

Real-time Streaming Insight & Time Series Data Analytic

For Smart Retail

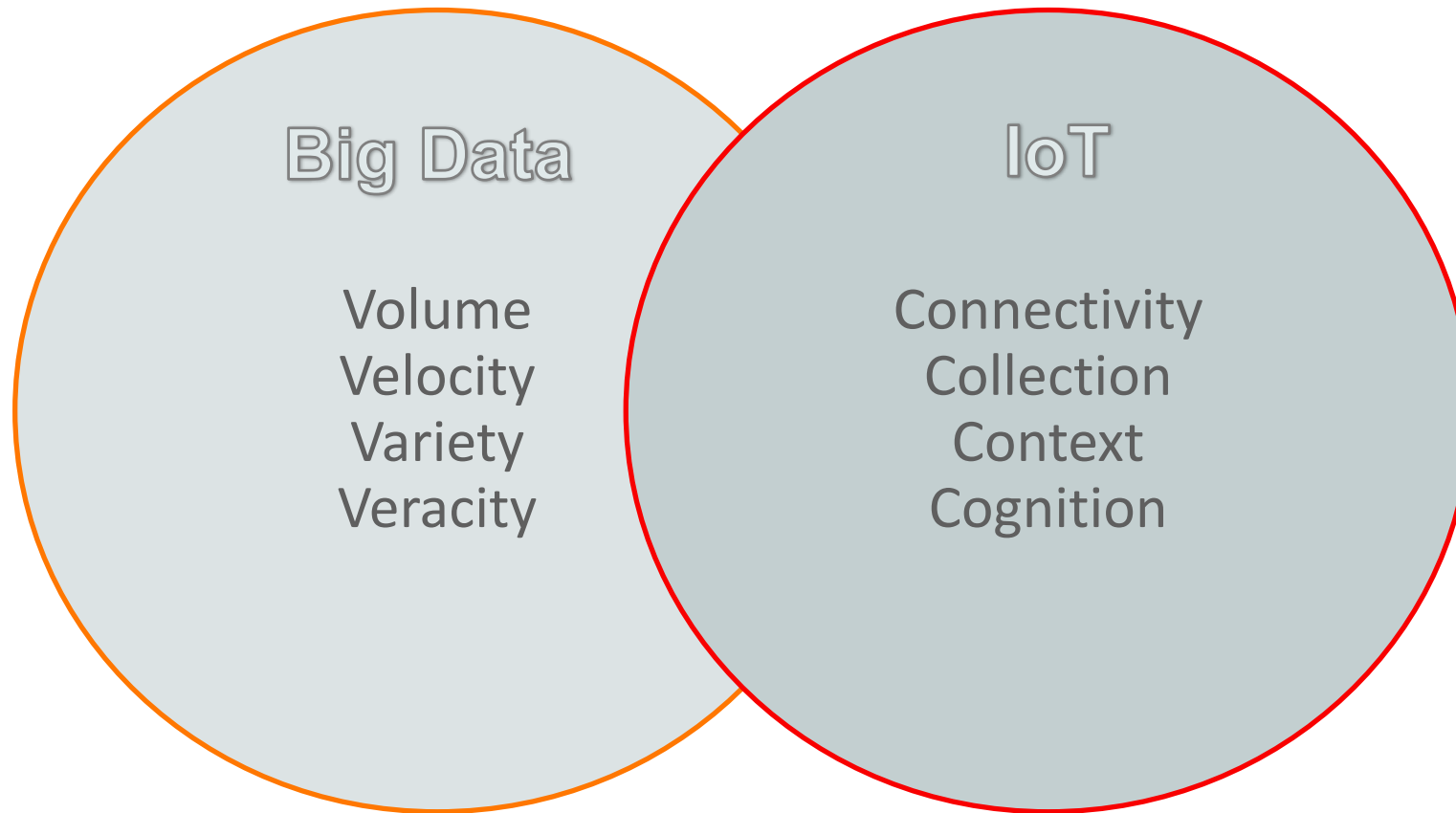
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Economic Characteristics of Data

“Data is the New Oil”then “Analytics is the new fuel”

Oil ----> Fuel	Data ----> Analytics
Oil is raw and is of little direct use	Data is raw and is of little direct use
Oil has Potential Energy	Data has Potential Value
Gas (refined Oil) has more 5x to 10x the Potential Energy than oil	Analytics (refined Data) has more Potential Value than Data
Burning Gas to create motion converts Potential Energy to Kinetic Energy	Applying data sciences to optimize decisions converts Potential Value to Kinetic Value
Oil is converted into fuel that powers the economy	Data is converted into Analytics that powers the business

