# Simplifying Digital Transformation with InterSystems IRIS Data Platform

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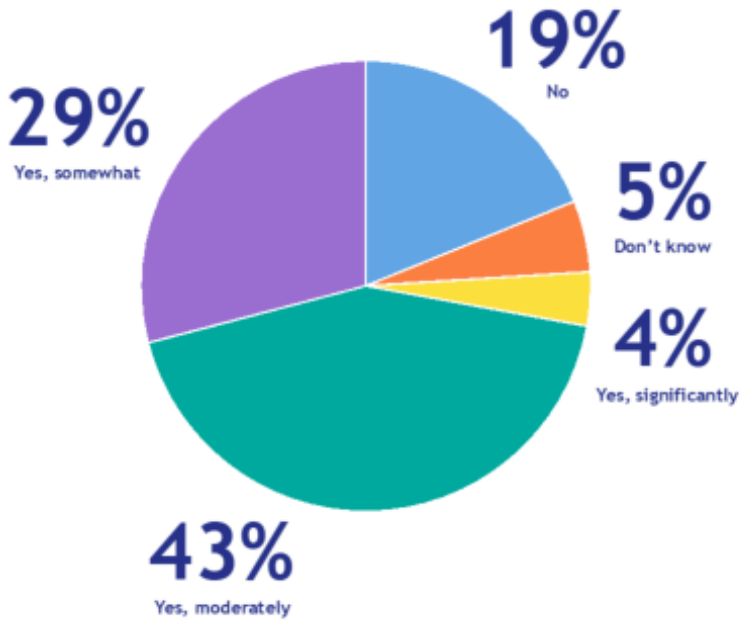
# Digital Transformation Requirements

**Successful Digital Transformation** Initiatives Require New Applications That…

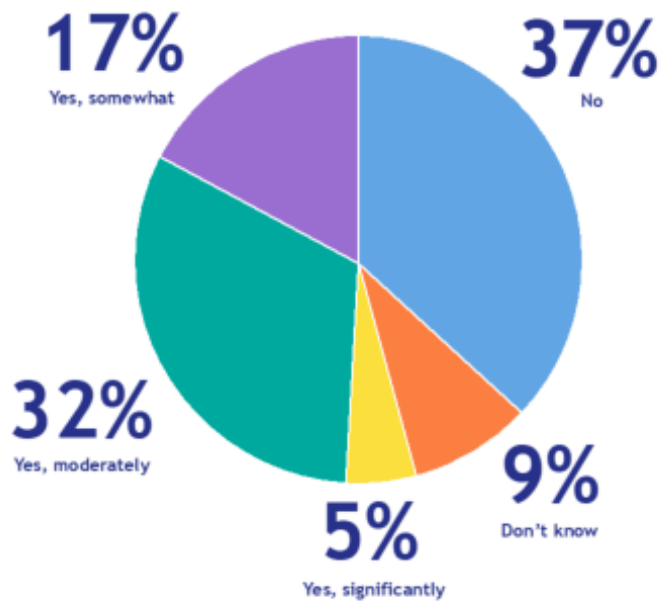
- Are Smarter…
- …And Faster
- Incorporate More Data From More Sources
- Work Seamlessly With Existing Infrastructure
- Scale On Demand
- Are Simpler to Build and Manage

# Faster




**Q.** Has the inability to analyze current live data inhibited your organization's ability to take advantage of business opportunities?



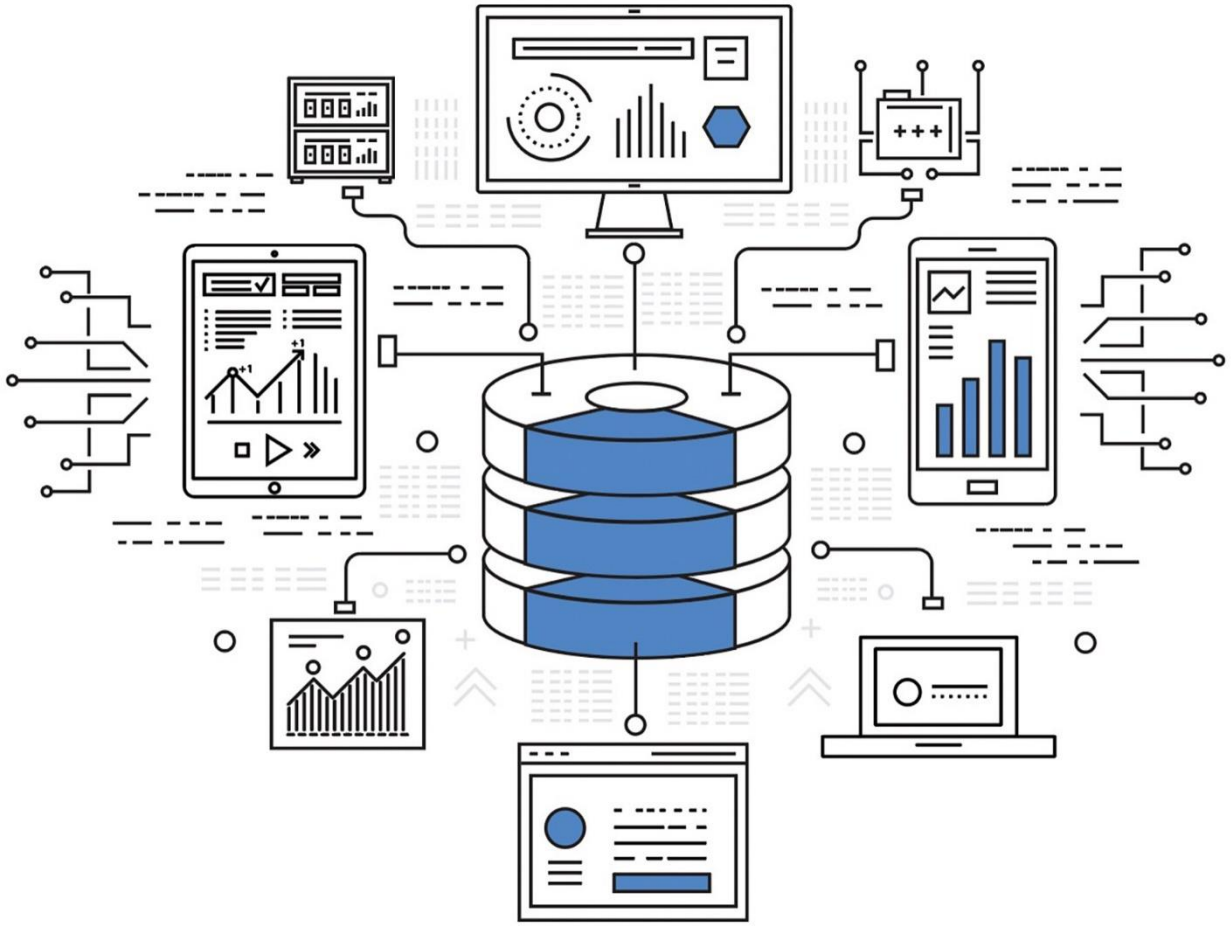

**Q.** Has the inability to analyze current live data inhibited your organization's ability to improve operational efficiency?

