

Analytics for All: Leveraging Data to Drive Your Business

February 25th, 2020

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Industry review

How is the industry shifting with regards to user privacy and data use?



CONSUMER NEEDS

Whether a user, publisher or advertiser, online data must be actively protected from actors who would use that data for harm or nuisance



Control

Simple ability to view, edit, and disable data that is collected by service providers and a clear understanding of the implications



Security

Security features built into all online products, services, and infrastructure to help thwart bad actors and secure personal data



Better Experiences

Technology and tools to better serve the personal and unique needs of individual consumers

IMPACT OF ITP

The elimination of 3P cookies from ITP-enabled browsers impacts the ability to measure consumer behavior outside owned & operated (O&O) sites and will be felt by brands in many important primary ways



DROP IN MEDIA EFFECTIVENESS

All media will appear to be less efficient, as conversions from ITP-enable browsers will not be included in conversion tallies.

View-through-conversions (VTC) and all measurement of passive consumer behavior outside of O&O properties will be entirely lost without 3P cookies.



REDUCED ABILITY TO TARGET CONSUMERS

Consumer targeting lists -- particularly re-marketing lists -- will drop in size as ITP-enabled consumers won't be added.

Safari or Firefox users without cookies will not be targeted by brands seeking to connect with these consumers outside of their O&O properties.



MORE RELIANCE ON PROBABILISTIC MODELS

To counter the loss of 3P cookie conversions, x-media attribution tools will be forced to rely heavily on probabilistic models to estimate consumer behaviors on ITP-enabled browsers.

More reliance on probabilistic models means higher likelihood of bias and errors in these tools.



INABILITY TO OPTIMIZE AUTO-BIDDING

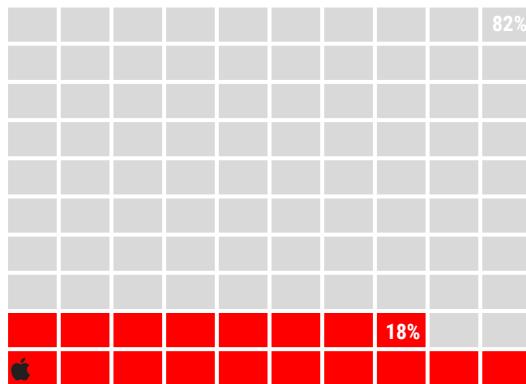
A lack of data from 3P cookies on ITP-enable browsers will generate more noise and errors in conversion reporting, preventing bidding systems tuned to conversions from accurately optimizing to consumer behavior.

No ITP-resistant tags means less bidding efficiency and profitability.

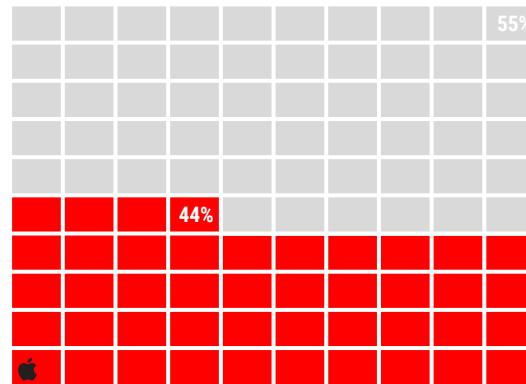
WHOM DOES ITP AFFECT?

ITP's technology impacts Safari browsers – as well as Firefox, as Mozilla moved quickly to follow Apple's lead – on mobile and desktop campaigns

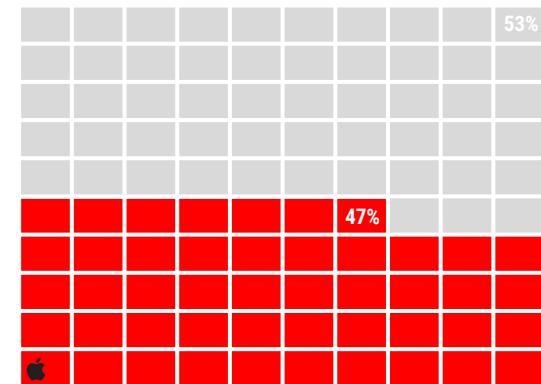
Affected Desktop Browser Share North America



Affected Mobile Browser Share North America



Affected Mobile OS Share North America

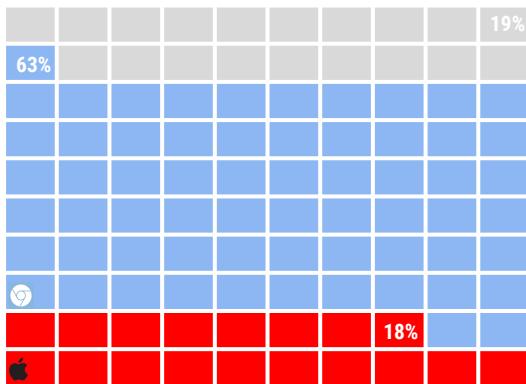


Mobile in-app campaigns are not affected by ITP since they do not rely on cookies for user tracking. Since mobile activity for most social media platforms happens in-app, those campaigns won't be significantly disrupted by the change either.

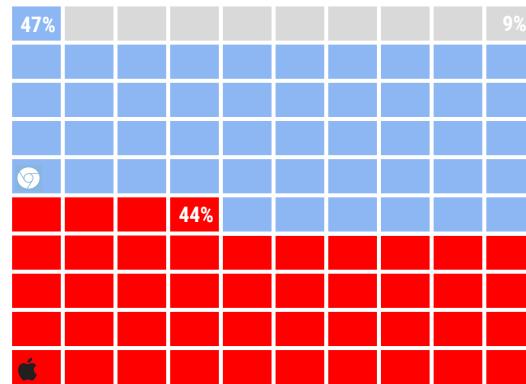
WHOM DOES ITP AFFECT?

Chrome continues to be the dominant desktop browser and has a larger share of the mobile device browser market than Safari and Firefox combined, while Android completes the OS market

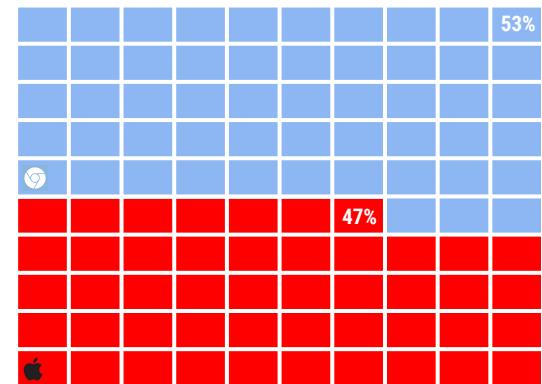
Affected Desktop Browser Share North America



Affected Mobile Browser Share North America



Affected Mobile OS Share North America



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HOW MUST BUSINESSES REACT?

Businesses must ensure high degrees of consumer consent – failure to comply with GDPR can result in a fine ranging from 10 million euros to four percent of the company's annual global sales



Provide Clear Consent Wording

Organizations are obligated to use clear, non-legalese language that allows the consumer to provide unambiguous consent to the collection and use of their user data



Include Cookie Consent Notices

When cookies are used, sites must receive consent from consumers before installing, signaling the use of cookies, offering more information on cookie data use, and ways to change user settings



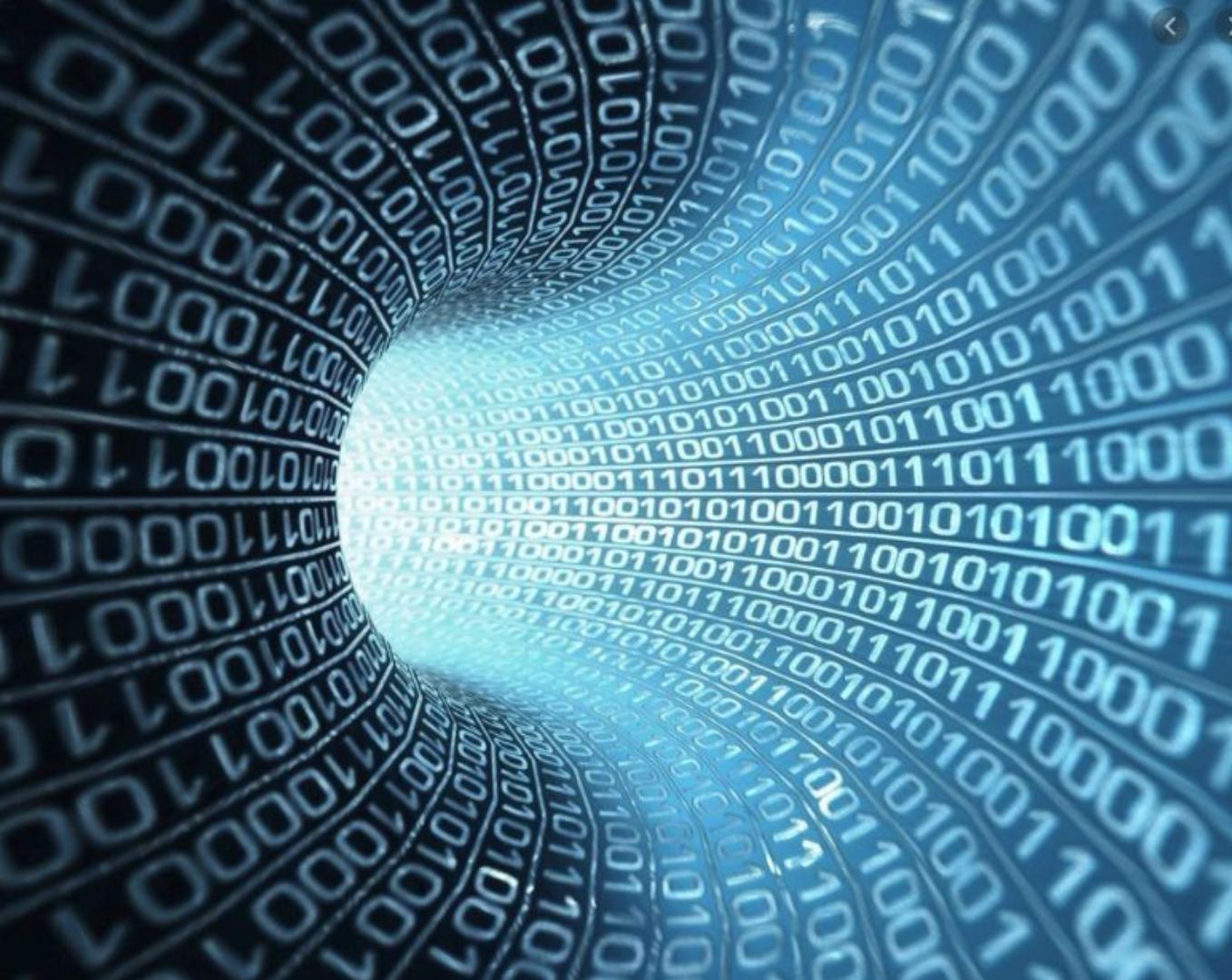
Age-Verification Processes

Parental consent is required to collect or process personal data of children under the age of 16 and, if not in current use, businesses must create a dependent verification process to collect consent

Analytics + Data

How we think about data and analytics

Analytics is
EVERWHERE













**Data is Essential
for Analytics like
Water is essential
for Life**

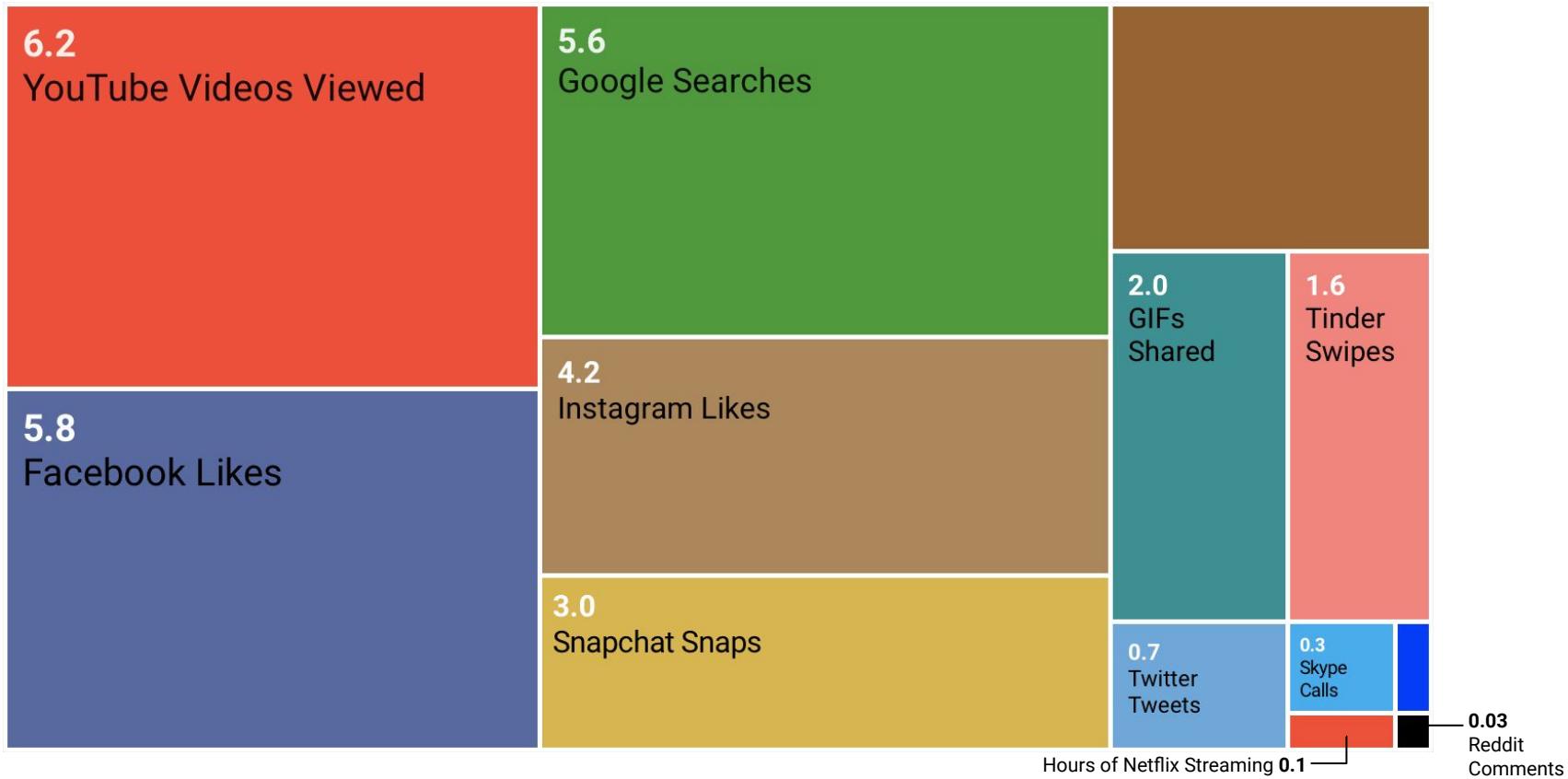
COMPARISON OF DAILY HUMAN DATA CREATION

An extraordinary amount of digital data is generated every single day



COMPARISON OF DAILY HUMAN DATA CREATION

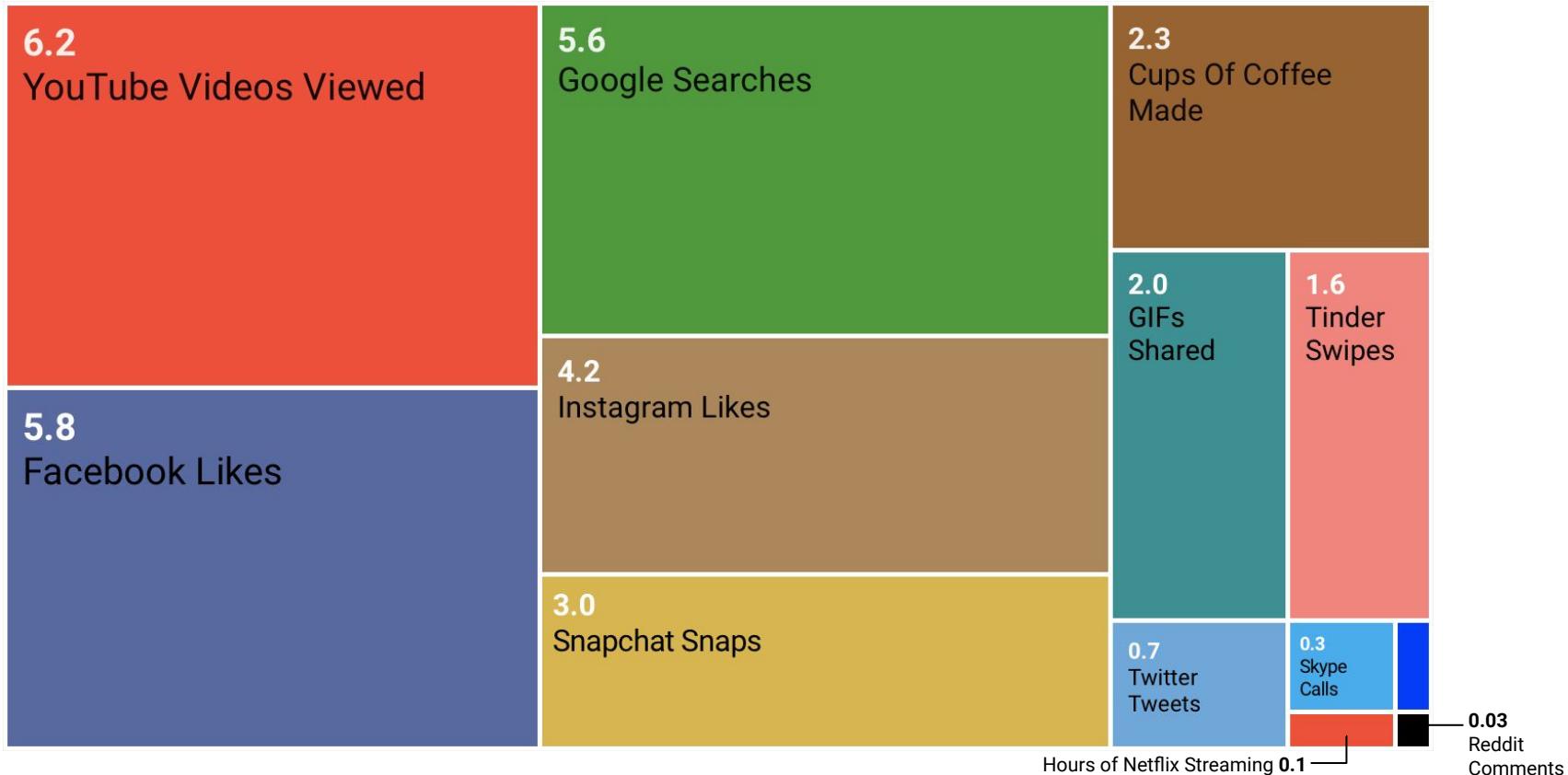
An extraordinary amount of digital data is generated every single day



