

TIBCO™

An Architecture for
Intelligent Trading



intelligent
trading
summit

- **The Need for Intelligent Trading**
- **The Challenges to Address**
- **The Value of the Platform**
- **Big Data in Motion and its Application to Trading**
- **A Modern Architecture for Intelligent Trading**
- **Wrap up and Q&A**

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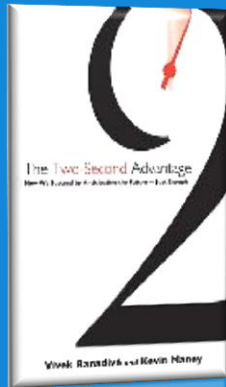
“In the past 10 years, **automated trading** has risen **from 5% to over 80%** of all trades done each year. The ROI of **intelligent automation** on Wall Street cannot be computed – it’s worth **billions** and is a matter of **survival.**”

- Head of trading, top tier broker dealer

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“The ability to capture the **right information** at the **right time** and **act** on it preemptively for a competitive advantage” – that’s the **Two-Second Advantage**.



– *Vivek Ranadivé, TIBCO Founder and CEO*

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“Business value doesn’t come from building faster applications; it comes from *building applications faster.*”

- *Head of algorithmic trading, top-tier broker dealer*

EMPLOYEES



YOUR IT INFRASTRUCTURE

A PLATFORM FOR INTELLIGENT OPERATIONS

SERVICE PROVIDERS



CUSTOMERS



SaaS



Statistics & Data Mining

Streaming Real-Time Analytics

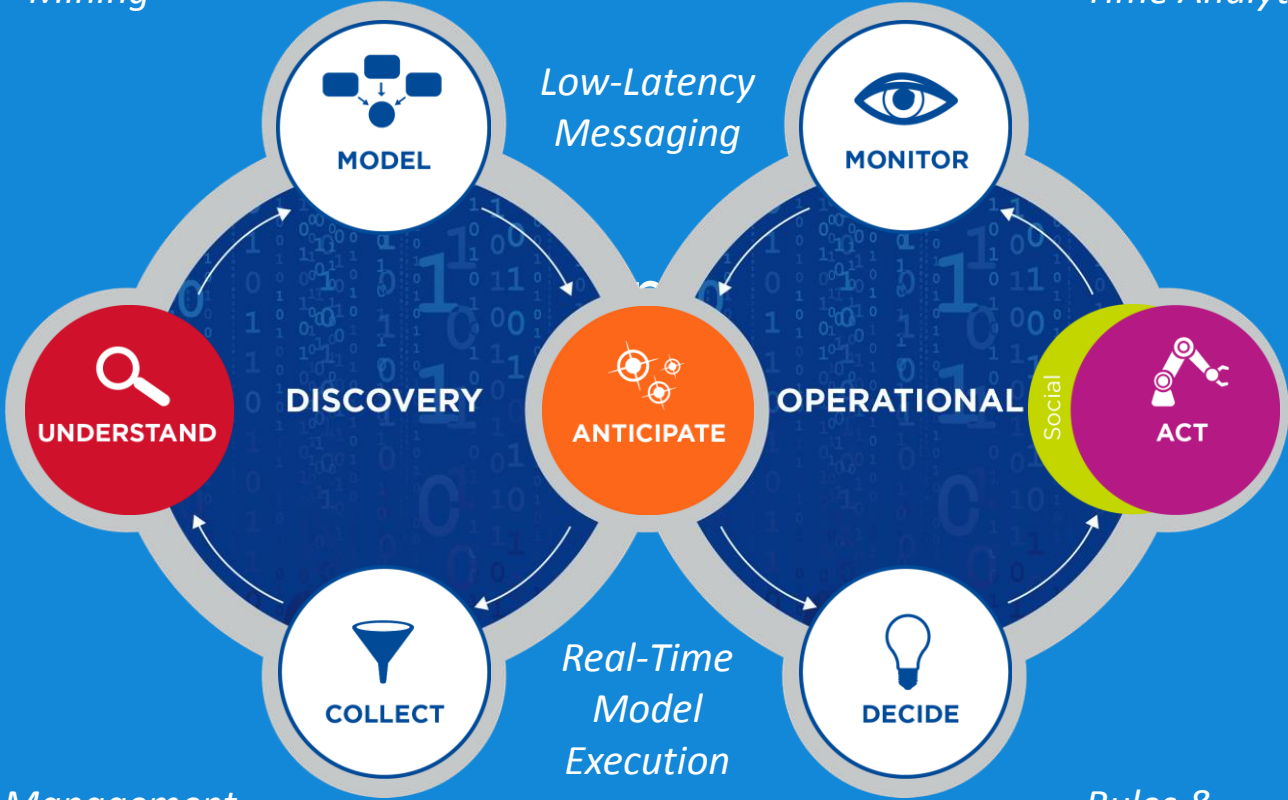
Low-Latency Messaging

Visual Analytics, MDM

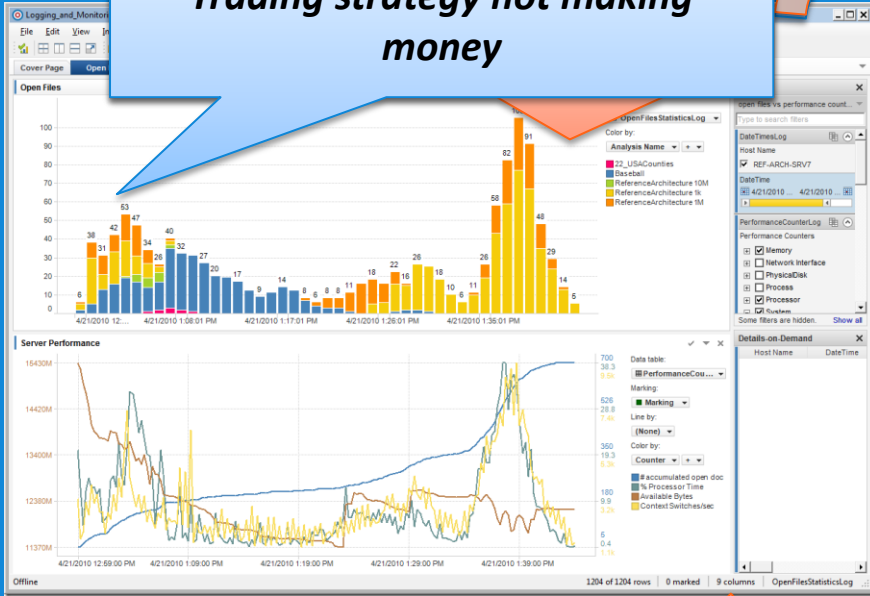
