



# Leveraging IoT data for business and customer value

Unify disparate data volumes & operationalize AI & ML

Jeremiah Morrow

Senior Industry Product Marketing Manager - Vertica

# The Data Explosion

More data, more problems

## Growing data volumes

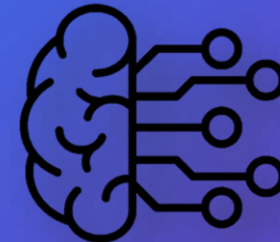
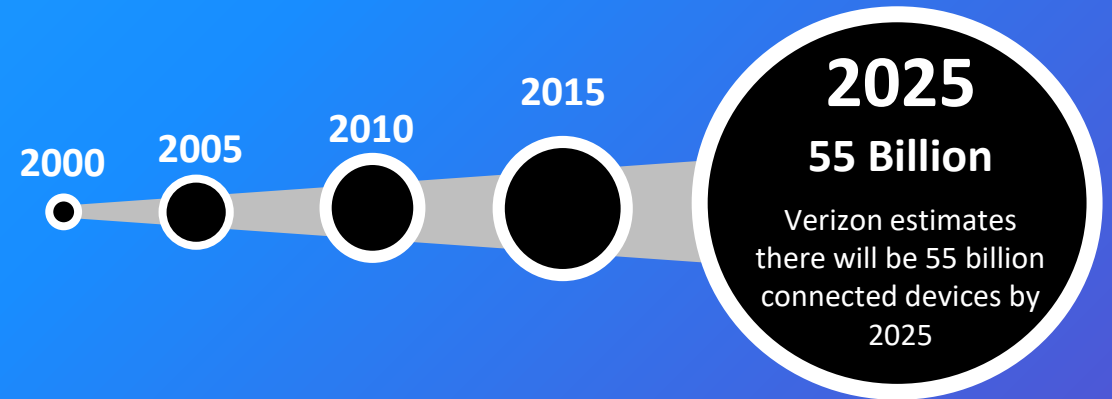
Data is growing in volume, variety and velocity. The fastest-growing sources of data over the next 5 years will be from IoT devices.

## Data silos

Data resides on-premises and in multiple clouds, in data warehouses and object storage and HDFS data lakes, and in multiple business systems.

## Operationalizing AI & ML

8 out of 10 AI & ML models fail to make it into production, and over 50% that do fail to realize their intended value.

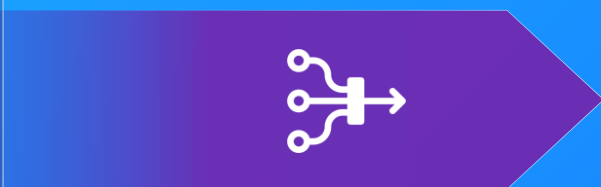


# Data Warehouse Architecture



**BATCH**

Transactional data  
Files  
Application Data  
Customer  
Operational  
Financial



Extract, Transform,  
Load (ETL)

