GLOBAL PRODUCT DATA INTEROPERABILITY SUMMIT 2014

Building a Real-time "Transparent" Factory to Ensure Quality Manufacturing at High Speed

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ELYSIUM Parker NORTHROP GRUMMAN BOEING

Building a Real-time “Transparent” Factory

Exploring Schwering & Hasse’s manufacturing process for building a “transparent” factory.

Opportunity

- Gain immediate and accurate visibility into multiple production quality factors.
- Can respond rapidly to head-off potential problems.
- Achieve uninterrupted and flawless production.

Key Benefits

- Improved quality management
- Faster response to production issues.
- Flawless, uninterrupted copper production process.
- Increased margins.

Software AG Government Solutions

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- Federal Subsidiary of Software AG located in Reston, VA
- Focused on providing precise, efficient solutions that produce ROI
- Highly differentiable software products for demanding complex environments:
  - Integration
  - Application Scalability
  - Business Process Management
- Experienced Team (Cleared and US Citizens) Dedicated to Supporting and Serving:
  - Department of Defense
  - Federal Civilian Agencies
  - Intelligence Community
  - Aerospace & Defense Community

U.S. Department of Transportation
Federal Motor Carrier Safety Administration

Schwering & Hasse Background

- **Specializes in enameled wire.**
- **Produces enough magnetized copper wire annually to stretch beyond Venus.**
- **400 production lines 24 hours a day.**
- **Quality manufacturing is core focus.**
- **Received "Best Supplier" status from multiple customers including Bosch due to consistent quality focus.**
- **Based in Lügde, Germany.**

Challenges Schwering & Hasse Was Facing

"One big mistake could result in us being dropped as a supplier."

Dirk Jäger | CIO, Schwering & Hasse

S&H Chose Software AG's Apama Engine

- **Monitors dozens of quality factors.**
- **Improved touch points.**
- **Scales beyond current needs.**
- **Complete toolset for design and implementation.**
- **Custom screens for visibility/input.**

> *"Apama helps us stay on top of thousands of quality related events per second, enabling rapid responses to potential problems."*

Dirk Jäger | CIO, Schwering & Hasse

Results of Implementation

- **Factory transparency.**
- **Monitor precision to within 25 millimeters.**
- **Real-time intervention.**
- **Faster product introduction.**
- **Improved margins.**

> *"We can model the entire production process in Apama. This gives us the ability to manage quality consistently as we juggle multiple changing specifications and customer requirements."*

Dirk Jäger | CIO, Schwering & Hasse

How can you leverage this technology?

- **Adoption into other quality manufacturing processes.**
- **Monitoring of process performance.**
- **Correlation at major assembly.**
- **Post production in-the-field monitoring.**
- **Real-time analytics and intelligent business operations.**
- **Supply chain performance monitoring.**

Technology Overview

Christopher Steel
Chief Solutions Architect
Software AG Government Solutions

The Trend: High Volume + Velocity of Data

Sensor Sensor Sensor Sensor Sensor Se

GEO GEO GEO GEO GEO

Weather Weather Weather Weather Weather

Complex Event Processing (CEP) Technology

Unlike traditional application infrastructure, event processing works on moving streams of data.