Source: All figures in billions, 2018 figures, Domo, BrandWatch, Social Pilot, Tinder

COMPARISON OF DAILY HUMAN DATA CREATION

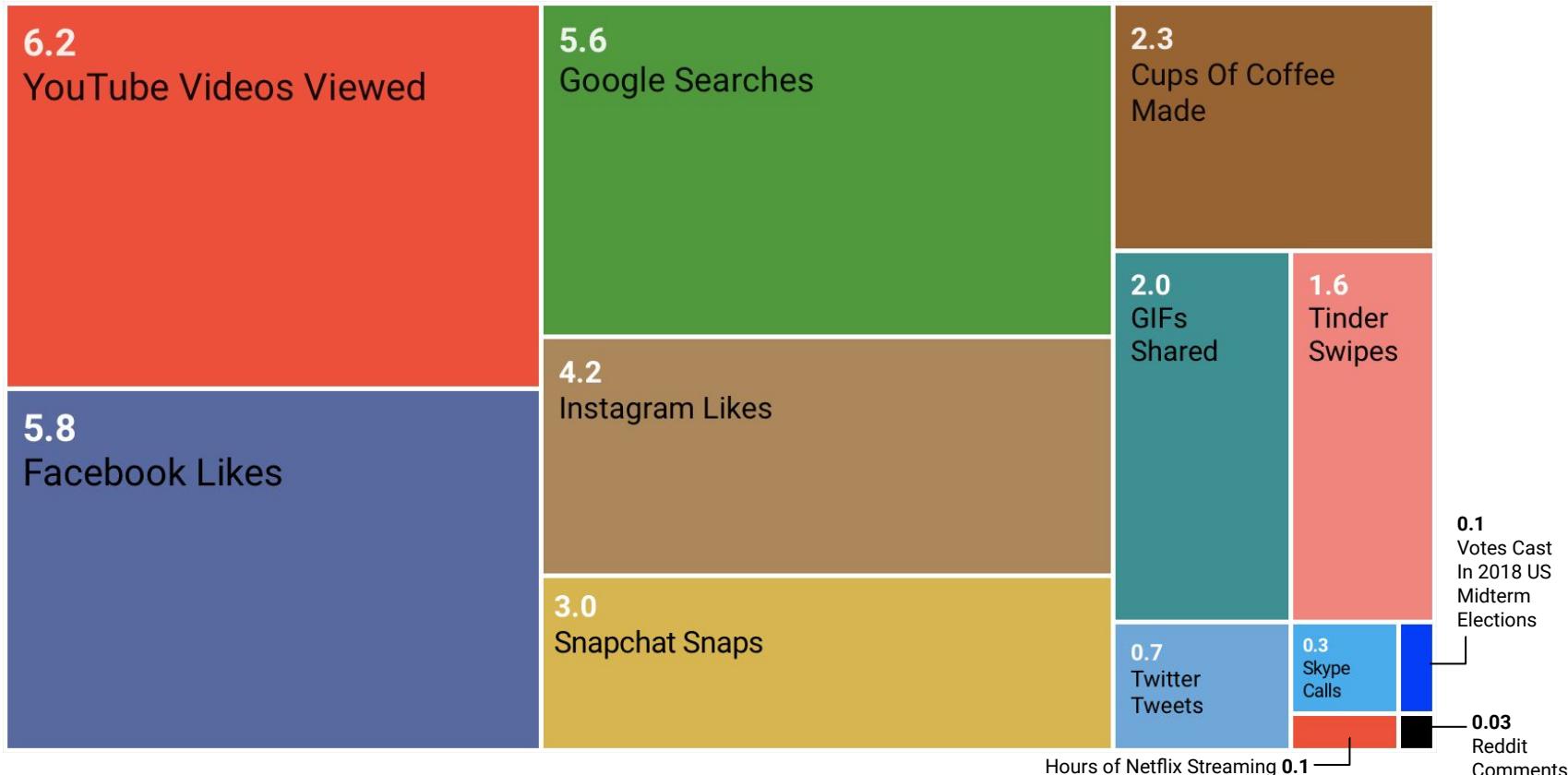
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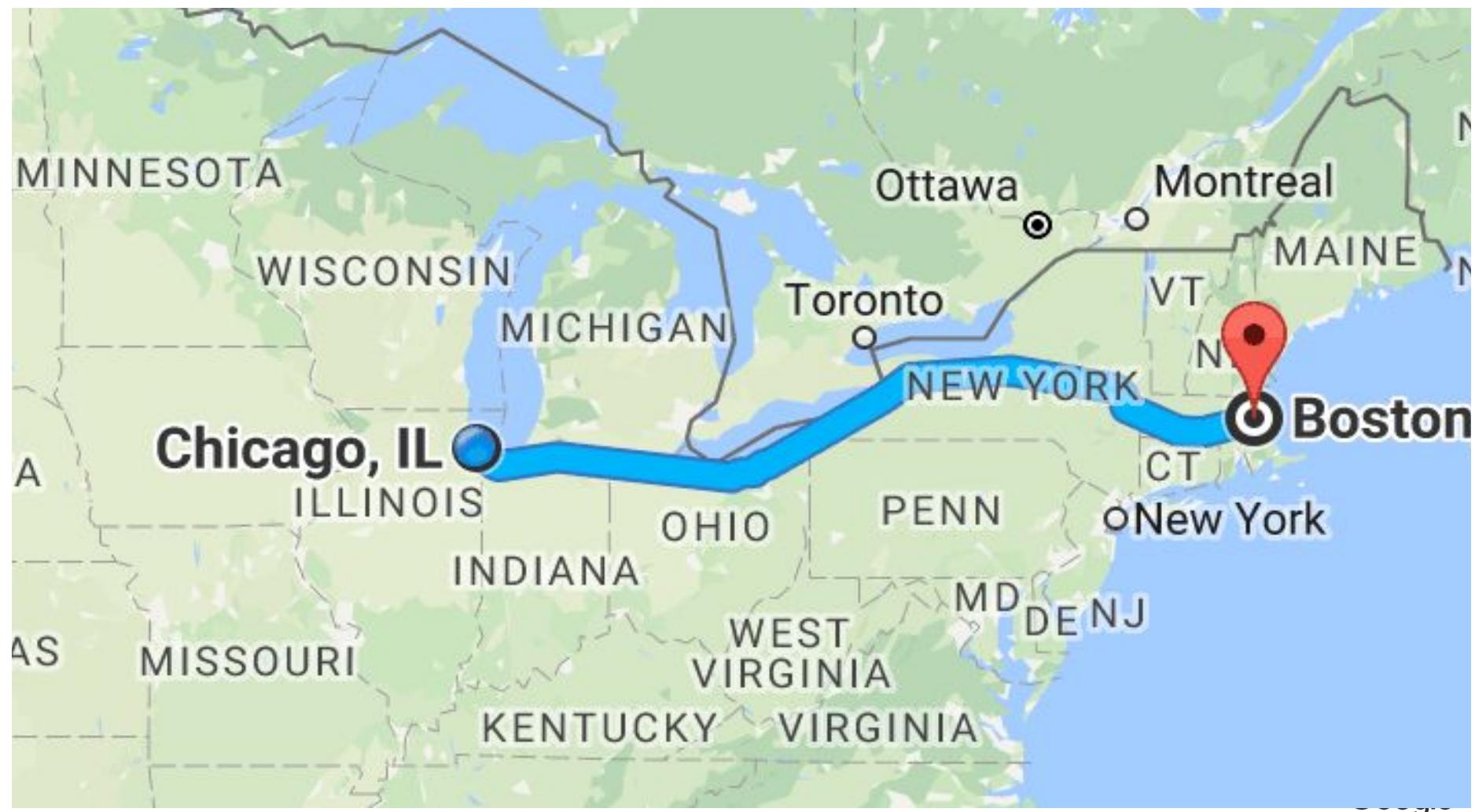
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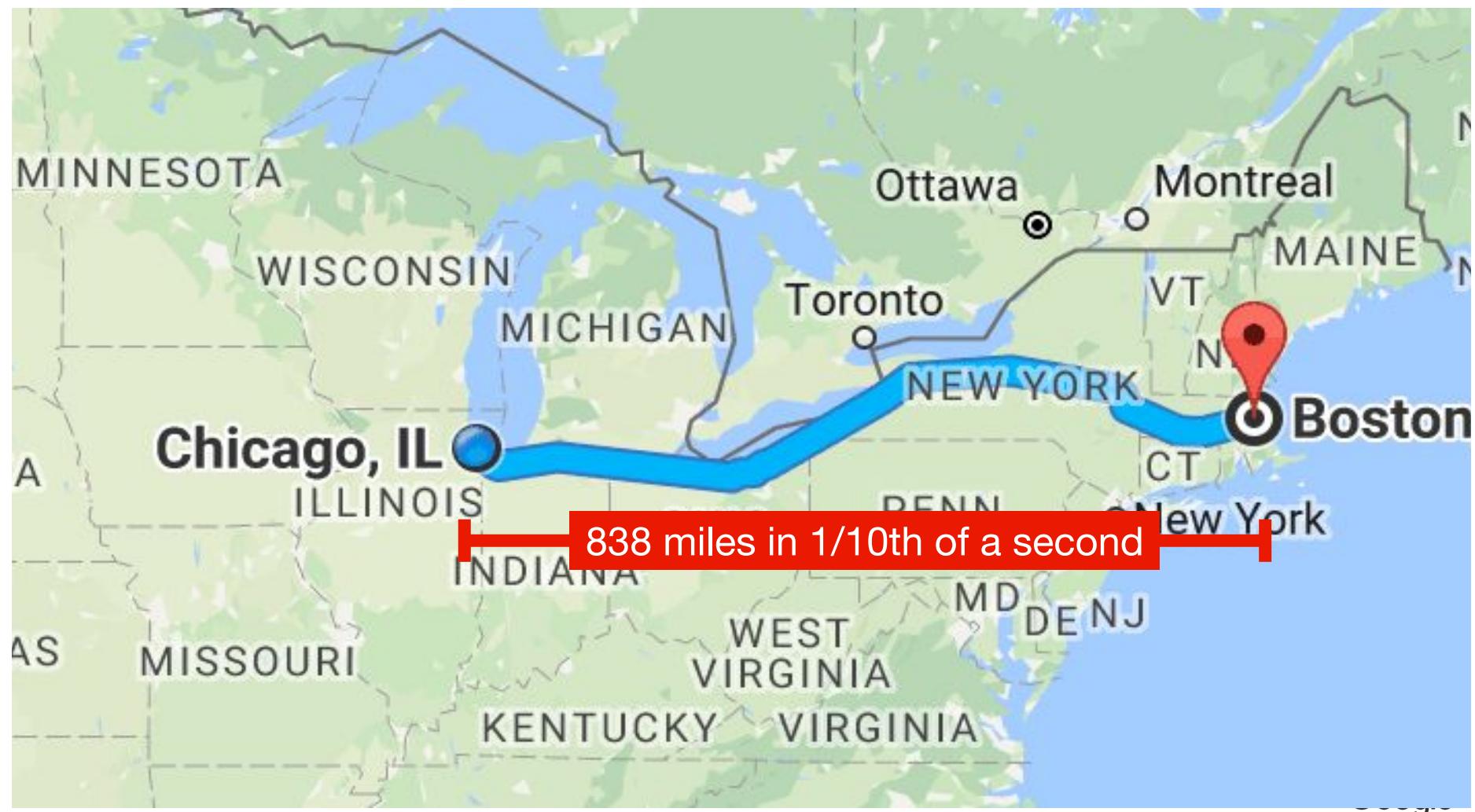


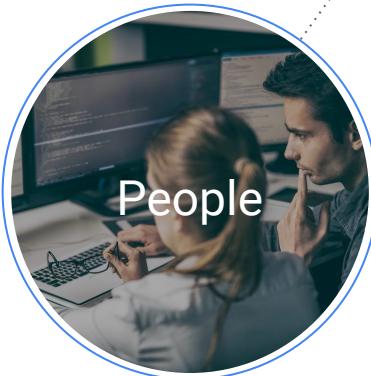
Source: All figures in billions, 2018 figures, Domo, BrandWatch, Social Pilot, Tinder, Word Development, US Election Atlas

90%

**of the world's data
was created in the
last 2 years**







People



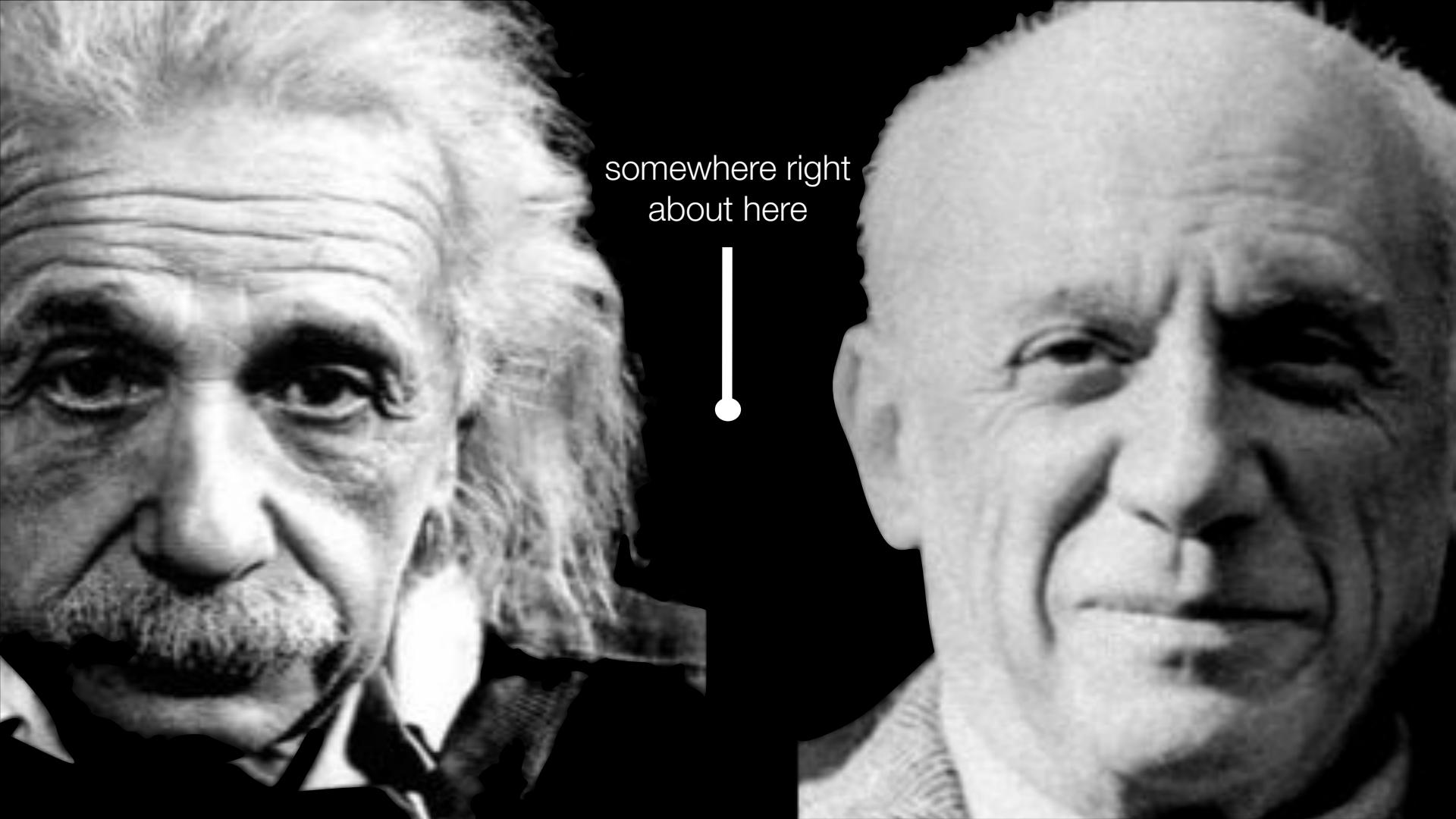
Process



Technology



ART+SCIENCE



somewhere right
about here



It's kind of fun to do
the impossible.

Walt Disney

Don't be limited in imagination. Have resilience
because it's hard.



If you're always trying to
be **normal** you will never
know how **amazing** you
can be.