**Analytical Database**

Reporting      Ad Hoc  
Queries

**Business Intelligence**



**BUSINESS INTELLIGENCE REPORTS, VISUALIZATION**

24    39    98

12    15    18    20    22    24    26    28

13    15    17    19    21    23    25    27    29

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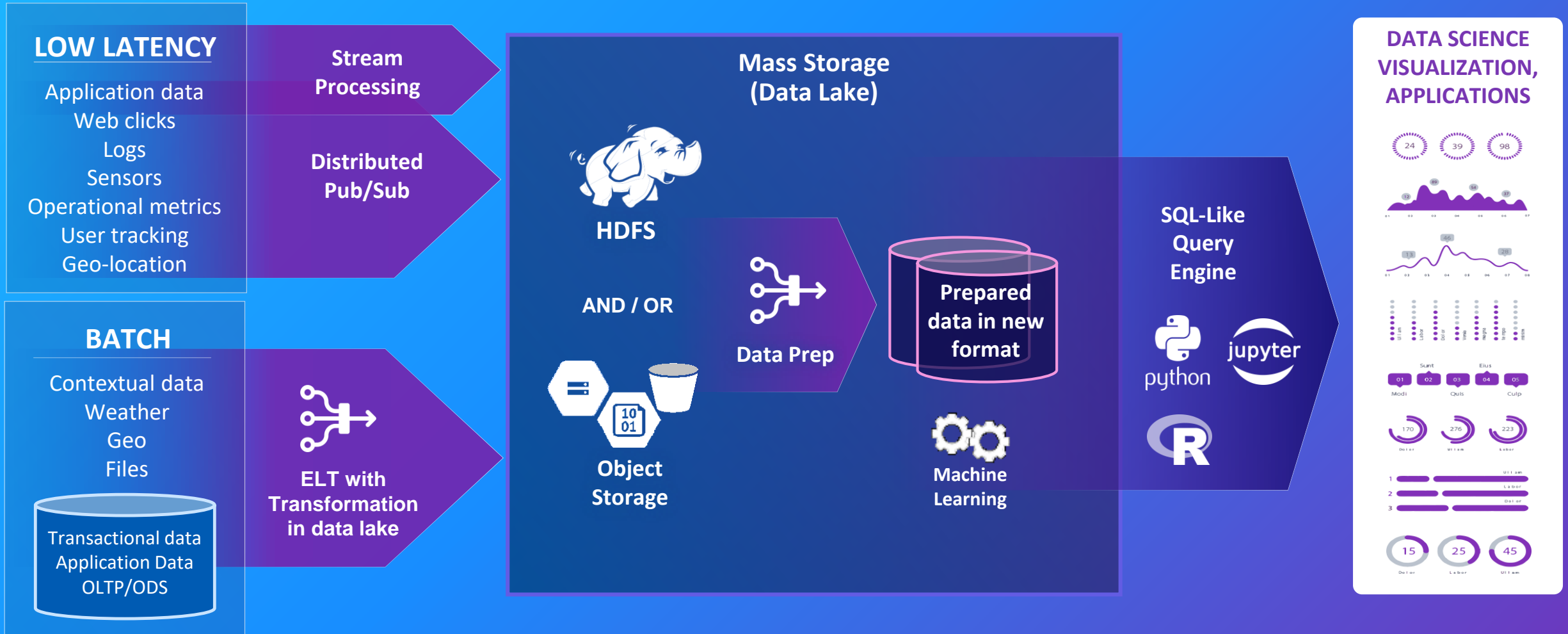
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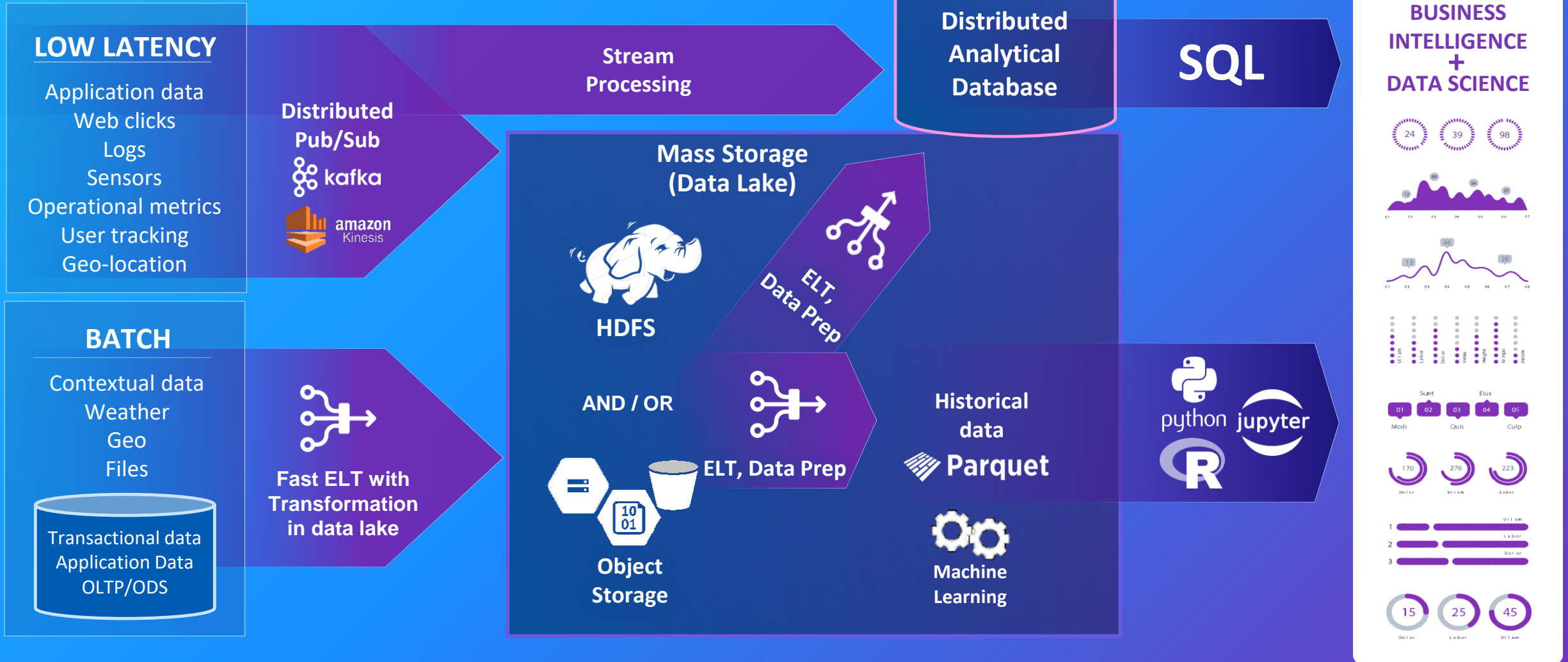
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# Data Lake Architecture



