Looker

The Business Application Platform for Data Experiences

Google Cloud Whitepaper

Google Cloud

Build Better Data-Driven Applications, Faster

Looker's suite of application development tools helps organizations of all sizes—from the newest startups to the largest enterprises—improve their products' competitive advantage and drive new revenue growth at reduced development costs. Looker makes it faster and easier for developers to deliver trusted and scalable solutions for near real-time data application use cases, including: feature-rich data experiences in customer-facing SaaS products, self-serve analytics embedded in internal portals, fully-automated operational workflows, custom third-party widgets in dashboards, custom report builders, custom filters and navigation, purpose-built administrative and developer tools, custom applications tailored for monetization use cases... and much more.

In this overview we'll walk through the business value of building data applications on Looker and introduce some of the developer tools that make it all possible.

A Triple Win for Your Business

Looker customers increase their competitiveness and drive growth by rapidly building scalable, best-in-class data products that keep development teams lean and focused on their core competencies. Here's how:

Increase agility and competitiveness of internal and external data products and workflows.

- Accelerate development with best-in-class time to value. Looker lets you build efficiently with modern APIs, SDKs and git software development workflows.
- Drive greater product market fit with rapid prototyping and iteration. Looker lets you easily and cost-effectively add new use cases, personas and customer types by taking care of governance, security, user provisioning and more.
- Make better data-driven product decisions. Looker comes with built-in data product instrumentation and usage analytics.
- Get peace of mind. Looker is architected to deliver secure, performant, accurate, near real-time data product experiences at any scale.

Reduce costs of software development, account management and operations.

- Focus engineering resources on core competencies to minimize data development and delivery costs. Looker takes care of the hard behind-the-scenes work: authentication, permissions, responsiveness and more.
- Grow and improve your product easily over time to minimize ongoing maintenance costs. Looker helps you scale-up your product by maintaining metric definitions and user permissions in one place and pushing out your updates automatically.
- Reduce the manual work done by account management and support teams to field ad-hoc data requests by streamlining their operational workflows. Looker data products empower non-technical employees and customers to self-serve explore their data.

Grow revenue by offering differentiated and premium data product experiences to customers.

- Incentivize upgrades by strategically tiering unique and high-value data product capabilities in premium plans of your subscription product offering. Looker customers monetize analytics, historical data, granularity, user types, integrations, and differentiated data experiences.
- Delight users with beautiful, dynamic and easy-to-use data product experiences. Looker powers your purpose-built custom applications to allow users to experience and explore near real-time data at scale and full granularity.

The Technical Challenges Companies Face

When homegrown or third-party data applications break, get too costly and lose users' trust, developers turn to Looker to solve the many, hard technical challenges of their high stakes business application.

Why? Looker is at its best for any combination of the following data and user experience requirements:

Common Data Requirements	
Performance	Supply data applications with governed, near-real time data at web scale
Security	Minimize security risk of sharing data inside or outside your organization
Integrations	Integrate data insights to streamline workflows across common SaaS platforms
Customization	Build completely custom data-driven user experiences via modern web APIs and SDKs
Unified Surface	Connect to many, diverse data sources; deliver to many, diverse endpoints
Embeddability	Operationalize data in existing portals where users already work
Automation	Automate real-time data-driven workflows for higher ROI of operations

Common User Experience Requirements	
External Users	Deliver data to customers, partners, suppliers, investors or the public
Row Level Security	Surface only the data the user has permission to see via row level user attributes
Self-Service	Empower users to drill and explore live data to ask and answer their next questions
Alerts	Let users set up rule-based alerts to automatically send notifications and trigger workflows
Schedule Reports	Give users ability to build and schedule their own custom reports
Spectrum of User Types	Tailor data experiences for the full spectrum of user proficiencies: non-technical to analyst
Growing, Changing Customer Types	Adapt to serve new customer types efficiently; no need to rebuild data pipelines from scratch

As needs evolve, Looker makes it easy to repurpose what you've built and add new capabilities to meet new requirements for future use cases. The way Looker unlocks this deep technical value comes down to its flexible architecture.

