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Data & Analytics: Unlocking the Door to Actionable Data Driven Enterprise Insights

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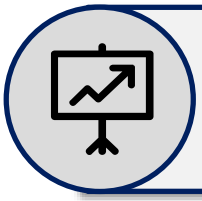
Unlocking The Door to Actionable Data Driven Enterprise Insights

Executive Summary

Data is everywhere. The ability to derive actionable business insights from the enhanced analysis of previously unobtainable or difficult to access data catalyzes a transformative shift across a broad spectrum of everyday tasks and activities. As enterprises transition their data storage from legacy server racks to easily accessible cloud environments, the door to data driven insight is being foundationally unlocked. Businesses that can successfully collect, store, find meaning and extract value from data at scale are uniquely positioned to bolster their monetization, optimize their operations and enhance their interactions with customers, while positioning themselves for immense ROI on analytics investments.

Data never sleeps. Ninety percent of the total data on earth was created within the past two years. The pace at which data is generated continues to accelerate, with data creation growing at a CAGR of 40% annually, and expected to top 44 zettabytes in 2020. The ability to seamlessly access this data to yield actionable data driven insight has never been more critical. Today, 98% of global information is digital. Gathering, analyzing and optimizing data will fundamentally alter how business is conducted across industries, creating a multi-trillion-dollar market opportunity for those ready to seize it.

Enterprise Benefits of Leveraging Data & Analytics



Enhanced Decision-Making
Sophisticated analytics can unearth valuable insights, minimize risk and substantially improve decision making. Data and Analytics enables executives and managers to have a more holistic view of decisions, a better understanding of associated consequences and an accelerated decision making timeline.

Information Accessibility
The combination of multiple pools of data can enable businesses to derive valuable actionable insights that were previously inaccessible given the prominence of data silos.

Superior Customer Understanding
Data allows for the precise understanding and segmentation of customers, allowing companies to better provide bespoke products, services and solutions. Operationally, companies are able to more effectively manage campaigns and personalize their offerings, enhancing the customer experience.

Turning Analytics into Action
Actionable insights generated from synthesizing, analyzing and identifying patterns in data will allow companies to enhance their strategic execution and operational efficiency.

Impact of Analytics Initiatives

5x — **75% of companies expect to see 5x+ ROI on their investments**

$100T — **Accenture and the World Economic Forum estimate $100T can be unlocked for businesses and society**

20% — **Half of companies anticipate a 20% or more impact to their bottom line within 3 years**

Source: McKinsey, IBM, Accenture, World Economic Forum

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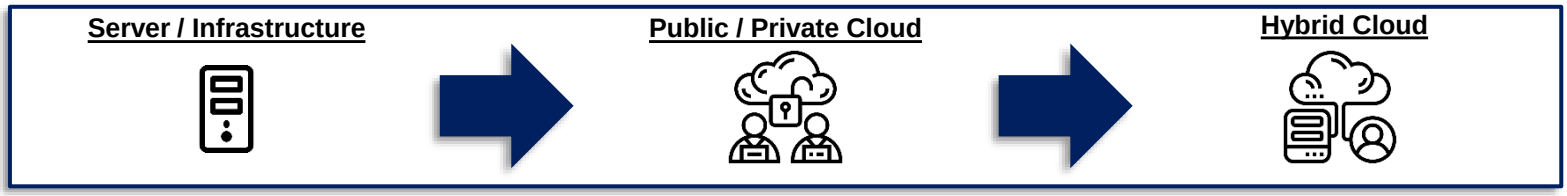
From the Server Rack to the Cloud

Historically, companies have captured large volumes of data and stored that data on legacy servers, primarily located in physical server warehouses. Legacy storage makes data access difficult, and effectively blocked data driven insights across departments. As the volume of data has increased exponentially, as has the enterprise demand for data-driven insights. This movement has catalyzed a transition of data away from legacy storage towards much more easily accessible cloud ecosystems. This transition of data from the server rack to the cloud has helped fuel the data and analytics revolution, and ultimately aids in large scale enterprise success.

Cloud Hosting Environments



	Public	Private	Hybrid
What is it?	The most common way of deploying cloud computing	Consists of computing resources owned exclusively by one business or orgnaization	Combines on-premises infrastructure (private clouds) with public clouds so organizations can reap the advantages of both
Advantages	Lower costs, no maitenance, near-unlimited scalability, high reliability	More flexibility, improved security, high scalability	Control, flexibility, cost-effectiveness, ease of use

Commentary

- Adopting the cloud is an enabler of the necessary standardization and automation of data. Utilizing the cloud, companies can reduce IT overhead costs by 30 to 40%, help scale IT processes up and down as needed thereby optimizing IT asset usage and improve the overall flexibility of IT in meeting business needs and increase quality of service through automation.
- 40% of companies have a portion of their workloads on public-cloud platforms. 80% of companies plan to have a portion of their workloads on public-cloud platforms in three years.
- IDC estimates that in 2020 nearly 40% of data will be stored or processed in a cloud between a byte's origination and consumption, with the rate of adoption continuing to accelerate in the following years.
- According to McKinsey, many Chief Information Security Officers have moved past questioning the security of cloud providers and acknowledge that cloud providers typically have superior security to the company's own.

