



**Introducing a New Approach to
Business Activity Monitoring**

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A New Approach to Business Activity Monitoring - Why Now?

Successful business operations depend on having repeatable and measurable processes that can be easily improved and extended over time. While most enterprises are adept at monitoring and improving processes that are orchestrated by siloed business process management (BPM) solutions or packaged applications, they have previously struggled with getting an end-to-end view of their business operations. One of their biggest challenges has been around gleaning real-time insight that lets them take action – while it still counts. And that's where a new approach to business activity monitoring (BAM) can prove to be valuable.

Introducing Vitria Operational Intelligence for Business Activity Monitoring

Vitria Operational Intelligence represents a fresh, new approach to BAM. It brings together state-of-the-art stream processing, real-time analytics, visual dashboards and business process management capabilities in one unified platform to help companies monitor business activity across end-to-end processes.

Vitria Operational Intelligence empowers business users to easily track and trace operational activity across applications and organizational silos, in real-time, and then take immediate action on the uncovered insights, a task that was hard to accomplish with siloed monitoring systems.

Business users can now uncover, analyze, and act on actual business activity patterns – in seconds and minutes. This helps them tackle supply chain challenges, fraudulent financial transactions, delayed order fulfillment and shipments, online customer service issues, and suspicious people of interest in real-time, before a customer or the broader organization is affected.

In the next section of this paper, we will discuss the benefits of this new approach to BAM using three case studies.

The Benefits

Customer Experience Management

Competitive pressures are driving companies to differentiate themselves by focusing on delivering a superior customer experience. To this end, many of these organizations are putting an emphasis on streamlining their customer onboarding processes. However, these processes typically span several applications, making it difficult to gauge a customer's actual experience in real-time. From banks to utility firms to mobile service providers, bringing on a new customer involves a host of activities including gathering a customer's information, evaluating his or her credit-worthiness, and opening and activating an account while adhering to the company's policies and other regulations. Inefficient onboarding processes can lead to customer churn and missed opportunities for growth and cross-selling. What's needed is a solution that can deliver complete visibility into the end-to-end process, in real-time.

A market-leading retail electricity provider in Texas wanted to make the process of bringing on a new customer seamless. Their onboarding process involved interactions between individuals at their firm, the transmission and distribution service provider, as well as the Electric Reliability Council of Texas (ERCOT) hub, and it spanned multiple systems including their CRM, billing and EDI systems. Using Vitria Operational Intelligence, this utility provider was able to quickly implement a real-time activity monitoring layer, without replacing or modifying their existing systems. The benefits of this approach are as follows:

- They gained complete visibility into the key activities involved in bringing on a new customer. They can now track the experience for individual customers as well as gain an aggregate view of how well they handle all onboarding requests
- The instant visibility affords them the opportunity to immediately identify and remediate potential onboarding issues, before a customer is impacted
- They have complete visibility into partner system or EDI system outages, that might impact customer transactions so that they can quickly intervene and correct the situation

Supply Chain Visibility

Today's supply chain operations are global, outsourced and more complex than ever. They are characterized by increasingly outsourced manufacturing operations, growing global competition, constant demand volatility, short product life cycles, and stringent regulatory requirements. Effectively managing each leg of the full supply chain is a daunting task. Consumers are clearly in charge and have companies scrambling to meet their aggressive and ever-changing needs. The success of an organization can now often be dictated by the success of its supply network. Whoever can deliver what customers want, when, where and how they want it, will win—but achieving this requires an extremely responsive supply chain based on cross-enterprise visibility and coordination.

“With Vitria Operational Intelligence, enterprises can tackle online customer service issues, supply chain challenges, and fraudulent financial transactions, in real-time, before a customer or the broader organization is impacted.”

A global restaurant chain needed an effective way of tracking and monitoring hundreds of thousands of shipments as they moved from thousands of suppliers through hundreds of distribution centers to their store locations across the globe. They implemented Vitria Operational intelligence to track and monitor their procurement processes, provide their planners with complete visibility into the status of orders, and receive alerts on shipment overages or shortages that might in turn impact a customer’s experience at any given store location. With Vitria Operational Intelligence, their planners can immediately respond to the following customer-affecting issues:

- Shortages and overages in received quantities
- Shortages due to receipt/return of damaged goods
- Shipment delays and scheduled receipt delays
- Goods receipt scheduled on non-work days for a distribution center
- Event lateness across all monitored activities – for instance, approvals, communication of the PO to a supplier, shipments, receipt at a distribution center, and confirmation within the corporate system

Planners can easily mark certain orders as high priority – for instance, a replenishment order to remedy an out-of-stock situation at a restaurant with heavy traffic or a seasonal product shipment for a holiday – so that the distribution and transportation personnel are immediately alerted to fast-track these orders.