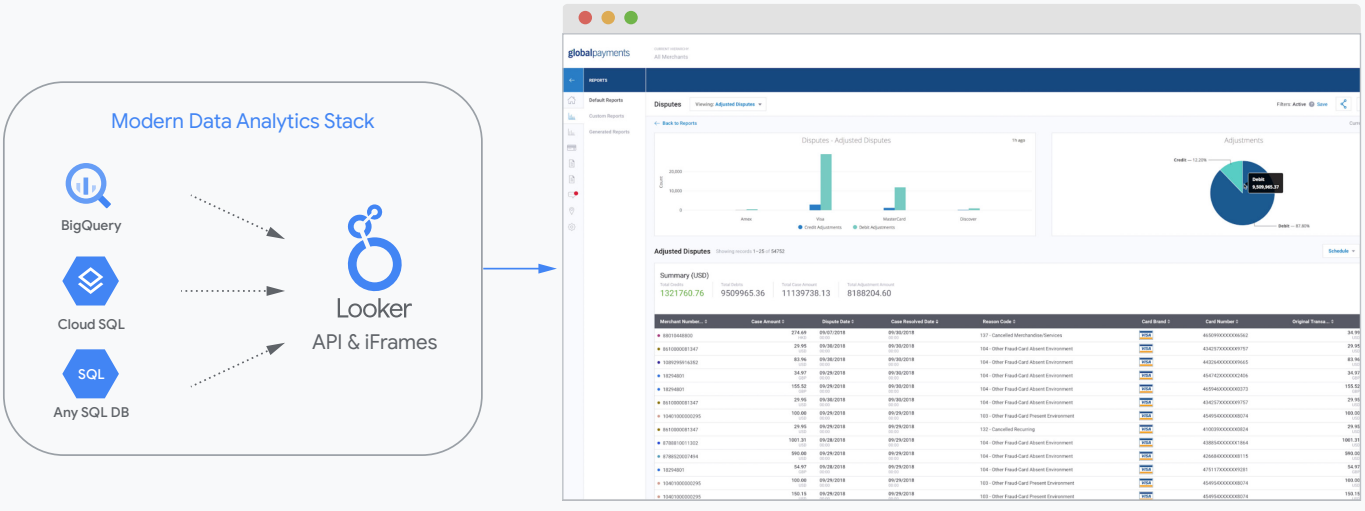
The Secret Sauce: An Architecture Designed for Modern Data Applications

Looker empowers builders to rapidly deliver solutions for historically challenging technical requirements thanks to a unique fusion of three core technologies:

1. **In-database architecture** that leverages modern cloud MPP databases (like BigQuery) that are significantly more powerful, far faster, and much more cost effective than their predecessors. This live connection to the database provides a complete and secure view of your data without having to move any of it into the application layer. Instead, Looker queries the database in real-time so data is always accurate and fresh.

2. **Version-controlled semantic layer** that acts as a centralized library of all metric definitions and user permissions. It separates business logic from physical data, allowing companies to abstract away the complexity of their data and reliably apply consistent data definitions across KPIs, so both technical and non-technical people can work with trusted, reliable data.

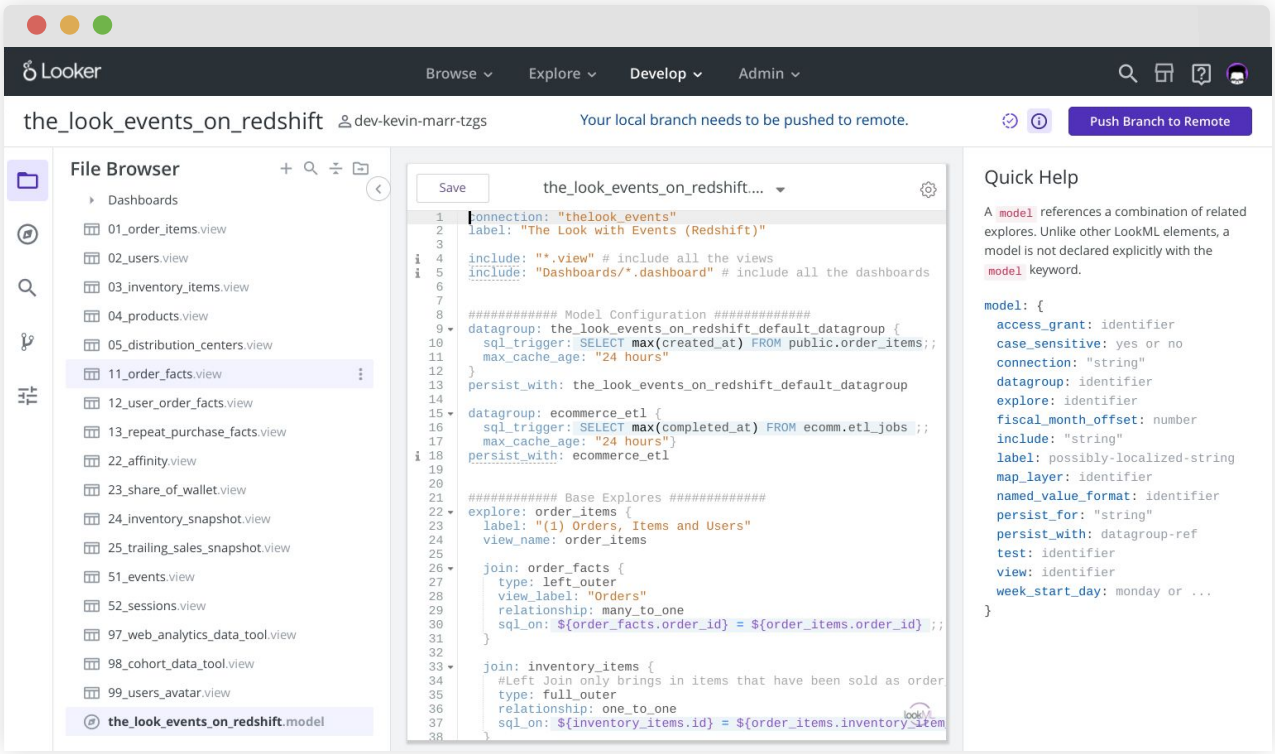
3. **APIs for data** that give builders the tools they need to deliver any data experience anywhere. Looker is 100% web-based, providing a suite of developer tools and an API for data on top of which you can build operational workflows and integrate data-driven applications for your business.