Source: McKinsey, IDC

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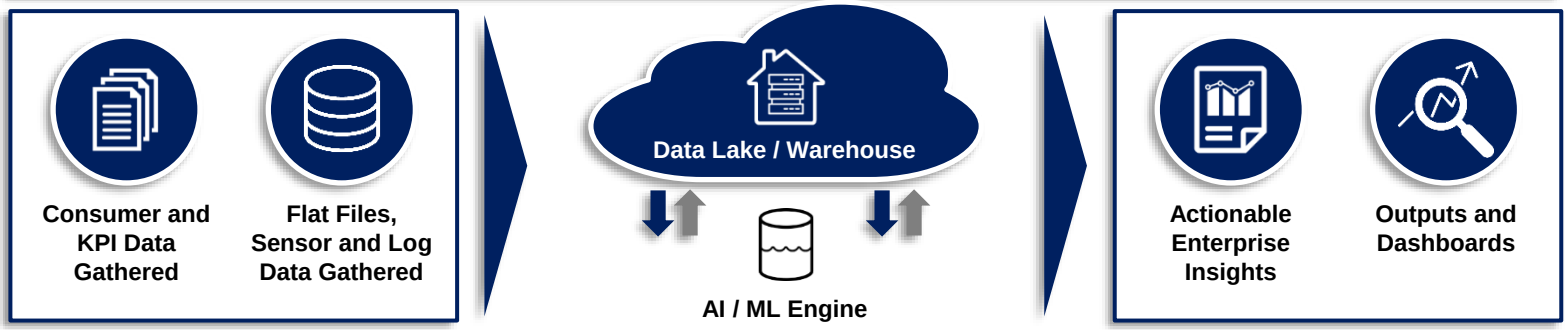
From Data Gathering to Actionable Insights



Areas of Application

Hindsight	Ad Hoc Reporting	*"How many, when and where?"*	Descriptive
	Canned Reports	*"What happened?"*	
	Discovery & Alerts	*"Where should we look?"*	Diagnostic
	Query & Drilldowns	*"Why did it happen?"*	
Foresight	Predictive Modeling	*"What will happen next?"*	Predictive
	Statistical Modeling	*"What is the pattern?"*	
	Optimization	*"What is the best action?"*	Prescriptive
	Random Testing	*"What if we try this?"*	

Key Definitions and Statistics

Hindsight	**Descriptive Analytics** Tells you what happened in the past	**Predictive Analytics** Predicts what is most likely to happen in the future
	Helps you understand why something happened in the past **Diagnostic Analytics**	Recommends actions you can take to affect outcomes **Prescriptive Analytics**

Foresight

80% — **80% of firms** see an opportunity to drive business value by improving existing products and services through data analytics

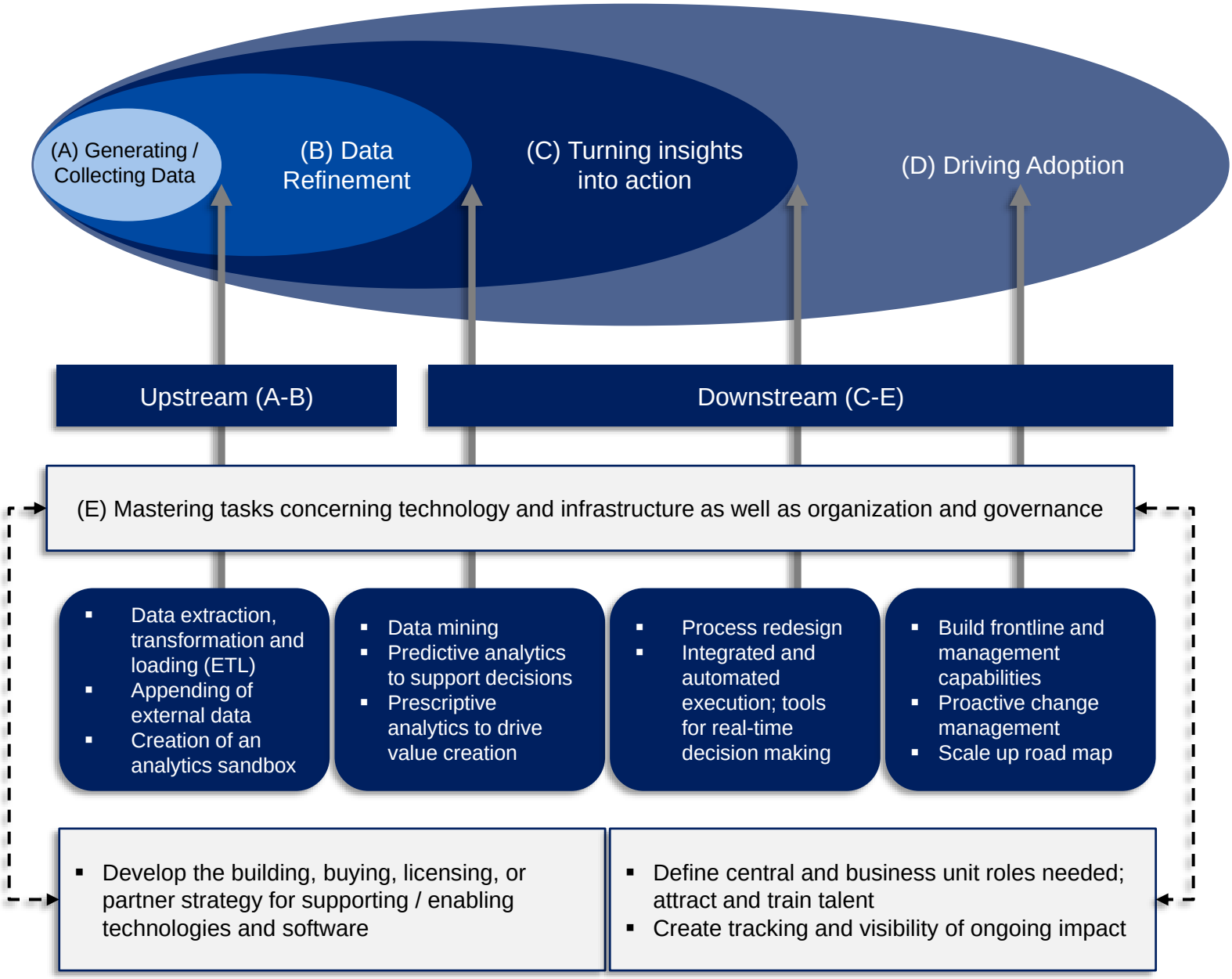
98% — **98% of global information** is now digital, contrasted with **25% in 2020**

