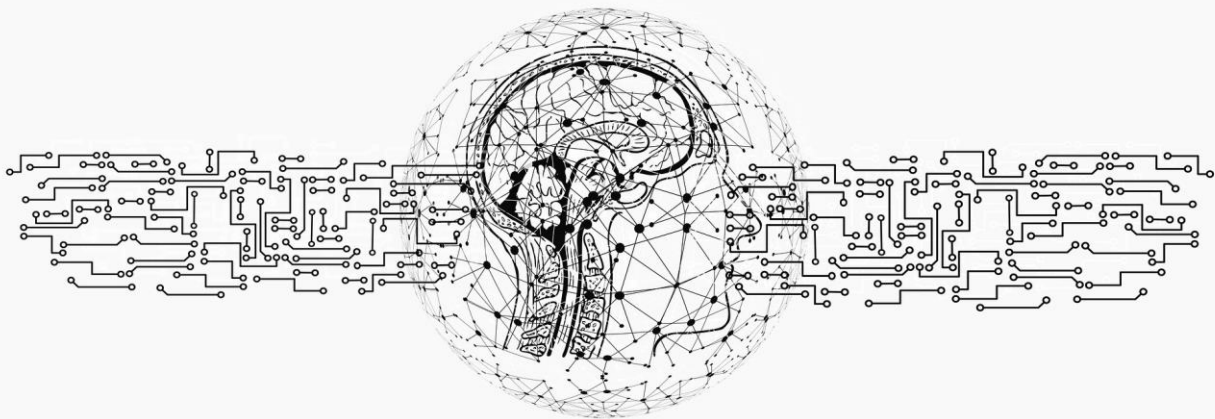


Automating Intelligence for Real Time Decisions

Responding to Business Events
with Context Aware Insight

By John Santaferraro, CEO and Head Research Analyst



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Since most common business operations have gone digital, the need to respond intelligently to business events as they occur has become mission critical.

Organizations that fail to make smart decisions in realtime will lack competitive advantage. We have already seen companies losing leadership positions, falling behind, and in some cases closing their doors because they cannot keep up with digitally astute competitors.

To keep up with the speed of digital business, business intelligence and modern observability platforms have attempted to meet the needs of modernization, but they have failed to address the need for immediate, intelligent responses to business events as they occur. Dashboards are becoming obsolete because they do not address the needs for realtime insight. They tell users what has happened, but not what is happening. Observability platforms show users what is happening in realtime, but they will quickly become obsolete because they do not address the need for contextual awareness.

On one hand, business intelligence platforms were originally built for reporting on existing or batch data, especially for data structures that do not change much over time. These platforms have attempted to adapt to meet market changes as the digital world moves to realtime data streams. However, most business intelligence tools find it difficult to acquire data streams and prepare them for analysis. In addition, the time to insight lags behind due to difficulty analyzing data or combining data streams with data at rest. Most business intelligence platforms fail to enable users to respond to business events as they occur.

On the other hand, observability platforms capture, parse, and combine data in motion, especially machine and log data. Users can easily understand, monitor, and analyze streams, but most observability platforms do not combine batch and streaming data, nor do they process complex analyses. As a result, they lack the contextual awareness necessary to run a business.

The Emergence of Contextually Aware Realtime Insight

In both the business intelligence and observability world, most vendors have failed to transform legacy technology to meet the rising demands of data moving at all times in all directions. Their initial architectural decisions keep them tied to old paradigms of data ingestion, transformation, and analysis. Innovative technology is emerging to fill the gap between business intelligence and observability. In these new platforms, built from the ground up for modern times, the convergence of four major technology trends meets all the needs of contextually aware realtime insight in the digital world.

TREND ONE: Automated Intelligence Delivery

Faced with greater demands on analysts and an increase in actionable data, leading business intelligence and analytics vendors have slowly been using artificial intelligence (AI) to automate formerly manual tasks and deliver insight to stakeholders without human intervention. Built on a rich set of metadata and powerful machine learning engines, the last few years have spawned at least ten insight automation or assistance features in data management tools. The explosive use of generative AI makes these capabilities more accessible to users not familiar with analytics or data.

- **Visualization Recommendation** – the automatic recommendation of the best visualizations for each dataset, especially for automated or assisted insight.
- **Automated Insight** – the automatic provision of insight to business intelligence users from machine learning algorithms that run at all times without user triggers.
- **Assisted Insight** – the ability to trigger machine learning algorithms from within the user context of business intelligence, analytics, or observability tools.
- **Search Recommendations** – the autofill or automatic recommendation within the search capability of the business intelligence, analytics, or observability tools.
- **Natural Language Queries** – the ability to type or speak questions in plain language to run a query and return results.
- **Natural Language Explanation** – the automatic generation of a plain language explanation for assisted or automated insight.
- **Next-Best Question** – the automatic recommendation of the next-best question to ask, based on the user context within an analytics platform.
- **Next-Best Insight** – the automatic recommendation of the next-best insight for the user, based on their context within an analytics platform.
- **Voice Recognition** – the ability of analytics platforms to understand spoken commands to operate the system or run queries. This ability often combines with natural language queries.
- **Image Recognition** – the ability to recognize images using machine learning and include images in analytical queries.