Looker is architected as an API for governed, near real-time data so you can rapidly build custom data applications without the need to develop your own complex and costly data retrieval framework.

The architecture lets developers build data-powered experiences efficiently and scalably. LookML, a more efficient and reusable evolution of SQL, obviates the need for complex, brittle data engineering pipelines. Instead, developers can build with data as software and do so using modern git workflows. This lets distributed teams:

- Collaborate better on the same project via branching, project importing and foldering
- Ship quality code in reliable releases via dev-staging-production environments and unit testing
- Ensure product continuity and rollback changes via true git version history
- Model data in Looker's integrated development environment



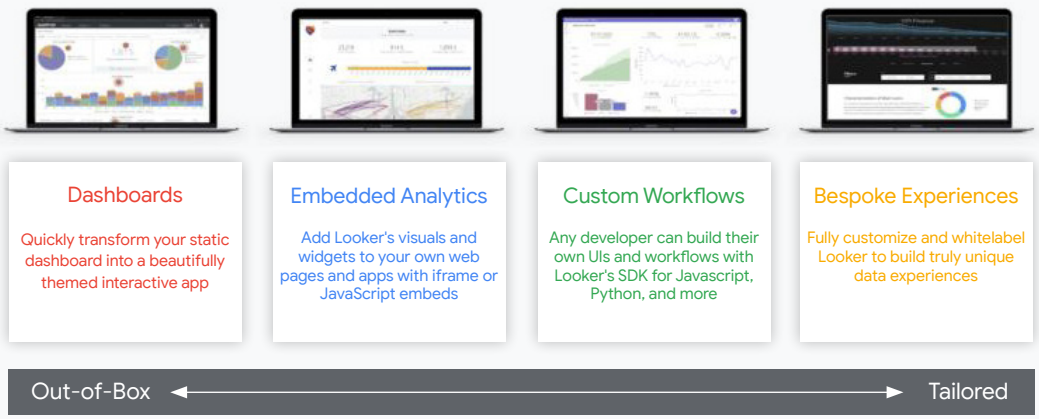
Developers get massive data engineering efficiency gains from LookML -- an evolution of SQL that enables transformation at time of query ("ELT, not ETL")

Modern data application development requires this cloud-native technology foundation to take full advantage of evolving trends in data infrastructure and avoid vendor lock-in.

From this technology foundation, Looker built a suite of tools to accelerate application development for a wide range of data experiences.

A Spectrum of Data Experiences and Developer Tools

Looker development tools span from low-code to full-code, and we can help recommend the best tool for the job.



Development approach	Custom branding	Embed analytics	Extend Looker web app	Full Stack data app
Primary Looker developer tools	Theming Looker BI web app	iframe + JS Embed SDK	New: Extension framework, UI components	APIs and SDKs
Time to value	Fastest	Fast	Medium	Varies
Technical skill required	Zero	Varies	Medium	High
Customization control	Medium	Medium	High	Total
DevOps, Infrastructure	Looker hosts	Developer hosts	Looker hosts	Developer hosts
	Lowest Effort	**Most Popular**	**Highest Return on Engineering Effort**	**Complete Control over the Data Experience**