-Maya Angelou

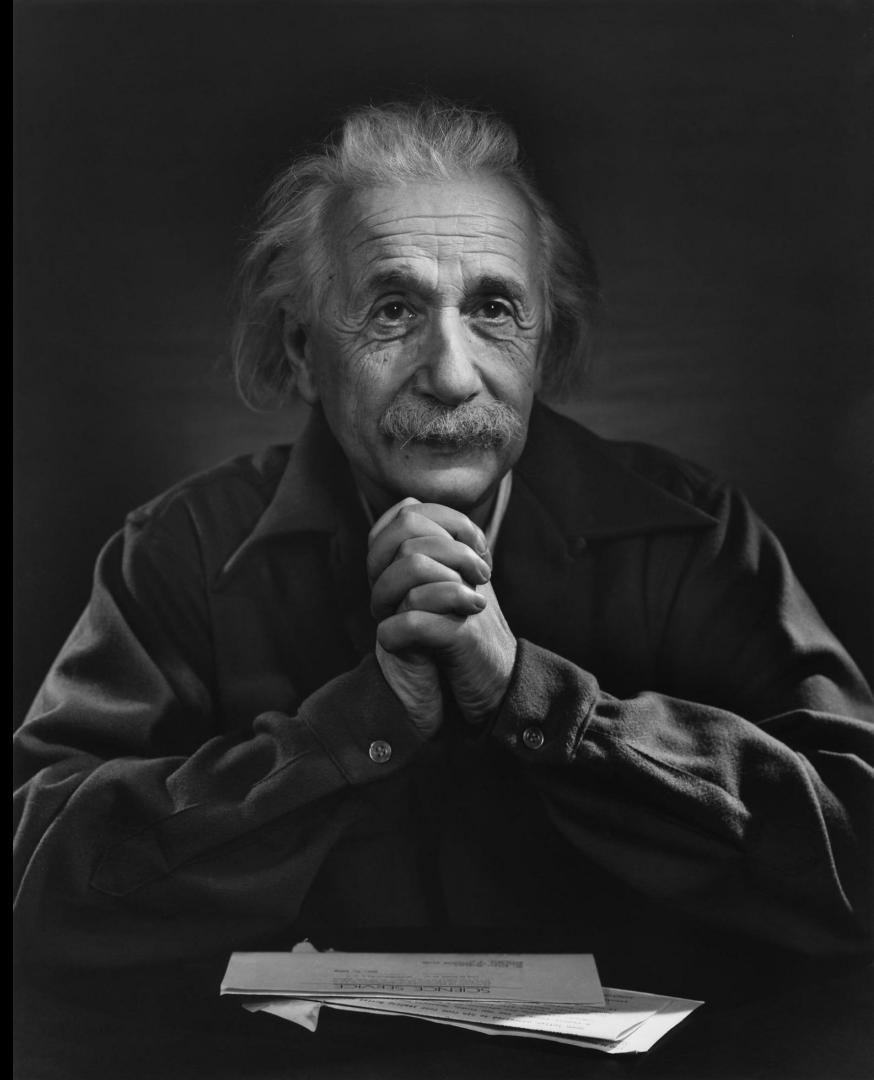
Believe there are always better solutions



I have no special
talents, I am only
passionately curious.

-Albert Einstein

Having curiosity is the most important trait of analytical thinking. If you are not looking at things in new ways you are being surpassed by others who are.



Curiosity.

Analytics can enable new and innovative capabilities that can completely differentiate a business. Those innovative capabilities aren't designed nor are they structured or envisioned, they are discovered and revealed through curiosity-driven tinkering.

Analytics operates on the leading edge of data science and technology as there will always be a new search afoot: a new framework to develop, a new challenge to quantify, a new learning to discover.

The 5 Whys:

The Truth Behind a Monumental Mystery



The 5 Whys

Problem: Monuments in Washington D.C. were deteriorating

Why #1	Why #2	Why #3	Why #4	Why #5
Why is the monument deteriorating?	Why are harsh chemicals used to clean the monument?	Why are there a large number of bird droppings on the monument? <i>Because the large population of spiders in and around the monument are a food source to the local birds</i>	Why are there a large number of spiders on the monument? <i>Because vast swarms of insects, on which the spiders feed, are drawn to the monument at dusk</i>	Why are swarms of insects drawn to the monument at dusk? <i>Because the lighting of the monument in the evening attracts the local insects.</i>

Solution: Change how the monument is illuminated in the evening to prevent attraction of swarming insects.

What day was Ice Cube's “Good Day”

Clue #1	Clue #2	Clue #3	Clue #4	Clue #5	Clue #6
"went to short dogs house, they was watching Yo MTV RAPs"	Ice Cubes single "today was a good day" release date	"The Lakers beat the Super Sonics"	When did "The Laker best the Super Sonics" where there was no smog?	"Got a beep from Kim..."	Ice Cube starred in "Boyz in the hood" that released late Summer of 1991
Yo MTV RAPS first aired: Aug 6th 1988	Feb 23 1993	Dates between Yo MTV Raps air date and the release of the single where the Lakers beat the Super Sonics: Nov 11 1988, Nov 30 1988, Apr 4 1989, Apr 23 1989, Jan 17 1990, Feb 28 1990, Mar 25 1990, Apr 17 1990, Jan 18 1991, Mar 24 1991, Apr 21 1991, Jan 20 1992	Dates of those Laker wins over SuperSonics where it was a clear day with no Smog: Nov 30 1988 Apr 4 1989 Jan 18 1991 Jan 20 1992	beepers weren't adopted by mobile phone companies until the 1990s. Dates left: Jan 18 1991 Jan 20 1992	Filming occurred mid-late 1990 early 1991 and Ice Cube was busy on set in 1991 and wouldn't be lounging around the streets with no plans

Deeper into Analytics

Types of Analytics and how it's
used to solve business
problems

Descriptive Analytics



What is the function of Descriptive Analytics?

Descriptive Analytics (when done properly) allows you to gain a deep understanding of a data set, specifically identify underlying trends and patterns which may not be readily apparent (ex: which segment of data was responsible for driving a change). Descriptive analytics is also used to prepare the data for further analysis (hypothesis generation, data set manipulation)

Question - What's happening with auto Searches?

[Feedback Link](#)

US Automotive Query Coverage Report

Search Interest

Volume **5B**

Δ YoY **7.5%**

Δ Prior Period **25.9%**

Searches are up
7.5% YoY

National Search Interest

— Queries (previous year)



Question - What is driving the growth in Search?

Interest by Device



Mobile is the only area of growth by Device

Make	Rounded Queries	Queries YoY
1. ford	400M	8.6%
2. toyota	300M	17.21%
3. chevrolet	300M	7.29%
4. honda	200M	6.83%
5. nissan	200M	7.2%
6. jeep	100M	9.56%
7. subaru	100M	13.91%
8. bmw		5.42%
9. dodge		6.12%
Grand total		10.01%

Toyota search interest is growing fastest compared to other top vehicle makes

Question - What is driving the growth in Search?

Ram 1500 is the fastest growing of the top vehicle models

Make Model	Rounded Q	Queries YoY
1. ford mustang	100M	3.95%
2. ford f150	80M	13.87%
3. honda civic	70M	1.13%
4. honda accord	60M	6.52%
5. chevrolet camaro	60M	-1.79%
6. toyota camry	50M	13.36%
7. jeep wrangler	50M	5.27%
8. ram 1500	50M	19.27%
9. chevrolet corvette	50M	0.74%
10. jeep grand cherokee	40M	9.94%

Model Parent Segment	Rounded Queries	Queries YoY
CUV/SUV	800M	17.89%
Small Sedan	500M	5.81%
Sedan	400M	5.78%
Truck	400M	14.48%
Sports Car	400M	2.38%
Large SUV	100M	15.18%
Exotic	60M	-2.21%
Minivan	50M	5.97%
Commercial Vehicles	10M	18.93%

Search for SUVs and Trucks is trending significantly higher than all other segments

Question - What is driving the growth in Search?

	fixed_ops_type	Rounded Queries	Queries YoY
1.	tires	70M	14.43%
2.	parts	60M	5.73%
3.	body and frame	60M	18.27%
4.	engine	50M	10.06%
5.	maintenance	50M	13.04%
6.	lights	40M	19.8%
7.	accessories general	40M	11.3%
8.	fluids	30M	22.36%
9.	problem	20M	11.85%
10.	transmission	20M	14.95%

Parts and Service Searches are growing twice as fast as overall automotive Search

Question - What's happening with auto Searches?

Did we answer our question?

Summary of our findings:

- Searches are up 7.5% YoY
- Mobile Search is the primary growth driver at 13% growth, with all other devices showing YoY declines
- Searches for Trucks and SUVs are growing 3x as quickly as searches for cars and sedans
- Searches for parts and Service are growing 2x as quickly as overall automotive Search

How does this analysis help us?

- We can use the data to come up with new hypotheses to test. For example: “pivoting to a mobile first site experience can drive brand success”
- We can use the data to make observations about overall Automobile marketplace. For example: “Increased in search for Trucks and SUVs may be reflective of a greater trend in the market towards those types of vehicles”

Predictive Analytics



Tell me... What is going
to happen next...

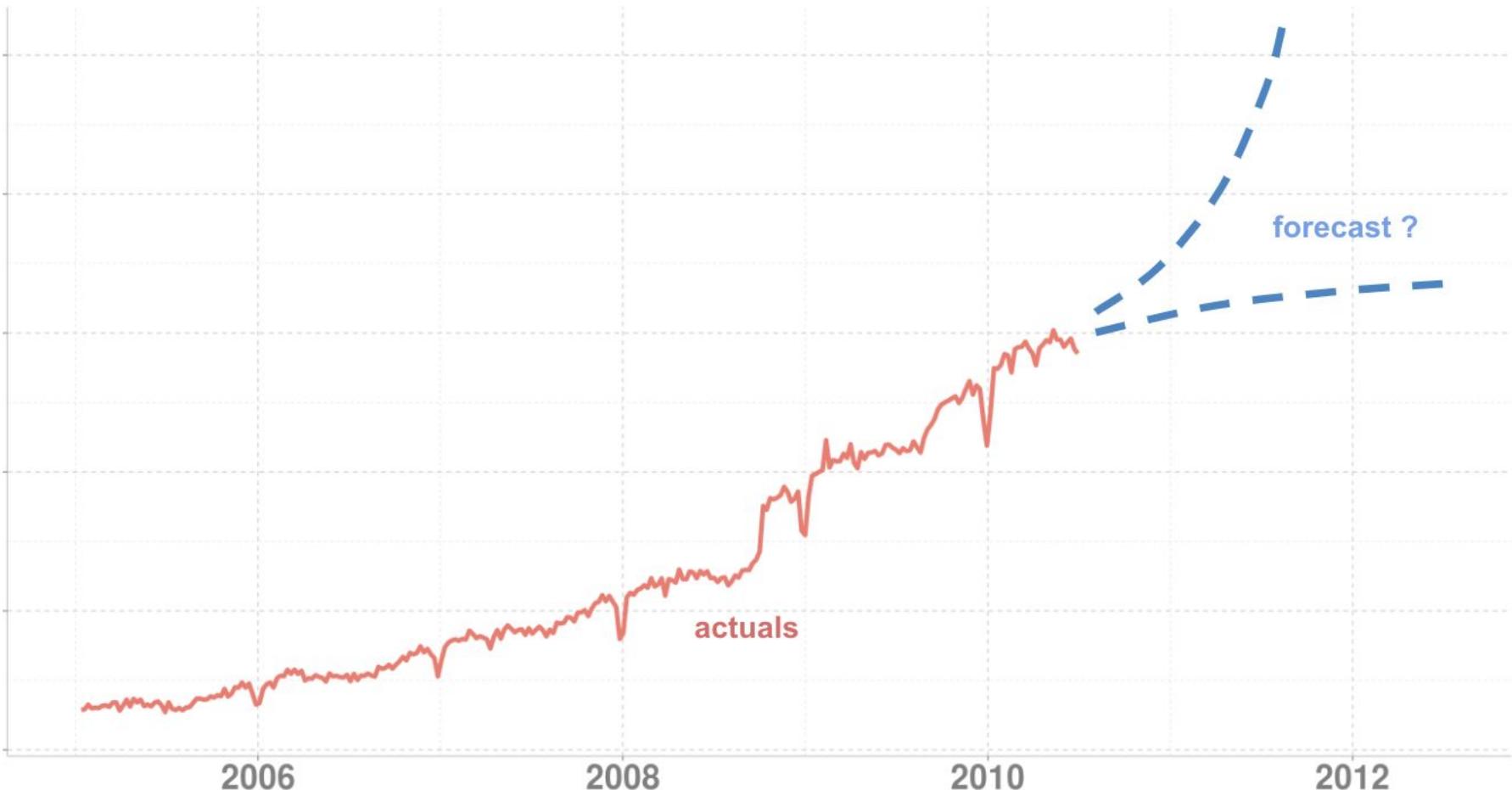
What is the function of Predictive Analytics?

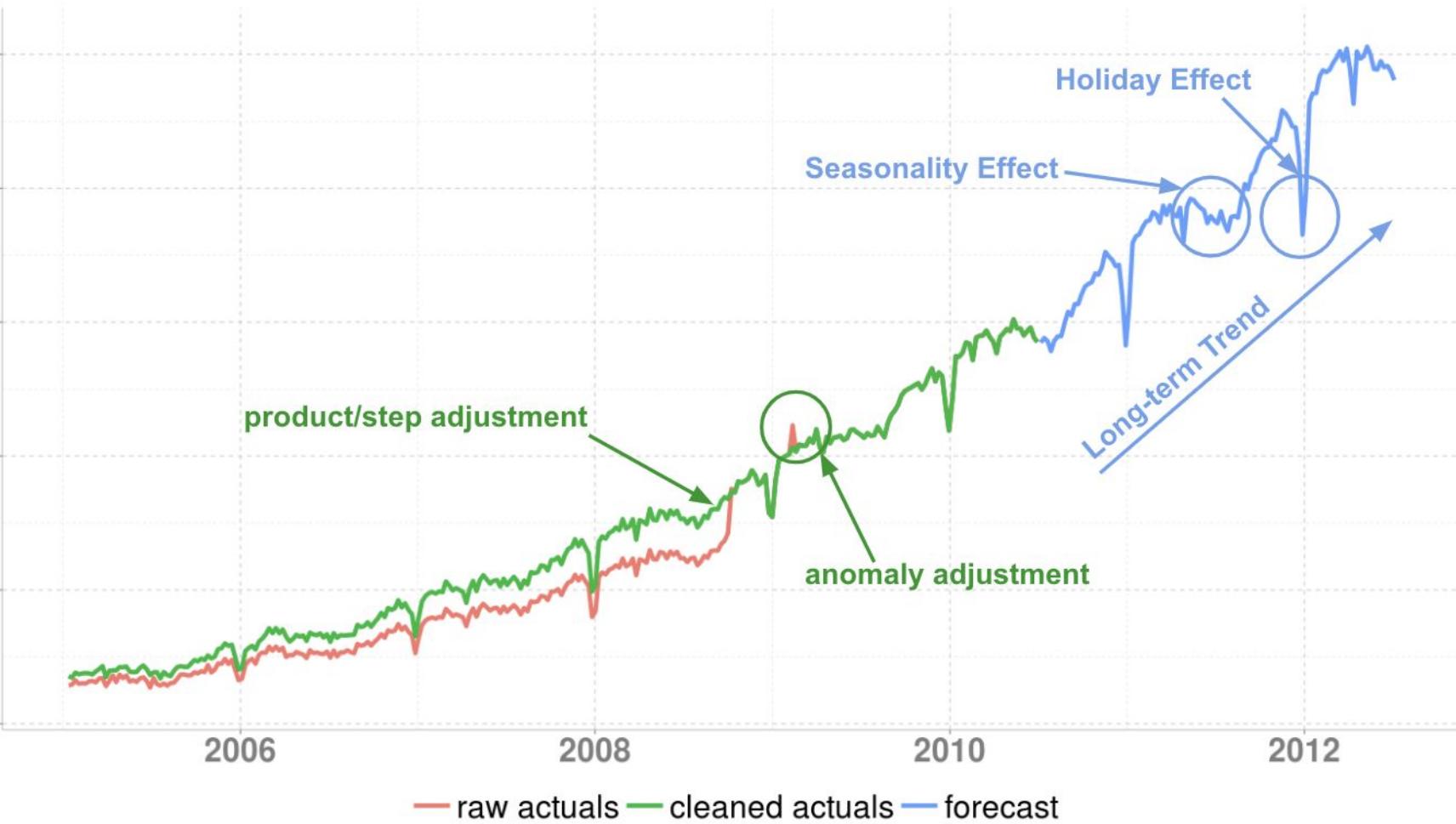
Predictive analytics is the use of data, statistical algorithms and machine learning techniques to identify the likelihood of future outcomes based on historical data. The **goal** is to go beyond knowing what has happened to providing a best assessment of what will happen in the future.

What is the function of Predictive Analytics?

Predictive analytics is the use of data, statistical algorithms and machine learning techniques to identify the likelihood of future outcomes based on historical data. The **goal** is to go beyond knowing what has happened to providing a best assessment of what will happen in the future.

TL;DR: Historical data + unforeseen data anomalies + seasonality = future view





Predicting Vehicle Sales

What we are doing

Use Google **Search intent** to predict vehicle sales and deliver **actionable** insights based on opportunities in the market

Why we are doing it

Understand a **clearer picture** of what the demand for vehicles is in **at-risk** areas so our partners can **test** and decide how to **best address** lagging sales.