# Cooperative Architecture





# Unified Analytics Platform



## LOW LATENCY

### STREAMING DATA

- Application data
- Web clicks
- Logs
- Sensors
- Operational metrics
- User tracking
- Geo-location

### STREAM PROCESSING



## BATCH

### CONTEXTUAL DATA

- Files
- Weather
- Geo

### Batch ETL

OR



### Fast ELT

### TRANSACTIONAL DATA

- Application Data
- OLTP/ODS

# VERTICA



ROS



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Ingestion, ELT,  
Data Prep



Machine  
Learning



Ad Hoc  
Queries



Reporting



Model Evaluation,  
Deployment,  
Management

SQL



python

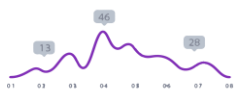


ON-PREMISES, HYBRID, CLOUD OR MULTI-CLOUD



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## BUSINESS INTELLIGENCE + DATA SCIENCE



# Operationalizing AI & ML

8 out of 10 AI/ML models never make it to production

## Barriers to Machine Learning for Enterprise Organizations

**Added Cost**

**Requires Down  
Sampling**

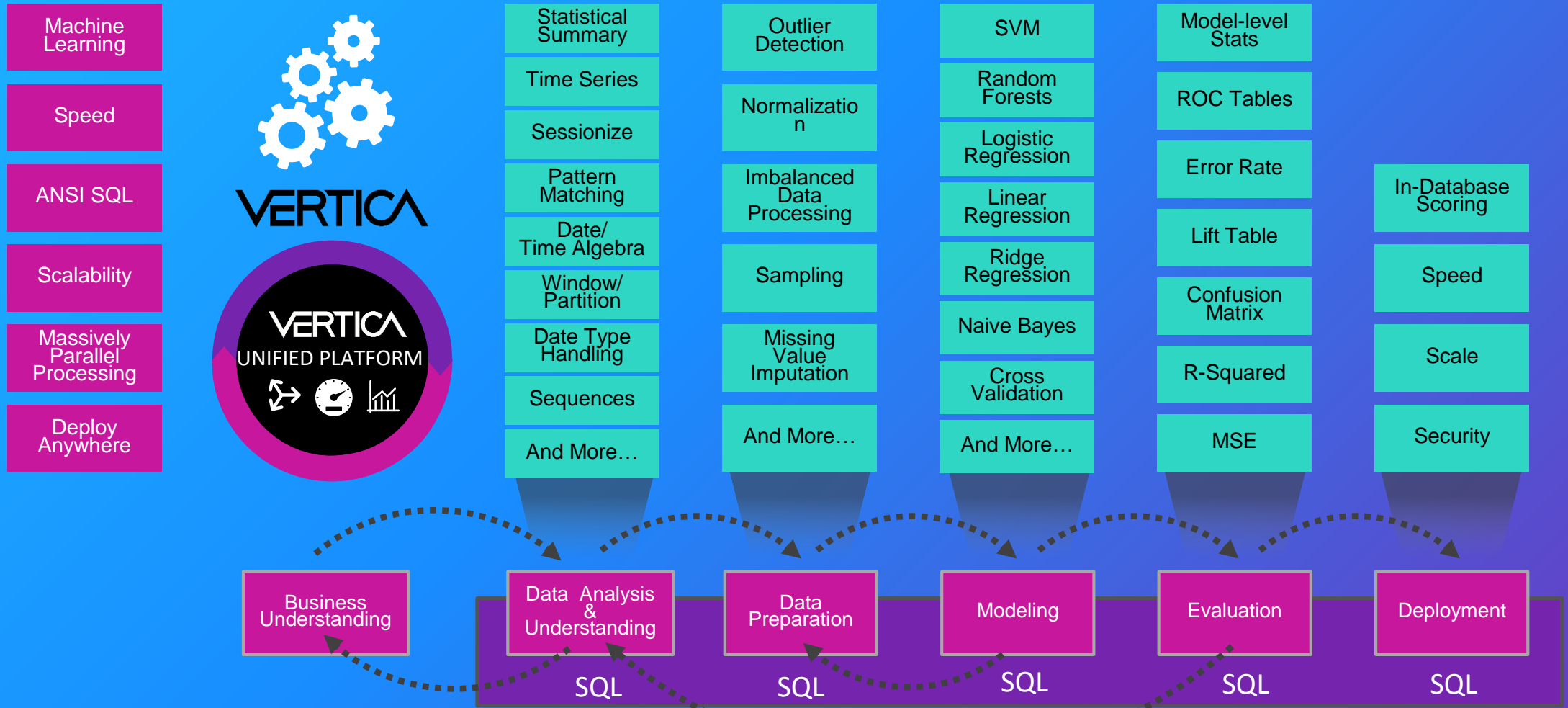
**Slower Time to  
Development**

**Slower Time to  
Deployment**