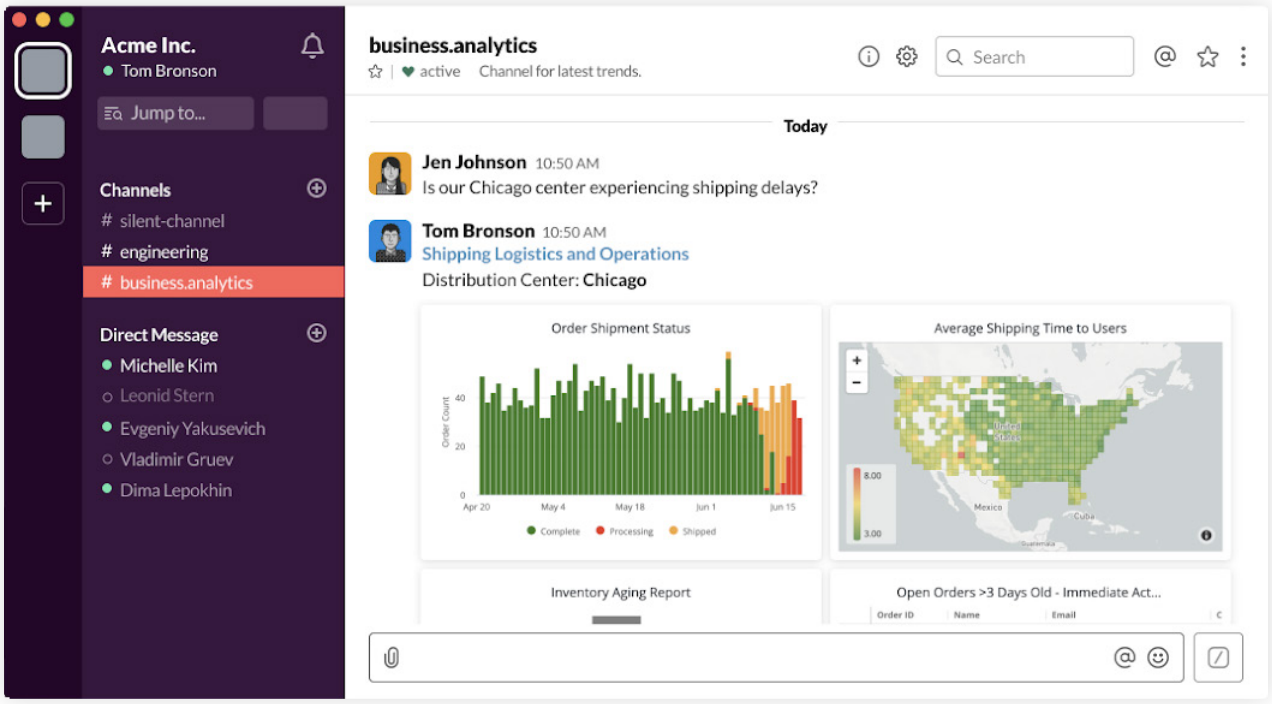
Get the Best of All Worlds

While these discrete tools are helpful to understand main categories of approach, developers often combine these tools to pick and choose the specific attributes needed for their project. For example, the most popular development approach—embedded analytics—is often used in conjunction with API calls for some additional customization. Historically, about 40% of Looker embedded analytics projects have taken such a hybrid approach. In these scenarios, developers can use the JavaScript Embed SDK to accelerate the customization of their embedded analytics. It lets them more rapidly leverage the APIs they need, while also benefiting from the fast time to value of the iframe.

A Connected and Complete Solution

No matter the deployment model and tools they choose, Looker developers can always take full advantage of all the powerful technologies in the core BI product, like the Action Hub. These out-of-the-box integrations (or "actions") into 30+ leading technology platforms can be called via API, or accessed directly from within the embedded Looker UI, so that users can take action on their data and streamline their data-driven workflows.

The Slack integration, for example, not only lets users send data to Slack from your application, but also lets users easily ask questions of the data in natural language from Slack and receive answers back in the chat app.