Variables - Used, Needed and Planned



Sales Data

OEM Retail Sales
Sales Objectives
Sales Incentives



Google Data

Query Volumes
YouTube Data
Share of Search
Store Visits



Marketing Data

Marketing Spend by Channel



Macroeconomic Data

Unemployment
T-Bill Rates
Lending Index
Gas Prices
Consumer Price Index



Transportation Data

Motor Vehicle Retail Sales
Vehicle Miles Travelled
Vehicle Production



Data in Model

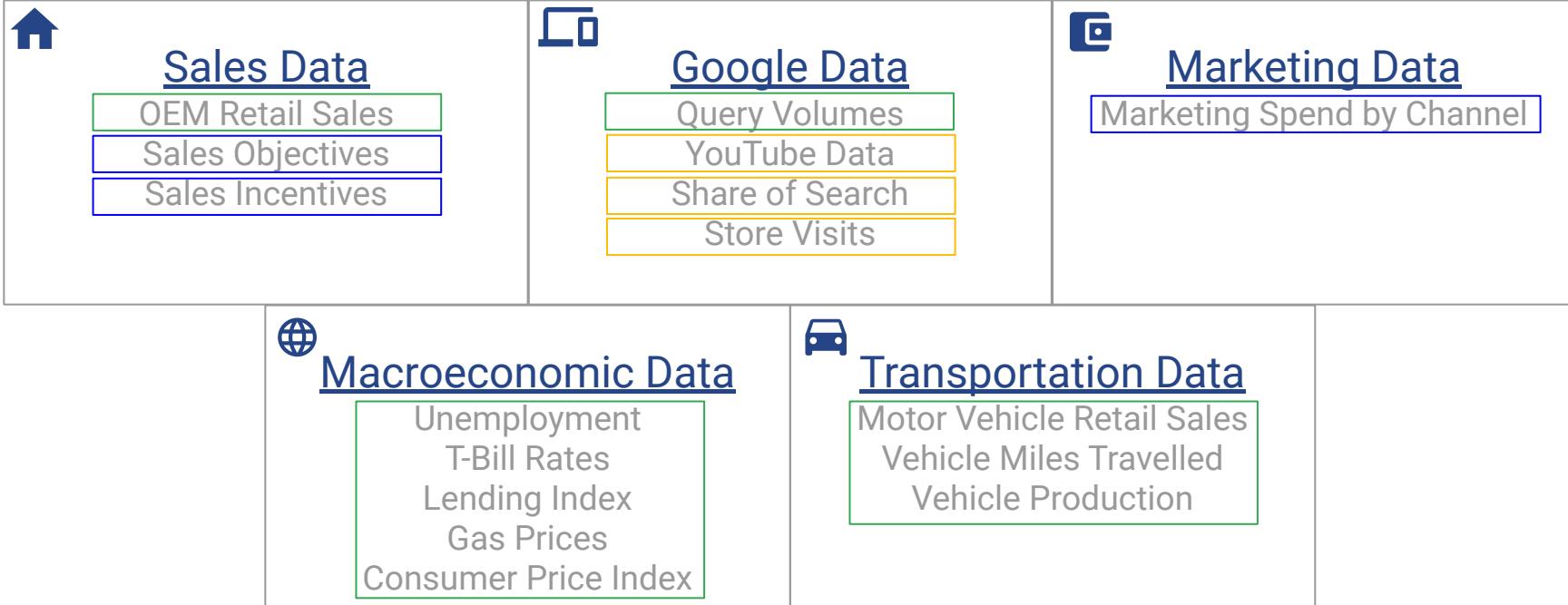


Data Needed from Partner



Additional Data points to test

Variables - Used, Needed and Planned



Data in Model

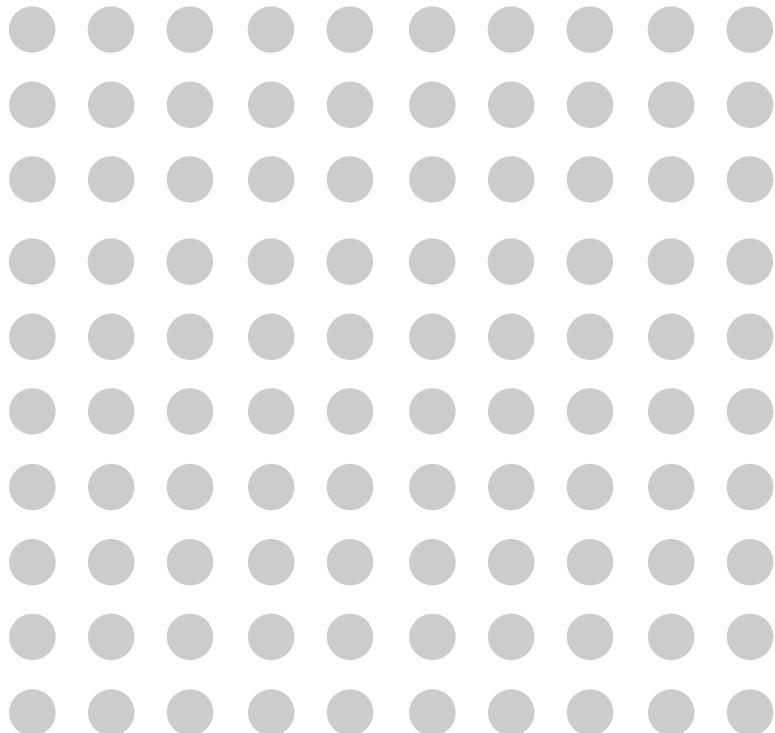


Data Needed from Partner

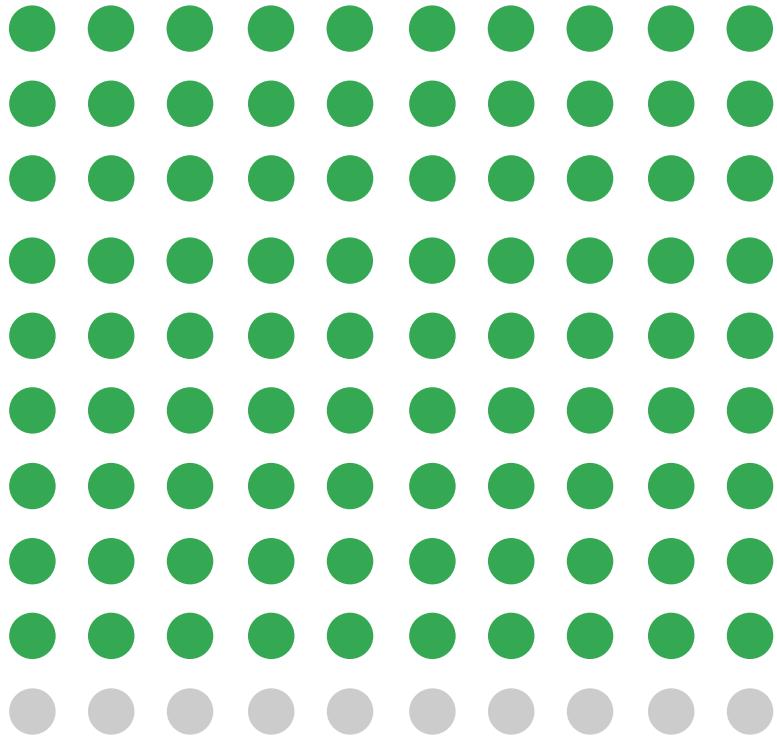


Additional Data points to test

Model Output

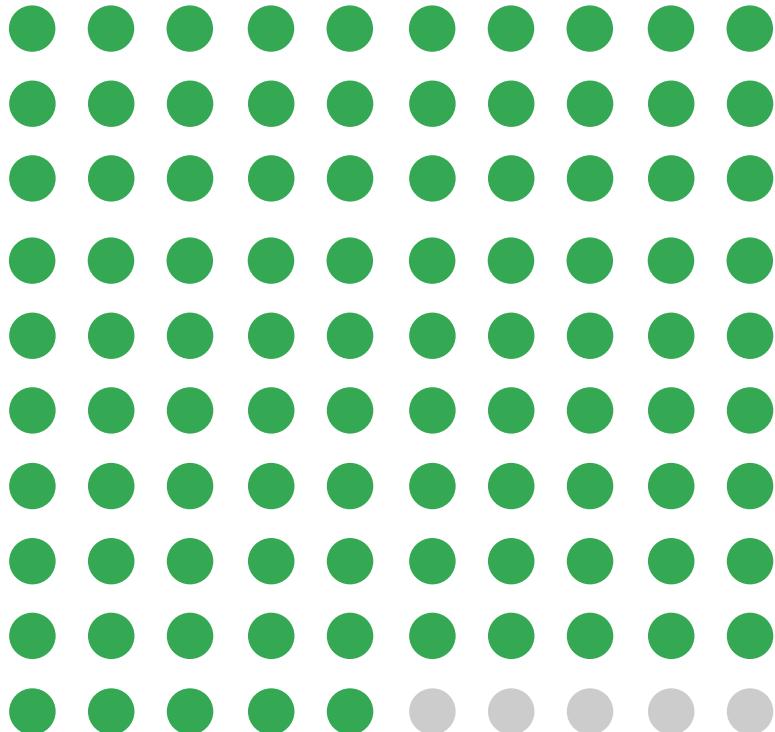


Model Output



Base Model
gave us an
Error of 10%

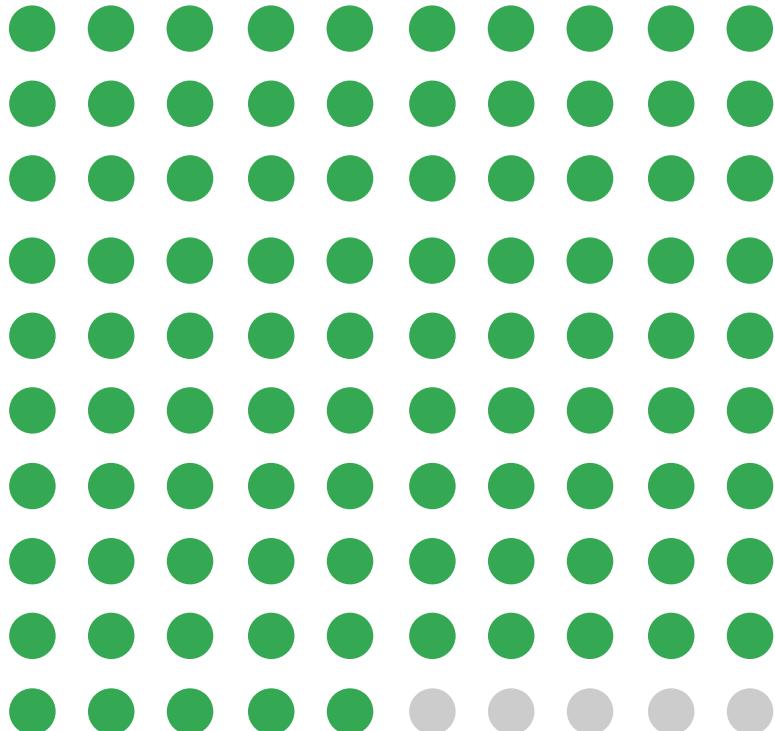
Model Insight



Adding Google
Search Data
reduced error

by **50%**

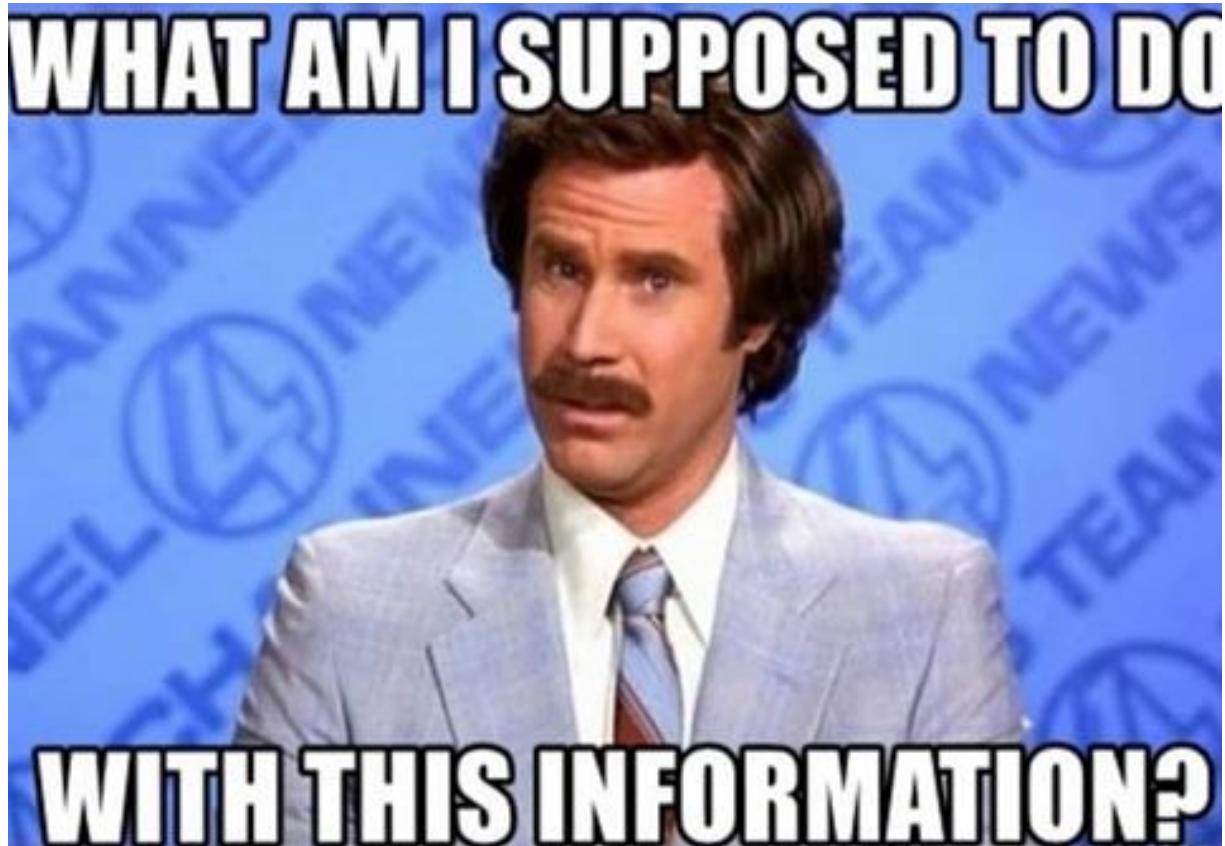
Model Final Output



95%

accuracy at
the national
level for a
given month

Prescriptive Analytics



What is the function of Prescriptive Analytics?

Prescriptive analytics is the area of business analytics (BA) dedicated to finding the **best course of action** for a given situation. Prescriptive analytics is the third phase related to following up on both **descriptive and predictive analytics**.

How do we know we're on the right track?

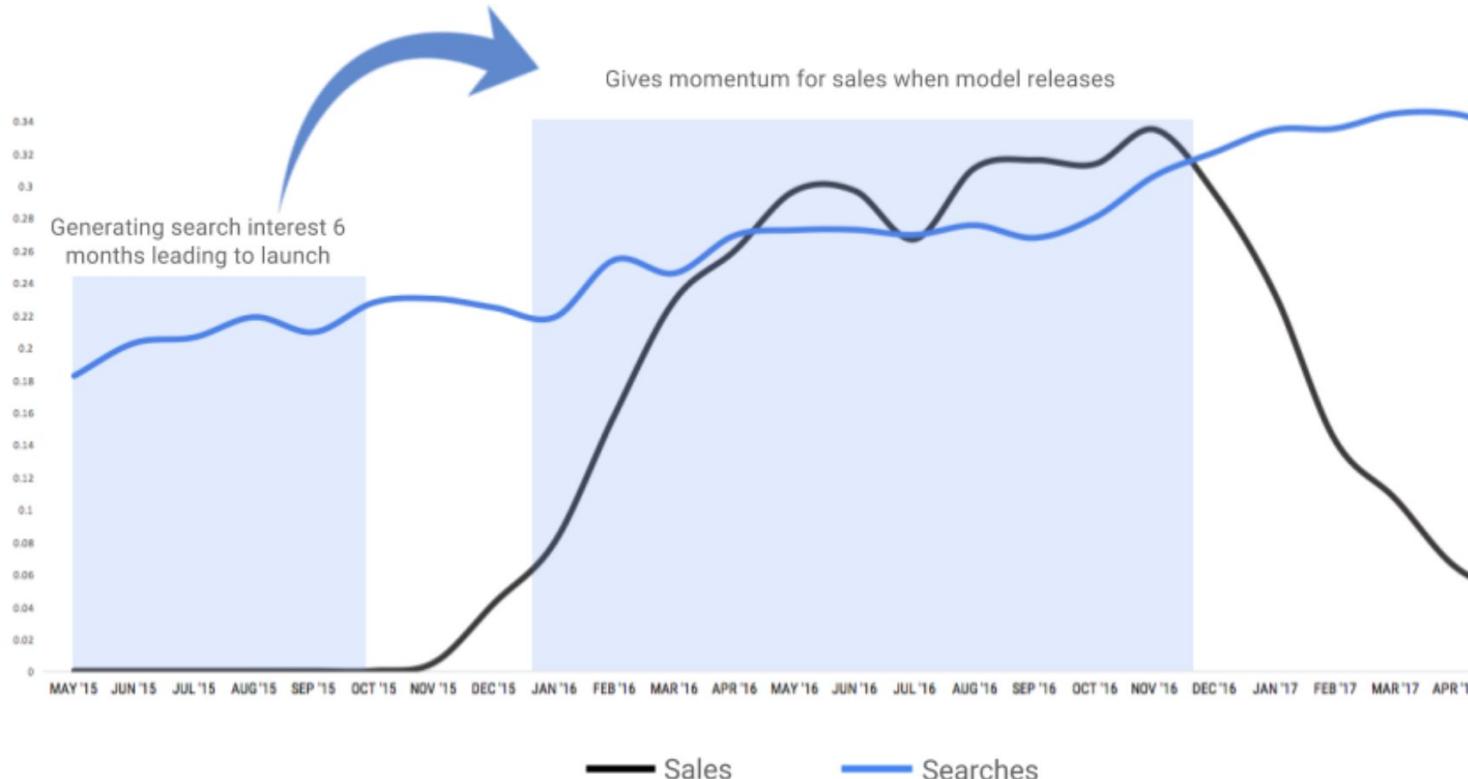
For years, we've been monitoring Search queries to keep a finger on the pulse of **consumer interest** and current demand.

What if we could see **today** what people are Searching for **in the future**?

Good news...**we can!**

And we can combine those signals with historical knowledge to **paint a clearer picture of the market conditions** heading into a launch.