**Shortage of Data Science Skills**

# In-Database Machine Learning

Removes many barriers to operationalizing AI & ML







## High-value use cases

Philips Healthcare – Predictive Maintenance  
Climate Corporation – Smart Agriculture  
United Group – Addressable Advertising

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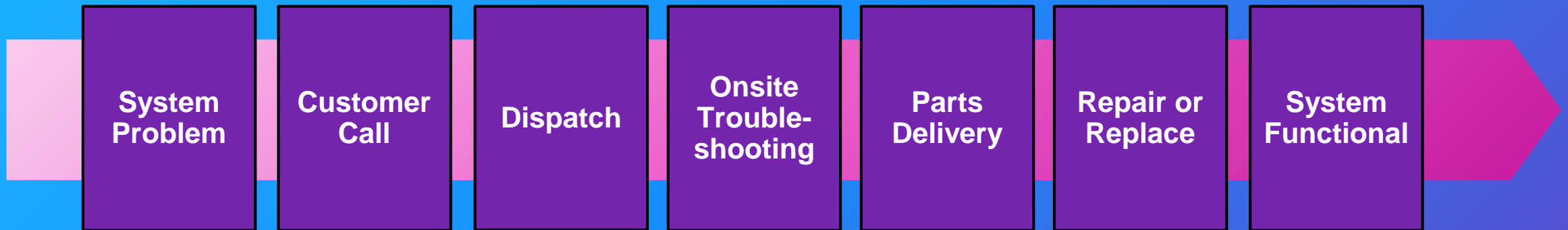
## Philips Healthcare

Predictive Maintenance for medical devices

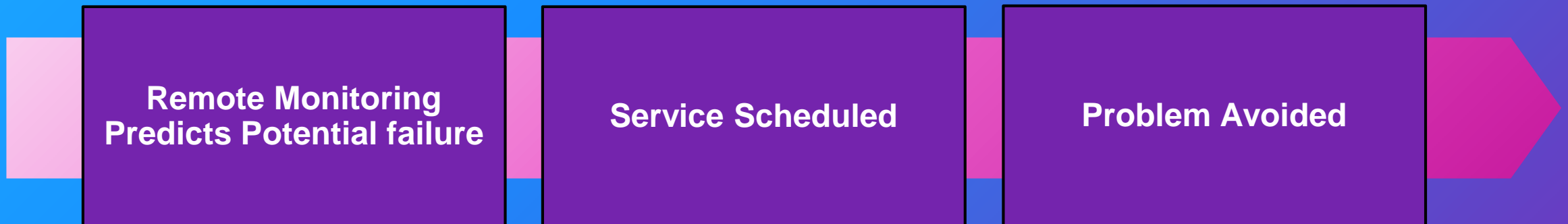
# Predictive Maintenance

Simplify business operations and create customer value

## Reactive Maintenance



## Predictive Maintenance





### LOW LATENCY



Philips Remote Service Network

STREAM PROCESSING

Mass Storage (Data Lake)



IBM Spectrum Scale



SQL



BUSINESS INTELLIGENCE + DATA SCIENCE



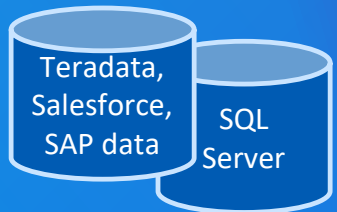
R & D Access

Remote Monitoring

Remote Service

### BATCH

CRM data  
Repair shop data  
Factory data



# A Big Data Solution

**500 TB**

of data in more than 300 tables. 30 trillion data points

**80**

different data sources integrated

**24/7**

live data feeds. Millions of logs per week.