Monitor

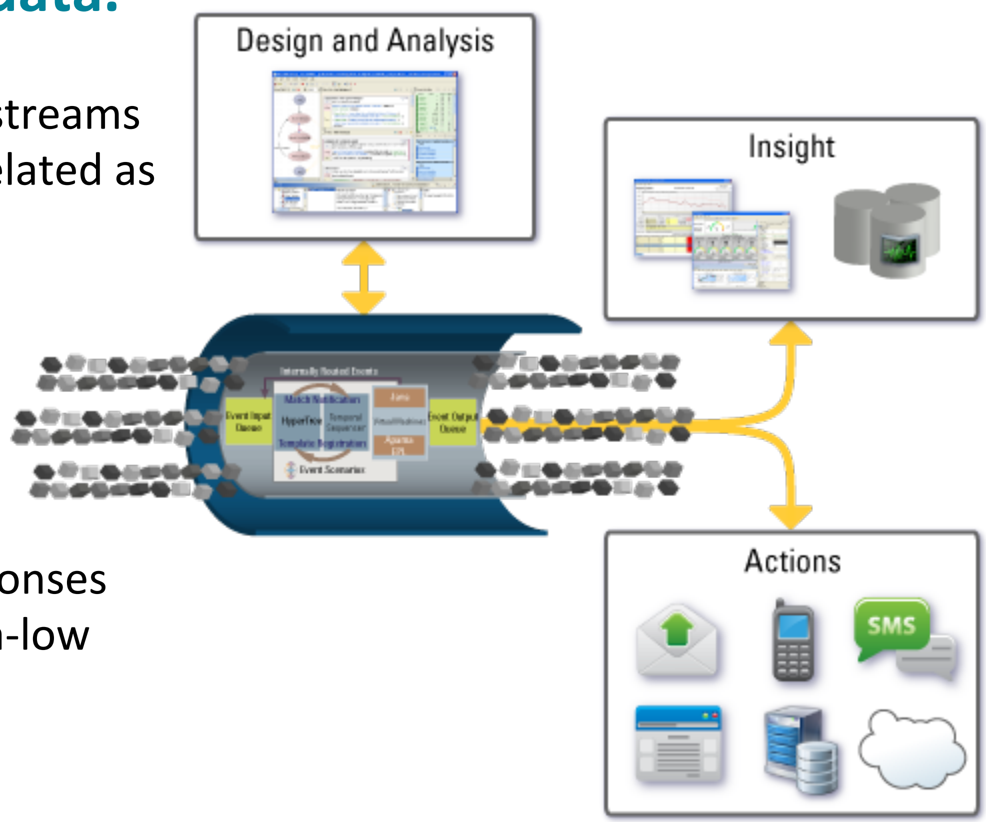
Events in one or more streams are identified and correlated as they happen