**Source: IDC,Choosing a DBMS to Address the Challenges of the Third Platform**

# Simpler

"We have seen that most users need a **broad variety of data type support** that goes well beyond what native RDBMSs provide."



"We have also seen that **maintenance of many databases leads to excessive cost and complexity** in the data center."

"We have seen that **tactical decisions cannot be supported as long as data is segregated** into transactional and analytical databases."

**"The answer is to concentrate key,** closely related data together for combined analytic and transaction processing, ideally included a range of data types in support of digital transformation."

**Source: IDC,Choosing a DBMS to Address the Challenges of the Third Platform**

# Top Barriers to Successful Digital Transformation

| Showing Top Nine Responses for Overall Respondents | Retail (n = 120) | Top Performers (n = 162) | Typical Performers (n = 1,976) | Trailing Performers (n = 160) | Overall Total (n = 2,399) |
|---|---|---|---|---|---|
| Skills/Resources | 23% | 27% | 26% | 22% | 26% |
| Funding/Budgets | 15% | 19% | 17% | 16% | 17% |
| Management Sponsorship /Understanding/Relationships | 5% | 10% | 8% | 16% | 8% |
| Culture/Structure of Organization | 8% | 4% | 8% | 10% | 8% |
| Technology Challenges (Legacy, Security, etc.) | 7% | 8% | 5% | 3% | 5% |
| Lack of leadership /Planning/Strategy | 10% | 4% | 5% | 6% | 5% |
| Capacity/Willingness to Change | 7% | 2% | 5% | 4% | 4% |
| It/Business Alignment | 6% | 6% | 5% | 3% | 4% |
| Business Value of IT | 3% | 2% | 4% | 7% | 4% |
| | Percentage of Respondents | | | | |

What is your biggest barrier to achieving your objectives in your role?
Coded open-text responses.

Source: Gartner 2017

# How Can We Simplify Digital Transformation Initiatives?

# Unified Data Platform

Real-Time

Business Intelligence

Cloud Provisioning

Relational DBMS

Data Integration

Object Store

Application Integration

Document Store

Orchestration

Key-Value Store

Workflow

In Memory DBMS

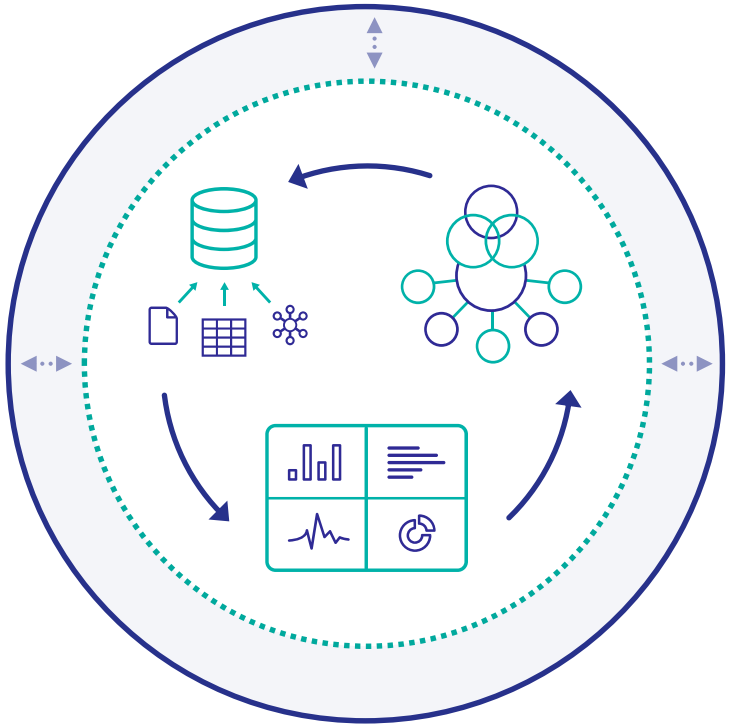
Natural Language Processing

Data Warehouse

Advanced Analytics

API Management

Data Lake



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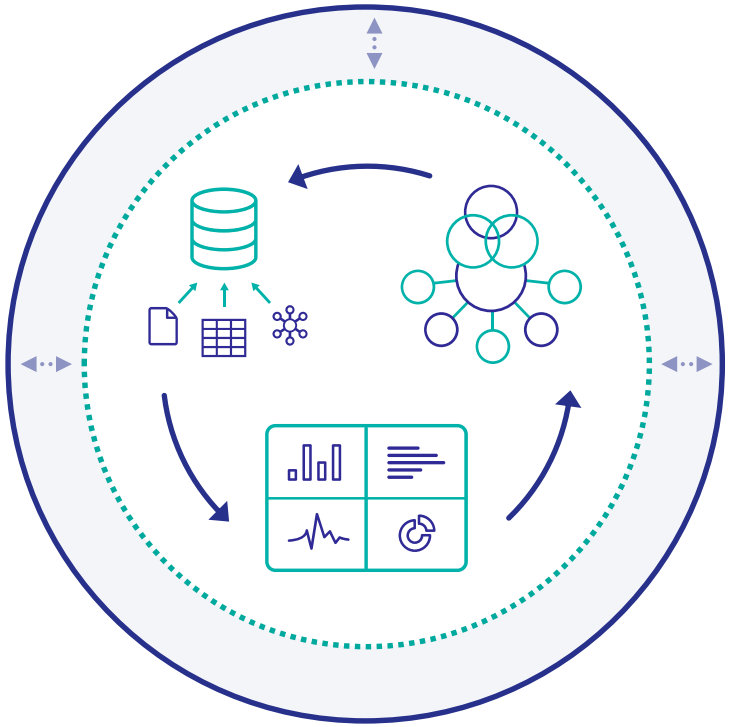
# InterSystems IRIS Data Platform