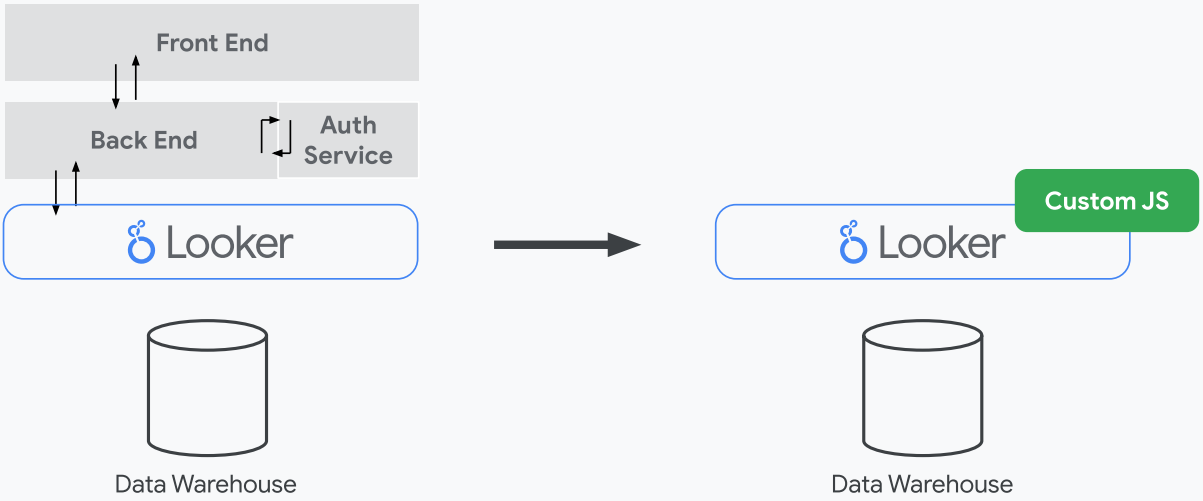


Of course, developers can also build their own custom actions and custom visualizations for their specific needs. Slack saved their sales team 5,000 hours a month by building a custom Looker action with Workato and Google Slides. Check out the blog post and the technical details to learn more.

Now, with the rollout of Looker 7, and the new extension framework and marketplace, it's faster and easier than ever for developers to build more, diverse and better data experiences to delight users, streamline workflows and accelerate business growth.

Stand on the Shoulders of Looker with the Extension Framework

The extension framework accelerates data application development to help product builders ship new types of data experiences fast and solve valuable data use cases. Developers get a great return on engineering effort - they focus on building great user experiences, and leave the data engineering, DevOps, security and hosting to Looker.



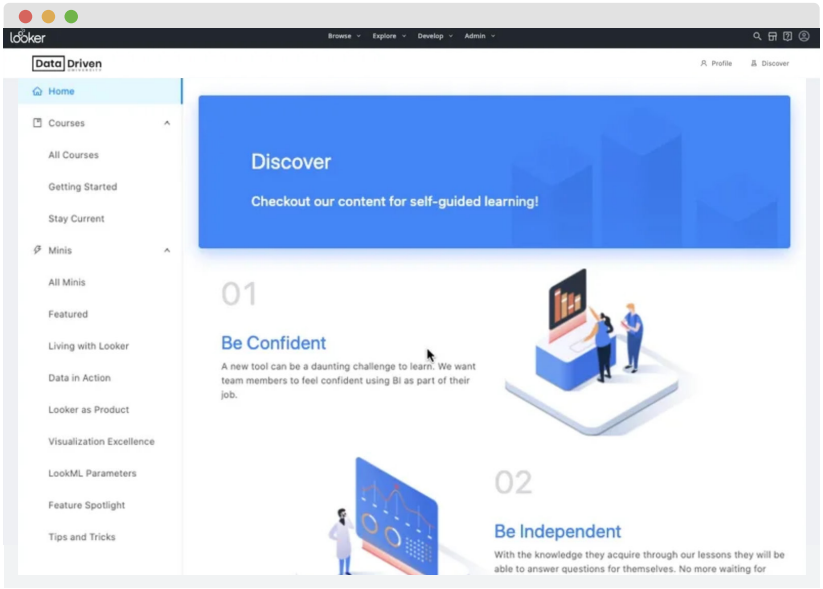
Build applications on your own tech stack

Build applications on the extension framework

Developers reduce the amount of required engineering effort with the extension framework.

We've opened up the Looker user interface as a development surface to let developers deploy JavaScript applications—even leveraging third party APIs—to create new and augmented data experiences in our core product. Because it lives in Looker, the extension framework handles web application hosting, authentication and authorization. It also provides developers with full access to the Looker APIs, a library of prebuilt UI components, and extension templates for even more customization control and faster time to value. Naturally, developers can also choose to embed their extensions anywhere in other web applications, by using iframes and the Embed SDK.

Looker is thrilled to empower developers across a wider range of technical sophistication with such an accelerated and enhanced low-code development experience.



An immersive full-screen onboarding app, built in the Looker UI by Data Driven.