Analyze

Scenarios are designed to act on meaningful patterns

Act

Automated action responses are delivered with ultra-low latency



Apama Event Processing Models

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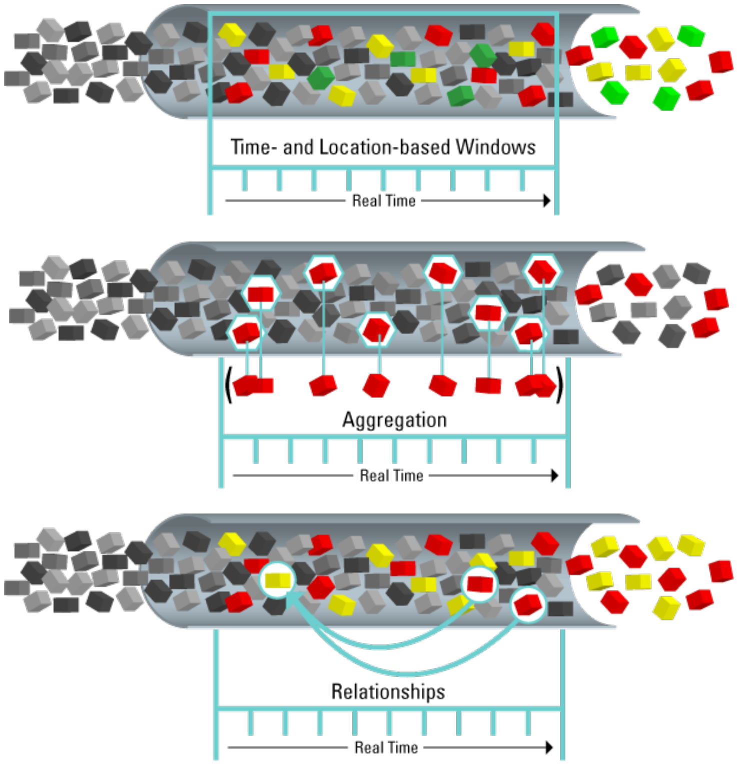
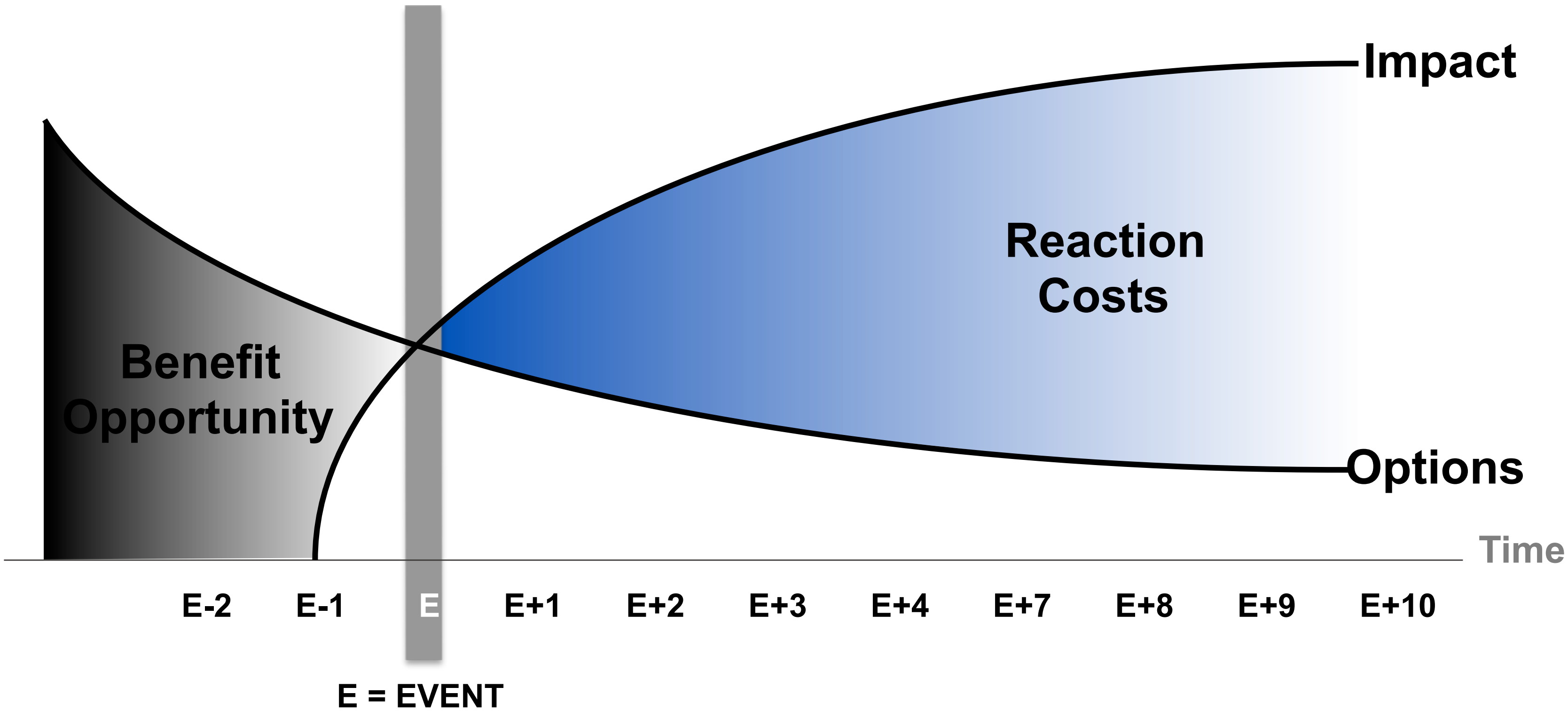
Apama – Faster than C and Java

- Time- and location-based windows
  - within, near, etc. based in real-time context
- Aggregation
  - Accumulation of values or quantity
  - sum, average, min, max, etc.
  - Support for custom aggregate functions
- Event Relationships
  - event A followed by event B
  - event A and Event B
  - event A or Event B
  - the non-event
- Flexibility and ease to mix models
- Rules can be templated and parameters updated dynamically



Data Insights - The Sooner, the Better



As time passes after an adverse event, the resolution options significantly decrease while the impact of the event significantly increases.