**8**

months from scratch to production

**...and marching towards 0 unplanned downtime**

*"Now we will have more uptime on the scanner and potentially be able to see more patients...It's a new level of service for us, with a greater satisfaction." -Radiographer, New Stobhill Hospital in Glasgow*

*"Remote service provides us with an engineer online all the time. They tell us when we've got a fault before we know we've got a fault. And not only that, they can fix the fault before we knew we had a fault. And that's impressive." Cobalt Imaging, Gloucester*

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## The Climate Corporation

Smart agriculture SaaS platform improves crop yields and helps farmers manage an increasingly volatile ecosystem



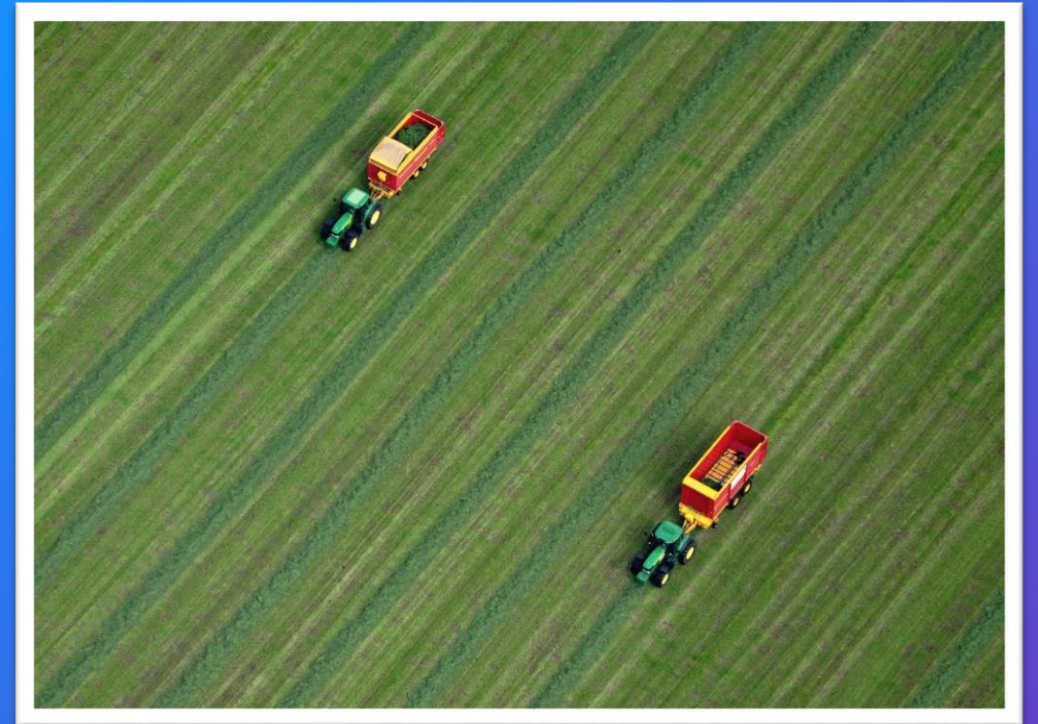
# A SaaS Solution for smart agriculture

## The challenge

The world's population is growing. Weather patterns are shifting and becoming more volatile. Farmers need to focus on sustainability and maximizing crop yields while avoiding potential disaster.

## An IoT solution

The Climate Corporation combines IoT data from farming equipment - tractors, combines, liquid applicators, and planters - with weather, geospatial, and satellite data to analyze optimal yield scenarios.