45% — **45% of firms say data and analytics** will be the most important factor within 3 years in determining competitive differentiation

50% — Between 2015 and 2019, data and analytics revenues grew from **$122b to $187b**

Source: Gartner, McKinsey, Data Warehousing Institute

Overview of the Insights Value Chain



Commentary

- The process of generating insights from data can be summarized into five key steps as highlighted above, from generating and collecting data, to ultimately driving adoption and implementing internal controls to ensuring optimal usage.

- Data refinement is a two-step iteration composed of enrichment and extraction. Firstly, companies must enrich raw data with additional information and / or domain expertise. Secondly, to extract the data into specific performance-enhancing actions that can be taken, business knowledge needs to be leveraged to create ratios of variables, trends or derivatives (e.g., changes in customer behavior) and categories from numerical variables (e.g., low, medium, high income).

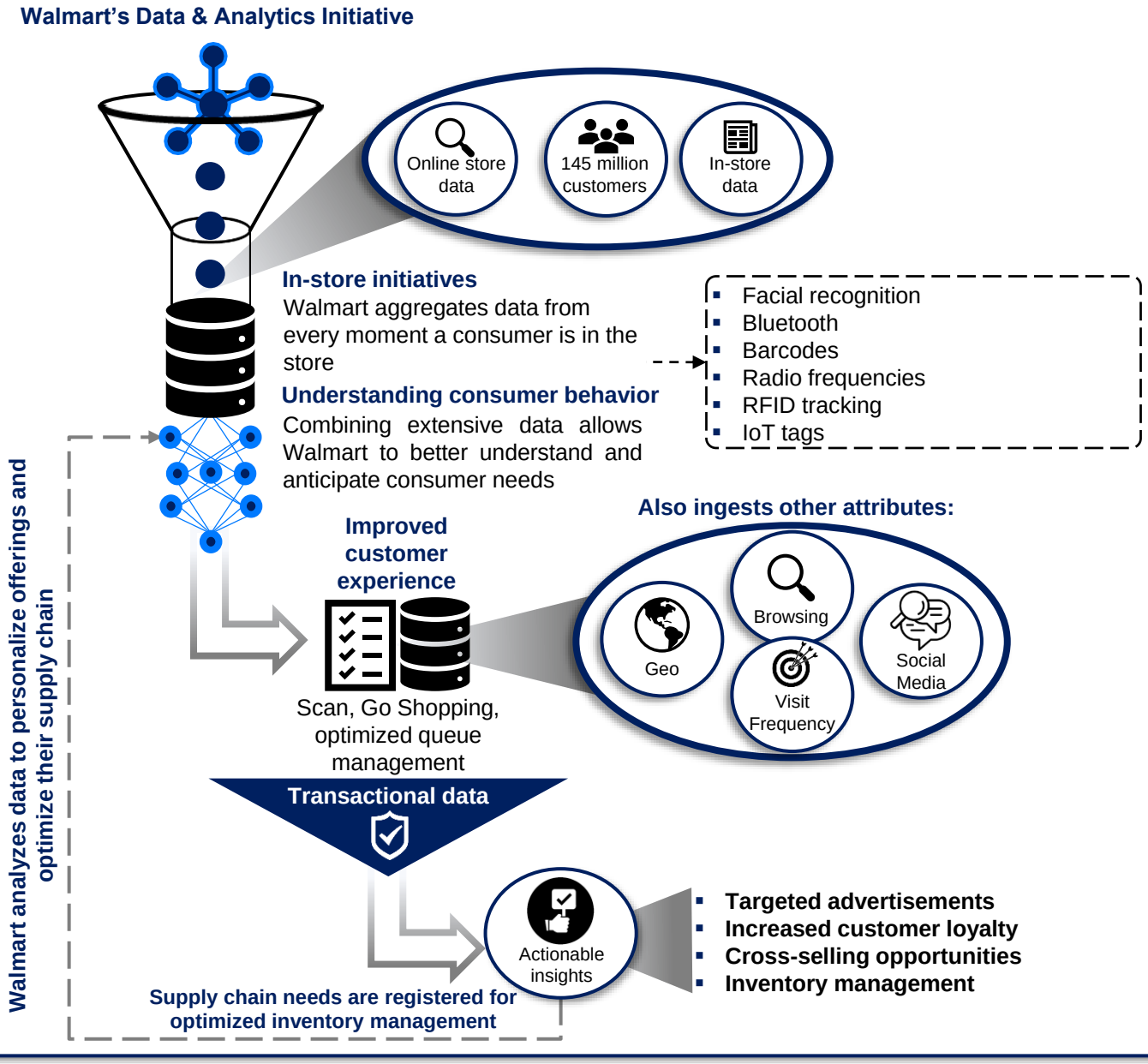
Source: McKinsey

Subsector Impact

 **RetailTech**	▪ Optimize supply chains and manage sale prices ▪ Improve the accuracy of product data to support cross-channel merchandising ▪ Enhance the reliability of vendor information to support pricing ▪ Provide a more holistic expectation of what consumers are looking for, when they are looking for it and at what price point it converts into a purchase
 **MadTech**	▪ Emergence of algorithmic-led marketing ▪ Ability to optimize KPIs in real time while utilizing data from multiple platforms ▪ Automate ad targeting ▪ Enhance understanding of the customer journey, driving engagement and cross-selling potential ▪ Mine public data sources and social buzz to gauge consumer reaction and adjust strategies in real-time
 **OTT**	▪ Improve content strategy using insights generated from the aggregation of data ▪ Enhance monetization via targeted product placement and targeted live ad insertion ▪ Ability to mine social buzz to generate immediate sentiment analysis on the content consumers have streamed ▪ Generate promotions and personalized content based on a consumer's demonstrated interests
 **Ecommerce**	▪ Enhance shopping pattern analysis ▪ Increase the effectiveness of customer relationship management ▪ Predict future operations plans by using insights to assist in managing inventory, supply chain, forecasting demands and generating better pricing and sales strategies ▪ Increase ability to capitalize on "micro moments" by understanding where a consumer wants to go, wants to know and wants to buy
 **Gaming**	▪ Ability to open the door to new means of monetization, including in-game product placement and sponsorships by understanding the particular interests of each user ▪ Understand how a consumer is engaging with other entertainment platforms and providing bespoke, automated in-game world results ▪ Develop insights based on how a player interacts with a game; opening the door to potentially monetizing the information discovered