CEP: Real-Time Analytics for High Velocity Big Data

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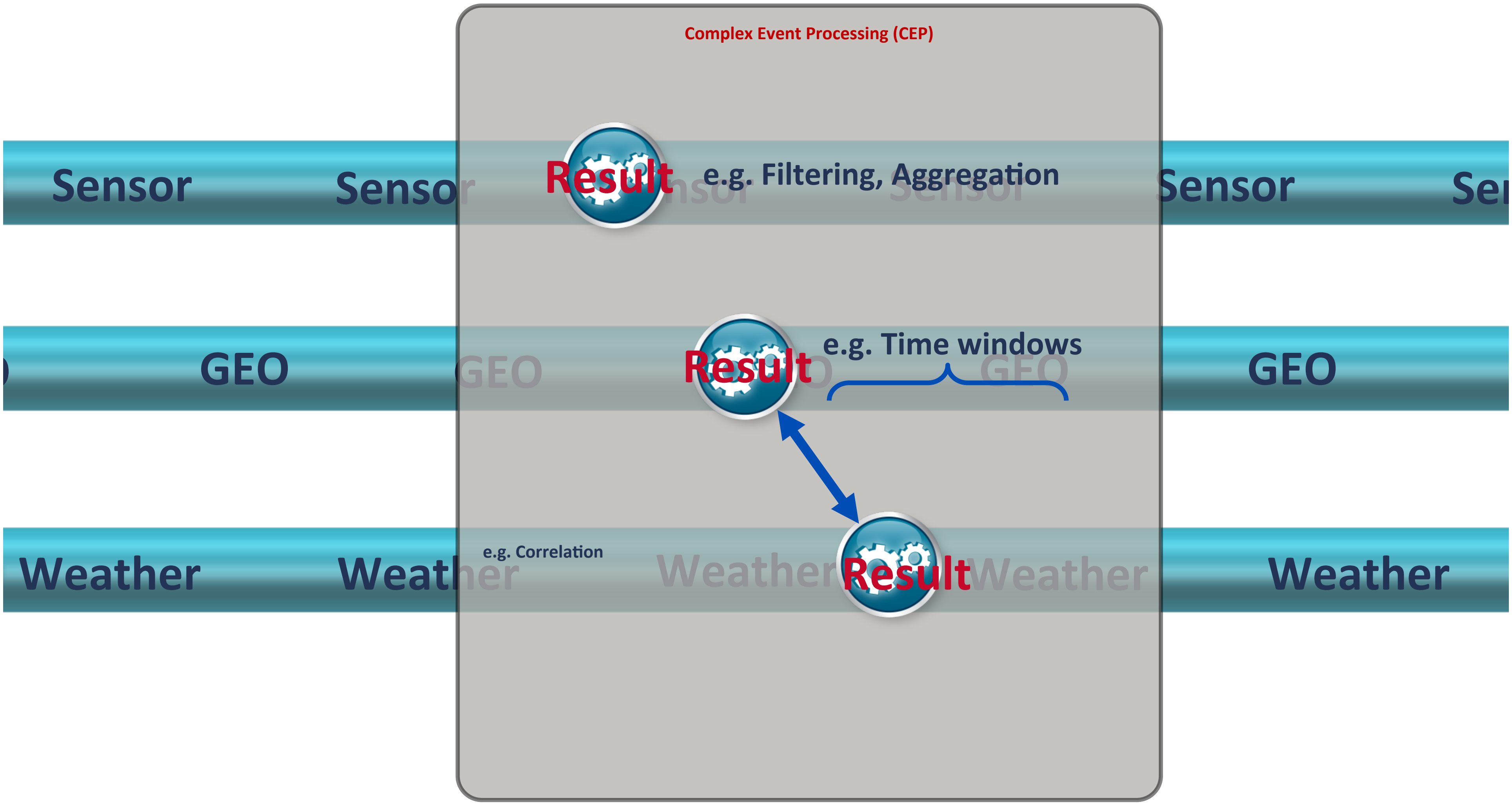

Relationship of Streaming Analytics to Big Data

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Sift Through High Volumes of Data in Motion

- Real-Time Analytics – What's Happening Now
- Real-Time Engagement with Customers
- Allow Applications to make Quick Decisions
- Proactively Notify someone to Intervene

INGEST

BATCH RESULTS AND DISCOVERED PATTERNS – CLOSE THE LOOP!