4V s Meeting 4Cs



Mapping

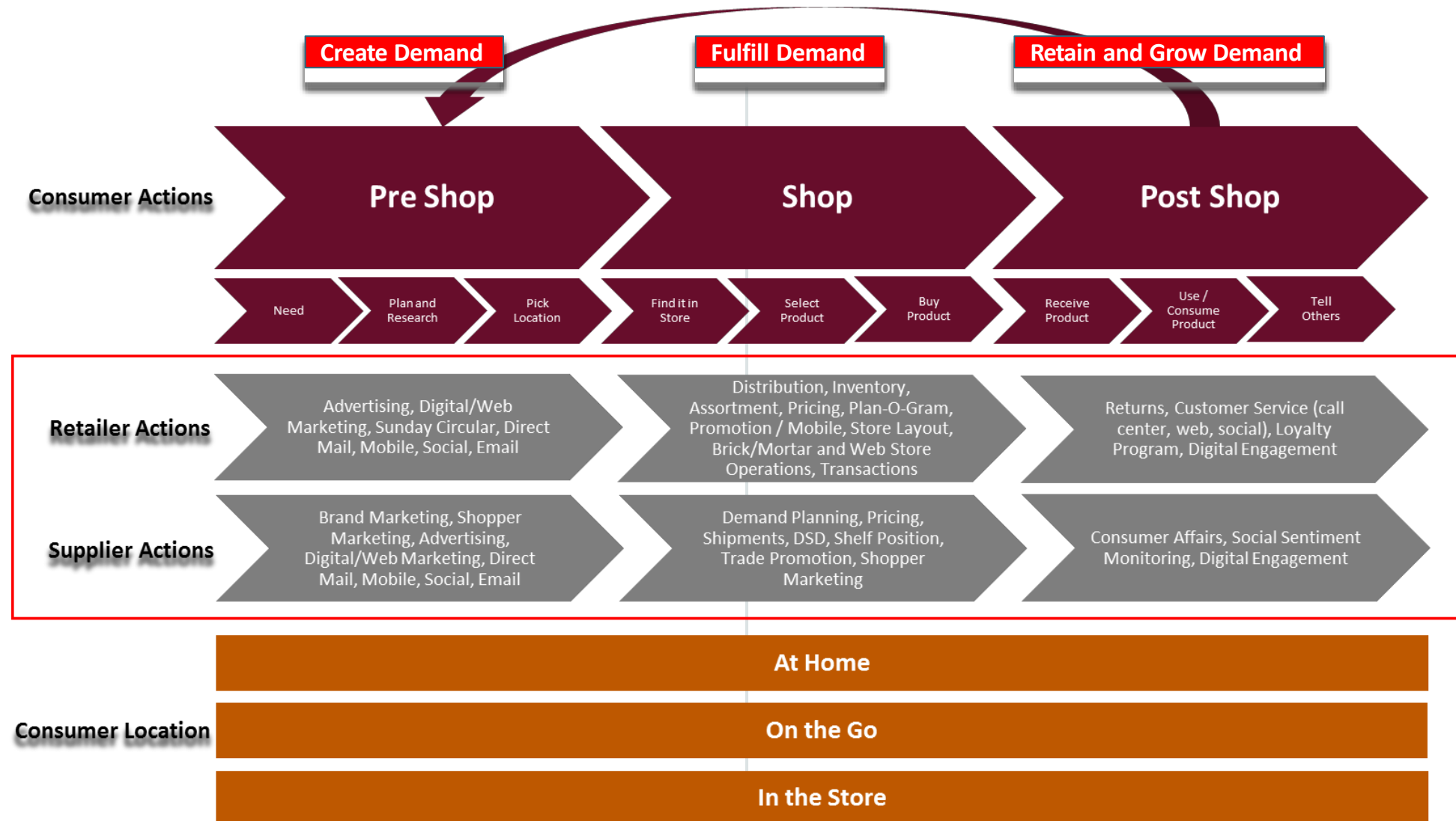
	Connectivity	Collection	Context	Cognition
Volume	Bandwidth to handle data pipeline, embedded capacity	Sheer amount of data generated and collected in sensors, mobile devices, wearable etc.	Sort out data , cleansing, Ingest, extract , transform , load	Descriptive, diagnostics, predictive and prescriptive model
Velocity	Network latency, high speed Wi-Fi, Internet connection, HaLow	Fast request/responses or one-way traffic between devices and backend systems	Timely processing, streaming, near real time, seamless scale-out	Just-in time analytics, on-demand intelligence ,hybrid
Variety	Flexibility on protocols e.g. Http, CoAP, MQTT, Websocket	Different formats of data, diverse devices, proprietary apps	Location data, clickstream, user behavior, motion	Sift thru all data for 360 degree view and conduct persuasive analytics
Veracity	Shut down devices or disconnect the network as needed	Shield the noise or bad data	Filter dirty/false data and correlating applicable data for semantics	Smart recommendation with engaging relevant and trustworthy sources

Some Bold Imperatives:

- Without IoT – Companies React to Failure
- From Sensors to Make Sense
- Radical Departure From Past to Digital Fabric