RetailTech Case Study

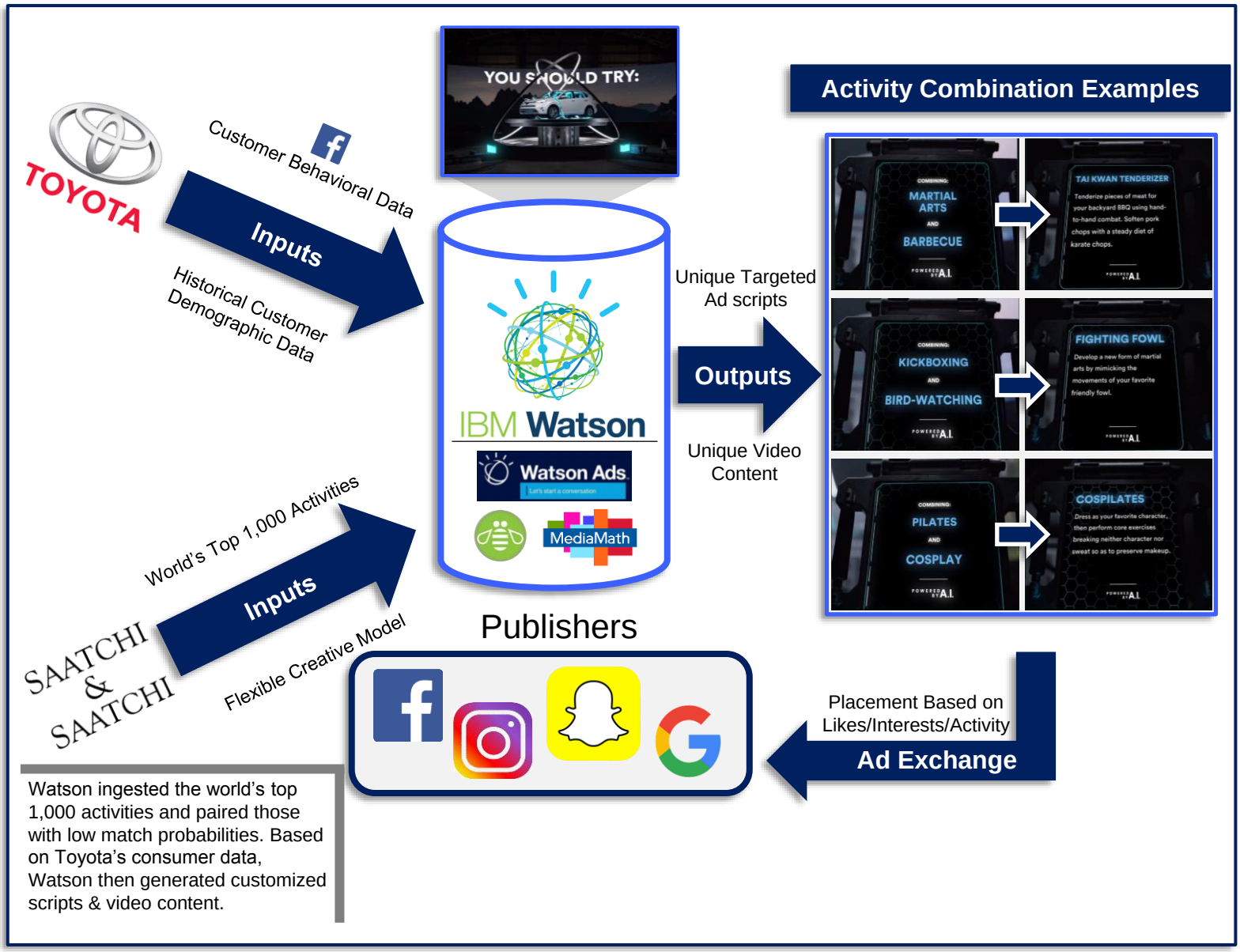
- Walmart has petabytes of consumer data on more than 145 million Americans.
- The company has been leveraging technology in its stores, including facial recognition, to generate consumer data from shoppers in-store to fuel the generation of actionable insights.
- The company is focused on connecting the real-world data generated from Walmart stores with online data sources to optimize its supply chain.



MadTech Case Study

TOYOTA