## A Unified Platform for Data Intensive Analytic Applications



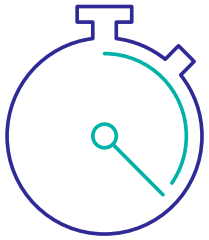
| | | |
|---|---|---|
| **Multi - Model** | • Relational<br>• Document | • Multidimensional<br>• Object |
| **Multi - Workload** | • HTAP with Isolated Workload Processing<br>• Unique Approach to Big Data Analytics<br>• ACID Transactions + Real-Time Indexing | |
| **Open Analytics** | • Analytic SQL<br>• Business Intelligence<br>• Natural Language Processing | • Predictive Model Runtime<br>• Connector Architecture |
| **Interoperability** | • Languages and Tools<br>• Data Integration<br>• Application Integration | • Composite Business Process Orchestration |

**Flexible Cloud | Hybrid | On Premises Deployment Options**

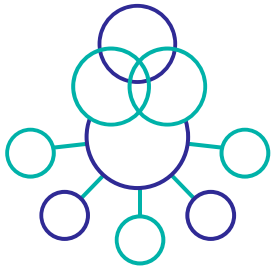
 

# InterSystems IRIS: Key Themes

Simplicity

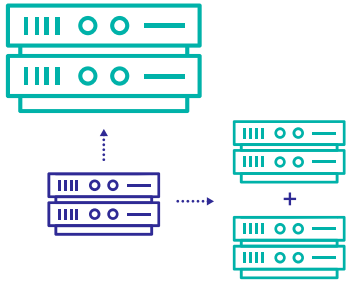


Real-Time



Interoperability

Big Data & Advanced Analytics



Scalability

Cloud

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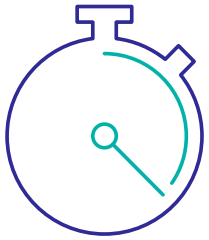
# Key Themes

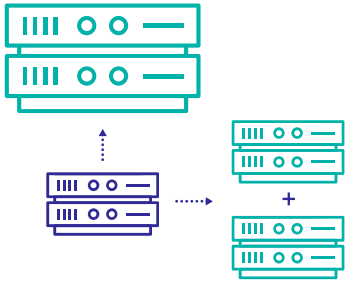
Simplicity



Real-Time

Interoperability

Big Data & Advanced Analytics



Scalability

Cloud

# Real Time

Transactions / Queries

**Less than one microsecond**

Process a single record transaction
Create the record in memory
Allow the record in memory to be accessed
(<8kB record)

Transaction Log

**Less than 20 microseconds**

- Create the durable journal file entry for the transaction
- Using commercially available NVMe storage

Persist to Disk

**Configurable**

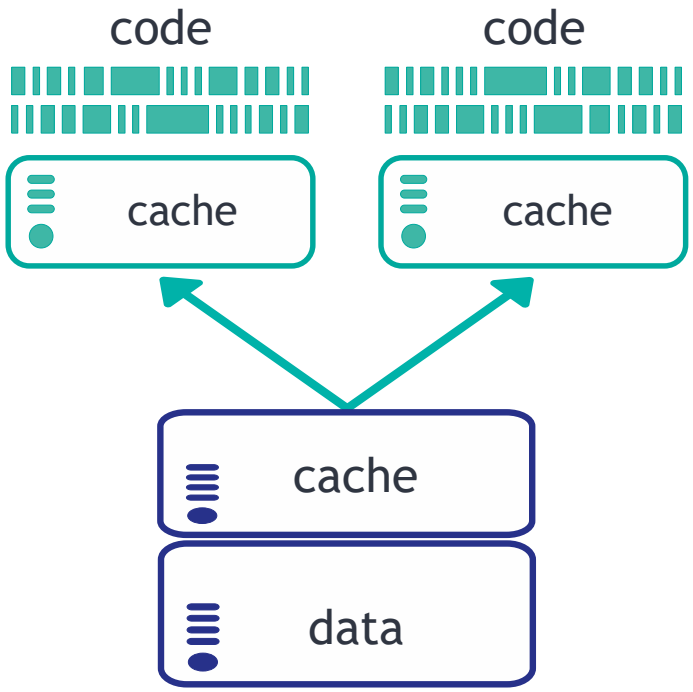
Transactions are automatically persisted to disk
Synchronous or asynchronous
Configurable based on time intervals and/or buffer size