Fraud Detection and Remediation

Fraud costs companies significant revenues – to say nothing of the time and resources it takes in attempts to recoup any of these lost revenues. By the time many companies have actually detected the fraud, the transaction has already cleared and the person committing the fraud has disappeared. The challenge in detecting fraud is to be able to detect it early in its lifecycle, ideally at the point it is being committed. Companies need to detect and act on two types of fraud: illegal or illicit behaviors from within the company, such as insider trading; and fraudulent transactions coming from outside the company, such as credit card fraud or insurance claim fraud.

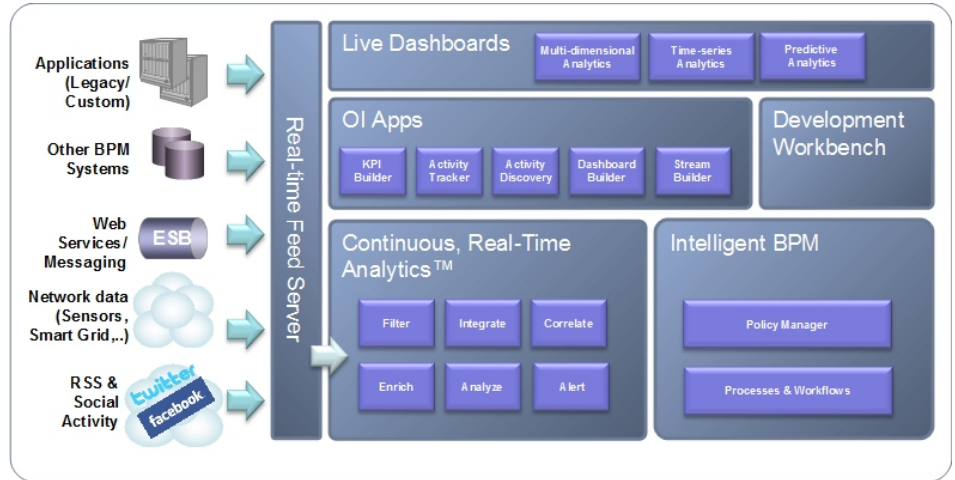
A financial services company struggled with significant levels of internal fraud because it was unable to integrate the myriad of data sources involved in fulfilling the company’s end-to-end transactions. Today, with its Operational Intelligence solution in place, the company monitors all activities and detects outliers as well as unusual business patterns. By analyzing live streams of activities, the company is able to identify suspicious transactions in real time. To curb external fraud, the company quickly incorporates newly identified fraud patterns into existing fraud models, and deploys these updated models rapidly to help them detect potentially fraudulent transactions faster.

Vitria OI for BAM components:

- Feed Server
- Continuous Real-time Analytics Server
- Operational Intelligence Apps
- Intelligent BPM
- Development Workbench

Vitria Operational Intelligence for BAM – How it Works

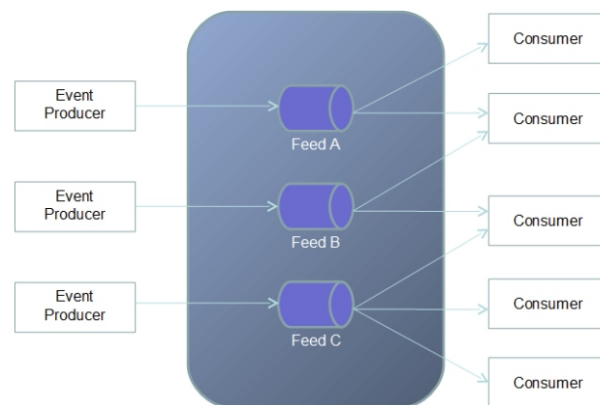
The diagram below highlights the major components within Vitria Operational Intelligence.