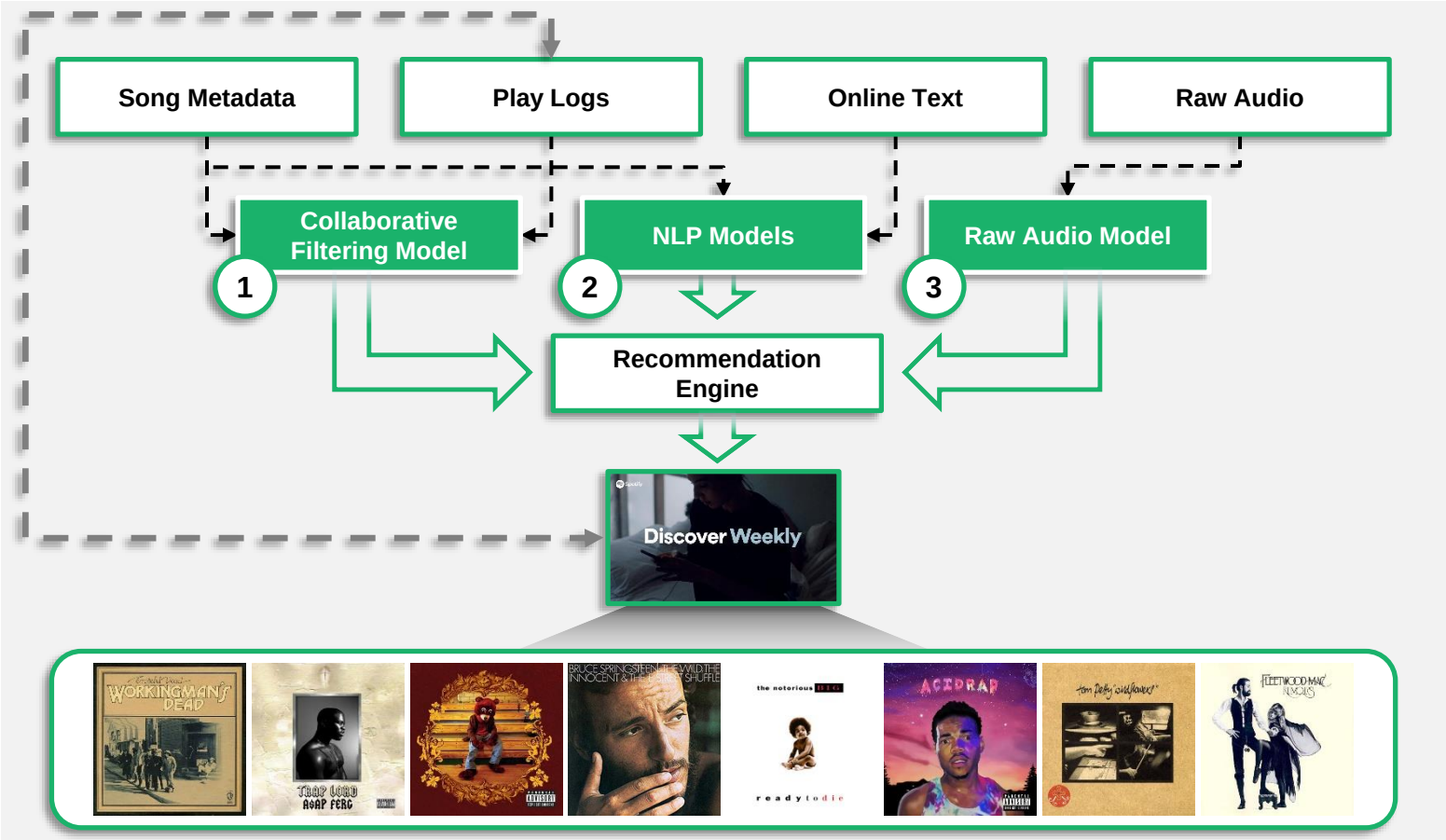
- Toyota is the largest automobile company globally based on units sold. The company wanted to optimize its marketing efforts by leveraging data and analytics to create personalized campaigns.
- Leveraging IBM's Watson and collaborating with Saatchi & Saatchi, Toyota launched a hyper-targeted marketing campaign for its RAV4 automobile.
- The resulting campaign produced 300+ personalized videos delivered to consumers based on personalized detected interests.