# Scalability

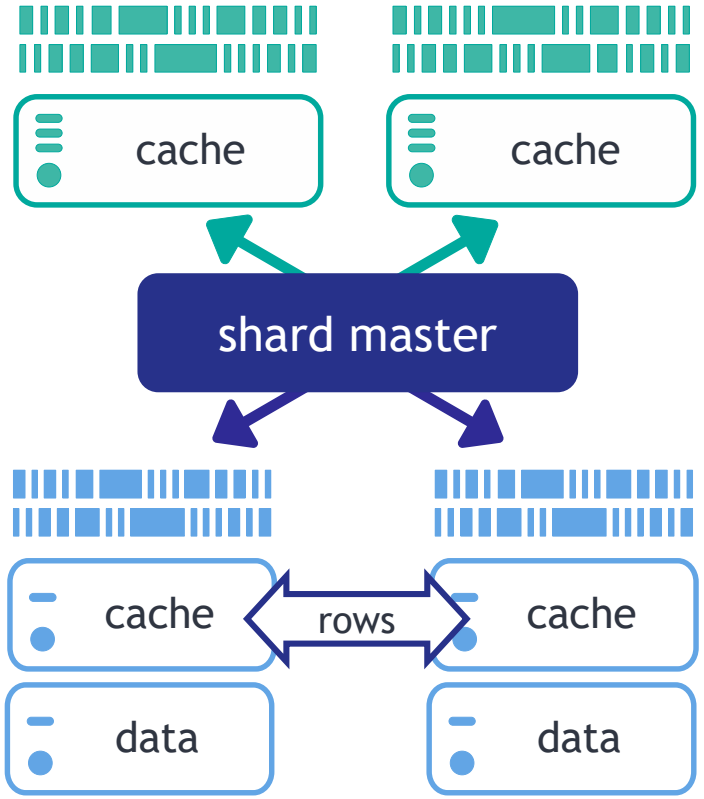
## Workload Distribution

enterprise cache protocol



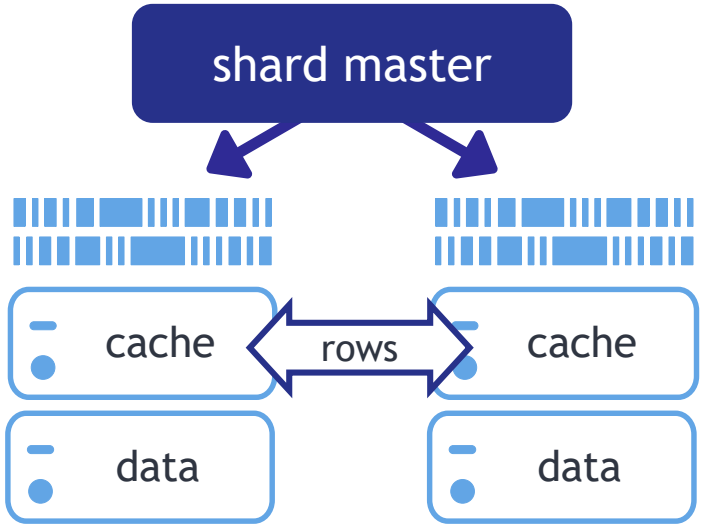

## InterSystems IRIS

intelligent inter-shard communication
with workload distribution




## Data Partitioning

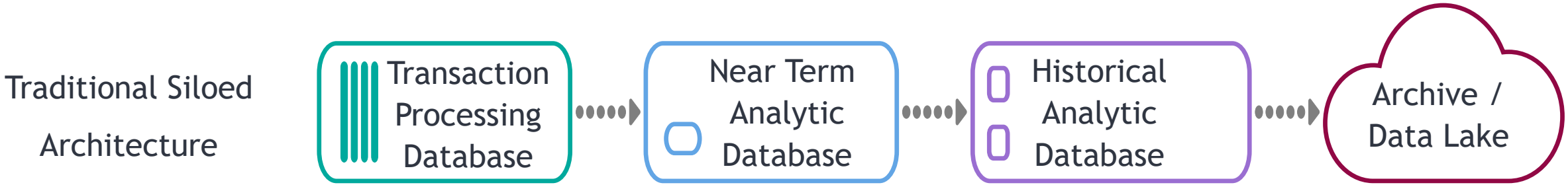
intelligent inter-shard communication



# Customer Use Case: Transactional-Analytics at Scale

- Global investment bank with 50,000 employees and $1 trillion (USD) assets under management
- Replaced in-memory operational DBMS
- Eliminating near term and historical DWs
- Zero issues even during peak trading periods





# Customer Use Case: Internet of Things

- 5th largest shipbuilder in Europe
- Manages 65,000 different real-time signals from a wide variety of sensors
- Combines real-time and non-real-time data
- Reduced development time for additional projects by 80%

*"We have been able to develop **a better system than anybody else in the world**. It **differentiates us from all competitors**. In some cases we have been **able to sell ships thanks specifically to our integrated ship information system**; sometimes it has been more important than the ship itself."*

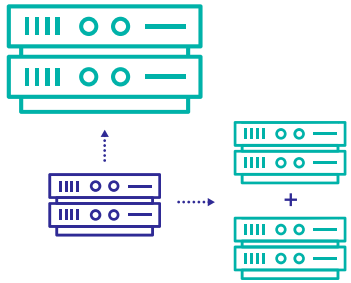
# Key Themes

Simplicity

Real-Time

Interoperability

Big Data & Advanced Analytics



Scalability

Cloud

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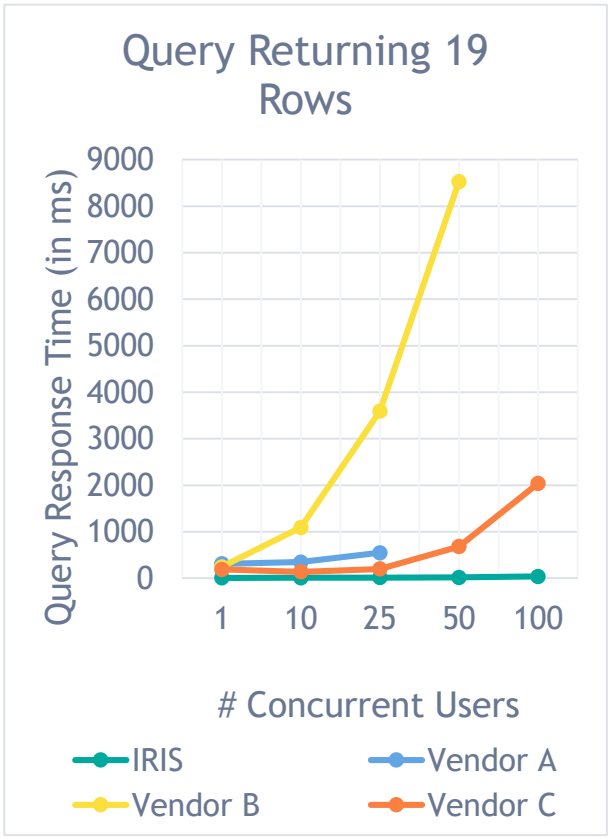
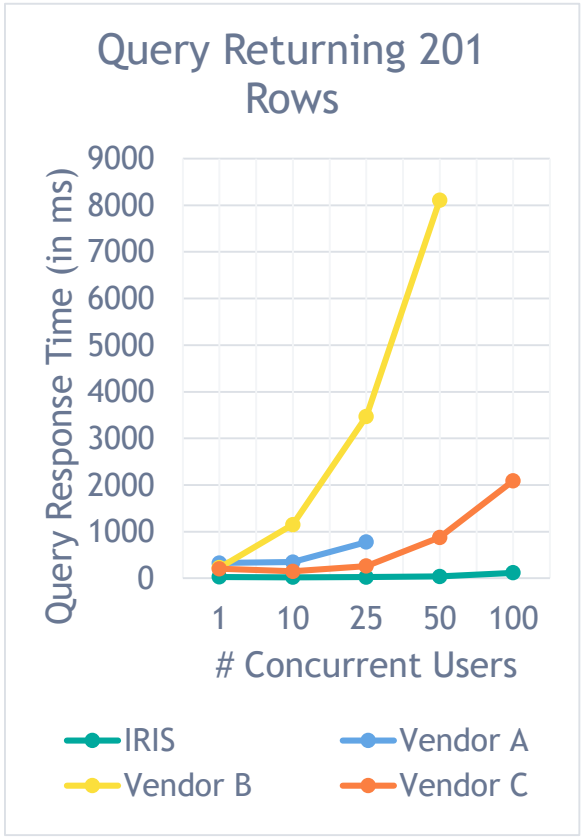
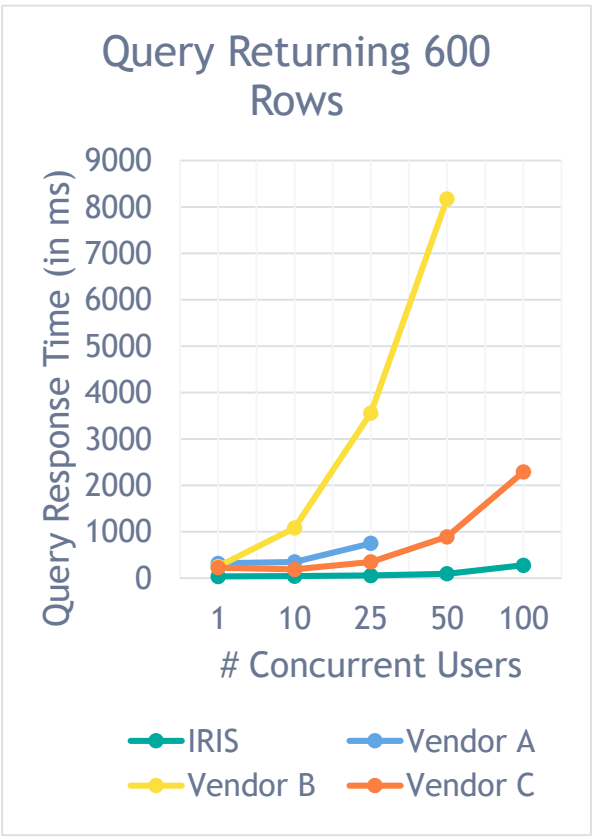
# Customer Use Case: Analytics on Distributed Data