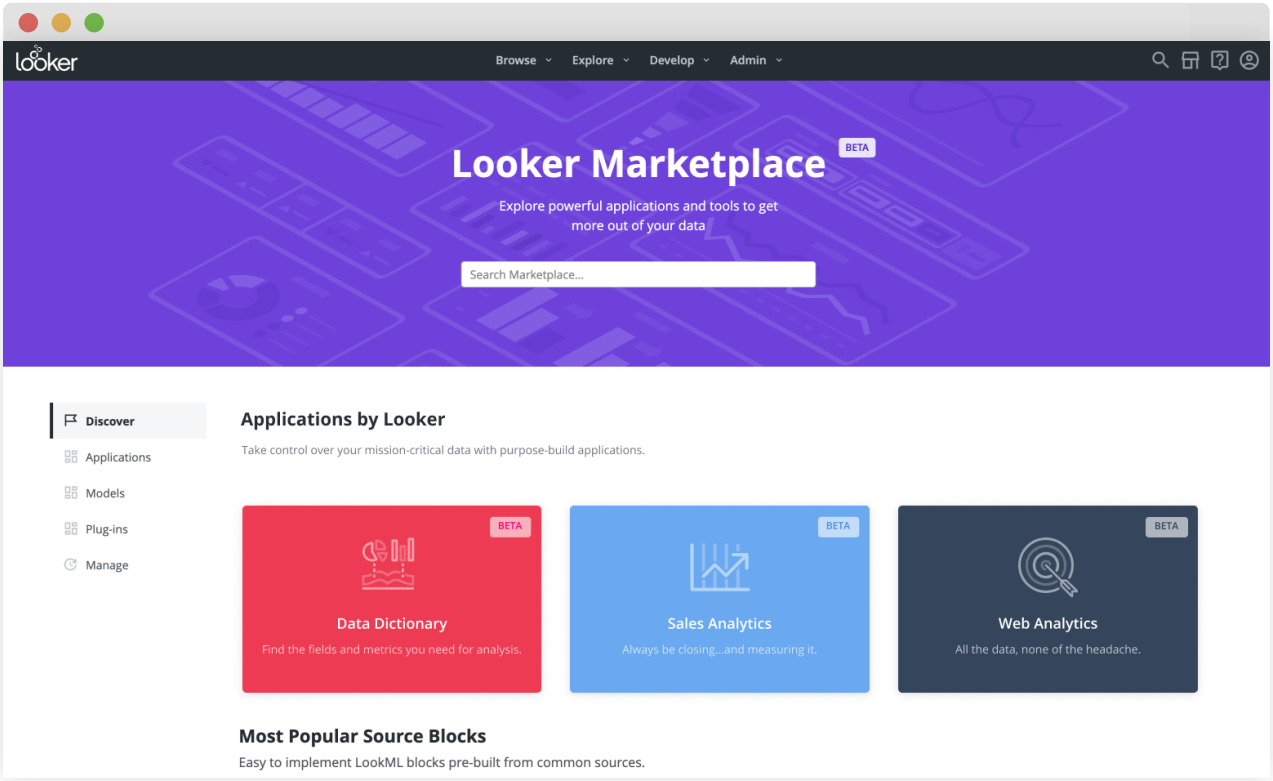
Distribute Applications to Customers in the Marketplace

The marketplace helps developers easily distribute their data applications to grow user engagement and create new revenue opportunities. Looker customers quickly discover new solutions for valuable use cases and get a fast, seamless installation process—all within the Looker interface.

We've brought together, in one place, Looker- and community-built applications, custom visualizations, data model connections, plug-ins and integrations to help more developer solutions reach more engaged users. Because the marketplace is in the Looker web app, administrators can quickly find, install and deploy the new data experiences and value accelerators within minutes instead of hours or days. As in other app stores, these packages are managed and versioned by developers, so all users will continuously benefit from updates and new functionality.

We're excited to grow the value created and realized for both customer and developer sides of our emerging data platform ecosystem.

> "Deploying our application in Looker took one developer one day! It was super easy thanks to the documentation, Looker components library, and the example applications on GitHub. The extension framework is the most exciting Looker feature since the Explore."
>
> Jawad Laraqui, CEO of Data Driven



Customers easily discover and install Looker- and community-built technologies in the Looker marketplace.

Taking the First Steps

This introduction has highlighted some of the most differentiated and valuable capabilities of Looker as a business application platform.

If it's your first time building a data application and you haven't experienced the challenges first-hand, the 'unknown unknowns' might make it hard to understand the value of Looker. For that reason, Looker takes a close partnership approach - from our award-winning support and professional services teams to our ecosystem of specialized consulting partners and systems integrators - so you can focus on being experts at your business and rely on us for expertise in data application development.