Watson ingested the world's top 1,000 activities and paired those with low match probabilities. Based on Toyota's consumer data, Watson then generated customized scripts & video content.

OTT Case Study

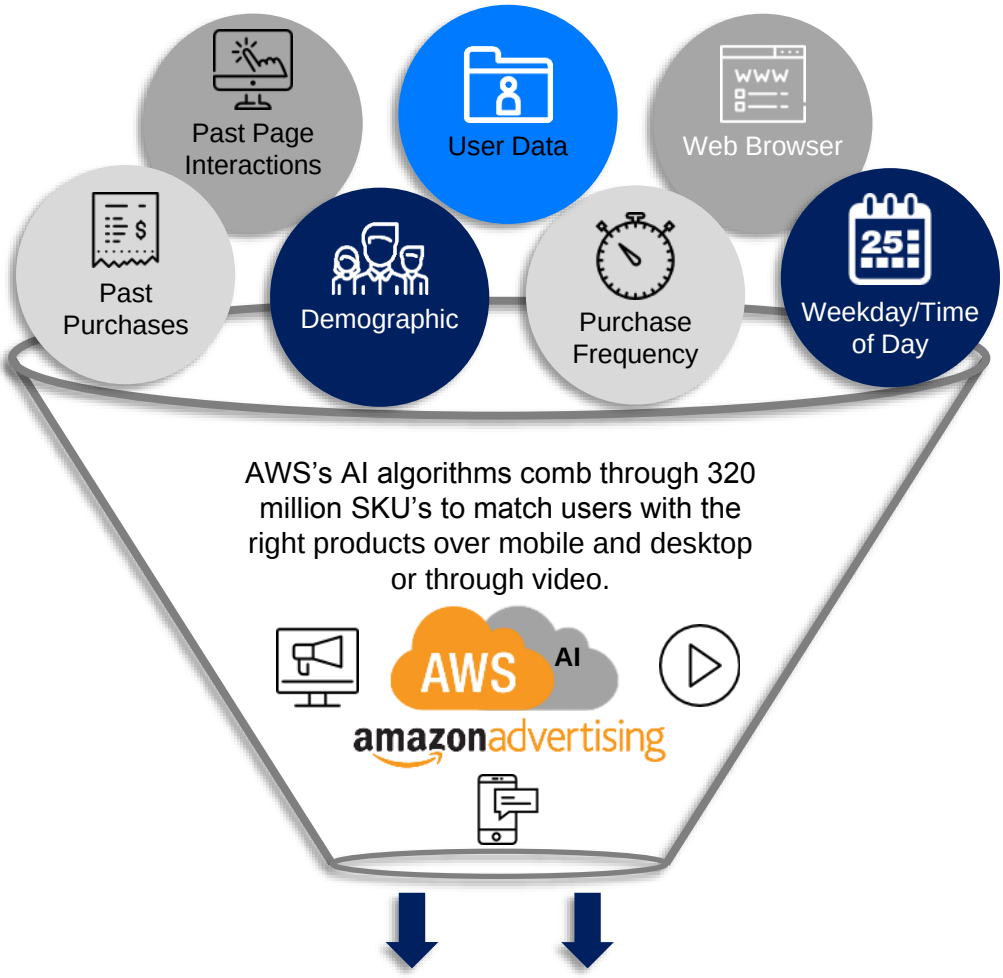
- Spotify is the market leader in audio OTT content distribution. The company has an unparalleled reach and was able to secure its position of market dominance in large part due to its commitment to excellence in data analytics initiatives.
- The company's 108.1 million subscribers represents roughly 35.5% of the 304.9 million global online music subscribers.
- One of the platform's most popular features, Discover Weekly, pushes a curated playlist of new content to users based on large proprietary datasets of songs paired with user listening habits.
- Spotify listeners who engage with Discover Weekly content on a regular basis spend twice as much time on the platform when compared to users who do not.