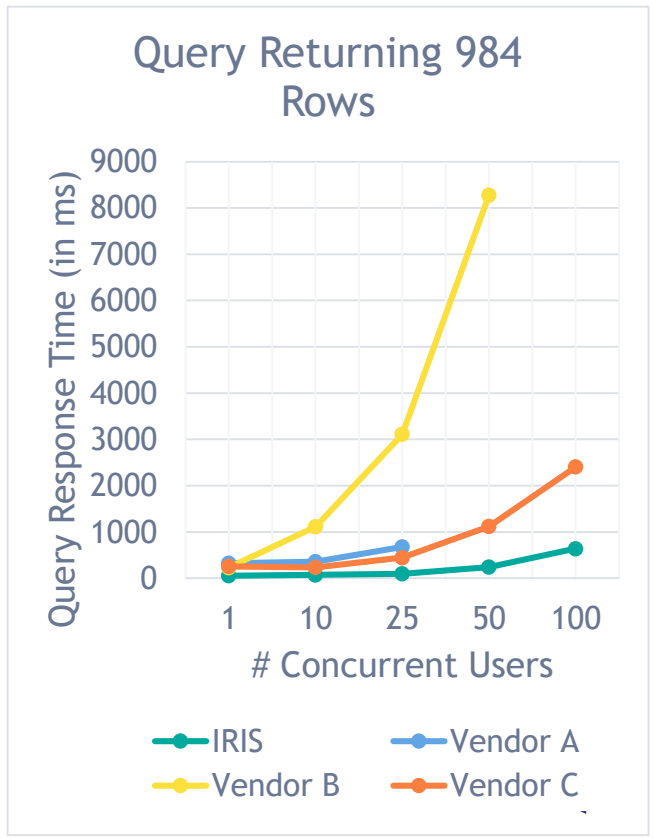
**RESULTS**
- Better Performance
- On ~10X More Data
- Using Less Infrastructure
- Zero Query Failures

| Database | Configuration | Days of Data |
|---|---|---|
| **InterSystems IRIS** | **4 VMs: 8 cores, 96GB RAM, 400GB local storage** | **135** |
| Vendor A (In Memory DBMS) | 8 VMs: 16 cores, 256GB RAM, 400GB local storage | 14 |
| Vendor B (In Memory DBMS with Column Store) | 8 VMs: 16 cores, 256GB RAM, 400GB local storage | 14 |
| Vendor C (Column Store Data Warehouse) | 3 dedicated physical servers, each with 24 cores and 256GB RAM, 2TB shared SAN storage | 20 |

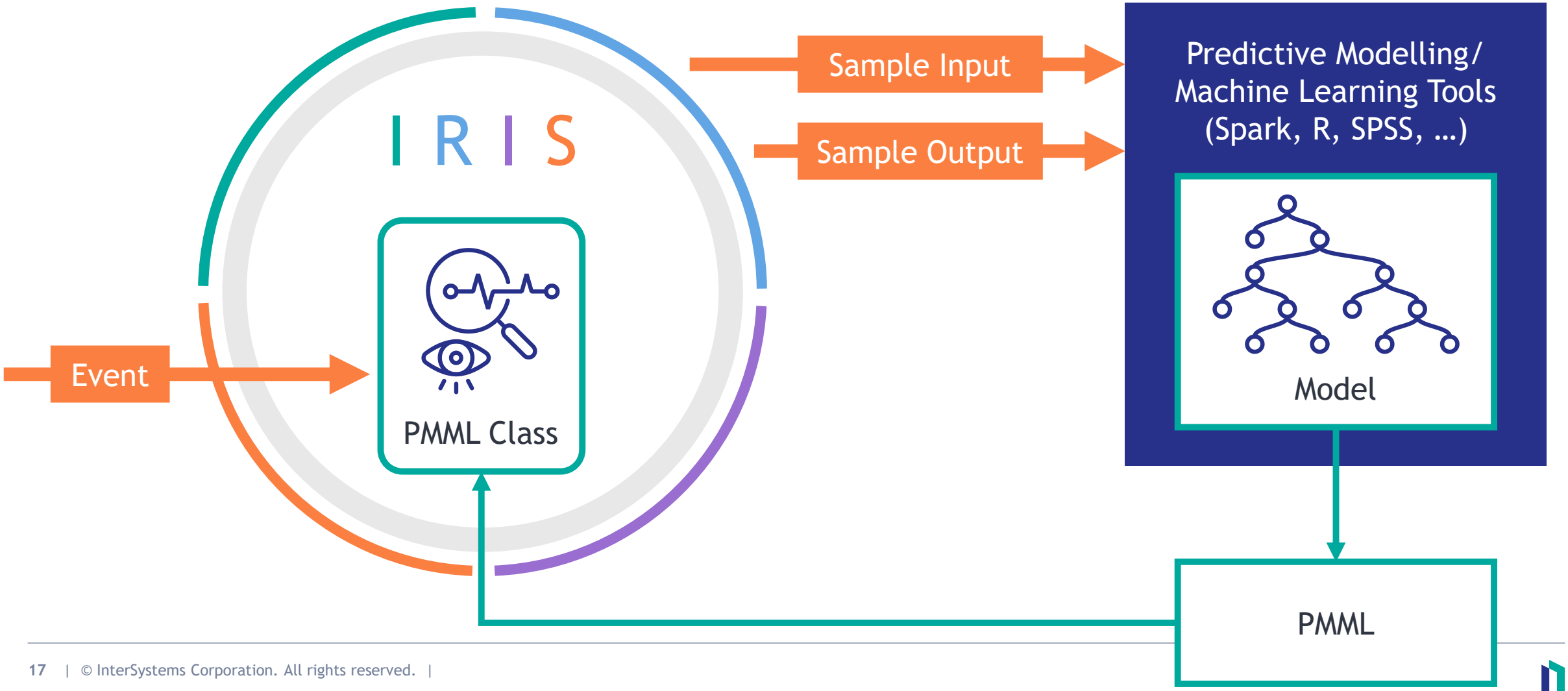


# Open Analytics

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# Customer Use Case: “Operationalize” Machine Learning