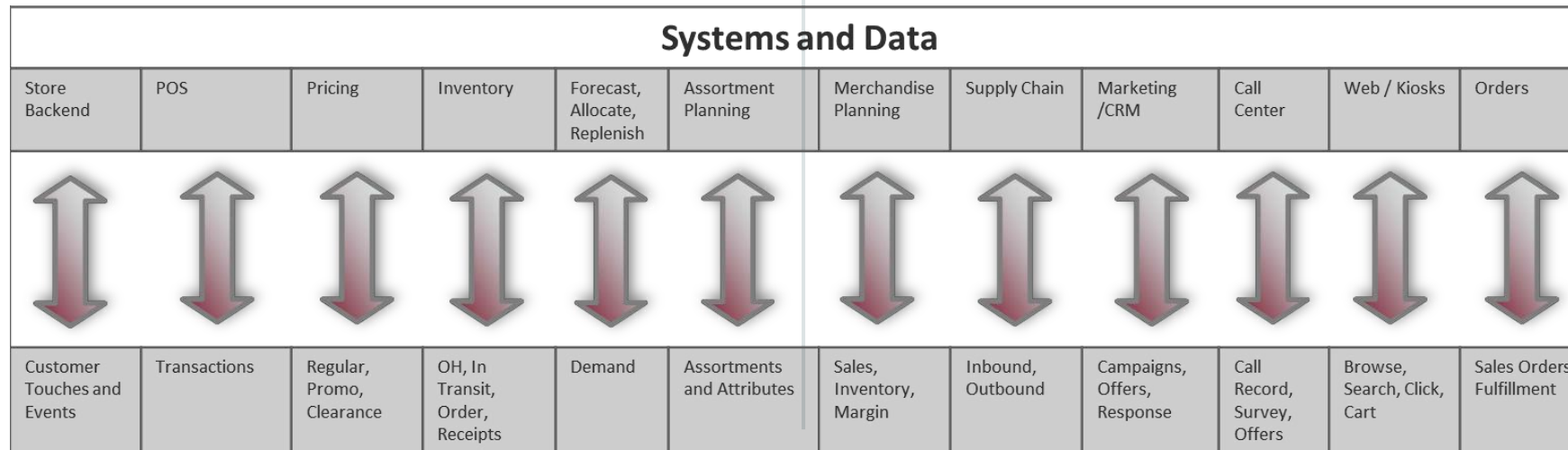
Complexity of the Consumer Experience Demands Integrated Analytics

How well can you anticipate and serve the needs of your consumer at each step of the shopping process?



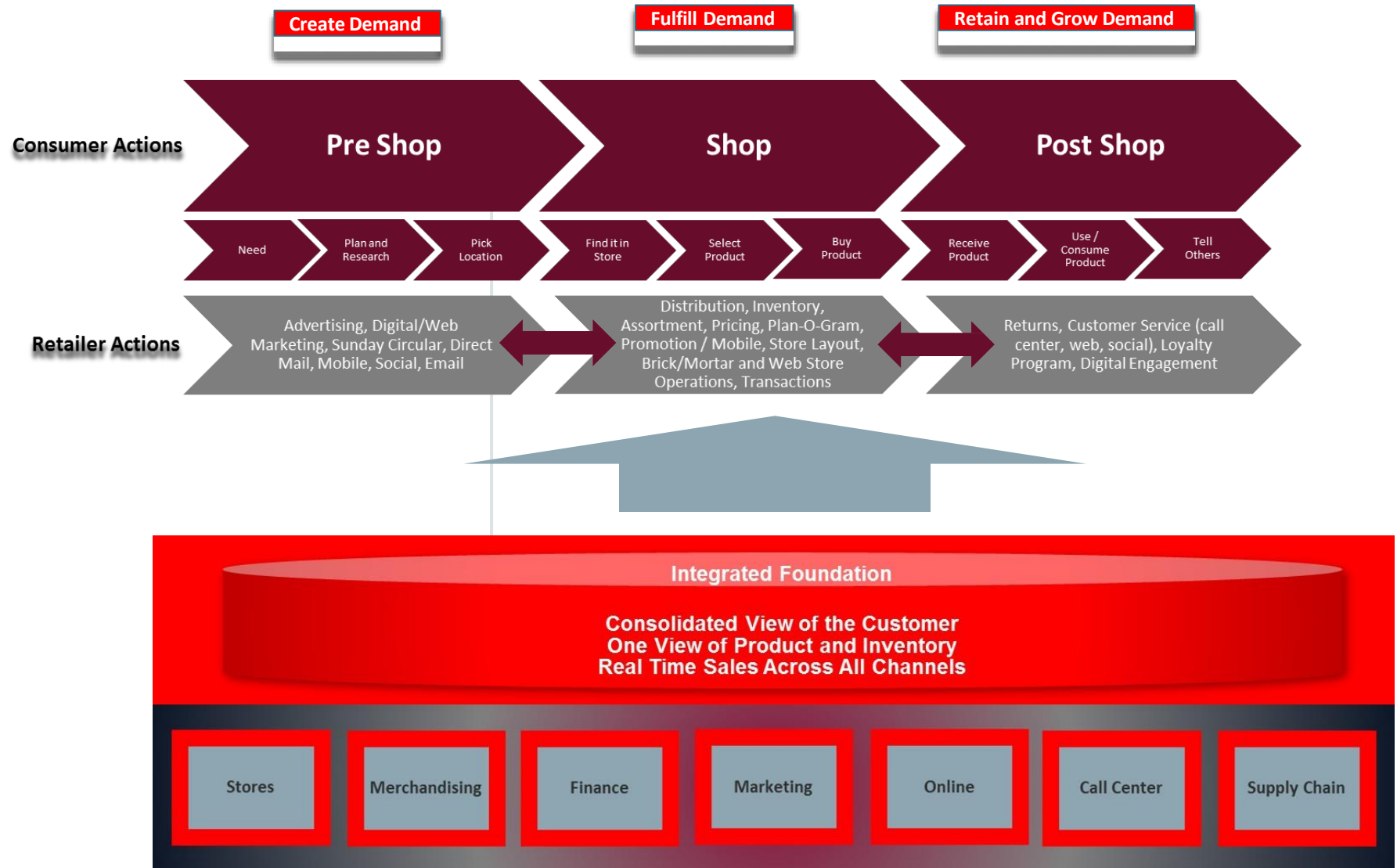
Realities of Retail – Inefficiencies and Opportunities