As a result of these AI-enabled, automated intelligence capabilities, many businesses are already experiencing faster innovation cycles, expanded use of data-driven decisions, and the ability to do more with less as an analytics organization.

TREND TWO: Automated Intelligence for Realtime Insight

According to the Apache Foundation, more than 100,000 organizations use Apache Kafka, including over 80% of the Fortune 100. The numbers are even higher when you include users of all other streaming data platforms. As a result, observability platforms are flooding the market, but functionally is limited to monitoring and extracting insight from streaming data. Beyond observability, these platforms include many of the automated and assisted insight features introduced in the business intelligence market.

While customer relationship management leads the way for value generation, realtime automated intelligence is already generating value for applications like fraud detection, risk management, demand sensing, dynamic pricing, and application performance monitoring. In the world of data analytics, automated insights are already being generated for data validation, profiling, data quality, and security.

With the focus on insight derived from data streams, modern technologies already yield significant gains in process mining, optimization, and automation.

Process Mining

Almost every stream of data originates from a digital business process. Every digital business process leaves a fingerprint of data that helps careful observers determine what is working well and what is not. By automating data processing, every user of modern technology can mine their business processes for continual improvement.

Process Optimization

Automated intelligence in realtime also provides the insight necessary to understand the value of process improvement and to help organizations better prioritize the improvement of those processes that will yield the biggest return. Optimizing business processes also creates opportunities for business optimization against competing priorities like time, cost, and resources.

Process Automation

The combination of process mining and process optimization, with the addition of automated intelligence creates the perfect feed for automation of business processes and spawns a continuous cycle of improvement. Historically, recommendation engines automatically delivered the best offer at the best price to ecommerce customers. The emergence of automated intelligence built for realtime insight opens the door for the automation of an ever-increasing number of business processes, even in complex business ecosystems.

For years, the telecommunications industry has perfected the operation of a NOC, a Network Operations Center. The network is at the core of the telecom business, so it has been important to understand every device, connection, cable, and currency throughout the entire network. In a similar manner, business events represent the core of every enterprise; and the ability to fully understand, optimize, and automate these procedures can set your organization apart from all others. Streams of automated realtime insight become the business network operations center, especially for digitally superior organizations.

TREND THREE: Built-In Contextual Awareness

The latest technology trend combines automation, realtime insight, and contextual awareness to fully meet the requirements for intelligent responses to critical business events as they occur. Moving beyond the limitations of business intelligence and observability, modern technologies utilize multi-structure data storage and high performance, distributed computing power to combine batch and realtime processing. The confluence of data in motion and data at rest give digital leaders exactly what they need to respond to real time events with maximum accuracy and intelligence.

Contextual Awareness

There are both physical and analytical limits to insight derived from data in motion. Physically, it is impossible to execute highly complex analytics in real time. Analytically, it is impossible to extract deeply meaningful insight from streams of "moment in time" data. The addition of historical and related data sets brings a wealth of insight to data while it is in motion; and there are almost no limits to the algorithms and machine learning that can be applied to data at rest. Contextual awareness makes the insight derived from data streams highly intelligent. Modern platforms ingest streams of data just as easily as they access data stored in data warehouse platforms like Snowflake, Google BigQuery, Microsoft Synapse, or Databricks. Contextual awareness adds the graduate-level insight of data lakes and data warehouses to the college-level insight possible with streaming data.

Continual Value Creation

As previously mentioned, when you have a platform that can automate both streaming and contextual intelligence, it sets in motion the ability to continually improve business processes with deeper and deeper insight. With a full value chain of data in place, every transaction adds more potential for value creation; and every moment increases the potential for better decision making. For example, adding every new click and purchase to the full picture of all clicks and purchases made at an ecommerce site gives marketers the ability to increase the likelihood of new purchases every time a user navigates through the site. Contextually aware, realtime analysis yields the insight necessary for better business.

TREND FOUR: Automated Realtime Business Optimization

Every organization operates within a specific industry and every part of the organization operates within a specific functional area. Generative AI has made AI more accessible, helping leading companies automate and optimize realtime business processes. Beyond optimization, the addition of industry-specific or business function-specific models speeds time to value and increases the potential for value creation.

The Value of Industry Specific Models

For example, a travel site provides pricing in real time. Because this business process is often automated, users come onto the site and see one price; if they do not book it and come back later, the price might have gone up, and as a result, they decide not to book, or they book elsewhere. Because rejection rate is an important metric, a travel site needs to carefully optimize between the two.

Bookability is equally important. The site needs to make sure that the offers they are making are truly available. If users try to book something, only to find that it is no longer available, they may get frustrated and choose another travel site. With millions of potential bookings, the ability to better understand bookability can make a significant impact on revenue and profit.