Key components within Vitria Operational Intelligence

Feed Server

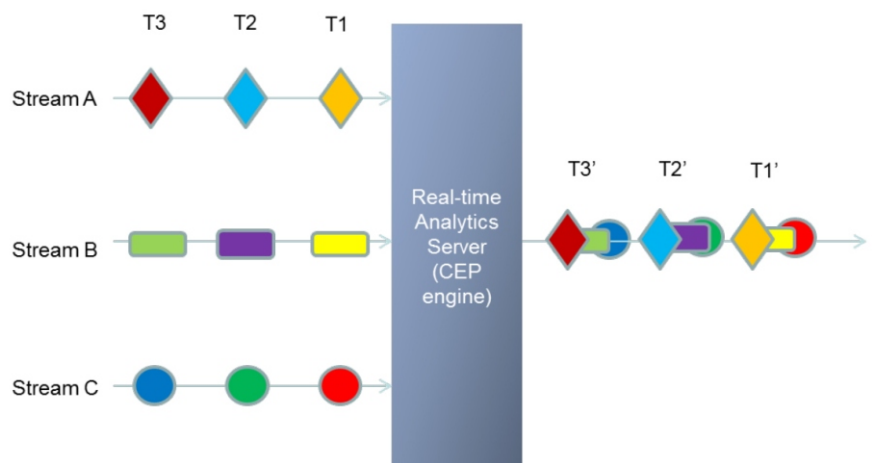
Vitria Operational Intelligence is designed to continuously ingest both streaming and stored data through its Feed Server. It provides a non-intrusive way of tapping into a variety of event sources including applications, databases, other BPM systems, logs, files, REST sources, Big Data sources such as Hadoop, NoSQL databases and more. The Feed Server enables these differing event sources using the notion of a ‘feed’, which provides an abstraction of an event source. The Feed Server manages multiple feeds. As new events arrive, they are streamed through the feeds and then consumed by downstream processing components such as the stream processing engine, tracking processes, BPM and dashboards. The results from the processing exercise can then be streamed into another feed, if desired, creating an event processing pipeline. The Feed Server is designed to ensure guaranteed delivery, recovery, and message replay. Once a feed is created, it can be easily shared with other developers, business analysts and power users based on their access rights. This enables them to easily tap into event streams to build analytical models that aid in business activity monitoring without the need for deep technical knowledge of the underlying event sources.



Feed Server: Connecting event producers and consumers

Continuous, Real-time Analytics Server

The high performance complex event processing (CEP) engine within Vitria Operational Intelligence continuously queries, filters, correlates, enriches and analyzes data streams to discover exceptions, patterns, and trends that are presented through live dashboards. By leveraging in-memory processing, the results are delivered with ultra-low latency. It can correlate and analyze structured, richly structured and loosely structured data to deliver real-time insight with the necessary contextual information to help you make informed decisions. Multi-dimensional, trend, time-series and predictive analysis of the data provide business executives with the “big picture” while also equipping operations teams with detailed drill-downs to spot anomalies and take corrective action. The ability to easily mash up these results with external data and event sources enables delivery of real-time insights in context.



Continuously filter, aggregate, correlate, join and analyze data streams

Operational Intelligence Apps

Vitria has extensive experience implementing BAM applications for many customers, and we have used that experience to uncover a set of commonly repeated BAM requirements. To help a broad spectrum of customers further accelerate and simplify business activity monitoring, we have abstracted these common requirements into a set of Operational Intelligence Apps. The OI Apps provide the following key capabilities:

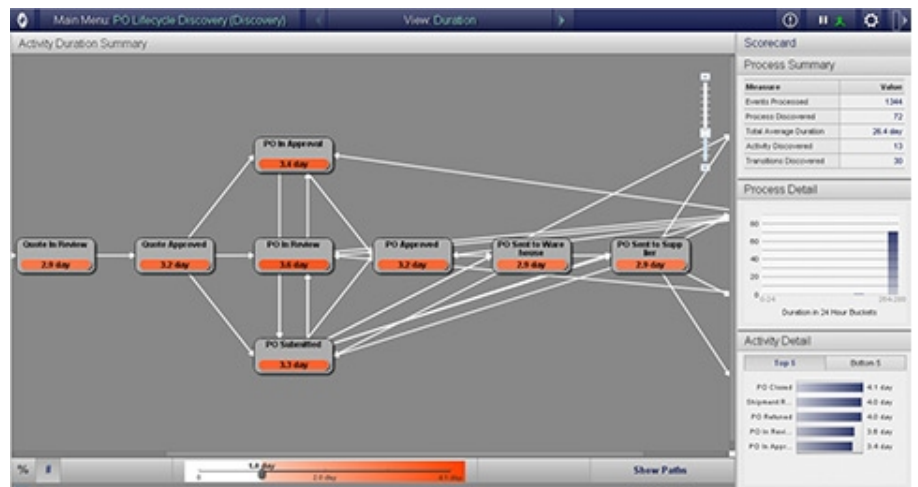
1. Helps easily track an end-to-end business process – either by top-down modelling of the key process milestones or by bottom-up discovery of the actual activity patterns from live data streams
2. Simplifies defining KPIs over streaming data
3. Quickly binds relevant events from IT systems and applications to a tracking model and correlates events that occur across the diverse data streams
4. Generates process performance metrics that can be easily shared
5. Mashs up analytics results into live dashboards
6. Lets users subscribe to important alerts and actions

Vitria's innovative OI Apps put the power of business activity monitoring using streaming data in the hands of business users. Enterprises no longer need an army of developers to gain real-time insight into where the bottlenecks are in their supply chain, or to predict in real-time that a customer is about to churn and automatically entice them with a compelling offer, or to detect potentially fraudulent behavior from streaming data and immediately intervene. What previously took months can now be accomplished in seconds and minutes.