- No integration of data or analytics across functions.
- Lack of measurement standards and common metrics.
- No alignment to the Consumer Experience.
- Pervasive Silos (Online-In Store Merchandising).
- No single view of the customer or inventory.
- Unresponsive supply chain.
- A Consumer Experience held back by legacy systems.



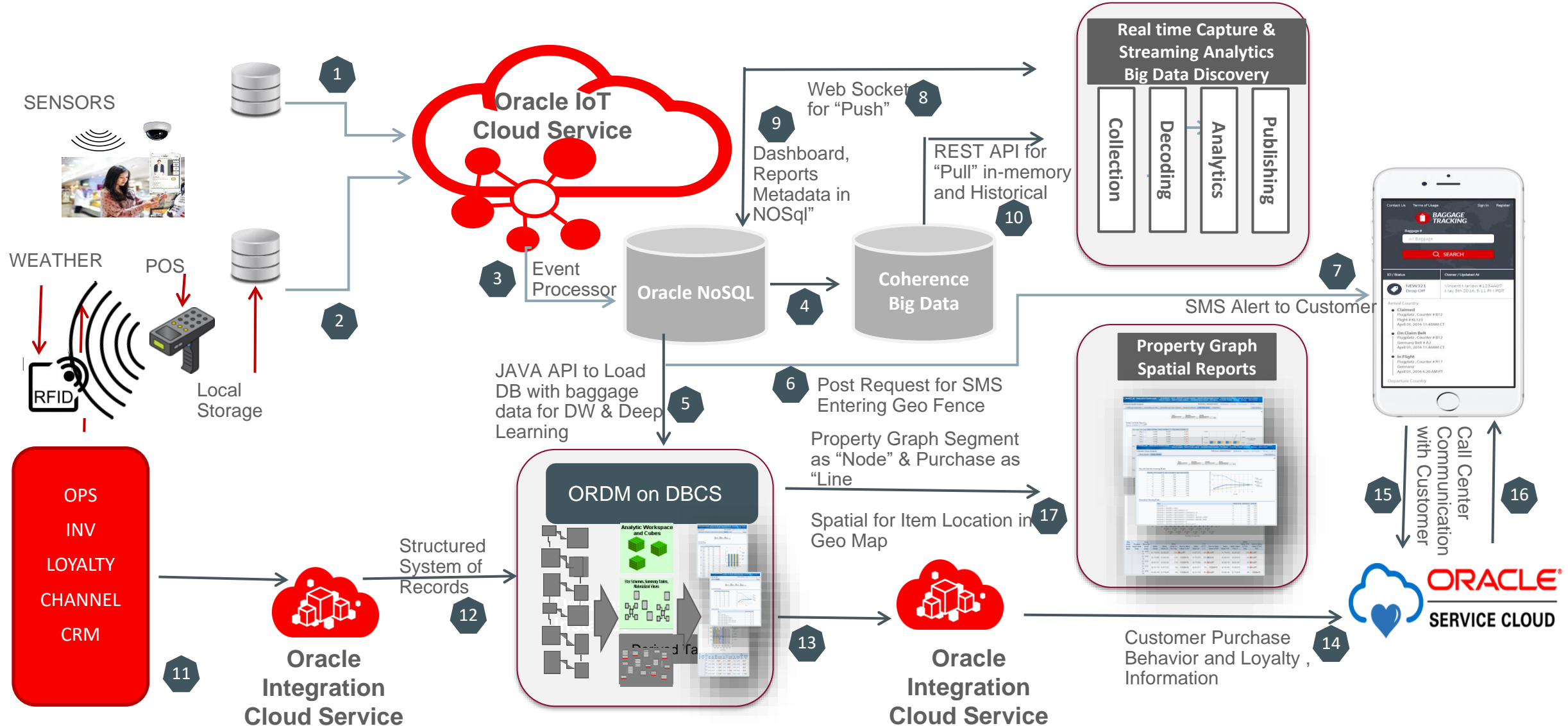
Opportunity: Integrate and Enable New Analytics