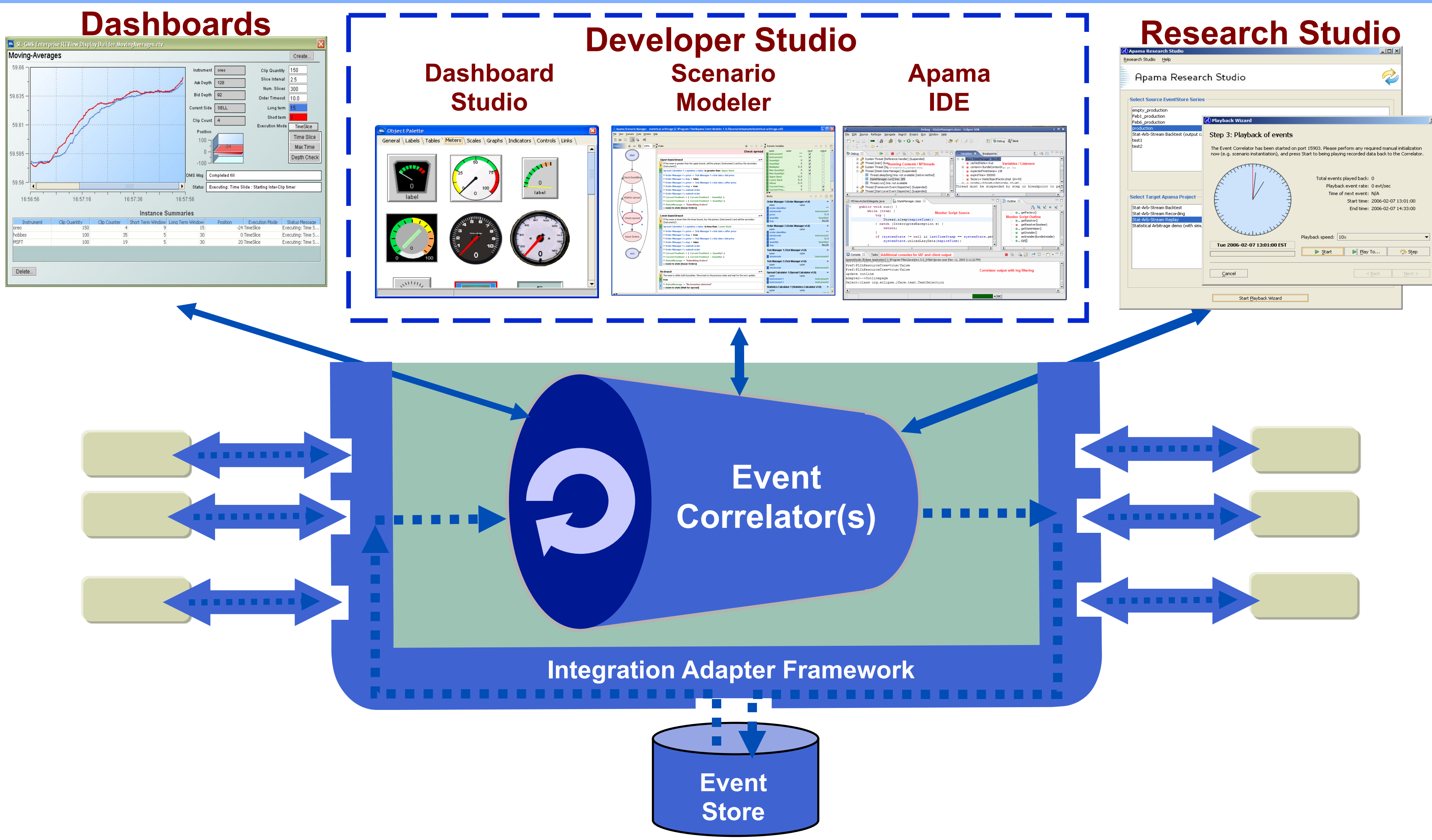
Sift Through Petabytes of Data at Rest

hadoop

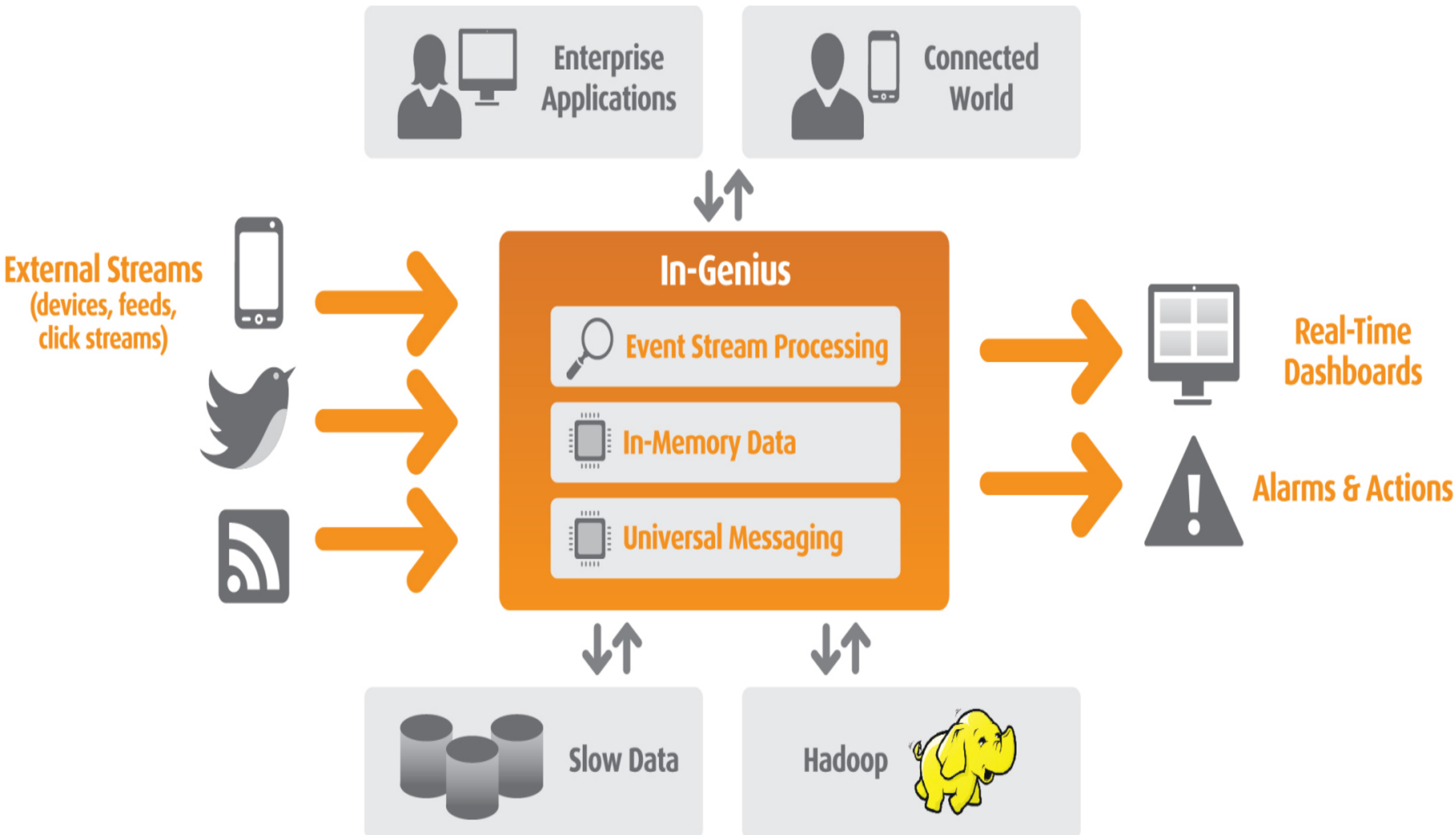
- Historical Analytics – What Happened last Month
- Discover Patterns of Customer Behavior
- Analyze Lots of Data to Make Off-Line Decisions
- Learn the Patterns of Predictive Maintenance

Your Big Data Strategy is not complete without Streaming Analytics

Apama Integrated Development Environment



Software AG Complex Event Processing



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