1. Using implicit feedback based on user interaction, Spotify predicts tracks using similar users listening patterns
2. NLP Models crawl song reviews, blogs and song metadata to create tags based on lyrics and descriptions
3. Convolutional neural networks analyze key song characteristics such as time signature, key and tempo of frequently played tracks

Ecommerce Case Study

- Amazon is the leading ecommerce platform in the United States. The company's success can be largely attributed to its prowess in leveraging data analytics initiatives to generate personalized recommendations to users.
- Amazon utilizes high-performance transaction systems, complex rendering and object caching, workflow and queuing systems, business intelligence and data analytics, machine learning and pattern recognition, neural networks and probabilistic decision making and a wide variety of other techniques.
- The company primarily uses its own proprietary technology for data analytics initiatives.



Power Search Rankings

Predict Product Demand

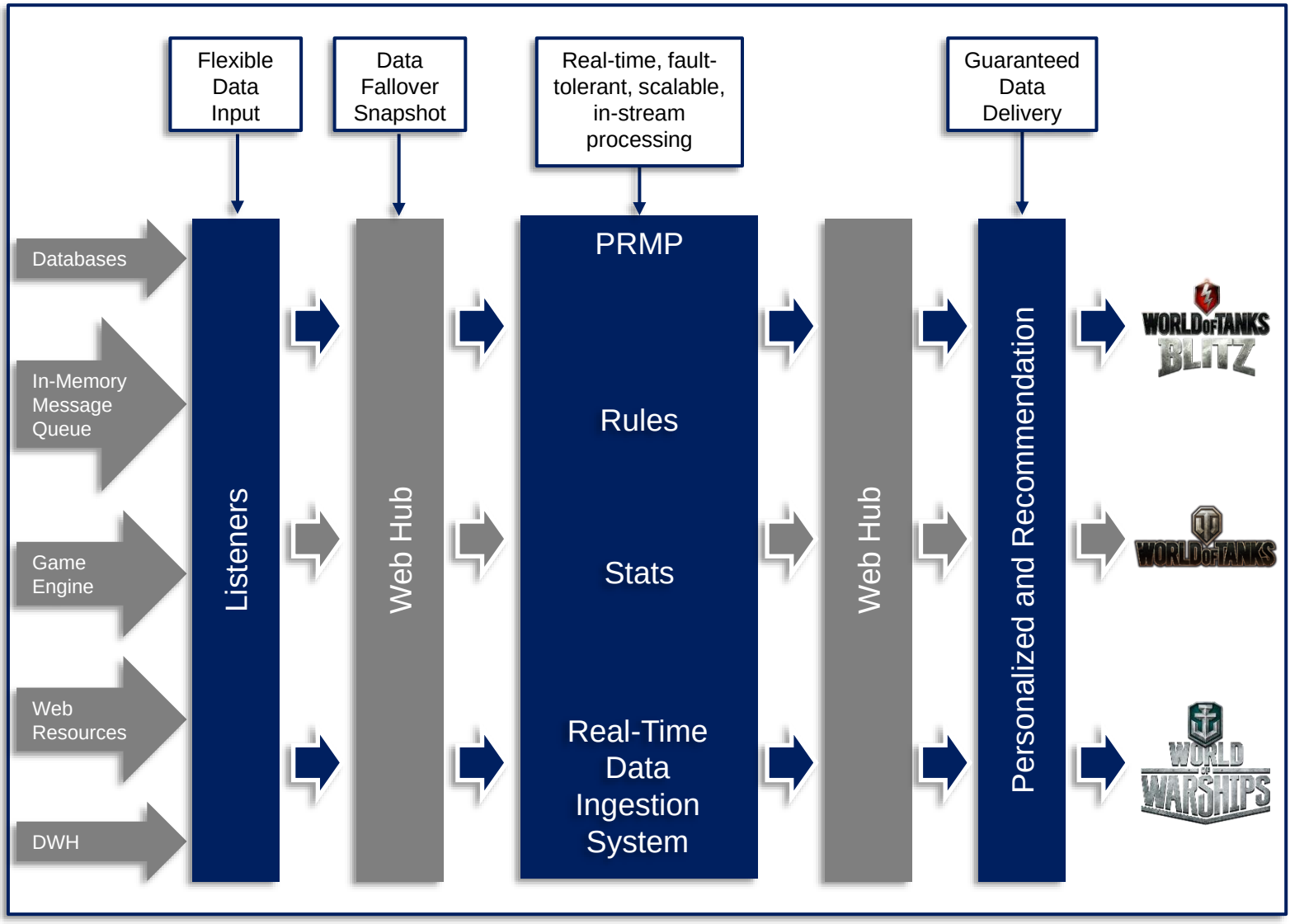
Create/Recommend Deals

Product Recommendation

Gaming Case Study

WARGAMING.NET

- Wargaming is the market leader in free-to-play massively multiplayer online games across all gaming platforms (PC, console and mobile). The number of registered users is well over 150 million. In the interest of optimizing their business and directly improving the player experience, the company invested in a data analytics platform.
- The company chose a combination of Cloudera Hadoop as a “data reservoir” and Oracle RDBMS to store summarization information for Data Marts and KPI reporting.
- The company has been able to increase the number of campaigns being run simultaneously by 10 times due to increased automation.



