

# Transform Operations with Real-time, Hyperconverged Analytics

## Democratizing operational intelligence with business intelligence simplicity

Your business runs in real time; Your analytics findings should too. Whether business-critical data comes from customer transactions, manufacturing data streams, supply chains, or the Internet of Things (IoT), you need to constantly analyze changing conditions in your environment and respond in the moment. Or even better, you need to act before a problem arises.

It's no longer enough to just perform visual analytics, or even data science infused predictive analytics. Organizations that can analyze data streams, and marry these streams to historical data for richer insights, will be poised to disrupt their competition. However, to extract value from real-time data you need a new approach: hyperconverged analytics. It will transform your operations.

Hyperconverged analytics is the next evolution of business intelligence technology, bringing visual analytics, data science, and streaming analytics together in a seamless experience that delivers immersive, smart, and real-time insights in an easy to use and tailored way. Real-time insights discovery and delivery is a defining feature of hyperconverged analytics.

Hyperconvergence enables democratization and self-service analytics for digital operations supported by IoT, GPS, real-time logs, and digital transactions. And with filtering, aggregations, linking, sorting, exploration, and automated action, it provides real-time evaluation of live visualizations.

## Why Real-time, Hyperconverged Analytics?

Every connected business is awash in real-time events that create real-time data: data streams from online transactions, sensor readings, GPS signals, and thousands of other sources. Most companies are unprepared to use and analyze the data in real time, and so settle for taking snapshots of this data and storing those in a data lake. Later, they might then rummage through it with machine learning to attempt to predict the future. This approach is far too slow and asynchronous for modern digital business, where response is needed now, not later.

To make the fastest strategic business decisions, real-time data and analytics are essential. Answering queries within seconds using real-time analytics equips you with always-up-to-date insights, so you can respond and prepare for the future as it emerges.

**63%**

average growth of organizations' data volumes per month<sup>1</sup>

**30%**

data that will be real time by 2025<sup>2</sup>

**748%**

median shortage of data science skills across 10 major US metros<sup>3</sup>

**48%**

insights-driven organizations exceeding business goals<sup>4</sup>

*Of the 150 billion devices that will be connected across the globe by 2025, most will create real-time data. Real time will account for 30% of the total data generated.<sup>5</sup>*

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- 1 Survey: Rapid Time to Value Is the Main Driver for Analytics Projects, Yet Making Data Available for Insights Is a Barrier for 90% of Enterprise, Matillion, October 21, 2019. <https://www.prnewswire.com/news-releases/survey-rapid-time-to-value-is-the-main-driver-for-analytics-projects-yet-making-data-available-for-insights-is-a-barrier-for-90-of-enterprises-300941624.html>
  - 2 Condon, Stephanie. By 2025, nearly 30 percent of data generated will be real-time, IDC says, ZDNet, November 27, 2018. <https://www.zdnet.com/article/by-2025-nearly-30-percent-of-data-generated-will-be-real-time-idc-says/>
  - 3 LinkedIn Workforce Report, United States, August 2018, LinkedIn Economic Graph, August 10, 2018. <https://economicgraph.linkedin.com/resources/linkedin-workforce-report-august-2018>
  - 4 Danport, Tom, et al. Analytics and AI-driven enterprises thrive in the Age of With, The culture catalyst, Deloitte Insights, July 25, 2019. <https://www2.deloitte.com/us/en/insights/topics/analytics/insight-driven-organization.html>
  - 5 Ibid. Condon.

For example, when a high-value passenger enters an airline's first-class lounge, a real-time application can deliver instant insight and foresight for providing an excellent customer experience. That experience will be based on the person's most recent preferences, choices, and likely intentions and actions. Similarly, when a critical pump's temperature shows an upwards trend towards a hard threshold, instant information and predictive analysis will be important for preventing downtime. Inventory levels for premium and highly profitable items also warrant close real-time monitoring to avoid lost opportunities for growing sales.

With real-time hyperconverged analytics, business analysts can detect emerging trends and patterns in real time, anticipate future conditions, and take action when it matters most.

## **Four Key Streaming Capabilities of Hyperconverged Analytics**

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### **1. Immersive Visual Analytics on Real-time Data Streams**

Hyperconverged analytics lets users immersively perform visual analytics on streaming data. It enables the use of one-click methods to connect to a wide-range of streaming data sources like IoT and Kafka and historical data sources like databases, cloud data warehouses, and big data stores. Exploring the data by visualizing it, and interactively drilling down and aggregating up, is the first step towards developing an understanding. To make sense of live streaming data, you need context. In part, context comes from history, which makes it extremely important that the live and historical data can be correlated in a single, unified visualization experience.