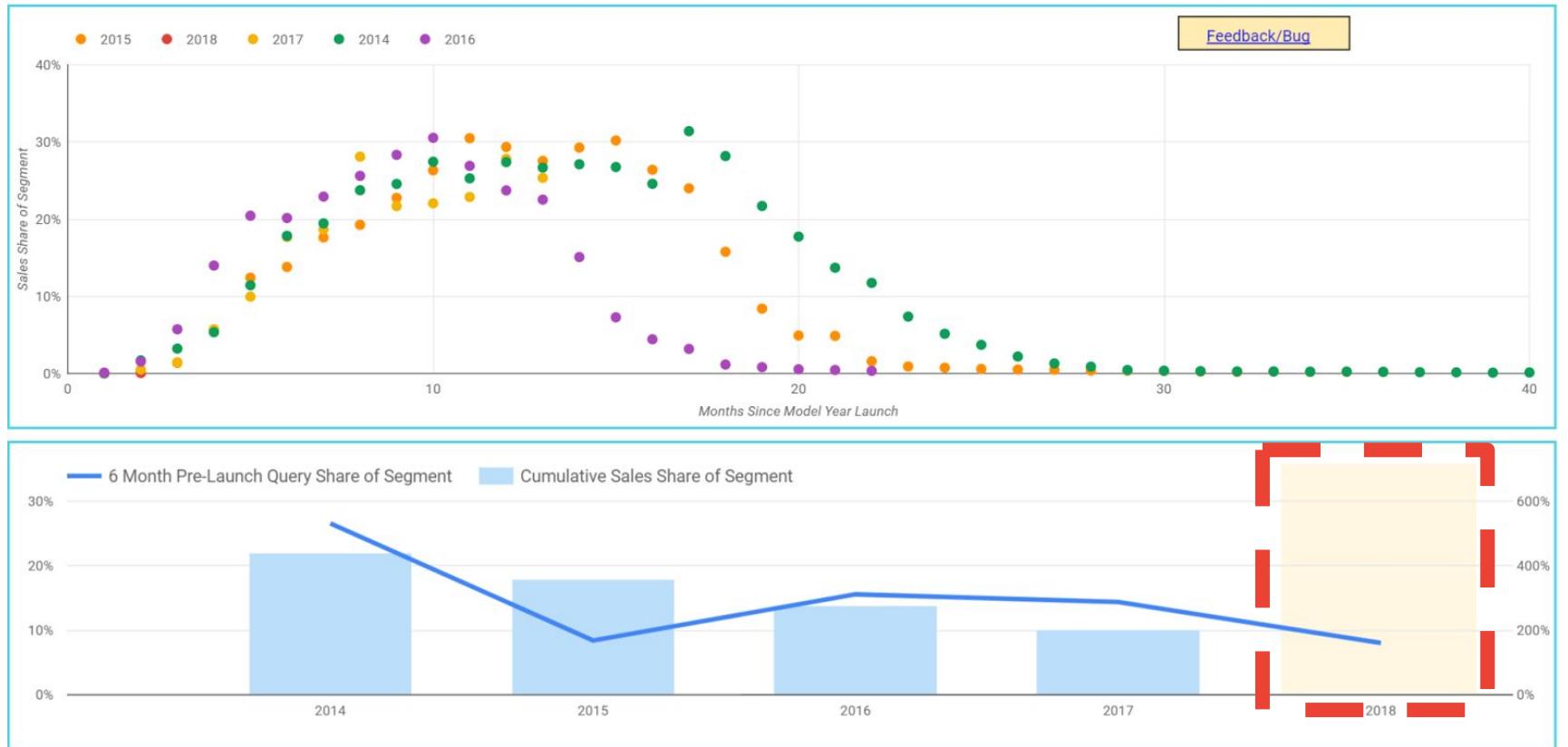
Present Value of Search ~ Future Value of Sales



Output | 2016 Success Story



Output | 2018 Cautionary Tale



Analytics benefits the entire organization

Executives: View the contribution of the web to the bottom line

Business Intelligence: Gain deep customer insights by analyzing behavioral trends

Marketers: Understand how all digital media channels interact with each other before a conversion

Webmasters: Show the value of infrastructure improvements like site load speed and browser type compatibility

Product Designers/Devs: Test feature/benefit messaging to see what customers want

Customer Service: Reduce call center volume by improving online support

Asking the **right** questions.

Analytics can enable new and innovative capabilities that can completely differentiate a business. Those innovative capabilities aren't designed nor are they structured or envisioned, they are discovered and revealed through curiosity-driven tinkering.

Asking the right **business related questions** matters in driving the conversation.

Questions We Should Be Asking

Think about the data types of analytics your teams are enabled to work in and what you need for your business

Good questions to ask for your business

How did we perform?

What does that mean for our future?

How do we change the future?

What behaviors are our customers showing?

What is the profile of the valuable users visiting our site?

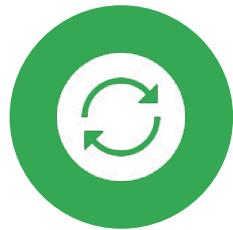
What outcomes drive value to the business?

Questions that Don't drive the business

How is my CTR compared to last month?

Why did the CPC increase 4%?

Usage Based Insurance



Monitor the speed of the car, acceleration events, time & distance driven, and overall **driving behavior**

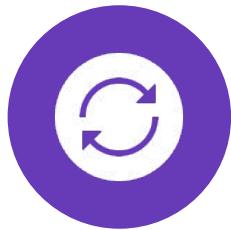


Use **data** to analyze driving behavior, compare with other drivers, **enrich** data with historic claims and demographic information



Base insurance premium on **actual driving behavior**, and provide the driver with information that can help them improve their driving.

Predictive Service & Maintenance



Combine **warranty claim** data with **telemetry data**

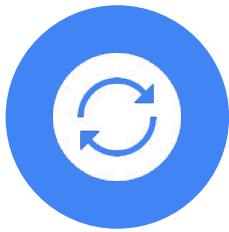


Use **data** to analyze events and understand their **relevance to breakdown** and failure rates



Predict when parts will fail and when vehicles need servicing.
Anticipate required inventory

Consolidation of Data Silos



Ingest data from **data silos** like CRM systems, sales systems, Marketing and Web site data.



Utilize **Cloud Instances** to gain valuable insights



Predict when users are mostly persuadable. Enable **intelligent, highly targeted** marketing.

Key Takeaways

#1

Analytics is about driving business results

#2

Data is Essential for Analytics

#3

Analytics = Art + Science
Curiosity is essential, so ask WHY 5 times

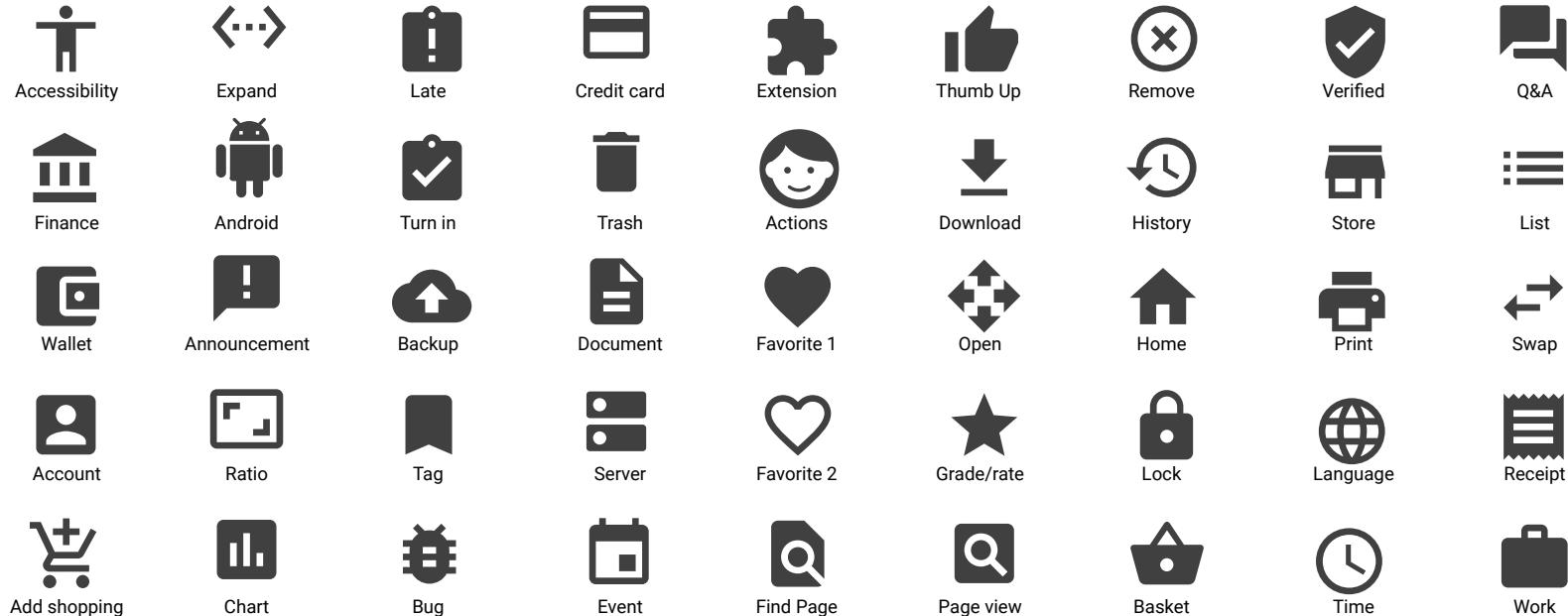
#4

There are 3 Types of Analytics:
Descriptive
Predictive
Prescriptive

#5

Ask questions that are important for your business, don't just ask based on what data you think you have

Thank You





Alarm



Assessment



Sync



Exit App



Movie



Visibility



Trolley



Open



Location



Settings



Assignment



Check



Explore



Thumb Down



Today



Perm Media



People



search



Airplane



Signal



Photo



Play 1



Block



Send



Smartphone



Style



Walk



Bluetooth



WiFi



Upload



Play 2



Email



Laptop



iPhone



Controls



Bike



Pie Chart



Money



Attachment



Video



Business



Chromebook



Security



Notification



Bus



Developer



Write



Cloud



Audio



Key



Desktop Mac



Watch



Person



Car



Devices



Quote



Folder



Web Page



Archive



Desktop PC



Flag



World



Boat



Software



Emotion



Mic



Call



Cut



headphones



Camera



Education



Train



Weather



Link



Movie



Chart



Paste



Keyboard



TV



MMS



Subway



Hotel



Laundry



Location History



Layers



Offer



Map



Bar



Pizza



Web



Cafe



Theatre



Gaming



Florist



Restaurant



Gas



Delivery



Hospital



Taxi



Print



Radio



Stream

Analyze GIS data in BigQuery with familiar SQL

Accurate spatial analyses with
Geography data type over **GeoJSON**
and **WKT** formats

Support for core **GIS functions** –
measurements, transforms,
constructors, etc... – **using familiar SQL**





Enabling a broad set of use cases

Structured Data

Classification/ Regression

- Customer Churn Analysis
- Product Diagnostics
- Forecasting

Recommendation

- Content Personalization
- Product X-Sells/Up-sells

Anomaly Detection

- Fraud Detection
- Asset Sensor Diagnostics
- Log Metric Anomalies

Unstructured Data

Image Analytics

- Identify damaged shipments
- Explicit Content Classification
- Identify “styles” in images

Text Analytics

- Call Center log analysis
- Language Identification
- Topic Classification
- Sentiment Analysis





Rethinking Big Data with Google Cloud Data Analytics & Machine Learning

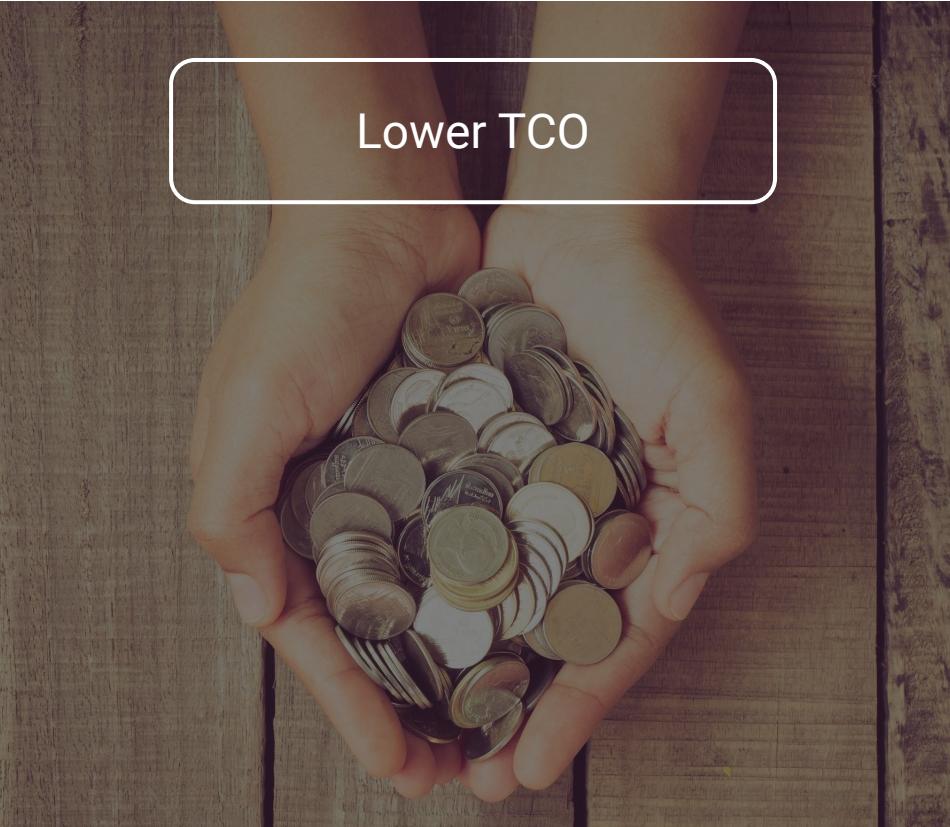
January 16 2019

Brian Sreniawski, howdypartner@google.com
Cloud Partner Engineer

Agenda

- 01 Data Challenges
- 02 Our Approach to Data Analytics
- 03 Modernize Your Data Warehouse
- 04 Big Data & Hadoop
- 05 Analyze Streaming Data in Real Time
- 06 Predictive Analytics & Machine Learning

What Matters to You the Most?



Lower TCO



Competitive Advantage



Machine Learning is the new ground for gaining competitive edge & creating business value

Competitive advantage ranked as top goal of machine-learning projects for 46% of IT leaders & 50% of adopters can quantify ROI

2X more
data-driven
decisions

5X faster
decisions
than others

3X faster
execution

*Source: MIT Survey 2017; n=375
Bain Consulting Study



First Step in This Journey Begins with Data

“Every Company will be a Data Company”

*Source: *Wired, Bloomberg, Fortune, McKinsey*

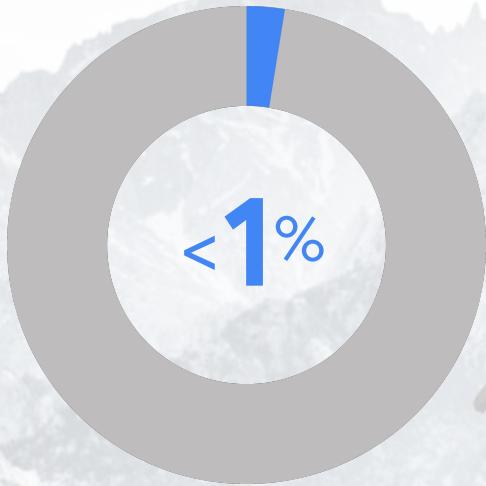
Data Challenges



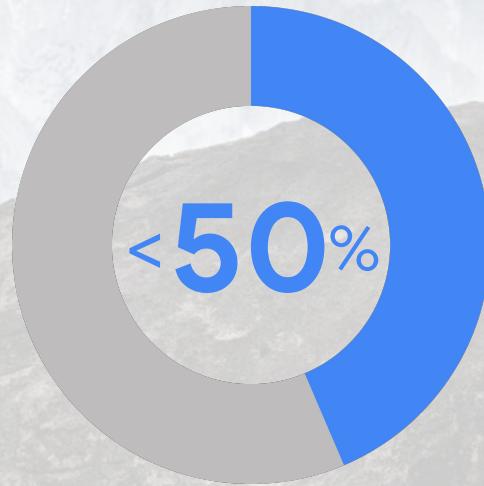
Data is Everything

Companies win or lose based on how they use it

Data analytics is still too hard



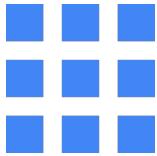
Less than 1% of unstructured
data is analyzed or used at all*



Less than 50% of structured
data is used to make decisions*

Data complexities

Unstructured data accounts for 90% of enterprise data



Legacy
applications

1011101
0100101
11010101
0111100
10001101

Data silos
everywhere



Changing view
on value of data



Regulatory
environment



Limited skills,
hard to recruit

BIG DATA & AI LANDSCAPE 2018



Final 2018 version, updated 07/15/2018

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mattturck.com/bigdata2018

Google Cloud

Confidential & Proprietary

Challenges with Big Data Projects

-
- The diagram consists of three columns of three numbered circles each. The first column has circles colored blue (top), yellow (middle), and red (bottom). The second column has circles colored blue (top), yellow (middle), and red (bottom). The third column has circles colored blue (top), yellow (middle), and red (bottom). Each circle contains a number (1, 2, 3 for the first row; 4, 5, 6 for the second; 7, 8, 9 for the third) and a corresponding challenge description.
- | | | | | | |
|---|--|---|--|---|--|
| 1 | Complexity of building and maintaining a Big Data system with consistent ease of use | 4 | Finding value in existing data very easily | 7 | Collaboration within or across organizations |
| 2 | Capture and store all data for all business functions | 5 | Reducing the time from data collection to action | 8 | Keep your data secure |
| 3 | Continuously accommodating greater data volumes and new data sources | 6 | Hurdles to innovate and iterate with Big Data | 9 | Keep system reliable/running |

If you want to unlock the power of your data, you need
a **customer data platform**, not just new tools.