Partners

YETI

4 MILE ANALYTICS

Bytecode IO

launch

Appnovation

Fivetran

Some of our favorite trusted partners for helping you build custom applications on Looker.

Looker has helped thousands of organizations build modern data application solutions and we're excited to partner with you in your journey. To help you get off to a great start, here are the first steps we see successful organizations take:

1. **Team.** Bring your team together early and keep them looped in throughout your evaluation process. This includes key cross-functional stakeholders (data engineering, product management, backend and frontend software developers, UI/UX designers, data scientists) as well as the executives who will need to give their approval to move forward (typically engineering and product leadership)

2. **Workshop.** Hold a workshop with your team to review your market's competitive landscape and your business strategy to win and grow. It'll prioritize business needs and justify the business case for the minimum viable (and future) data and user experience requirements. Looker often hosts free strategy workshops to help facilitate these discussions and share best practices and timelines we've seen at other organizations for ways to differentiate and drive new revenue growth, for example.

3. **Partner.** Treat Looker and our trusted partners as an extension of your team. Each of us bring different skills and experiences, and we're all invested in your success. Don't hesitate to ask for help for anything from technical proof of concept to making the ROI business case to resource the project.

To identify some more of the 'unknown unknowns' for embedded analytics specifically, check out this whitepaper, this blog post and this customer story.

Get Started Today

Contact the data application experts at Looker here.

Customers

ATLASSIAN

Akamai

bizible

FOX

FUTURE PLAY

globalpayments

GoSpotCheck

Kollective

pixiv

slack

WPP

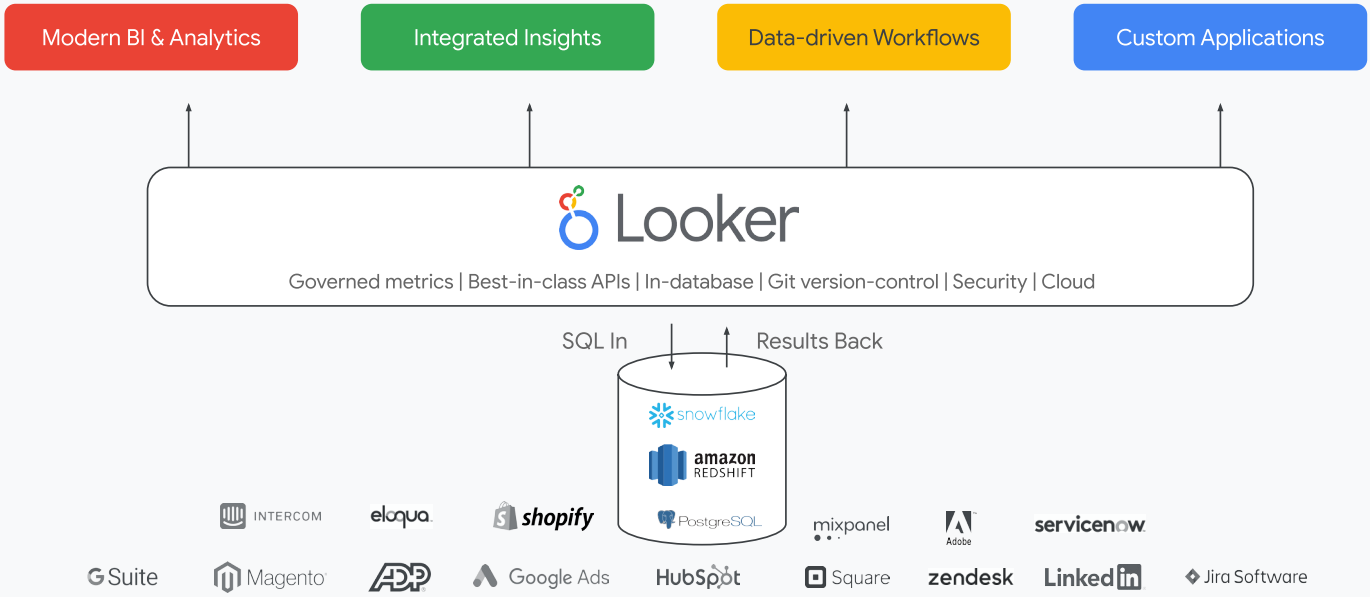
WiX

Some of the many customers who have built high value data experiences using Looker as an API for their data.