A Crowded Market Landscape

Data Analyst Platforms

Microsoft
alteryx
MODE
incorta.
Datameer
stay curious
ENDOR

Data Science Platforms

ALGORITHMIA
databricks
data iku
IBM
DOMINO
rapidminer
Microsoft

BI Platforms

aws
THOUGHTSPOT
ARCADIA DATA
SISENSE
Microsoft
ThoughtSpot

Visualization

Google Cloud
celonis
Qlik
plotly
TOUCAN TOCO
+ableau

Machine Learning

aws
DataRobot
Google Cloud
H2O.ai
deepsense.io
BIG DATA SCIENCE
VISENZE

Computer Vision

Azure
clarifai
deepomatic
EVER AI
clarifai
trax

AI

bluevision
IBM Watson
PETUUM
Fortress IQ
sentient
Cortana

Speech and NLP

Google Cloud
twilio
NUANCE
Mobvoi
SoundHound Inc.
SMARTLING

Storage

aws
Google Cloud
PURESTORAGE
Azure
nimblestorage

Integration

Informatica
Infoworks
MuleSoft
TEALIUM

Transformation

alteryx
talend
tamr
data united
unifi

Governance

IBM
SailPoint
dremio
IMMUTA

What Comes Next?

AI & ML	▪ By 2022, 75% of new end-user solutions leveraging AI and ML will be built with proprietary commercial solutions rather than open source platforms. Commercial vendors will provide superior project and model management, transparency, data lineage and platform cohesiveness.
Augmented Analytics	▪ Augmented analytics uses AI and ML to automate data preparation and sharing. It simplifies data to present clear imaging and sophisticated tools. By 2020, augmented analytics will be a leading source in analytics and business intelligence, data science, ML platforms and embedded analytics.
Advanced Data Management	▪ Augmented Data Management allows for firms to leverage AI and ML capabilities for the purposes of data management, data integration, self-tuning and configuration. By increasing the use of self-taught technical reparation systems and data management manual tasks can be reduced up to 45% by 2022.
NLP & Conversational Analytics	▪ The introduction of NLP and conversational AI into consumer facing platforms will provide even more data from which enterprises can gain insights. The 'purification' of data makes conducting analysis easier for internal users so actionable insights can be derived to bolster the decision-making process.
Continuous Intelligence	▪ Organizations have long sought real-time intelligence, and it is now finally practical to implement these systems due to the emergence of the cloud. By 2022, more than half of major new business systems will incorporate continuous intelligence that uses real-time context data to improve decisions.

Source: Accenture, McKinsey, IBM

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Select Spotlight Transactions

2017			2018			2019		
BISAM	March '17 $205M	FACTSET	PRAGMATIX	Jan. '18 $560M	CRISIL	Linguamatics	Jan. '19 $65M	IQVIA
nimble storage	April '17 $1B	hp	UTOPUS INSIGHTS	Feb. '18 $100M	Vestas	PullString	Feb. '19 $30M	
eliza	April '17 $172M	hms	intermedix	Feb. '18 $460M	R1	ClearStory DATA	April '19 $20M	alteryx
hp	Sept. '17 $8.8B	MICRO FOCUS	Mattersight	Aug. '18 $90M	NICE	Webtrekk a mapp company	April '19 ND	mapp
Symphony HEALTHCLOUD	Sept. '17 $530M	PRAHEALTHSCIENCES	XOR DATA EXCHANGE	Sept. '18 $176M	Zelle	ATTUNITY	May '19 $560M	Qlik
guavus	Sept. '17 $215M	THALES	zhilabs	Oct. '18 ND	SAMSUNG	Periscope Data	May '19 $100M	SISENSE
DataGenic	Oct. '17 $215M	Battery Ventures BV	CALLCAP	Nov. '18 $35M	Marchex	looker	June. '19 $2.6B	Google
ALPINE DATA	Nov. '17 $215M	TIBCO	LIGHTHOUSE COMPUTER SERVICES	Dec. '18 $23M	CONVERGE	+ableau	Aug. '19 $15.7B	salesforce
CLAVIS INSIGHT	Dec.'17 $219M	ASCENTIAL	DATAWATCH	Dec. '18 $176M	Altair	METRICLY	Aug. '19 ND	VIRTUAL INSTRUMENTS
						deep 3	Oct. '19 ND	CACI EVER VIGILANT
						planeum	Dec. '19 ND	PASSPAS

Source: PitchBook

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