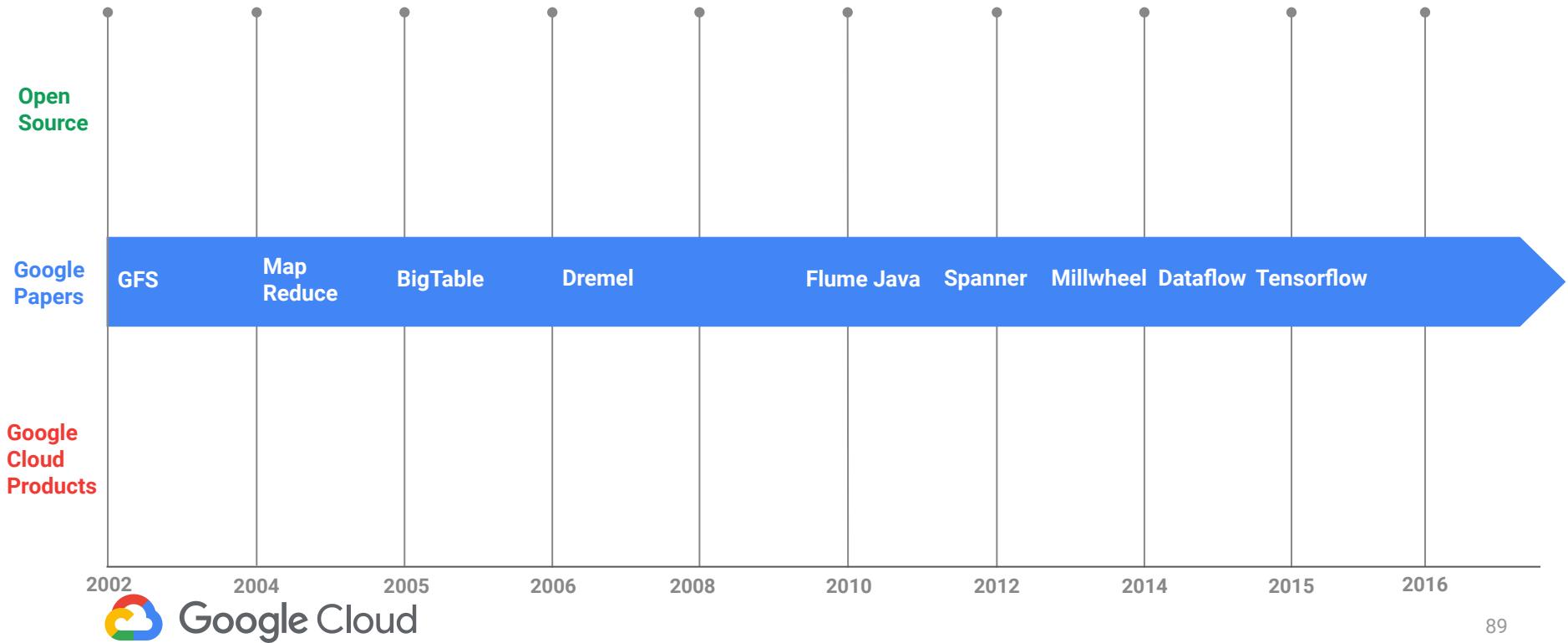


**“If Your Company Isn’t
Good at Analytics,
It’s Not Ready for AI”**

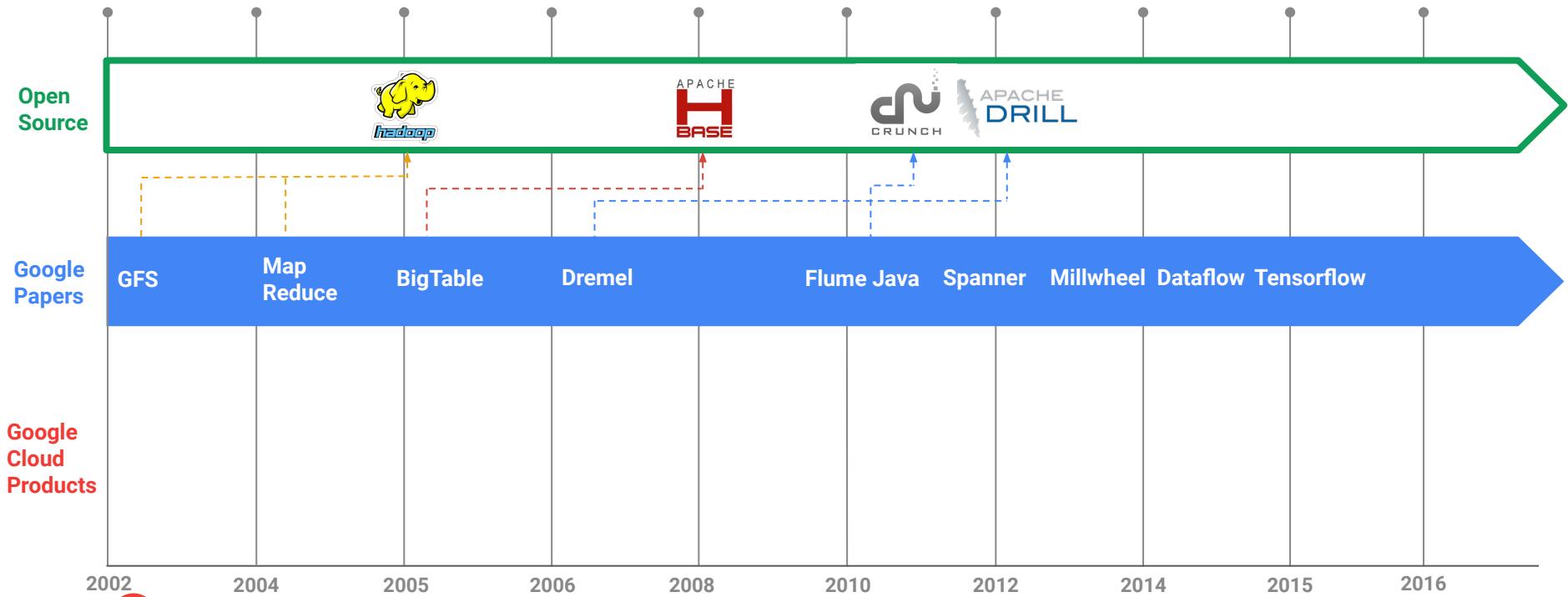
*Source: Harvard Business Review

Our Approach to Data Analytics

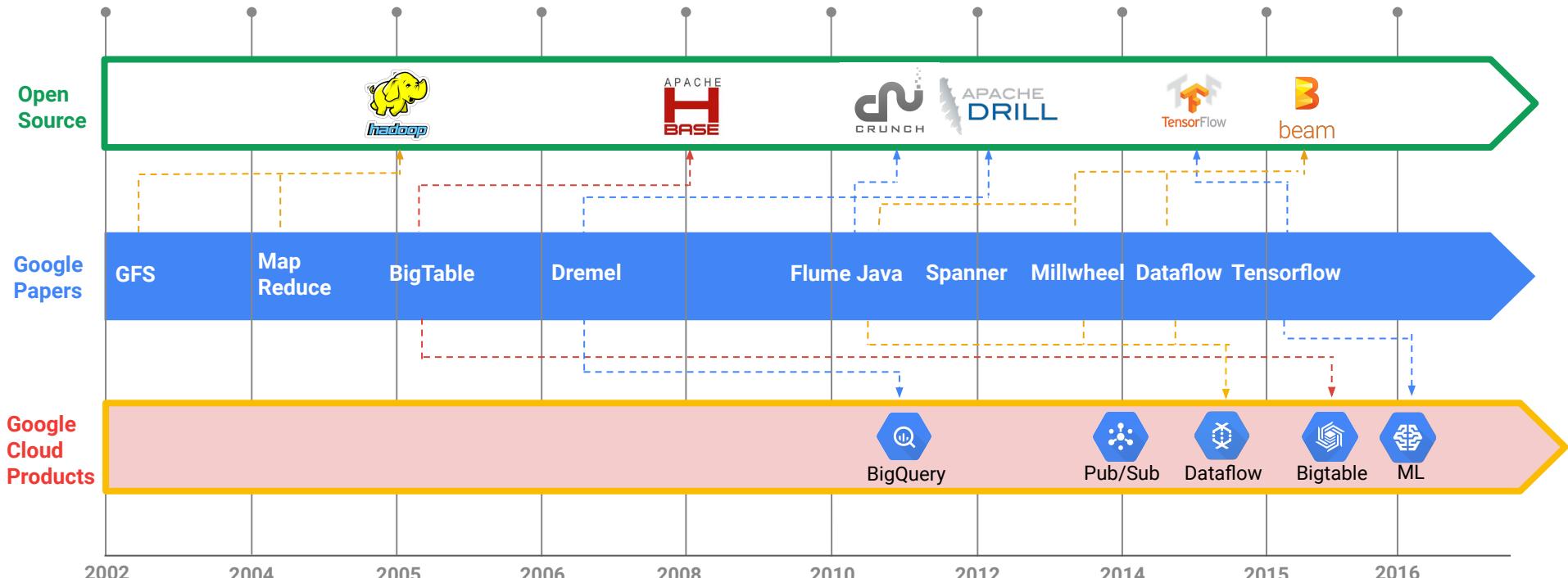
15+ Years of Tackling Big Data Problems



15 Years of Tackling Big Data Problems



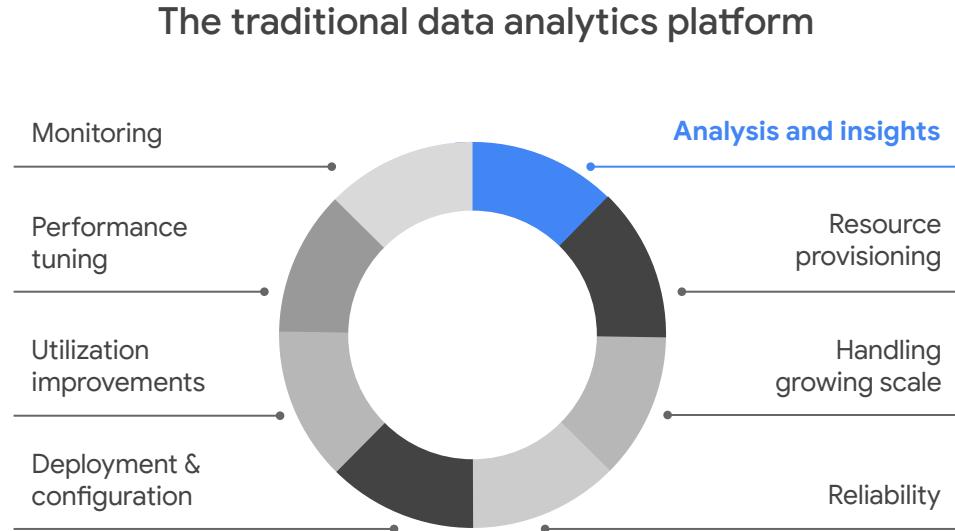
15 Years of Tackling Big Data Problems



Serverless data analytics

From infrastructure to platform for insights

The traditional data analytics platform



The serverless data analytics model



Enterprise Challenges in Data to ML Journey



Data Silos and Legacy Systems

Limits decision-making
and is time consuming



Missing Out on Real-Time Insights

Rear-view approach
causes business anxiety



Lacks How-To Predict Business Outcomes

Depends on guts for
predicting the unknown

Key Solutions Powered by **Google** Cloud



Cloud Data Warehouse

Modern Data Warehousing which builds foundation for AI



Streaming Data Analytics

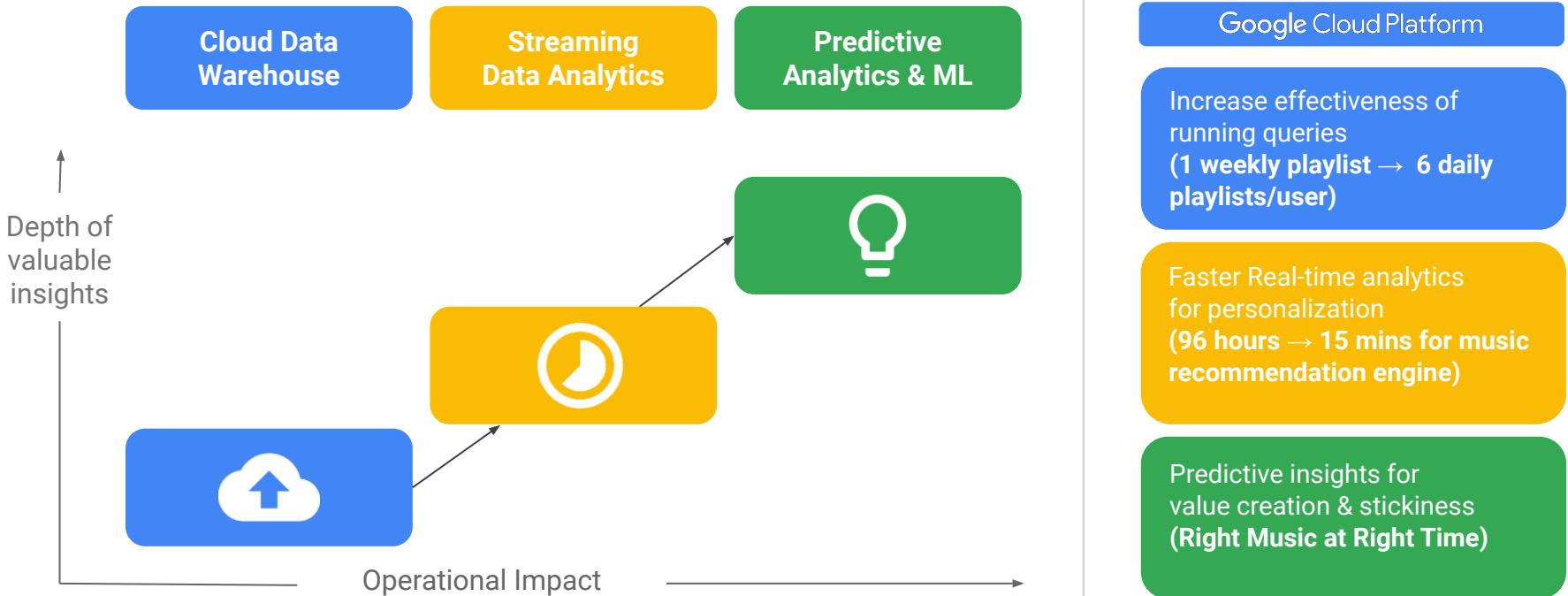
Process Streaming Data along with batch data to generate real-time insights



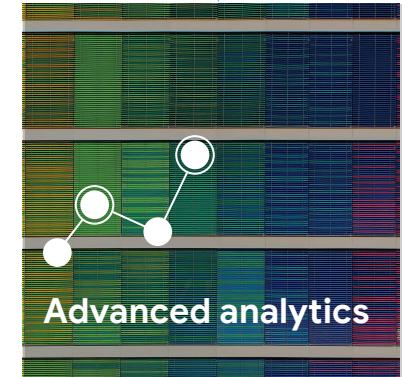
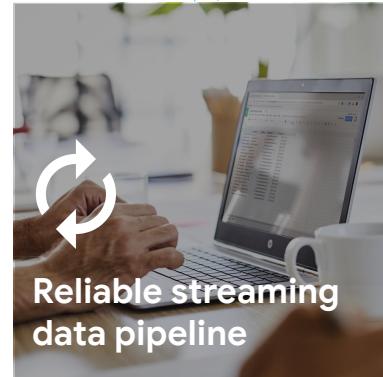
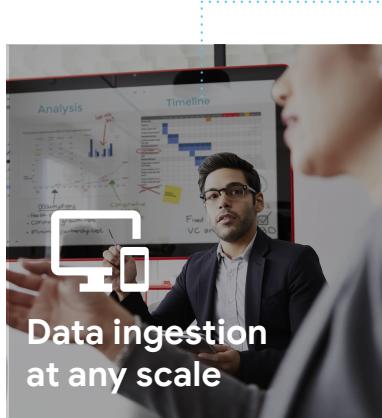
Predictive Analytics / ML

Anticipate customer needs and automate delivery with Machine Intelligence

Accelerating Time to Insights



Complete foundation for data lifecycle



Cloud Pub/Sub



Data Transfer Service



Cloud IoT Core



Cloud Dataflow



Cloud Dataproc



Cloud Dataprep



Apache Beam



BigQuery



Cloud Storage



Cloud Composer



Cloud ML Engine



Google Data Studio



Tensorflow



Sheets

Modernize Your Data Warehouse

Get all your business data in one place
for faster and comprehensive analysis



Data warehousing for AI-driven business



Data warehouses

From 1st-gen EDWs, increased data collection and analysis has helped build more data-driven businesses.

BI foundations

Data warehousing formed the foundation of reporting and business intelligence.

Cloud data warehousing

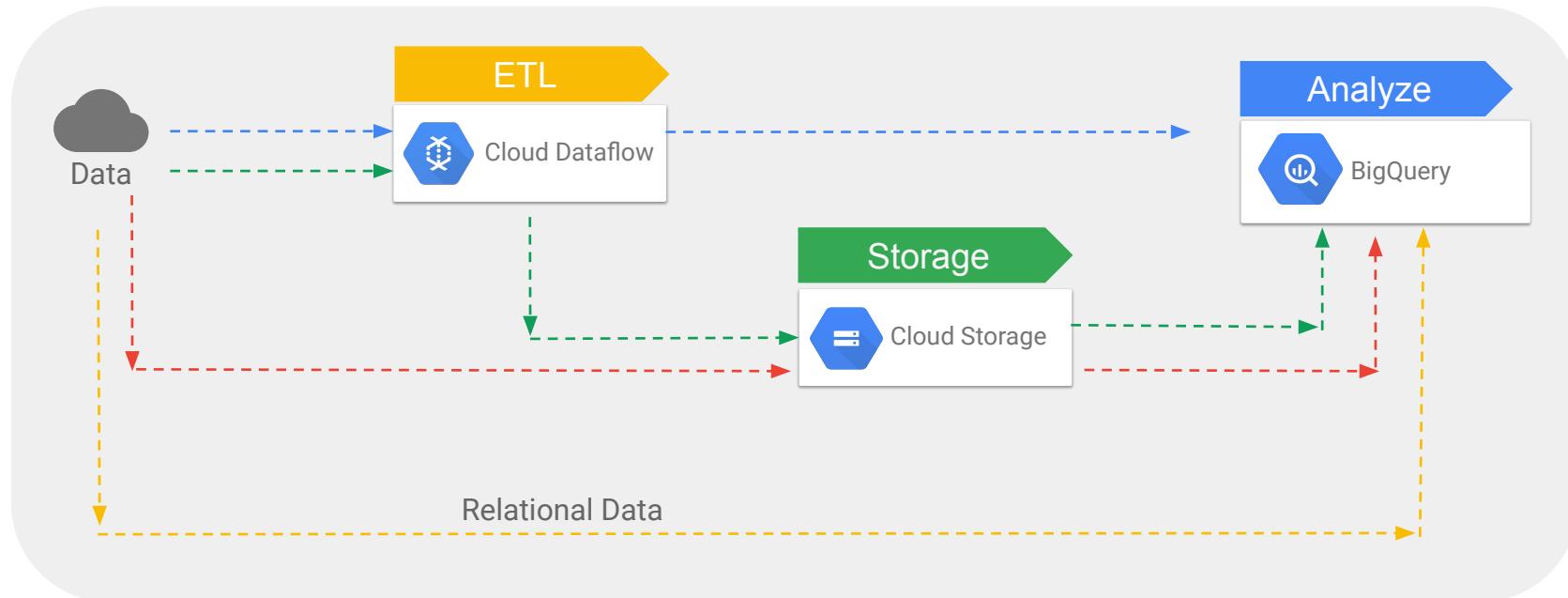
BigQuery represents a fundamentally different approach to cloud data warehousing.