## Risk Model Learning

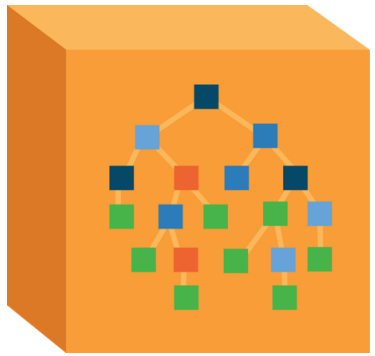
### Any Data Source

- Demographics
- Payer
- Zip Code
- Diagnoses
- Procedures
- Encounter history
- Claim history
- Medications
- Vital signs
- Orders and results
- Assessments
- Observations
- Clinical notes
- Cost

### Patient Profile

- Age / gender cohort
- Family history
- Social determinant
- Behavioral
- Modifiable
- Mental health
- Chronic disease
- Disease exacerbations
- Clinical
- Medication
- Utilization
- Care gaps

### Machine Learning / Artificial Intelligence / Risk Engine



## Risk Assessment

### Individual & Population Risk Management

- Predicted future cost
- Risk of inpatient admission
- Risk of emergency dept (ED) visit
- Risk of acute myocardial infarction (AMI) event
- Risk of cerebrovascular accident (CVA) event
- Risk of mortality
- Risk of chronic disease onset, including:
  - Risk of CHF, COPD, diabetes, CKD, hypertension, 30+ more

### Acute Episode Risk Management

- Predicted length of stay
- Risk of hospital acquired infections
- Risk of sepsis
- Risk of mortality
- Risk of 30 day inpatient readmission
- Risk of 30 day ED re-visit

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# Customer Use Case:  Public Safety

- Provides the core data management and application infrastructure supporting all **196 local police zones and five federal zones**
- Correlates dissimilar information about **events, people, places,** and other details in various formats to enable cross-referencing and analysis of structured and unstructured data
- Improves reliability and performance, simplifies infrastructure, reduces costs
- Continuous usage even while disconnected from the network
- Supports 36,000 concurrent users and 32,000 connected nodes


*"InterSystems was chosen because it provided the best combination of quality, reliability, performance, and price."*

– François Laruelle,
ICT Director of the Belgian Federal Police

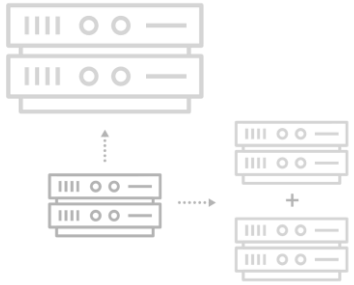
# Key Themes

Simplicity

Real-Time

Interoperability

Big Data & Advanced Analytics



Scalability

Cloud

# Support for Public, Private, On Premises, Hybrid

## Enterprise Infrastructure & Solution Abstraction

- Declarative self-contained & self-describing definition for a specific cloud provider
  - Compute nodes
  - Storage
  - Network
  - Infrastructure services

## Simple Provisioning & Deployment

- Define
- Create
- Provision
- Run InterSystems clusters via simple JSON definition templates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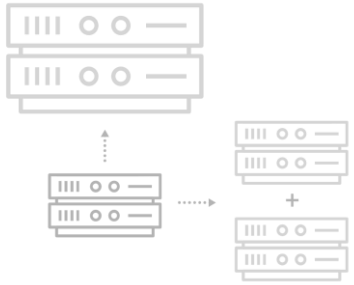