- Each function understands its role in serving the consumer.
- Insights and actions directed by a common set of metrics.
- Discovery and collaboration becomes possible across multiple business dimensions.
- IT becomes a strategic enabler.

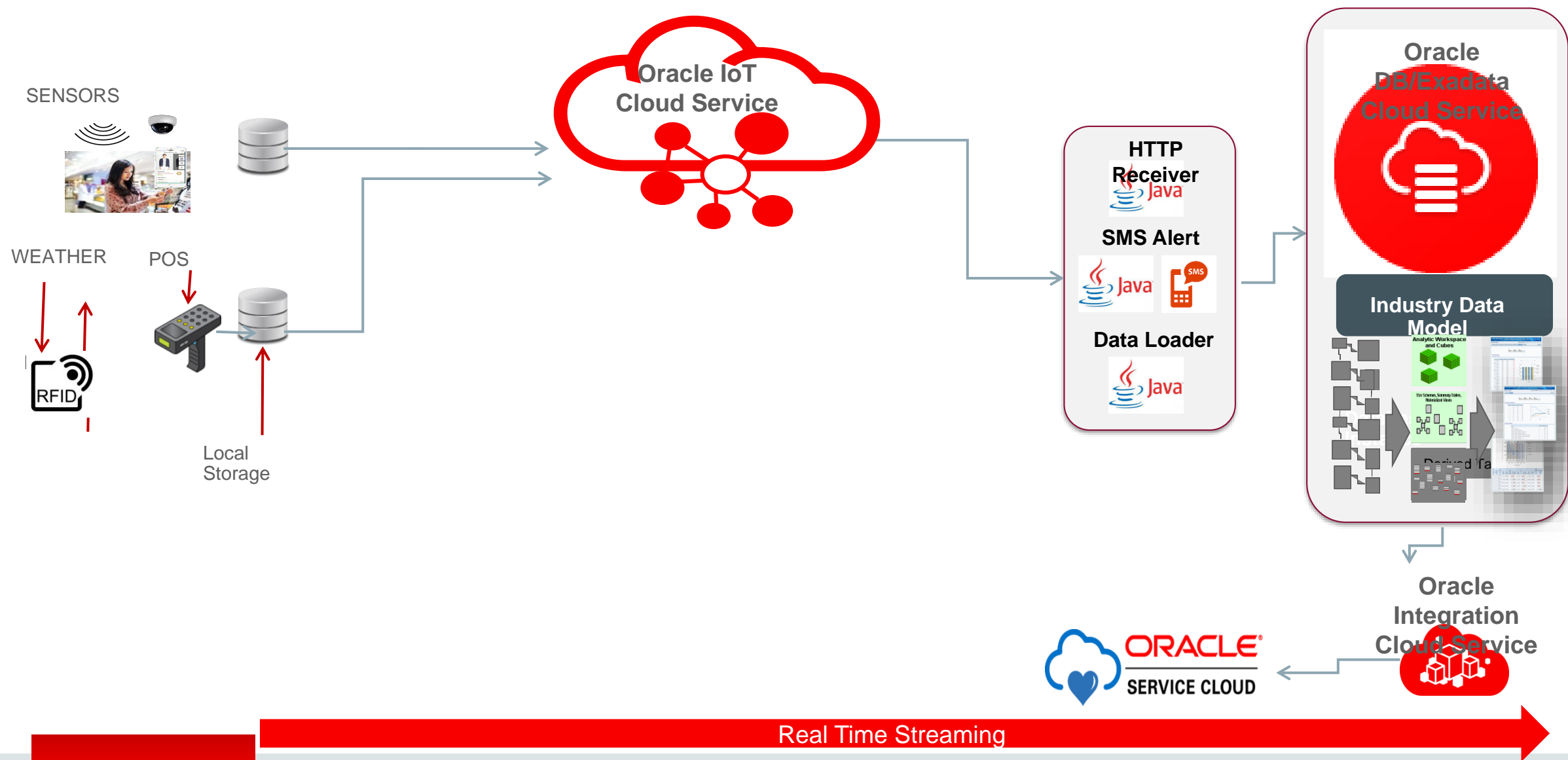


KEY QUESTION:
How do you get started?