**LOW LATENCY**

Planting and harvest equipment  
Weather stations, probes, satellite imagery  
Application data - clickstreams



Mass Storage (Data Lake)



Separate cluster for data Ingest, ETL



SQL

DATA SCIENCE + BUSINESS INTELLIGENCE



**BATCH**

Bayer research trials  
Climate research farms (CRF)  
Climate research partners (CRP)  
FieldView data  
Environmental data  
Platform partner data  
Sales data  
Marketing campaigns



# An Award-Winning Application of AI & ML

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## Climate Corporation won Computing.co.uk's award for Outstanding AI/ML Industry Project

*“There are thousands of uses for AI & ML. This award is for a project that accomplished something radically different, way beyond what a manual approach could do...Food security and climate change have become crucial issues. This project gives farmers access to the tools they need to sustainably maximize their output. Agriculture is a tough industry. So the work done to simplify data capture and then transform that data for use is definitely the way forward.”*







## United Group

Addressable Advertising – a revenue opportunity for operators & publishers

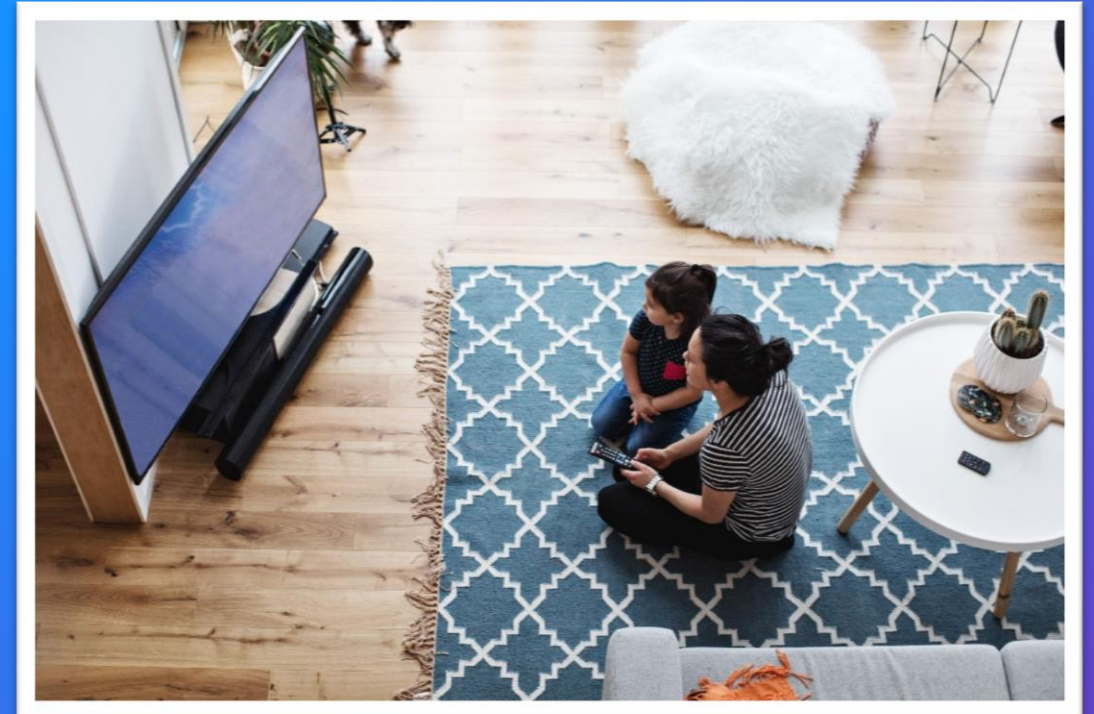
# Addressable Advertising requires unified analytics and AI & ML

## The challenge

Telecommunications operators have a wealth of customer data and are in prime position to monetize that data with ad revenue – but will need to combine data from multiple sources and operationalize AI & ML to be successful.

## United Group's VIDA Solution

United Group combines 50+ customer and device profile attributes to feed a model that fills ad blocks in real-time via their IPTV platform.



# Takeaways – 3 Big Things

IoT data is here now and companies who are able to leverage it have an opportunity to gain an advantage over their competitors.

Data silos are the most consistent challenge we see for producing real-time and predictive insights. Moving all of the data to a single repository is a complex, expensive, time consuming project. You should care more about the analytics than where and how your data is stored.

Operationalizing AI & ML appears in virtually every CEO's letter to shareholders but a majority of models don't make it into production. In-database ML simplifies and accelerates the ML process, produces more accurate models, and helps companies get predictive models into production fast.



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Q&A

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Jeremiah Morrow

Senior Industry Product Marketing Manager – Vertica

[Jeremiah.morrow@microfocus.com](mailto:Jeremiah.morrow@microfocus.com)

[www.linkedin.com/in/jeremiahmorrow/](https://www.linkedin.com/in/jeremiahmorrow/)