SOA, BPM, Social

Log Management, NoSql, Enterprise DB

Rules & Inferencing

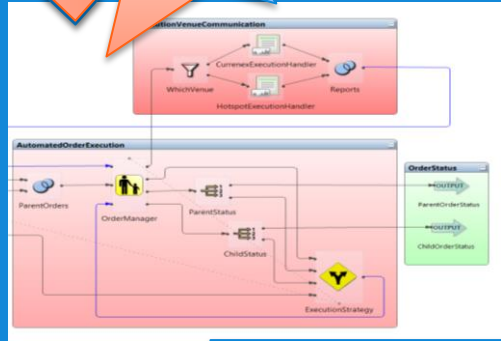


Trading strategy not making money

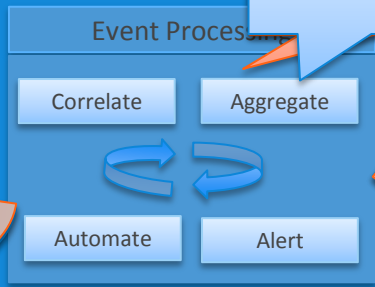


Analyze

Adjust trading algorithm



Deploy

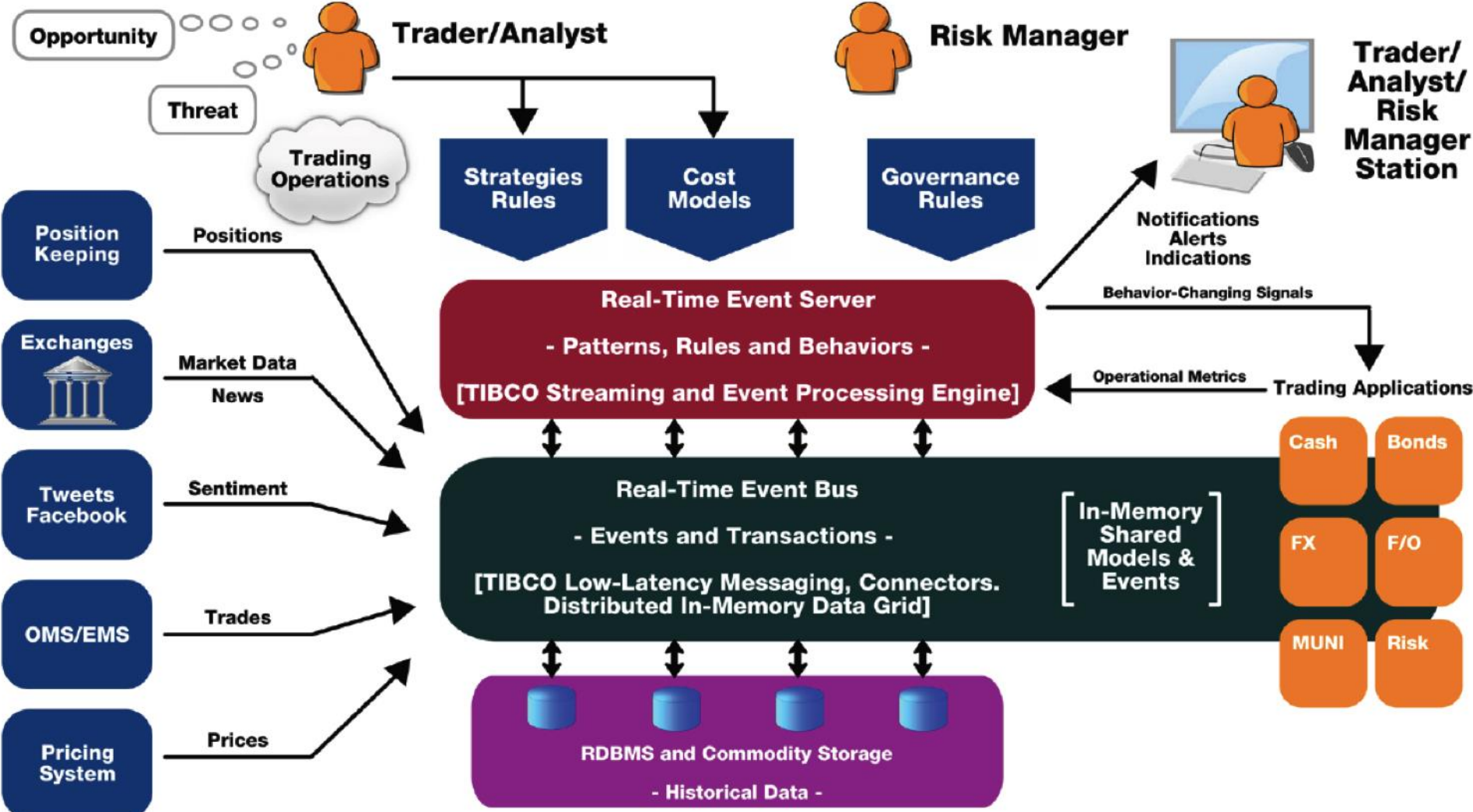


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BIG DATA

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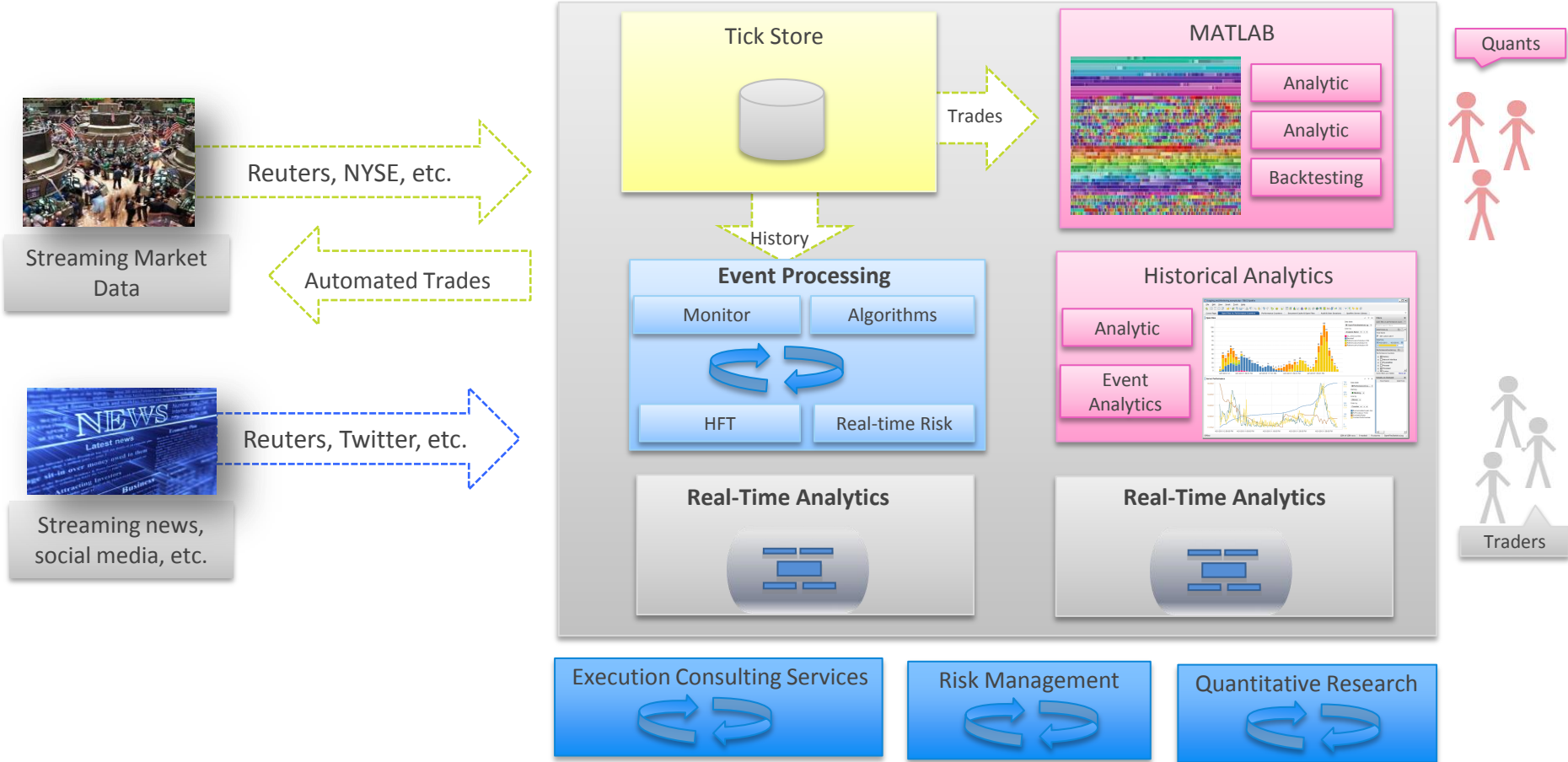


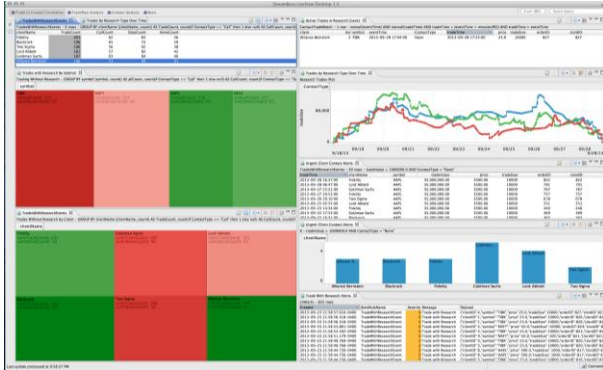


“In three months we were up and trading, and we were the fastest auto quoter on the market.”

- Head of algorithmic trading, top-tier broker dealer

- **Situation: Wall Street Imperative to Deploy Algo Trading**
 - In the last 10 years, automated trade flow has gone from 5% to 80%
 - Innovative algorithmic trading technology and time to market are critical to survival in the capital markets
- **Problem: How to Automate?**
 - Custom coding? Packaged applications? Event Processing?
 - Streaming analytics are essential to effective algo trading
- **Solution: TIBCO for Algorithmic Trading**
 - With TIBCO, algorithms are developed 3-5X faster than if traditional technologies were used like databases or application servers
 - Provides low latency event processing, aggregation, scale, and visualization
- **Result: Event Processing Provides Pure Competitive Advantage for Algo Trading**
 - Quants and IT communicate and build systems more quickly, with built-in performance, scalability, and connectivity.

