform to manage and monitor the real-time flow of inventory for all locations, retailers can optimize on-shelf tracking by continually investigating stock, sales, and bay capacity data at the product, store, or location level. By combining ERP data in a cloud data warehouse, you can extend these capabilities across all parts of the business.

Last but not the least, connecting stores to your broader technology platform is critical to tully achieve the promise of 'channel-less retail'. Google Cloud Anthos for Retail enables retailers to create a "Connected Store" ecosystem and modernize store solutions by extending cloud capabilities to physical stores on top of the Anthos platform.

Enable superior clienteling experiences

While the shift to ecommerce has accelerated since the onset of COVID-19, the truth is that the in-store experience still matters. Around a quarter of shoppers find the online shopping experience less satisfying than visiting a physical store, and many product categories can expect some level of rebound once vaccines are widely rolled out and restrictions are lifted.

In this moment of pause before in-store shopping resumes at scale, retailers have a unique opportunity to reimagine the in-store experience. This might include reducing friction in the checkout process or empowering sales associates to go above and beyond to serve customers.

On the latter, superior clienteling can be enabled through innovative new uses for connected technologies. For instance, a sales associate is better able to support an individual customer if they have immediate access to the customer's full purchase history. They can then use to personalized analytics on that purchase history to generate customer-specific product recommendations.

25%

of shoppers find the online shopping experience less satisfying than in-store.[19]

50%

of frontline workers say that technology at their workplace has not changed in the last five years.[20]

Google Cloud

Empowering your frontline workforce with technology innovations can offer a game-changing competitive advantage. A Google study revealed that more than 50% of frontline workers say that technology at their workplace has not changed in the last five years.[20] Incorporating modern collaboration tools can result in delivering customer experiences that generate customer preference and loyalty.

By bringing such technologies in-store, brick-and-mortar retailers stand to gain valuable digital capabilities that narrow the divide between online and offline experiences. For example, chatbots can now be deployed on Google Maps and Search to answer common questions about store opening times, product availability, and even product location in a particular store. These solutions help to enhance the in-store experience, bringing the best of digital innovations to the high street or mall.

Increase efficiencies across the supply chain

Almost three-quarters of retailers report that a lack of real-time inventory visibility is a top supply chain obstacle that reduces efficiency and productivity.[21] This came to a head in 2020 and memories of pandemic-induced supply chain disruptions will live long for many business leaders.

The future of supply chain efficiency requires a two-pronged approach: rethink and rebuild in line with financial priorities, while also considering business operations continuity in the most trying of circumstances.

Digital twin platforms that provide a real time view of supply chains along with data analytics can help retailers build resilience by improving efficiencies, while at the same time helping to protect against future disruption. This was described in Forbes as the need to "create resilient systems that offer deeper user understanding, more flexible management, and better stability in the face of unpredictable disruptions."[22] The results will improve current operations, and make it easier to introduce new models and processes as customer demands continue to evolve.

71%

of retailers report a lack of real-time inventory visibility is a top supply chain obstacle.[21]

Rebuild supply chains considering both financial priorities and business operations continuity.

Google Cloud

Take the next steps to run operations and supply chains more efficiently

Power next-level intelligent operations with the flexibility and scalability of the cloud by hosting SAP on Google Cloud. Connect your data, processes, and equipment to power more intelligent business operations. Get instant answers from your SAP S/4HANA with BigQuery and Data QnA. And, generate ML empowered data insights through combining SAP and BigQuery Data Lakes with self-service smart analytics based on Looker. With SAP on Google Cloud, retailers can react faster to market changes by combining SAP order data with external datasets (e.g. weather) to predict business impact. Using Solver, retailers can also empower the planning optimizers of SAP IBP with continuous operational optimization capabilities.