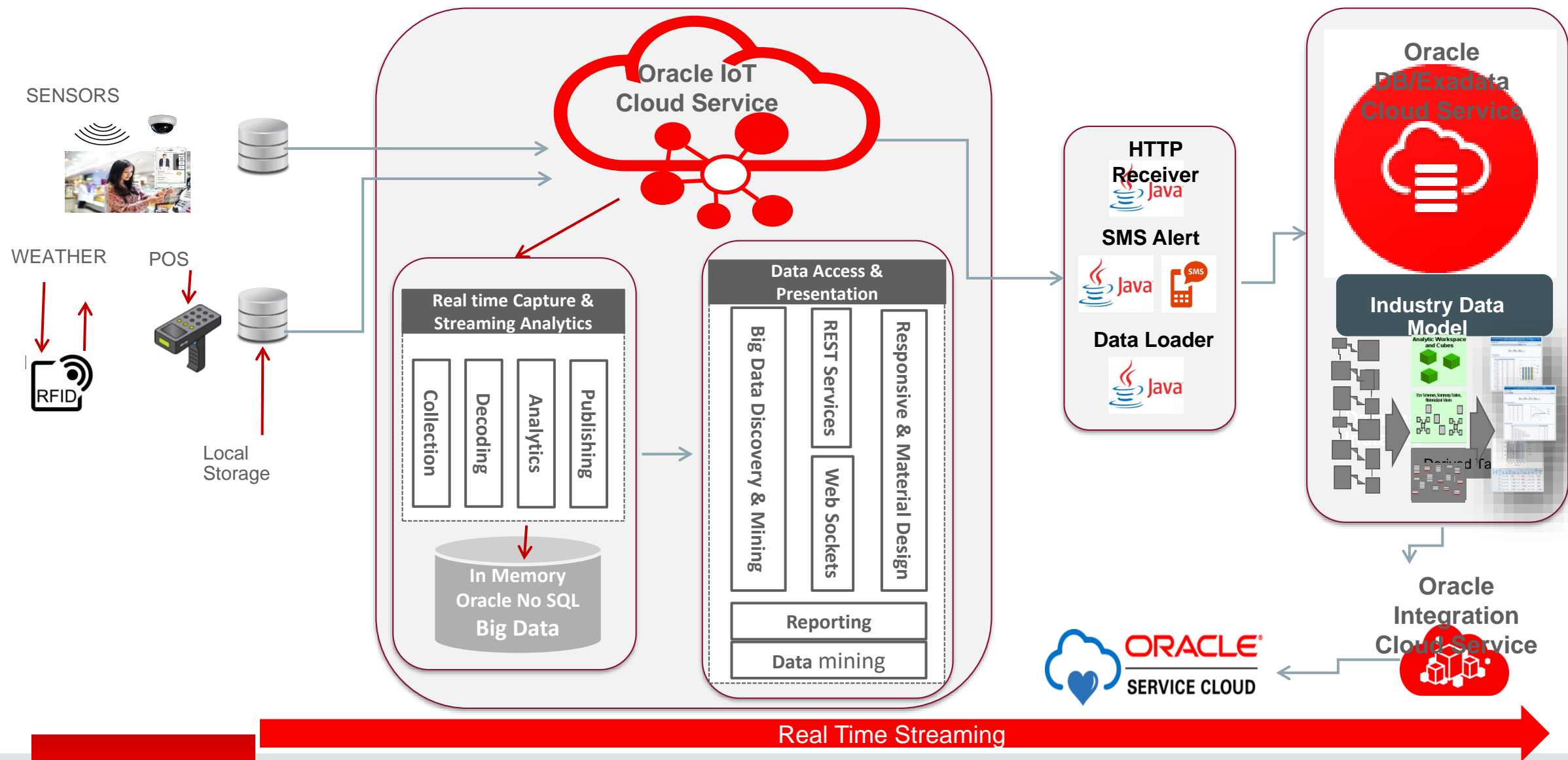
Smart Retail: Process Flow



High Level Architecture

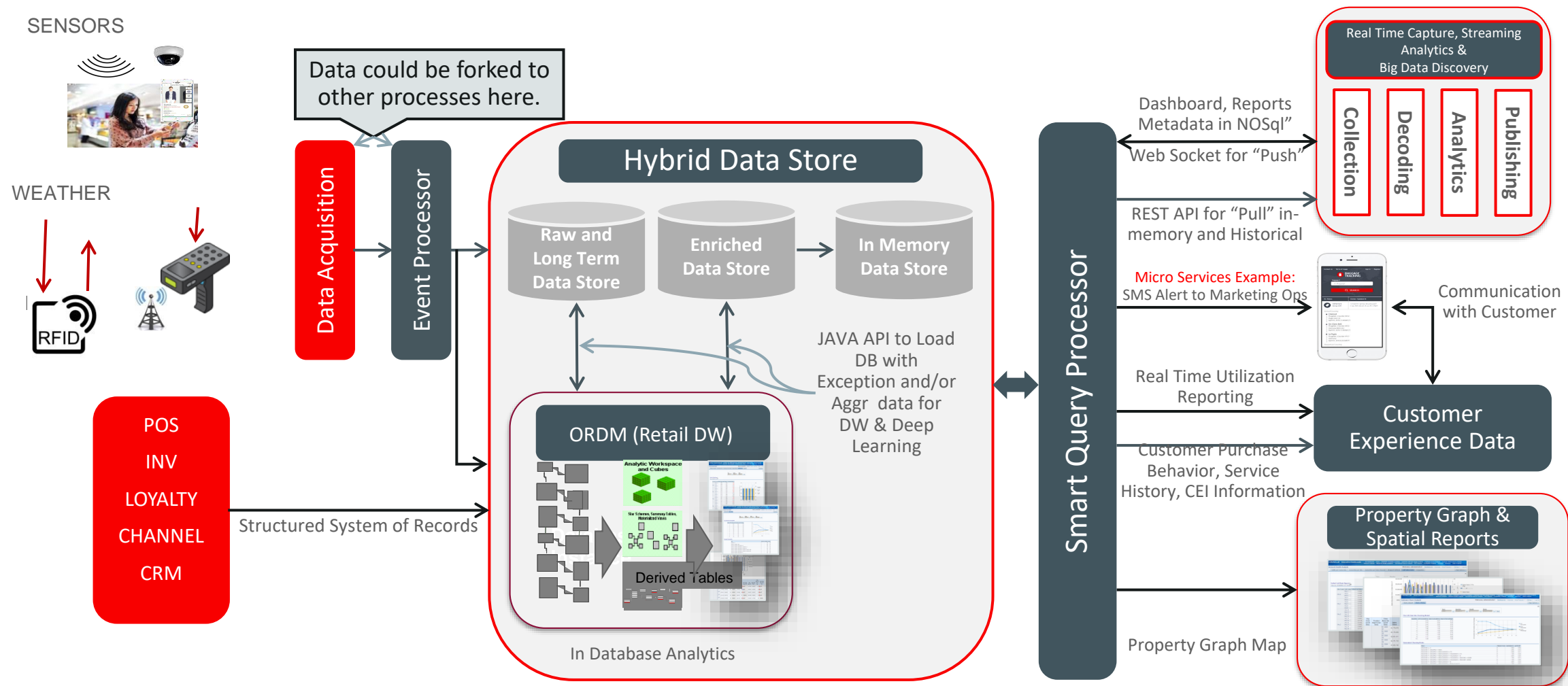


High Level Architecture



Our Solution – Real Time Analytics Architecture

Production View



Oracle Solution – Real Time Analytics Architecture

Architectural Components Description

- Feed Orchestrator
- Hybrid Data Store
- Smart Query Processor
- Actionable Intelligence Platform

Oracle Solution – Real Time Analytics Architecture

Feed Orchestrator

The Feed Orchestration Layer provides capture and distribution of records received from the data source to downstream processes.

- Designed to support horizontal scale by adding / removing capacity to meet processing demands
- Provides **Lambda Architecture** capability to the solution by enabling writing on multiple types of data stores
- Provides feeds to:
 - Real-time Message Queue/Stream Processing Modules
 - Relational SQL Database Writers for Quick Response Data Storage
 - NoSQL Database Writers for Intermediate Storage and Processing
 - Hadoop Data Store for Cold Storage and Batch Processing
 - External sources such as Wholesale partners

Oracle Solution – Real Time Analytics Architecture

Hybrid Data Store

The Hybrid Data Store consists of:

- Hadoop Data Store
- NoSQL/Real Time Data Store
- Relational Data Store

Oracle Solution – Real Time Analytics Architecture

Hybrid Data Store

The Hybrid Data Store provides Peta scale capability to handle:

- Real Time / Near Real Time Streams
- SQL Data store for Relational data store and self-serve reporting data model
- NoSQL Data store for Schema less data store and transaction level events processing
- Hadoop Data store for Long Term Storage of Raw data / transactions
- Provides flexible linear horizontal and vertical scaling capability - expansion of individual data stores
- Serves both the Batch Layer and Speed Layer in support of a **Lambda Architecture**

Oracle Solution – Real Time Analytics Architecture

Smart Query Processor

The Smart Query Layer provides the capability to query multi-platform back end data stores using standards-based SQL tools

- Provides singular interface for querying the Hybrid Data Store
- Enables retrieval and merging of query results from Near Real Time feeds and SQL/No-SQL storage
- Provides JDBC Connectivity to downstream applications
- Provides load balancing capabilities to query servers
- Acts as the Serving Layer of the Lambda Architecture