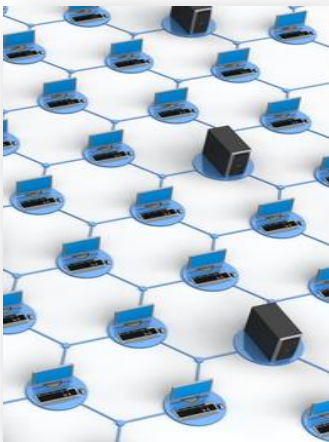




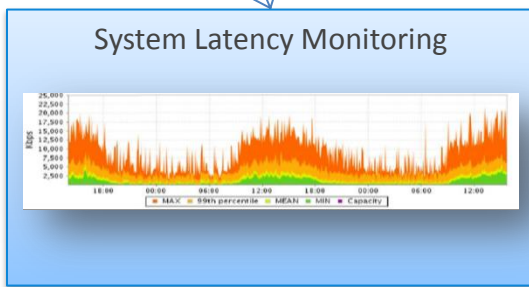
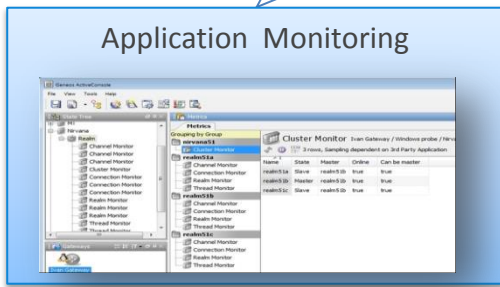
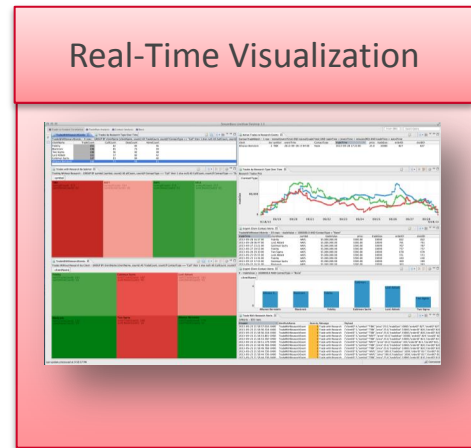
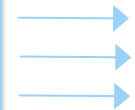
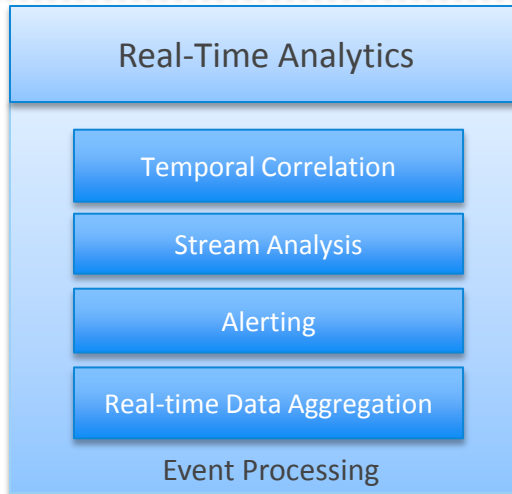
“Event-driven monitoring and fraud detection make it easy for us to whittle 100 million trading events down to the few that matter and ACT in real-time.”