Create a "Connected Store" ecosystem and modernize store solutions by extending cloud capabilities to physical stores on top of the Anthos platform. Anthos enables retailers to consistently deploy, configure, and manage applications across a fleet of stores at scale without sacrificing performance or reliability. Adopting Anthos enables retailers to rapidly build, test, launch, and scale new store operations capabilities and customer experiences to drive engagement, increase sales, optimize operations, and improve margins. With this foundation in place, retailers can start instrumenting the store and collecting real-time information on things like inventory flow, store traffic, and customer satisfaction. Retailers can then leverage this edge computing capability to infuse AI into critical functions and drive automation—ultimately fulfilling on the store modernization journey.

Build a unified view of your inventory and better forecast demand with data in BigQuery. Analyze store inventory in real time, share insights, and manage orders across multiple channels for omnichannel inventory management. This allows you to adjust fulfilment and assortment decisions and respond faster to changing customer needs in a granular fashion.

Google Cloud

Empower frontline associates to better assist customers and offer higher levels of customer service by providing them with instant, secure access to information (such as product, inventory, promos, and orders) and apps via shared company devices and approved personal devices. With Google Workspace (formerly GSuite) each user has a unique digital identity with permissions-based access to apps and information, ensuring security.

Deliver consistent customer experiences across channels with Apigee, Google Cloud's API Management platform for Retail. Apigee provides an abstraction layer in the form of managed APIs that enable retailers to move faster in the delivery of new and differentiated front-end applications, and that includes apps used in-store for clienteling and other purposes.

Create data experiences that connect customer concerns with logistics by using aggregate feedback to pinpoint the source of issues, be it a specific shipment, product, or delivery partner. With Looker, you can plan inventory purchasing and warehousing to ensure availability, send automatic alerts when stock is high or low, improve workflows by keeping warehouse and floor managers up-to-date on inventory numbers, trace customer feedback, and pinpoint supply chain issues quickly.
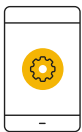
Give your customers more ways to reach you through their preferred channels. Google My Business provides a seamless, location-specific connection to local customers. With support for both calling and messaging from Google Search or Google Maps, you can use chatbots and live agents to meet customers where they are, quickly provide the information they need, and drive footfall to stores.

Google Cloud

Drive superior shelf execution by easily finding the answer to how many items are out-of-stock or incorrectly-priced, along with which items are currently available to shoppers right now by store format and category. Google cloud partner Trax uses custom camera technology, a computer vision platform, and massive datasets to provide a cutting edge solution for tracking inventory movement within the store.

Create a "digital twin" for your supply chain to better understand and manage risk. A digital twin is a digital representation of a physical asset, process, or system that can be tweaked and redesigned at will, letting businesses better understand how aspects of their supply chains interact, where possible points of failure may arise, and how different contingency plans could be implemented. By using digital models to forecast and plan for disruptions within the physical supply chain, retailers can move with agility to manage relationships with suppliers, ultimately improving the structure of their supply chains, enhancing collaboration, and increasing reliability and performance.

Customer success:
Delivering data-led customer experiences

Charlotte Tilbury, the global luxury beauty and skincare brand – available in more than 60 countries via CharlotteTilbury.com and 550 physical locations – sought to advance its data analytics processes while scaling up its ecommerce platform to meet growing customer needs across channels. The company chose Looker and BigQuery to deliver a unified approach to analytics and reporting that would open up access to real-time, critical data insights across the business, from ecommerce to supply chain and finance.

While the initial Looker deployment was focused on ecommerce, all teams are now using Looker including its physical retail teams, bolstering Charlotte Tilbury's omnichannel integration. This multi-departmental sharing of insights also helps improve efficiencies throughout the company's supply chain, assisting with stock-shortage notifications and order-volume fluctuations across different geographies. With access to trusted data through the Looker platform, the company can tackle issues based on real-time information.