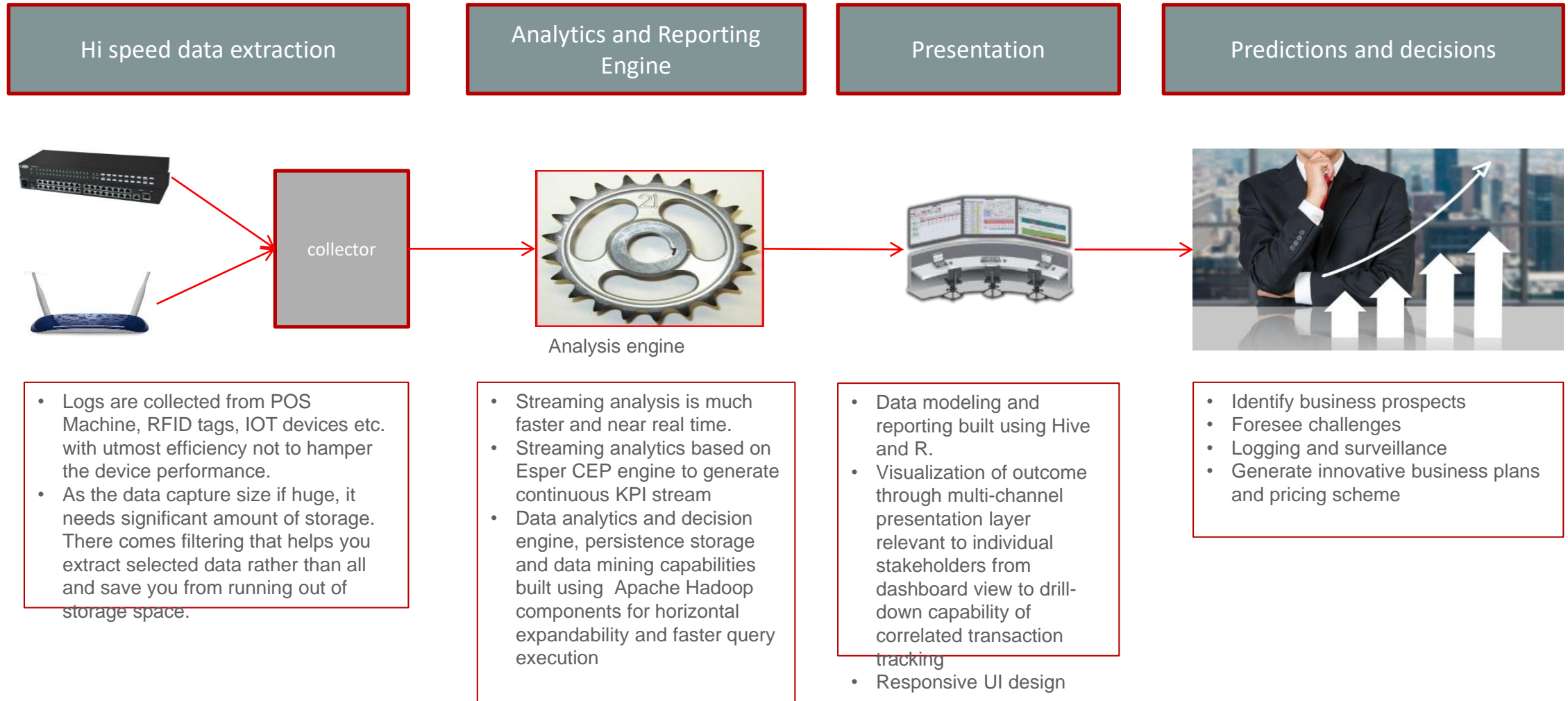
Oracle Solution – Real Time Analytics Architecture

Actionable Intelligence Platform

The Actionable Intelligence Platform is composed of 3 modules

- Real Time Insights
 - Based on open source / Angular JS
 - Provides capability to query and report on real time feeds, create dynamic dashboards and canned reports
 - Provides flexibility to internal development teams to create rich visualization for specific users or use cases
- OBIEE / VA (Optional)
 - Provides Self-Service, Dash boarding and Reporting capabilities
 - Provides pre-built reports and dashboards for use by various Stake Holders, such as Store Ops, Marketing, Finance, Category Management, Loyalty Program, etc.
- Big Data Discovery (Optional)
 - Provides the ability to explore, hypothesize and validate the scenarios for critical business problems and potential business opportunities
 - Provides test bed interface to analyze data without impacting production reports

Workflow



Key Take-a-Ways

- Like the Internet, **IoT Monetization will occur**
- **Value** delivery will dictate early winners
- IoT Monetization silver bullet is **packaging and pricing flexibility**
- **Real time visibility and agility** are essential to monetization
- Scale goes beyond volume, infrastructure needs to support **business scale**

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