### **2. Easy Logic Creation for Streaming Applications**

Streaming analytics can be configured using a no-code or low code approach that makes it simple for business analysts to author and manage executable decision logic for business rules, decision rules, and models. Rules can be tested using simulation feeds or test data packaged as decision table artifacts and stored in project folders. Additionally, with TIBCO Hyperconverged Analytics, integration with visual analytics makes it an ideal core technology to power real-time command centers and empower analysts wherever they may be.

### **3. Scoring of ML Models with Real-time Business Data**

Also needed are rich capabilities and features to visualize and explore the efficacy of models, both in a batch-analysis (e.g., periodic summaries of recent historic data) or via real-time visualizations (streaming data and real-time visualizations).

Customizing the visual data exploration experience via underlying data functions is extremely useful when matching up raw outcome measurements with business-specific key performance indicators (KPIs). Alerting on measurements is provided using built-in mechanisms for communicating asynchronously via email, SMS, enterprise messaging, or whatever method is desired.

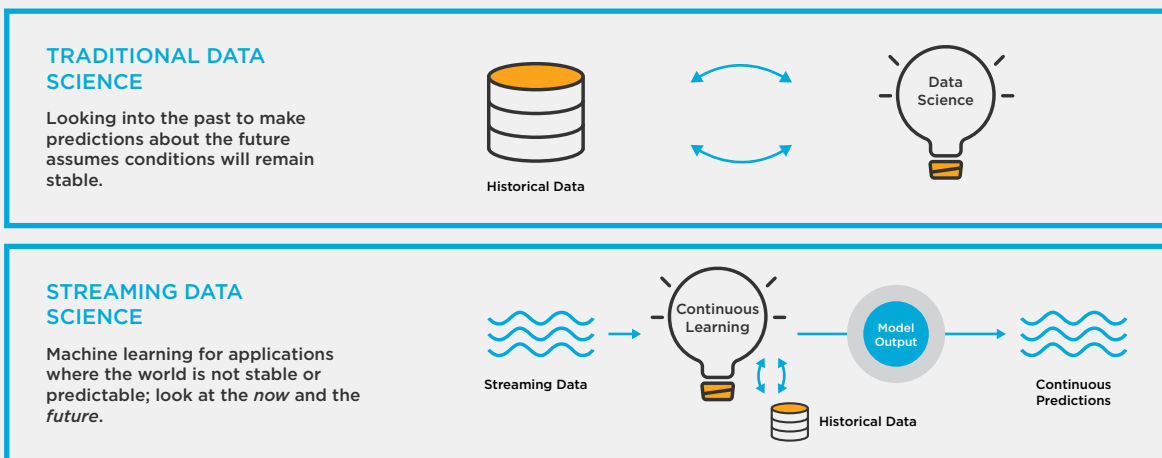
Modern solutions also provide support for multiple languages and frameworks to invoke predictive models. For example, predictive analytics scoring models with machine learning capabilities expressed using Python, H2O, and PMML can provide extensions to streaming logic.

#### 4. Dynamic Learning: Adjust Models Based on Real-time Information

In traditional machine learning, models progress multiple times through a lifecycle. They act on historical data, enable analysts to extract insights, understand conditions, wrangle information, and evaluate the model to determine how effective it is. In traditional machine learning, you repeat the cycle several times, deploy the model, monitor, and update the model as many times as necessary. Ultimately, models lose relevancy and expire.

Dynamic learning, in contrast, puts the learning algorithm directly into the streaming data and updates and adapts BI platforms and/or information systems as new insights are surfaced. The key difference from traditional machine learning is that dynamic learning automates learning adaptation directly in the streaming process.

This dynamic learning loop ensures the highest value insights because it is based on real-time data that is automatically generated and consumed by operational processes. This automation democratizes data science and benefits everyone in an organization.



## Transforming Operations with Real-time Sense and Respond Capabilities

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As presented in the TIBCO whitepaper, *Hyperconverged Analytics: Immersive, Smart, and Real-time*, hyperconverged analytics offers best-in class visual analytics, machine learning, data preparation, geoanalytics, and streaming analytics in one experience. In this environment, it's possible to discover what was heretofore completely unknown, and lift the efficiency of knowledge workers across the organization, including general business users, analysts, data scientists, and analytics app developers.

While visual and historical analytics are powerful as a standalone experience, its strengths are amplified exponentially by the multipliers of smart and real-time. With real-time analysis driven by embedded data science models that inform mission-critical, data-driven operations, immersive, real-time hyperconverged analytics gives decision-makers the confidence to act in the moment.