CharlotteTilbury
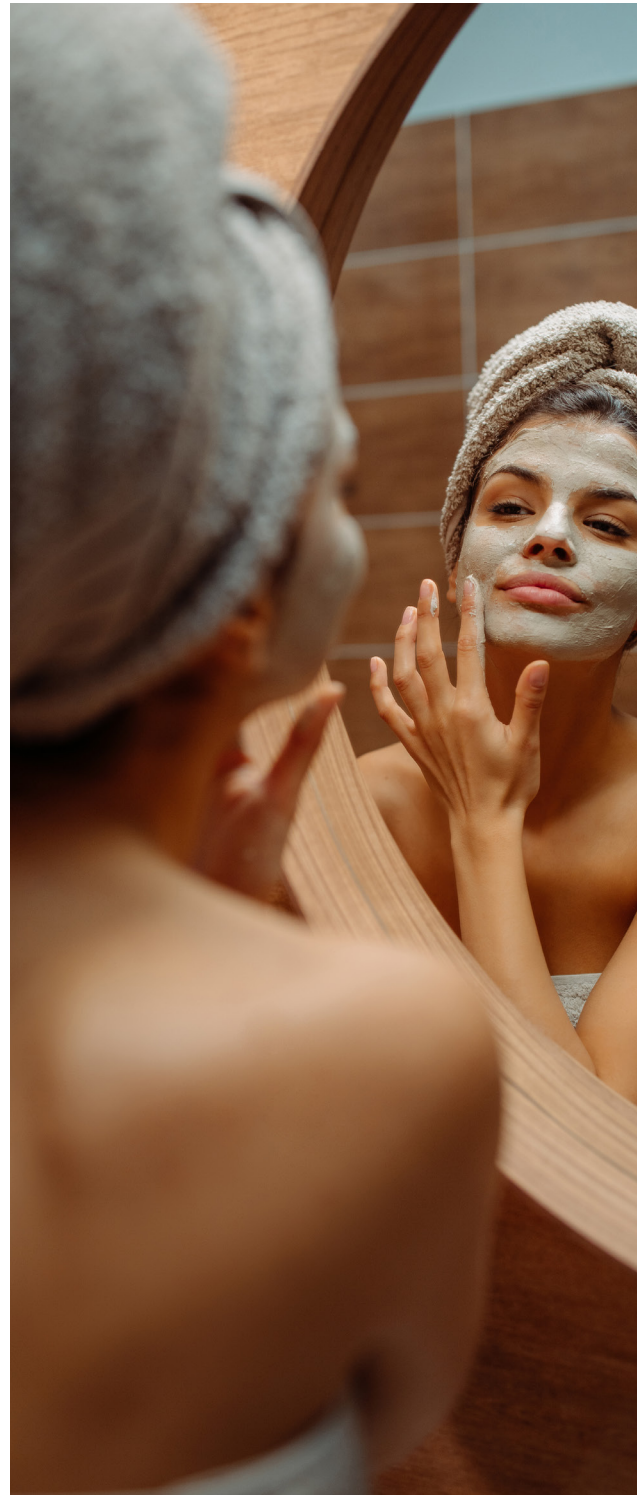
Real-time insights

From ecommerce to supply
chain and finance

550

physical store locations

Source: Google Cloud

> " It's an incredibly challenging time for retailers around the
> world. Now, more than ever, we need to focus, adjust,
> and invest in technology that will help us navigate the
> current climate by creating consistently excellent customer
> experiences across all channels. With the recent spike in
> online demand, the powerful combination of Looker and
> Google BigQuery has been critical in enabling us to easily
> adapt. We now have faster access to reliable, real-time
> insights that provide informed decision-making, and build
> trust at this uncertain time."
>
> **Dr. Andreas Gertsch Grover,** Director of Data, Charlotte Tilbury

Google Cloud

Customer success:
Providing great retail experiences, on- and offline

In 1963, Carrefour was the first chain to bring the hypermarket model to France, opening a 2,500 m^2 store that offered its customers the previously unseen combination of self-service shelves, a vast range of products, and free parking spaces. Since its foundation, the group has grown into one of the world's largest food retailers and has continued to innovate. It now aims to transform the future of retail by offering the best retail experience and the best products at the best price to customers around the world, pursuing an omnichannel strategy that encompasses ecommerce alongside brick-and-mortar stores.