Starting with an industry model that understands the nuances of a business can save organizations the time it would take to fine tune their understanding of how to use modern analytical technology. It enables them to quickly plug into realtime insight and immediately begin getting value from new applications.

The Value of Business Specific Models

Like industry models, business-specific models provide the same kind of value. For example, customer facing data has always comprised 70% of all money invested in analytics. This includes sales, marketing, and customer service.

For example, when someone purchases a software download online, they can immediately download the software. Sometimes it is an upgrade, and in other cases it is a new purchase. If that person downloads the software, immediately begins to use it, and encounters some problems, they will need to call for customer support. It will be vital for the customer service agent to have recent and historical data to give the best service possible.

Starting with a business specific model that understands the nuances of customer experience across sales, marketing, and customer service condenses the amount of time needed to gain value from diverse, customer-centric data streams.

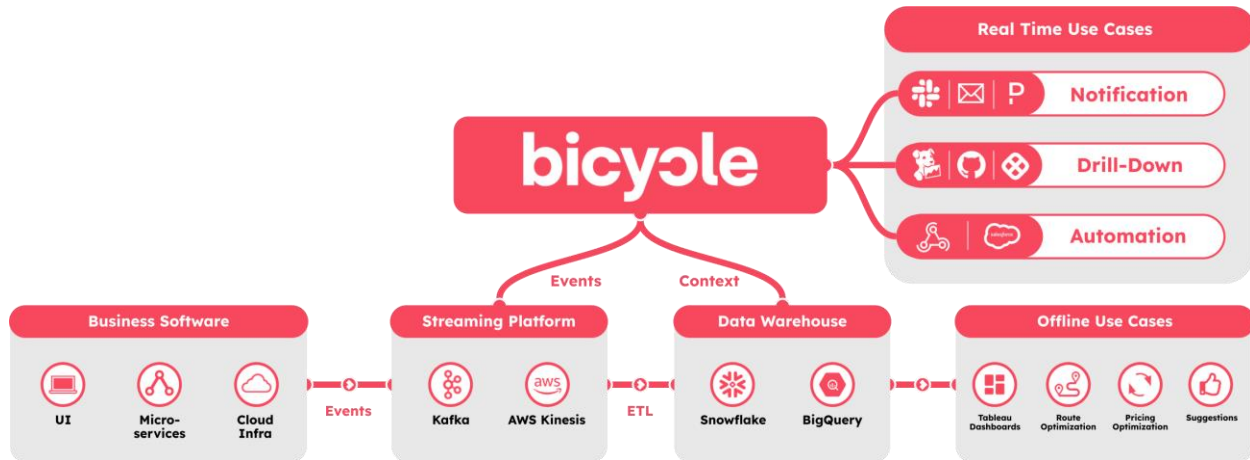
The Convergence of Automation, Realtime, and Context

At the time of writing, Ferraro Consulting considers Bicycle.io to be the only technology with automated intelligence built for realtime insight with built-in contextual awareness and business-specific models to accelerate time to value. Automated intelligence and realtime insight are nothing new, but the addition of context and business specifics sets them apart and gives users immediate insight. Bicycle.io quickly becomes the business cockpit, the NOC of the business, with automated insight into whatever is happening now in a business.

With Bicycle, data teams can plug a data stream into the platform, quickly derive the business context, calculate the value of business transactions, immediately see what is happening, and understand the potential for improvement. Gone are the days of acquiring data, creating data lakes, and hiring data scientists, and waiting for people to discover what is happening. Simply plug in a Kafka feed and Bicycle.io auto-generates visualizations, builds dashboards, offers insight, and recommends alerts.



The Convergence of Automation, Realtime, and Context



Underneath the covers, there are several technical steps automated to make insight quickly available.

- **Rapid event ingestion with automated context** - events and context automatically combine to increase the accuracy of automated insight.
- **Automated query and insight delivery** - queries are automatically generated and insight delivered without human intervention.
- **Automated anomaly detection** - anomalies are automatically detected and surfaced for viewing or delivered as needed.
- **Automated triage and classifications** - probable causes, impact, and solutions are automatically generated and classified for quick insight.
- **Built in alerting and automation** - "surgical" notifications are generated for insertion into relevant business processes at the point of need.
- **Automatic application of industry-specific models** - industry or business specific models automatically provide deeper context for data streams.
- **Automated generation of language models** - a specific language model is created for use by generative AI in a controlled with more accurate output.

With these modern capabilities, transactional business can expect immediate results in both technical and business value creation.

Technical Value: Technical teams can expect to do more with less, respond more quickly to the needs of the business, and spend more time on innovative projects.

Business Value: Business teams can expect to respond intelligently to business events as they occur, continually improve business processes, and innovate new business models at a competitive rate.

For more information, contact John Santaferraro at john@ferraroconsulting.com.