Scalability

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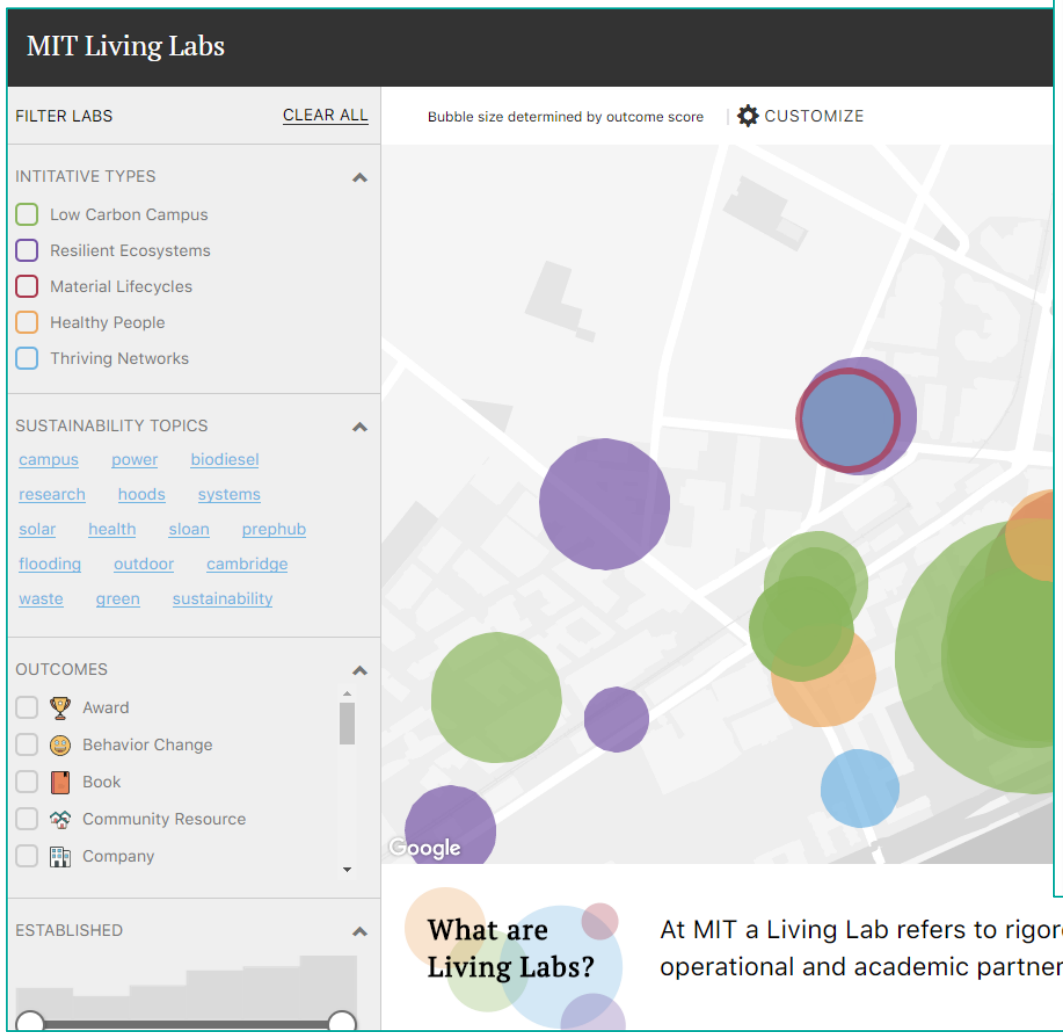
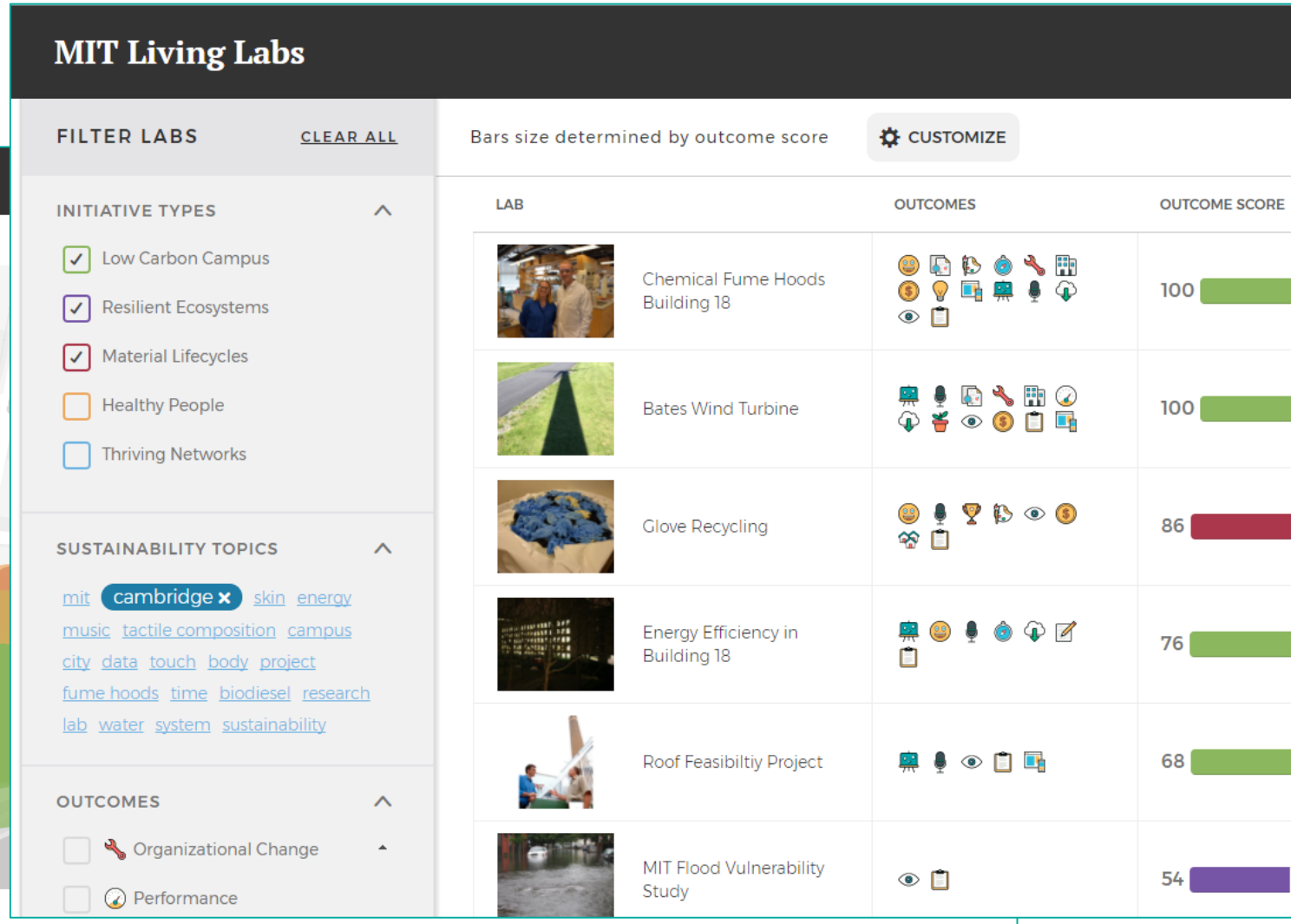
# Simplicity



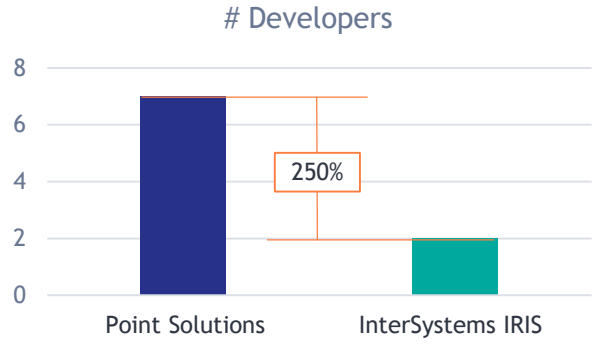



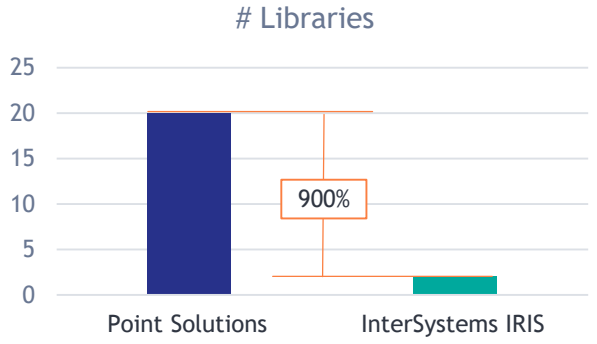

**What are Living Labs?**

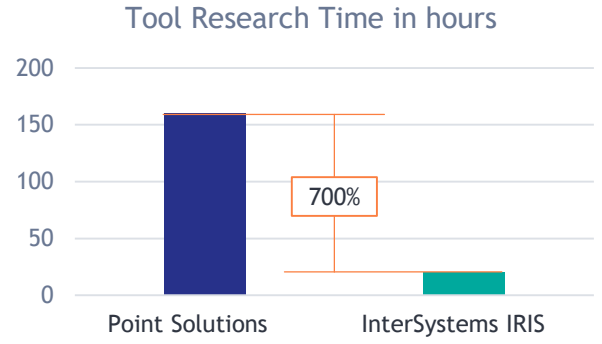
At MIT a Living Lab refers to rigorous, campus-based research. All living labs include specific attributes such as diverse operational and academic partners, sustained data collection, formal and informal learning activities and measurable outcomes.