To ensure that Carrefour delivers the same high quality service whichever channel the customer uses, the company has to collate multiple strands of data, relating to products, prices, stock levels, and local availability. The existing on-premises IT infrastructure was not designed for the amount of data processing such services require and had reached its technological limits. In order to scale up and meet demand, the company would have had to carefully plan its capacity in advance, sinking costs into hardware that had to be ordered, installed, configured, and maintained. By 2018, Carrefour Spain needed not just new equipment, but a new kind of infrastructure.

## Carrefour

Google Cloud

2,000
consolidated data streams

Real-time
information collation,
analysis, and action

Moving to Google Cloud provided Carrefour with the perfect opportunity to update and standardize its back-office procedures and consolidate its data streams. It runs SAP on Google Cloud, which gives retailers access to the world's leading ERP application vendor combined with the advantages of a cloud-based infrastructure. With SAP on Google Cloud, Carrefour Spain has built an infrastructure optimized for customer service. The company has consolidated more than 2,000 data streams into a single place, and it now has the capacity and power to collate, analyze, and act on that information in real time.

Source: Google Cloud
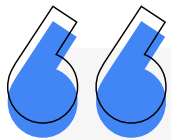
> The goal was to build a data-centric technology infrastructure, so that we could serve our customers better and improve their experience. We needed to reconfigure our core infrastructure from the ground up, transforming our back office with Google Cloud and SAP."
>
> **Jose Antonio Santana,** CIO, Carrefour Spain

The preferred cloud for data-driven retailers

Retail is at a crossroad. With consumers' growing comfort with ecommerce, plus pent-up demand for in-person shopping experiences, the future of your retail business is multifaceted, omnichannel, and yours for the making.
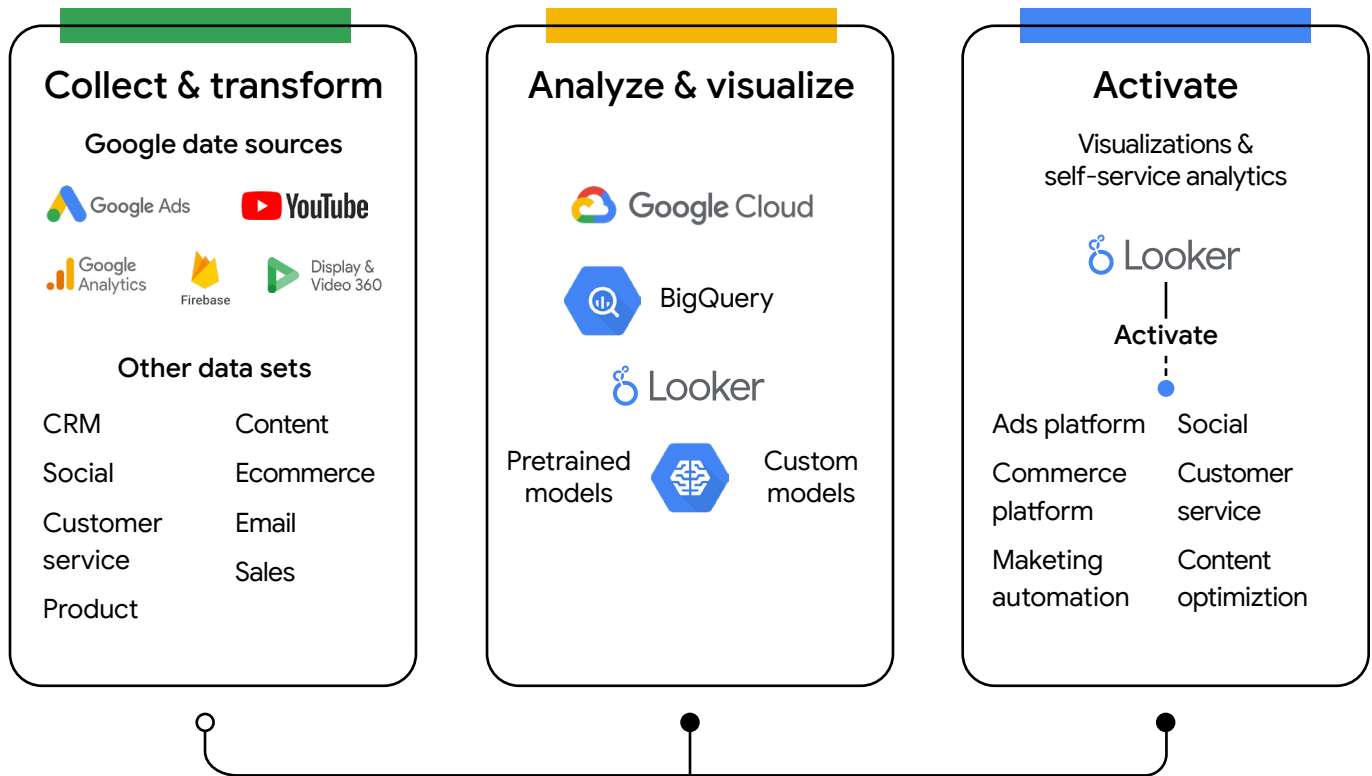
Aimee Kim, Senior Partner in McKinsey's Seoul office, highlighted how future success will depend on a retailer's ability to understand consumers—and change and adapt based on their needs. She said, "Really understanding what the consumer values and quickly pivoting your business model and your services to cater to that is how you weather the storm and continue to grow."[23] That means using data-driven intelligence across the retail value chain to drive everything from personalized marketing to supply chain efficiencies.