AI foundations

We're working to make BigQuery the foundation for organizations that will leverage machine intelligence in their businesses.

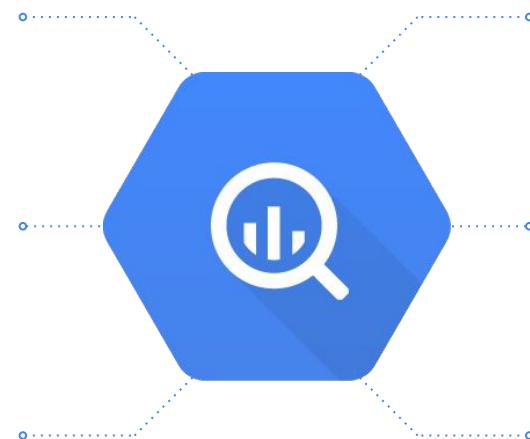


Google Cloud Data Warehouse: Four Typical Flows



What is BigQuery?

Google Cloud Platform's enterprise data warehouse for analytics



Petabyte-scale storage and queries

Convenience of standard SQL

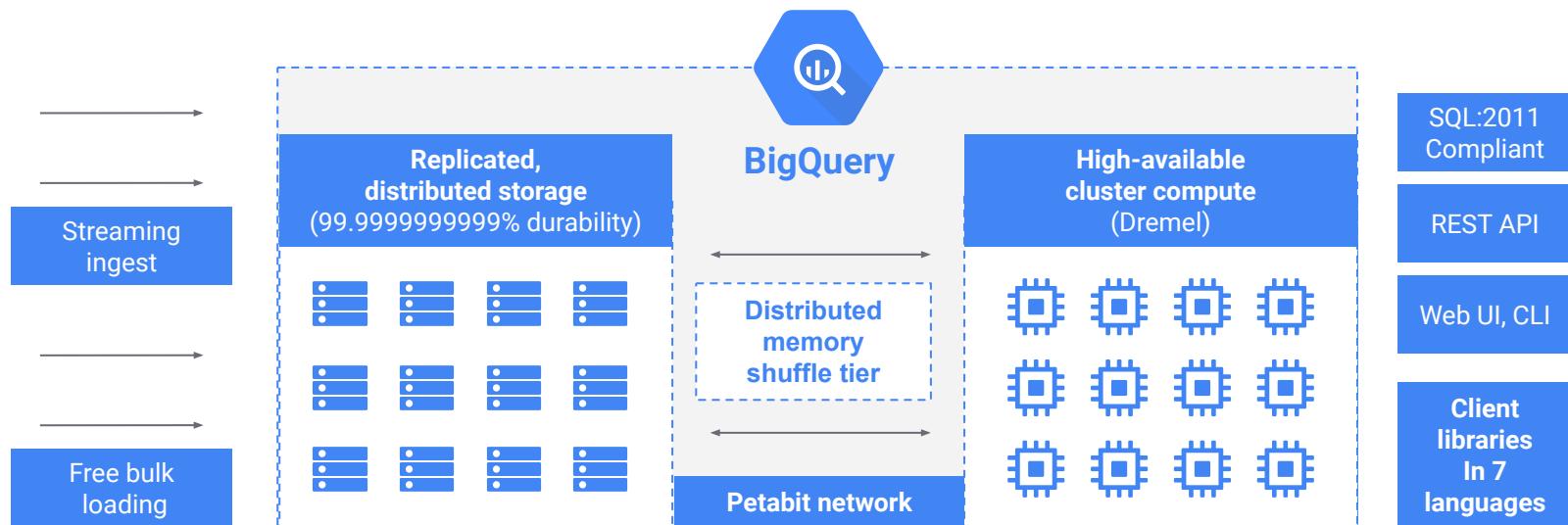
Encrypted, durable and highly available

Fully managed and serverless

Real-time analytics on streaming data

BigQuery: architecture

Serverless. Decoupled storage and compute for maximum flexibility.



Introducing BigQuery ML

Making machine learning accessible

BigQuery ML
empowers data
analysts and
data scientists

Execute ML initiatives without
moving data from BigQuery

Iterate on models in SQL in BigQuery to
increase development speed

Automate model selection, and
hypertuning

Analyze GIS data in BigQuery with familiar SQL

Accurate spatial analyses with
Geography data type over
GeoJSON and **WKT** formats

Support for core **GIS**
functions – measurements,
transforms, constructors, etc...
– using familiar **SQL**

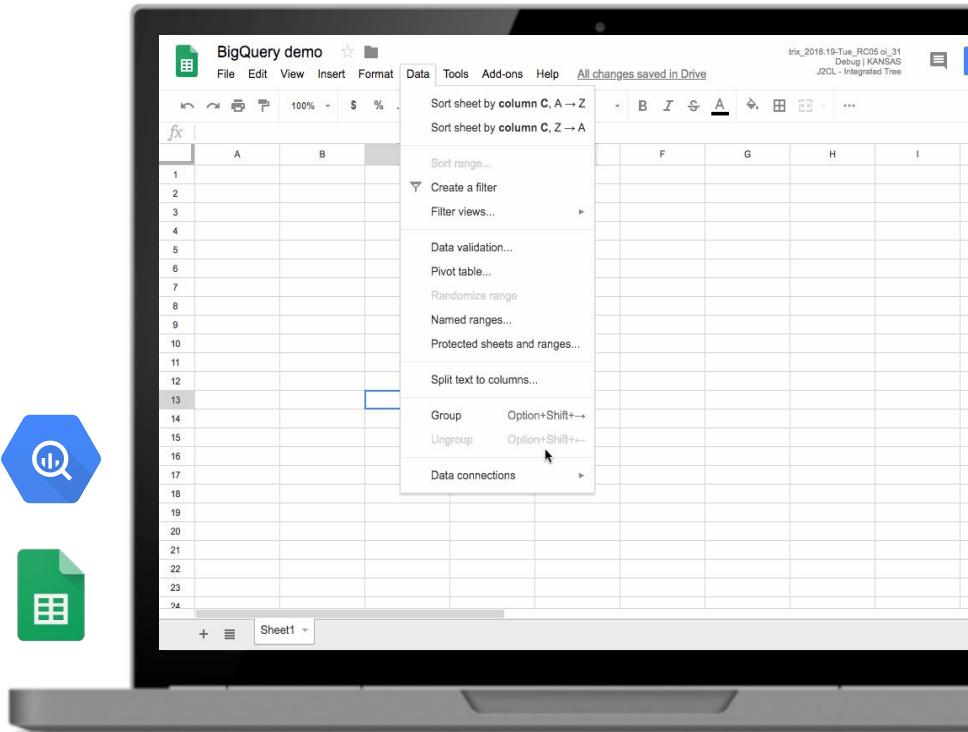


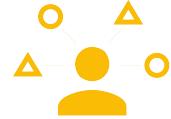
Unlock big data for all users with BigQuery & Sheets

gsuite.google.com/bq-sheets

**“For analysts spread across
the globe, this is a blessing.
They can now collaborate
easily with a streamlined flow
for sharing their insights.”**

-- Nikhil Mishra @ Yahoo





See your BigQuery data in one click with Data Studio Explorer

Tight integration in the BigQuery UI brings visual exploration of your query results in one simple click.



The screenshot shows the Google Cloud Platform BigQuery interface. On the left, there's a sidebar with 'Query history', 'Saved queries', 'Job history', 'Transfers', and 'Resources'. Below that is a search bar and a dropdown for 'water-demo-2'. The main area has a 'Query editor' tab open with the following SQL query:

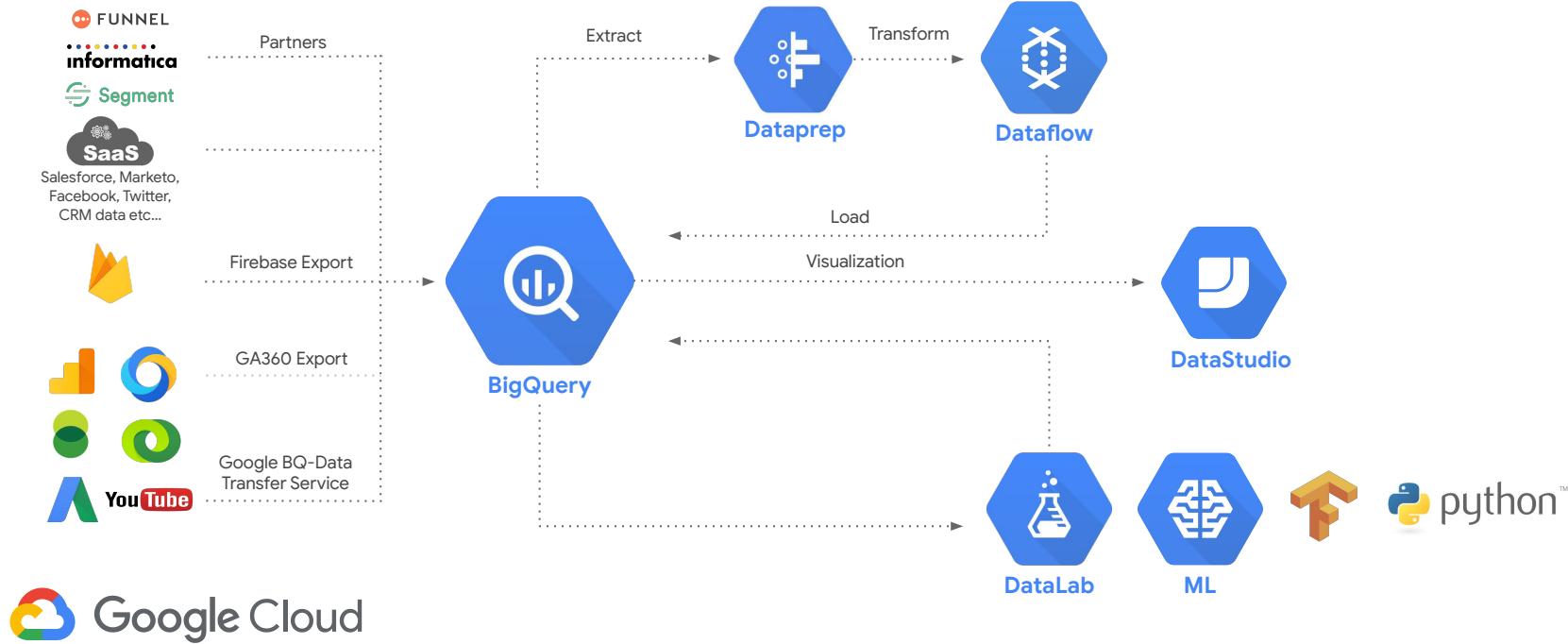
```
SELECT * FROM `water-demo-2.water_gauge_data.2018_actual_predicted` LIMIT 1000
```

Below the query editor are buttons for 'Run query', 'Save query', 'Save view', and 'Options'. The 'Processing location: US' is listed. The 'Query results' section shows a table with two rows of data:

Row	createdDateTime	flow_12340000	flow_12334550	flow_12353000	flow_12334510	flow_12334510
1	2018-07-07 13:30:00 UTC	2560.0	3460.0	11000.0	1120.0	0.0
2	2018-07-07 13:45:00 UTC	2560.0	3510.0	11000.0	1130.0	0.0

A yellow box highlights the 'EXPLORE IN DATA STUDIO' button in the 'Results' section. An arrow points from this button to a yellow network icon at the top right of the slide.

You can use BigQuery to build a modern marketing data warehouse



“

We don't have to do a lot of work to get an answer, as Google does most of the heavy lifting and scaling with the data.

*—Paul Clarke,
Chief Technology Officer*



Retail



Inform supply chain

Moves business, product and transactional data out of inaccessible silos



Increase logistical efficiencies

Analytics of more than 100TB of data helps control inventory, predict demand and more



Allow for expansion and competitive advantage

Continue to compete against brick-and-mortar grocery stores



Big Data & Hadoop

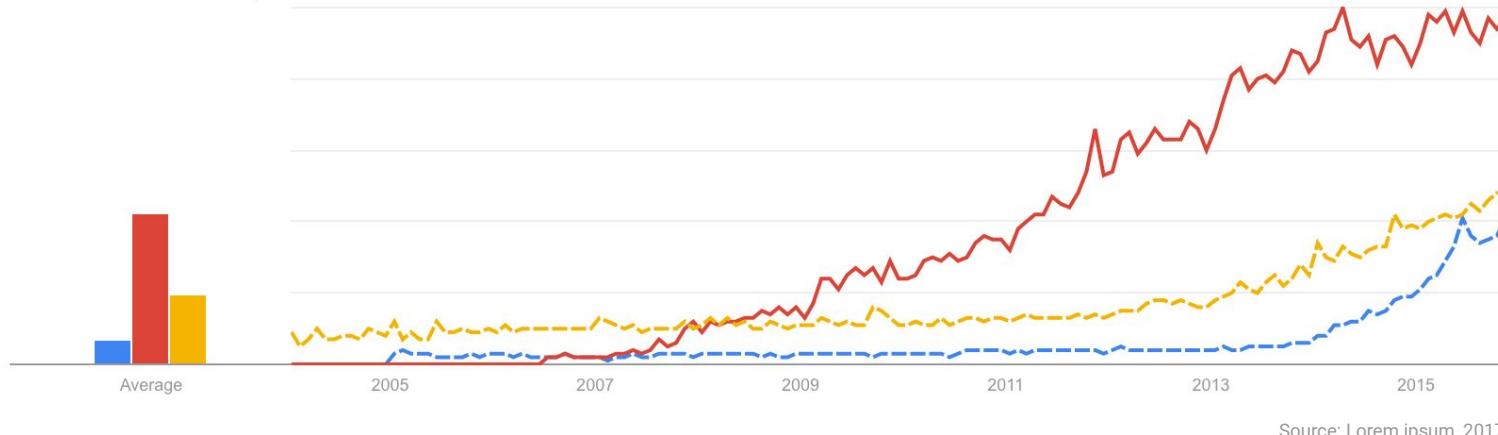


Hadoop Ecosystem is a Popular Choice

Production implementations of **hadoop**, **spark**, and other components (like **hive**) are growing steadily over time

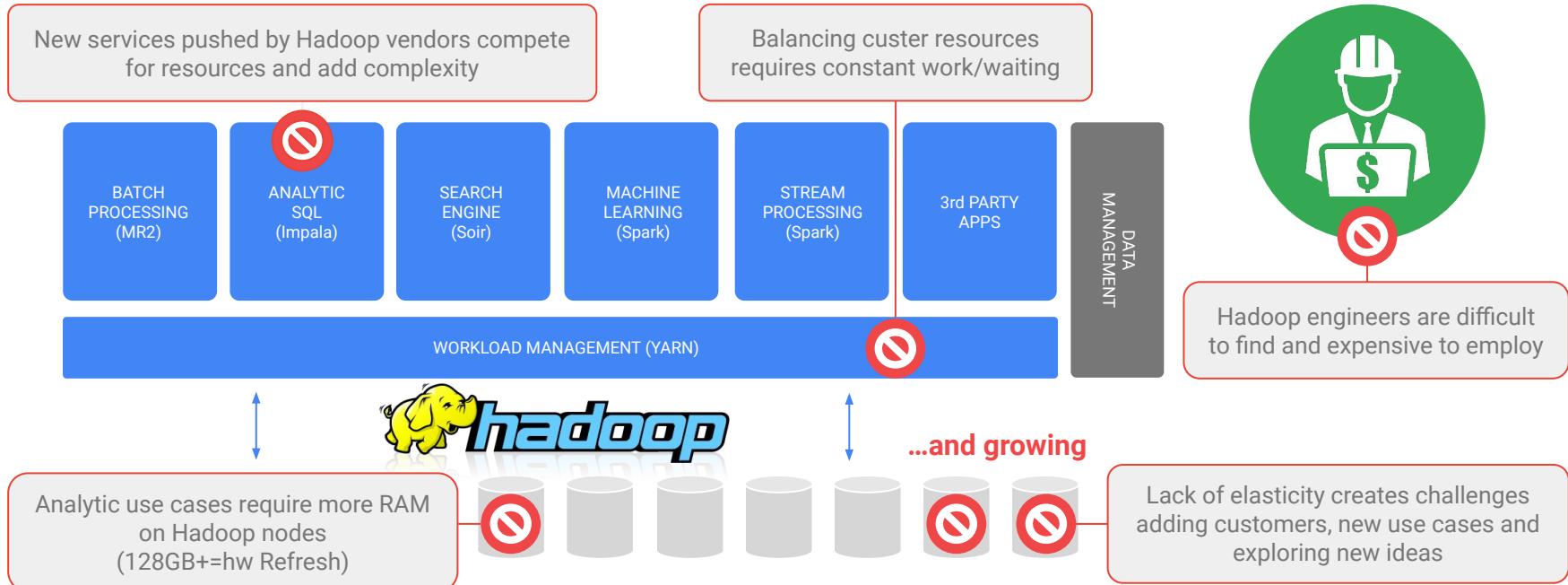
Hadoop will likely be a \$50b market by 2020

Hadoop is used by 80% of the Fortune 500



Source: Lorem ipsum, 2017

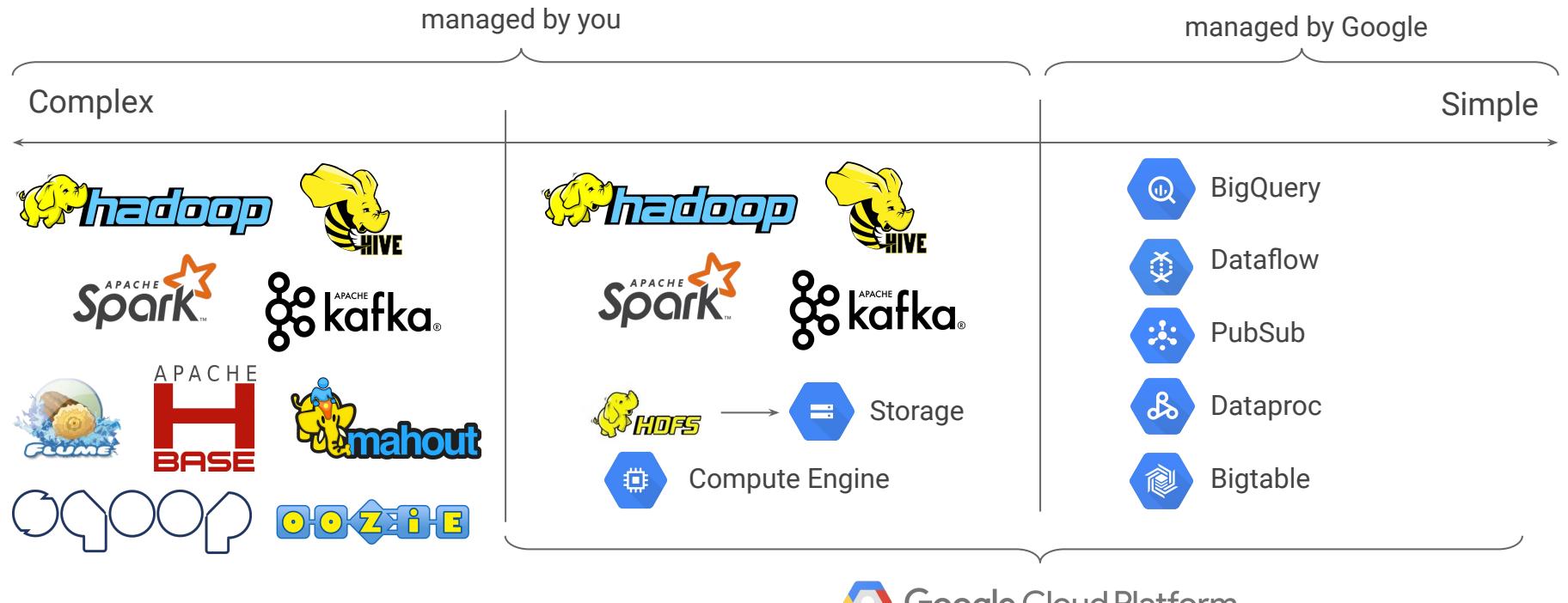
Managing Hadoop can be ... Complex





How can you simplify Hadoop management?