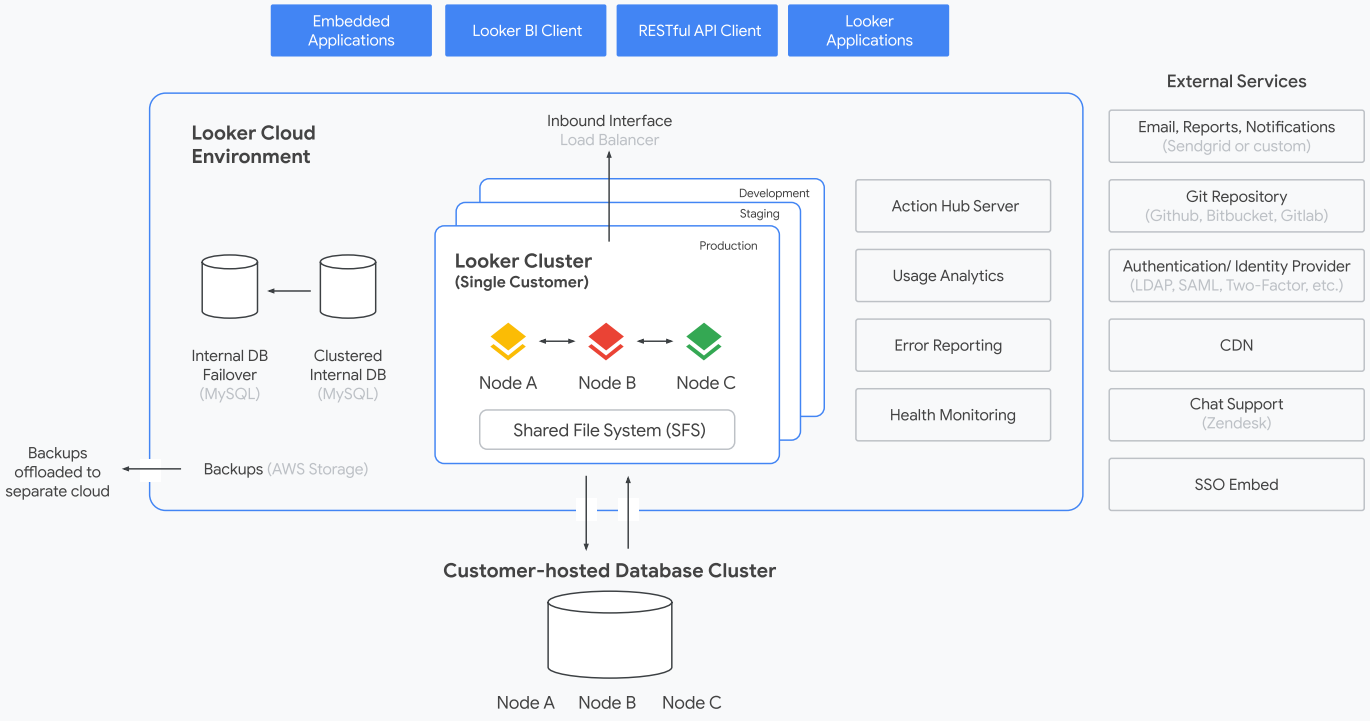
Glossary and Links to Resources

Action Hub	Looker's native integrations with 30+ third party applications and services. Includes integrations for: • Marketing Automation and Messaging (Segment, Twilio, SendGrid, Marketo) • IT, Data Storage and Administration (AWS S3, Google Cloud, Azure, Airtable, Digital Ocean, Box, Dropbox) • Data Science and Machine Learning (IBM Watson, Amazon Sagemaker, BigSquid, Data Robot) • Product Management and Communication (JIRA, HipChat, Slack) • Application Process Automation (Tray.io, Zapier) And many more
Embed SDK	A library of JavaScript functions to help manage and customize embedded dashboards, Looks and Explores in your web application. Learn more
Explore	A custom report builder in the Looker user interface. Learn more
Embedded Analytics	Surfacing data and business intelligence in your existing applications. Learn more
Extension Framework	A development surface that lets you 'extend' the Looker web app UI. You can deploy JavaScript applications and leverage third party APIs right within the Looker UI to create new and augmented data experiences. Getting started: Examples - looker-open-source/extension-template-react - looker-open-source/extension-template-kitchensink - looker-open-source/extension-template-redux • APIs available • React components • JavaScript/TypeScript SDK • Looker's core APIs
Marketplace	A centralized location for Looker community-built data applications, integrations, model templates, custom visualizations and plug-ins. Available via navigation bar of the Looker web application.
System Activity	Built-in analytics to monitor user activity, content activity and content performance of your data-driven applications and workflows. Available via admin console of Looker web application.

Architecture



Looker's lightweight software layer sits on top of any SQL database to make all data available to anyone by doing data transformation at the time of query.



Looker is architected for enterprise-grade deployments yet lightweight enough for a founding startup team.