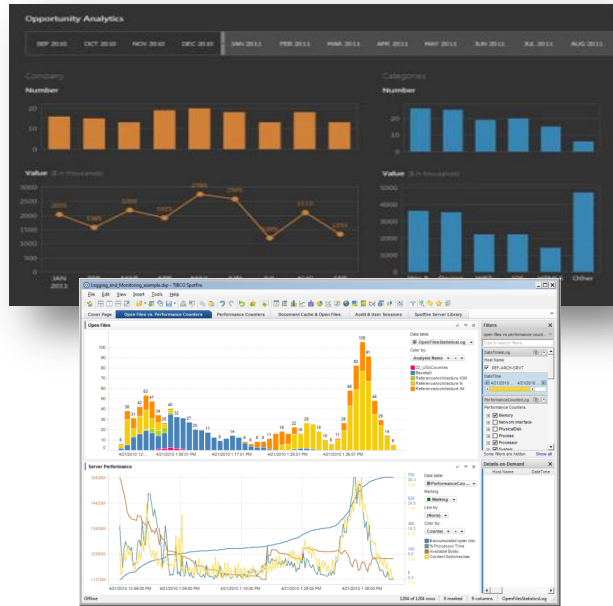
- Managing Director, Global Brokerage

- **Situation: Moving Data Requires Event-Driven Monitoring**
 - Streaming machine-generated data overpowers existing end-of-day analytics and reporting infrastructure
- **Problem: Existing Commercial Products Not Real-Time**
 - Existing products are designed for ETL-style capture and analytics, not for streaming data
- **Solution: Event-Driven Monitoring with StreamBase**
 - Event Processing for event stream aggregation, correlation, and action
 - LiveView for monitoring
 - Integration with Hadoop and streaming machine-generated data
- **Impact: Market Disruption, First Mover Advantage**
 - Firms that are first to market with real-time monitoring and fraud detection capture a distinctive advantage in the market and save millions due to electronic-induced outages and fraud.



Transactions,
machine data





- **Situation: Major Asset Manager Needs Better and Faster Insight for Price Discovery**
 - Which trades are slipping? How close to target are we for participation rates? How can we adjust our trading in the market now?
- **Problem: How Make Informed Real-Time Decisions?**
 - Need real-time and historical trading analytics to put intraday trading strategy adjustments in the proper context
- **Solution: TIBCO StreamBase, LiveView, and Spotfire**
 - Firm deployed visualization and analytics for traders & portfolio managers to assess real-time and historical trade performance at once.
- **Impact: Improved Intraday Adaptability of Trading Strategies**
 - Solution helps allow traders and PM's understand where their trade performance is going, and adjust trading strategies during the day

“We can analyze everything that impacts trade performance, and adjust to it on the fly.”

- Head of IT, Asset Management

PORTWARE

FIX



THOMSON REUTERS

FIX



KX

MQ



FIX PROTOCOL
INDUSTRY-DRIVEN MESSAGING STANDARD™

DBMS



Event Processing

Trading Analytics

Real-Time Analytics

Aggregation

.NET GUI



Traders & Portfolio Managers



Alerts



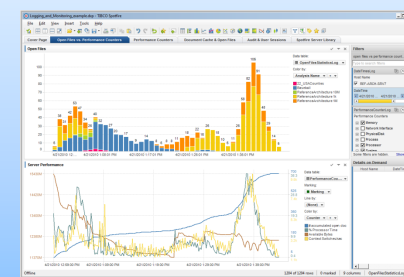
OMS



EMS



Historical Analytics



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- White Paper: “An Architecture for Intelligent Trading”

An Industry Briefing By

**AN ARCHITECTURE FOR INT
LEVERAGING BIG DATA IN MOTION F**

In Collaboration with
Sponsored by

AN ARCHITECTURE FOR INTELLIGENT TRADING

Alongside algorithmic development and deployment, execution logic and real-time risk controls are required to continuously feed back overall trading performance and holistic risk information to trading and risk managers.

Thus, trading system applications need to be integrated with reporting dashboards, which continuously display key metrics, such as positions, exposures, an overall trading efficiency. These dashboards typically allow deeper insight and information to be requested, and viewed in different formats.

Under the Technology Hood – integration between different trading system and reporting applications is generally facilitated via a combination of a messaging middleware bus – which alerts related applications to events – and an in-memory data grid, which provides a uniform, consistent and clean data store on which all applications operate.

A key design requirement is that these components be scalable, in order to cope with extreme peaks of message traffic (millions per second) seen on data feeds during market openings and volatile trading. Moreover, this performance and scalability needs to be implemented in a reliable and resilient manner, so that technical outages and performance bottlenecks are a rarity.

Thus, a combination of event processing, a real-time event messaging bus, an in-memory data store, data feed/data stream connectors and reporting/visualization tools, will need to be combined to create an architecture to support Intelligent Trading.

An Architecture for Intelligent Trading

An architecture – or an infrastructure – to support Intelligent Trading comprises a number of functional software and hardware elements, which are described below, in the context of a reference model created by TIBCO Software, as shown in figure 1.

Figure 1: A Reference Architecture for Intelligent Trading

The Intelligent Trading Architecture is designed to run on a distributed network (deployed within a data center, across data centers, or even across more than one enterprise) of

AN INDUSTRY BRIEFING RESEARCHED AND WRITTEN BY LOW-LATENCY.COM FOR TIBCO

An Industry Briefing By



Thank You

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