Hadoop to Cloud: options



Faster and easier Spark & Hadoop jobs with Cloud Dataproc



Cloud Dataproc

It is the simpler, more cost-efficient way to make your Apache Spark & Hadoop deployments a success

It's flexible

Create and resize managed Hadoop and Spark clusters in less than 90 seconds

It's easy

Lift and shift existing projects or ETL pipelines, no redevelopment necessary

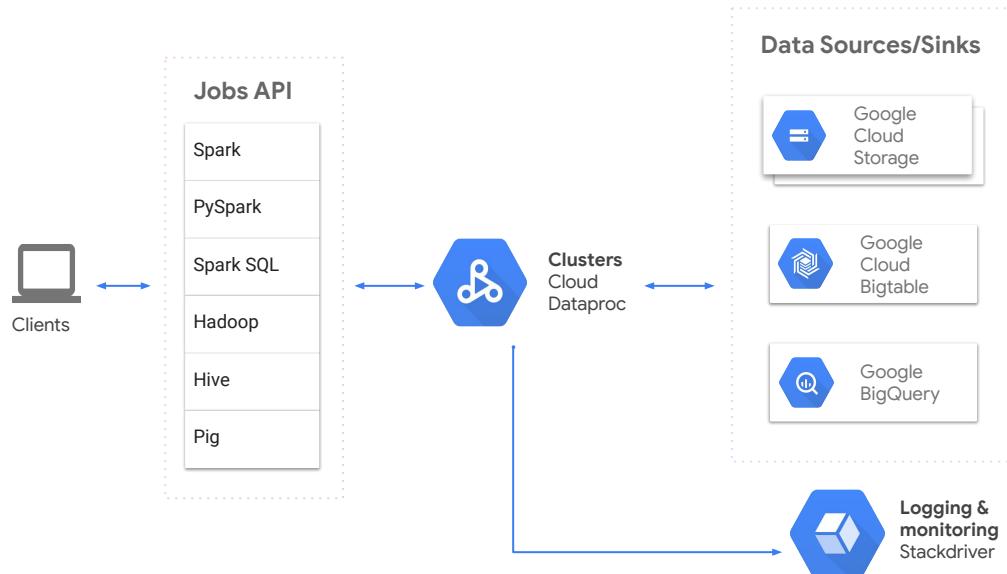
It's cost effective

Easily process large datasets at low cost, pay only for the resources you use (by the minute)

It's open

Leverage tools, libraries, and documentation from the Spark and Hadoop ecosystem

Integrates easily with other Cloud Platform services



Share data across the platform

Connectors available to read/write from BigQuery, Cloud Bigtable, and Cloud Storage

Match processing with data

Bring the right processing engine to the workload (and at right cost) on the same storage

Monitor & alert with Stackdriver

Integration with Stackdriver, GCP's logging & monitoring framework, lets you identify/diagnose issues

Analyze Streaming Data in Real Time

Gain real-time business insights and
make your business more responsive



Stream data analytics on Google Cloud Platform

Ingest

Ingest and distribute data reliably



Cloud Pub/Sub

Transform

Fast, correct computations quickly and simply



Cloud Dataflow

Analyze

Machine learning & data warehouse



BigQuery



Cloud Machine Learning



Cloud Translation API



Cloud Vision API



Cloud Natural Language API

Unified streaming and batch data processing with **Cloud Dataflow**



Cloud Dataflow

The fully-managed data processing service that simplifies development and management of stream and batch pipelines

Accelerate development for streaming & batch

Fast, simplified data pipeline development via expressive Java and Python APIs in the [Apache Beam SDK](#)

Simplified management and operations

Remove operational overhead by letting Cloud Dataflow auto-manage performance, scaling, availability, security and compliance.

Build on a foundation for machine learning

Add TensorFlow-based [Cloud Machine Learning](#) models and APIs to your data processing pipelines for real-time predictions

Visually prepare data for analysis or ML projects with Cloud Dataprep

Fully-managed and serverless

Team-based data wrangling

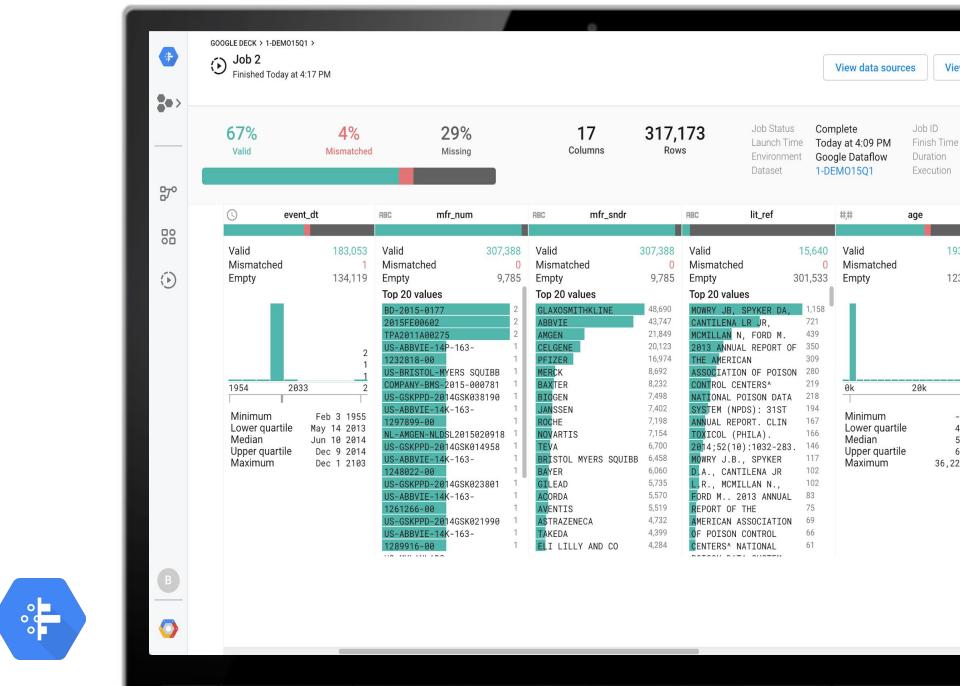
Share & copy flows to collaborate in real-time, reuse custom samples in a recipe, and audit individual user wrangling steps

Data analyst productivity

Use shortcuts for popular transforms (pivots, joins, unions), simplify date formatting, and parameterize scheduled flows with dynamic data

Comprehensive design refresh

Ensure smooth onboarding, see activity organized by recency and navigate easily between different stages of the workflow



Collaborative Business Intelligence with Data Studio

One-click visualization

Visualize BigQuery data in a click with Data Studio Explorer

Data Studio data blending

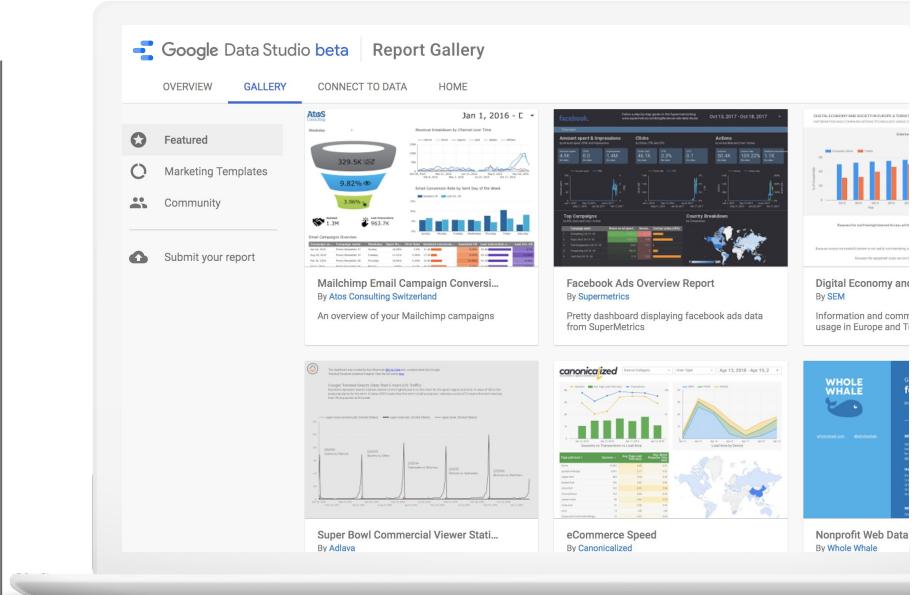
Join across data sources with a simple right-click

Data Studio template gallery

Get started fast using Google-built or community-built templates.

Data Studio custom Visualizations DEVELOPER PREVIEW

Build custom visualizations using the popular D3.js framework.



More from the tools you already use

Data ingest



Data integration



Data management



Prep / processing



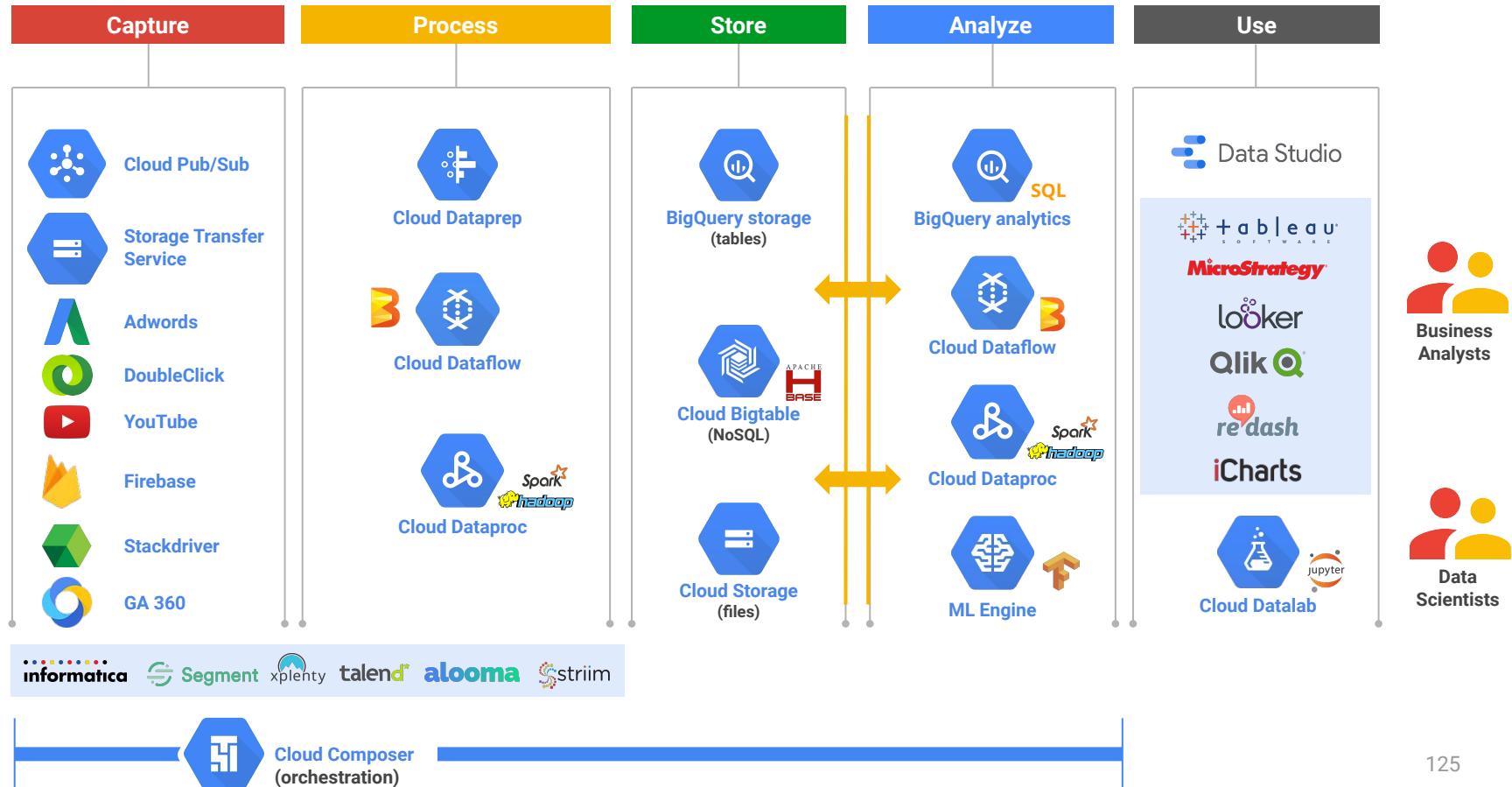
BI/visualization



Services partners



Serverless platform & auto-optimized usage across the entire data lifecycle





Google Cloud

Brightcove Media

Brightcove uses Google Cloud's open and integrated solution for stream analytics to get real-time insights from rapidly growing event streams. Using stream analytics on Google Cloud supports understanding of **8,500+ years of video each month/7B+ events per day.**

IT strategy approach

- Cloud Pub/Sub for large-scale event ingestion
- Cloud Dataflow for stream processing
- BigQuery for ad hoc analysis, with data cached in Cloud Bigtable for extra-low latency

Results

Re-architected its analytics platform to support tremendous growth, with no changes to existing APIs



Customer momentum

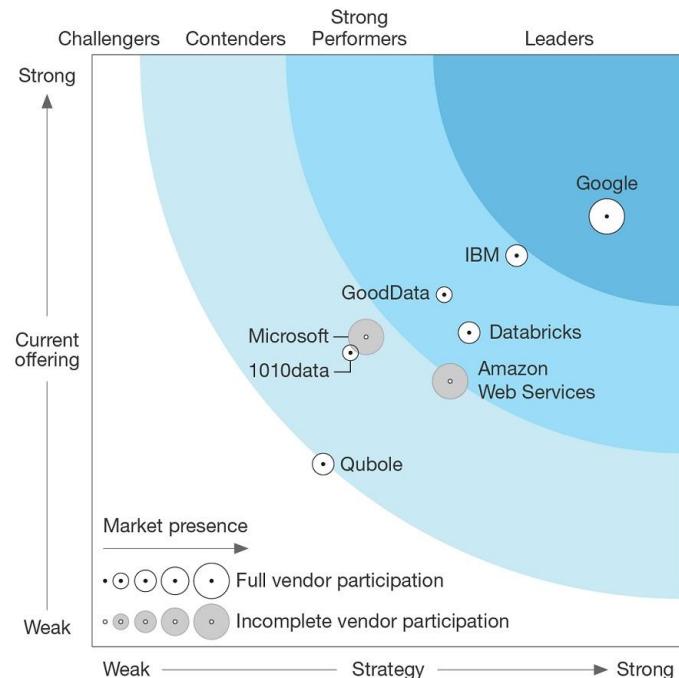


Google: a leader in insight platforms-as-a-service

“Our evaluation identified one vendor as a Leader based on the strength of its PaaS strategy, advanced tools for batch and real-time solutions, and machine learning and AI offerings.”

— The Forrester Report

- Google has the highest scores in the Current Offering and Strategy categories.
- Noted as the only vendor in the evaluation to offer insight execution features like full machine learning automation with hyperparameter tuning, container management, and API management.
- Receives recognition for advanced platform features like autoscaling for most of its services, efforts at integrating leading Hadoop cloud services and its data flow service works on both batch and streaming data.

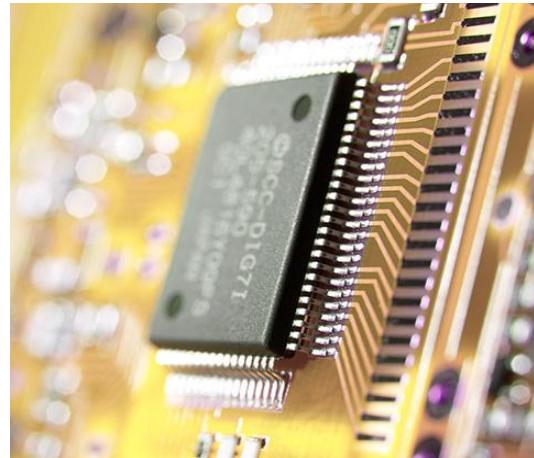


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Make your applications intelligent



Building blocks



Platform



Solutions