### **For CargoSmart, real time provided a profoundly enhanced customer experience.**

Ralph Ho, senior manager, customer integration: "We wanted to use advanced analytics to provide unprecedented visibility so ocean carriers could plan ahead in case of disruption and make use of real-time analysis to improve decision-making. We needed a platform that would allow us to crunch different data types in high volumes."

CargoSmart found that real-time hyperconverged analytics met the challenges. This integrated approach to analytics allows the company to facilitate, or co-design with customers, custom analyses and dashboards. "It's shortening time to market and is also allowing us to deliver exactly what customers need to meet their business objectives," said Mr. Ho.

With real-time hyperconverged analytics, CargoSmart can apply artificial intelligence on IoT data to augment decision-making for disruption handling. For example, medical supply manufacturers need to know that certain supplies are continually refrigerated. Now, if conditions change, IoT temperature sensors can raise alerts visualized for customers in real time.

## **For TXODDS, real time, means fast innovation, customer time savings, profitability, and reliable & relevant data.**

Using a network of Kafka messages, TXODDS absorbs events from cloud-based systems that monitor thousands of live sporting events in real time—football, rugby, cricket, and more. Events include real-time inputs such as which players are on the field, the score of the game, and even the weather. Kafka streams millions of these events, thousands of simultaneous changes occurring during thousands of simultaneous sporting events.

Those Kafka events are fed to the TIBCO-powered TXODDS “brain” (including TIBCO Streaming software with sophisticated event-driven rules and TIBCO Spotfire analytics) and predictive models are applied in real time. The brain compares current game conditions to history, executes sophisticated AI learning models to predict which way the game is likely to go, and transmits streaming predictions to subscribers to inform their betting line movement.

The result is a scalable, easy-to-use platform that helps augment human intelligence with streaming, real-time, cloud-based analytics for the global sporting community. With TIBCO’s low-code / no-code analytics for processing streaming Kafka data, the company more quickly creates advanced AI-driven streaming analytics, adjusts to changes in dynamic game play, and reacts to serve its betting customers.

## **Real-time Analytics Summary**

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### **Real-time, Immersive, and Smart Analytics Makes Digital Transformation Possible**

Use cases for real-time analytics are endless. Think about the data you have that changes frequently: sales leads, vehicle location, equipment status, mobile apps, wearable devices, social media updates, kiosks, websites, customer orders, chat messages, supply chain updates, file exchanges, and more.

Next, think of questions or requests that start with the words “tell me when, tell me why.” Real-time analytics can answer those questions instantly (with math, rules, or even analytic models), millions or billions of times a day. For example:

- Tell me when a high-value customer walks into my store, and what she will most likely be looking for.
- Tell me when a piece of equipment begins to show signs of failure and should be shut down to avoid costly losses.
- Tell me when a plane is about to land with a high-priority passenger onboard at risk of missing her connection, and what can be done to make sure she makes that connection.

Real-time TIBCO Hyperconverged Analytics reduces the complexity of applying deep analytics to data streams, providing a unified view of real-time change for insights-driven decision-making.

While visual analytics is powerful as a standalone experience, with fully interactive and responsive dashboards or apps, its strengths are amplified exponentially by the force-multipliers of smart and real-time. With real-time analysis driven by embedded data science models that inform mission-critical, data-driven operations, immersive analytics gives decision-makers the confidence to act in the moment.

## Why it Matters

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“We were first to use streaming analytics software in Turkey, which enabled us to integrate different platforms—data from up to 25 institutions—into one real-time big data stream. With the help of TIBCO Streaming software, we increased FX volume, and we became the first bank in Turkey to provide a gold exchange market. With the TIBCO Streaming system, we can write and deploy an algorithm that has the ability to respond to a volatile market in real time.”

— Abdulkerim Ozcan, senior trader, KuveytTurk Bank

“The gates are the last points at which we capture Wi-Fi data, so we can correlate passenger flow with flight data, and flight data with boarding card information used in our shops. By analyzing correlated data, we can activate predictive analysis and study trends and historical buying patterns to identify future improvements for the airport’s shopping and food businesses.”

— Floriana Chiarello, head of demand management, Aeroporti di Roma S.p.A

“TIBCO is enabling our customers to move more quickly and express requirements and demands for change because of the agility we’ve gained. We’re able to address those requirements and deliver on them more quickly. Our responsiveness is reflected in the happiness of our customers.”

— Noel Jelsma, vice president of global sales and marketing, CyberLogitec

## How to Get Started

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New TIBCO Cloud Data Streams software is available now in the TIBCO Connected Intelligence Cloud and enabled in Spotfire analytics. Log into your TIBCO account and start exploring real-time data in minutes! Visit the [Real-Time Analytics](#) page to get started.

**Learn more about TIBCO Streaming software.**



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