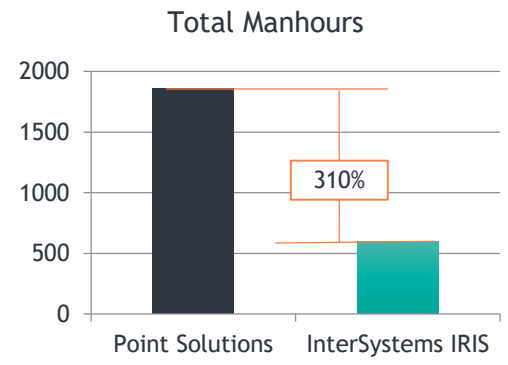
 

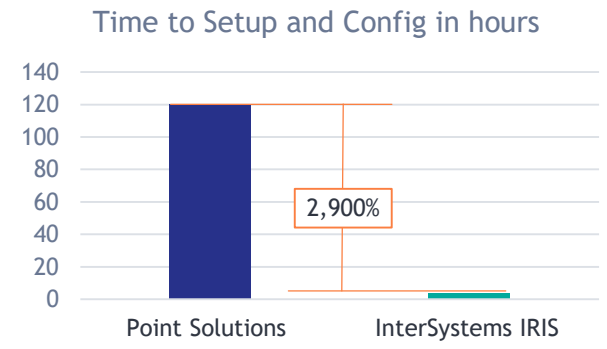
# Simplicity

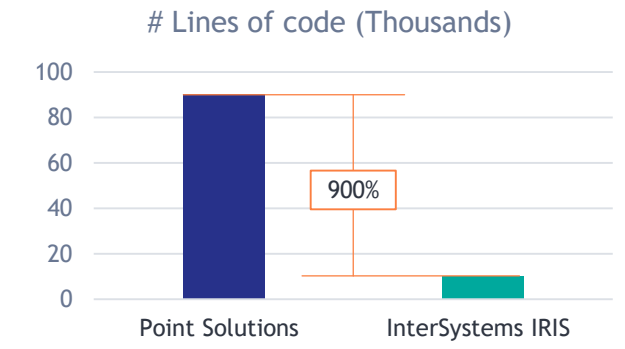


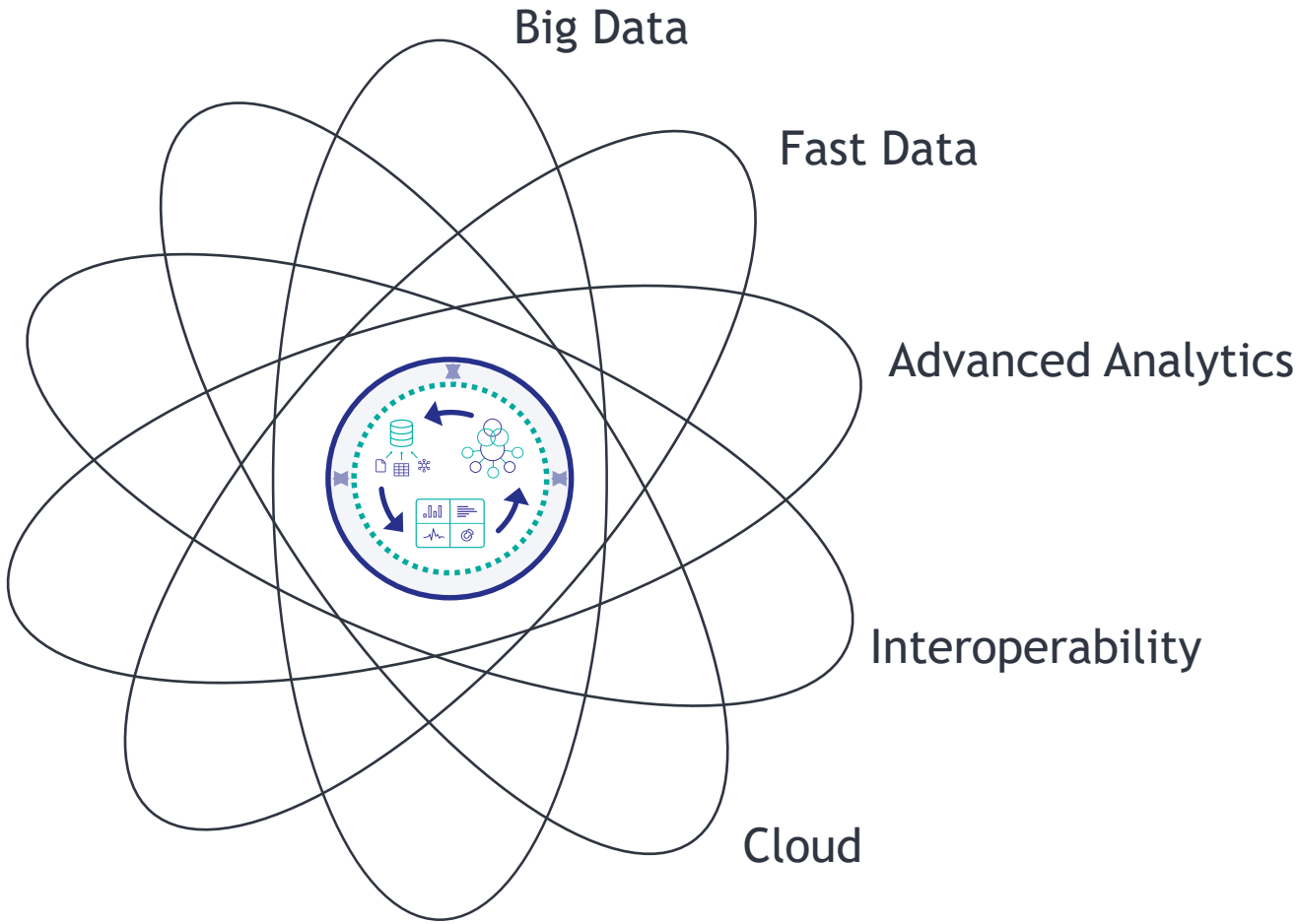



# InterSystems IRIS “Sweetspot”



The power behind what matters.

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Health | Business | Government

*Dank Je!*

*Joe Lichtenberg*
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