Google Cloud is uniquely positioned to help retailers with their data transformation. Google has years of experience of understanding consumer intent and using it to make smart decisions across flagship properties such as Google Ads, Google Search, and YouTube.

Retailers get access to this expertise through Google Cloud, which is run on the same proven and reliable technology principles that power Google services for billions of users. From customer segmentation to inventory management, Google Cloud's industry-leading machine learning and advanced analytics capabilities enable you to maximize the insights you derive from your data. Our serverless data analytics and machine learning platform go further to help you automate processes, make intelligent predictions, and streamline management and operations.

Google Cloud

How it comes together

Collect & transform

Google date sources

Google Ads · YouTube

Google Analytics · Firebase · Display & Video 360

Other data sets

CRM	Content
Social	Ecommerce
Customer service	Email
	Sales
Product	

Analyze & visualize

Google Cloud

BigQuery

Looker

Pretrained models · Custom models

Activate

Visualizations & self-service analytics

Looker

|
Activate
|

Ads platform	Social
Commerce platform	Customer service
Maketing automation	Content optimiztion

Our unique understanding of consumers, retail-first industry solutions, differentiated services that support retailers during peak shopping moments like BFCM, as well as our robust ecosystem of industry technology and services partners, provide the help you need to tackle your biggest challenges.

Beyond driving innovation, Google Cloud cares about the same issues as retailers, including privacy, security, and sustainability. The key tenets of our privacy commitments include that we will never use your data for ads targeting and that security and privacy are primary design criteria for all our products. Read more about how Google Cloud protects your data and prioritizes your privacy on our Privacy page.

Google Cloud also protects your data, applications, and infrastructure, as well as your customers, from fraudulent activity, spam, and abuse. We protect your data against threats, using the same secure-by-design infrastructure foundation and security services we use for our own operations, ensuring you never have to trade-off between ease of use and advanced security.

Google Cloud

Not only is your data secure and compliant, but with Google you can also meet your sustainability goals. Google is the only cloud provider to have achieved 100% renewable energy. By 2030, our goal is for all cloud workloads to use carbon-free electricity every hour of every day in every region. Find out how you can innovate sustainably with the cleanest cloud in the industry.

Adopting new, cloud-based technologies can be a lengthy and expensive process—but it doesn't have to be. Choose a cloud partner that is committed to your ongoing success, with support for the multi-cloud reality that many retailers inhabit, and the ability to scale with your growth in the years to come. Google Cloud is dedicated to continuous innovation for the retail industry and working with our customers on new, customer-centric solutions that are at the forefront of technology. We can help you take the right steps to becoming a data-driven retail leader. This is why 7 of the top ten leading retail and CPG companies trust Google Cloud. What are you solving for?

Google Cloud

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