The Vitria OI Apps designed to simplify BAM solutions include:

1. Activity Discovery

The Activity Discovery App lets business users quickly uncover and analyze actual business patterns – typical paths, exception paths, and bottlenecks – from live streams of data to proactively respond to uncovered insights. It helps them visualize and analyze each transaction or activity as it unfolds. The Activity Discovery App also helps enterprises get a clear understanding of all the steps involved in an end-to-end business process. Previously, documenting business processes involved months spent interviewing key business stakeholders by which point the process was obsolete or had evolved. The Activity Discovery App helps uncover true process patterns in minutes by tapping into business activity, transaction or audit logs. Unlike other discovery tools that mine subsets of historical data, the Activity Discovery App can also tap into live streams of data. The discovered process can then be used as a baseline for continuously monitoring business activity. This is a bottom-up approach to arriving at a tracking model.

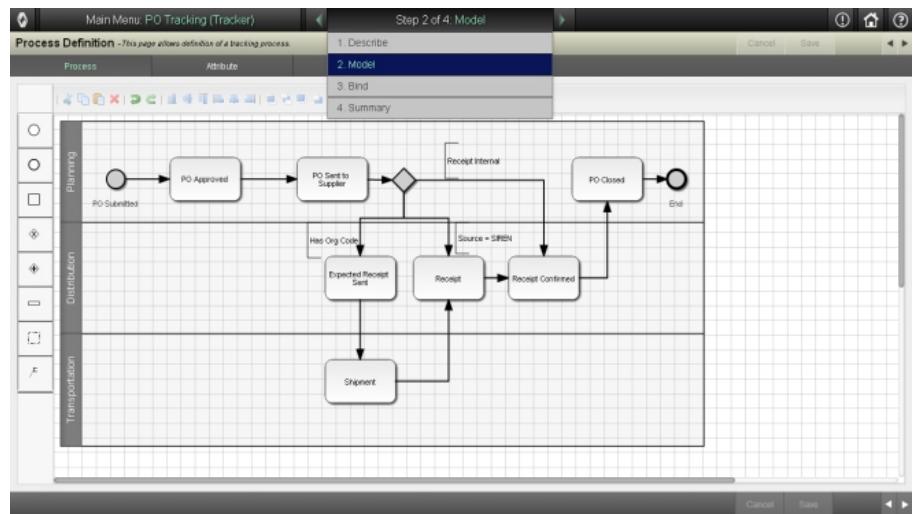


Continuously filter, aggregate, correlate, join and analyze data streams

2. Activity Tracker

The Activity Tracker App significantly simplifies tracking business activity that spans application and organizational silos. It lets business users leverage an activity pattern “discovered” using the bottom-up approach enabled by the Activity Discovery App. Alternatively, users can easily map out the major business milestones that they want to monitor in real-time using a top-down approach. With the Activity Tracker App, they can:

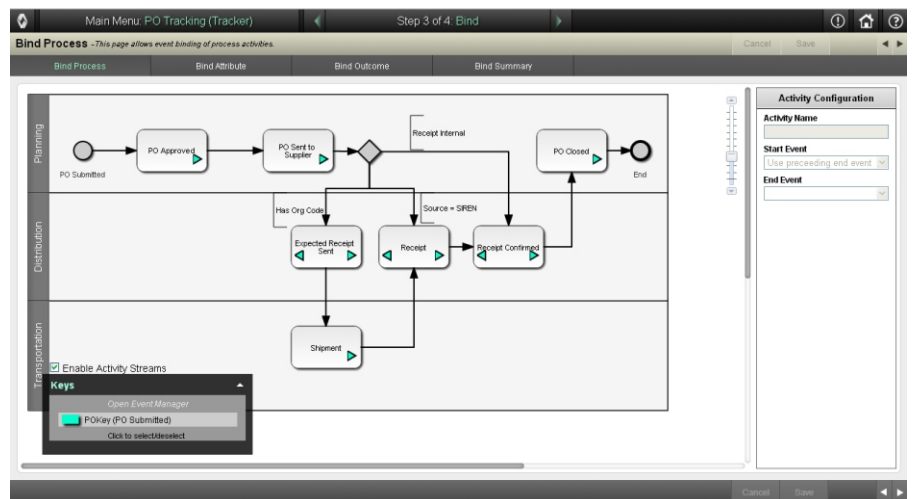
A. Map major milestones to track – the top-down approach



Continuously filter, aggregate, correlate, join and analyze data streams

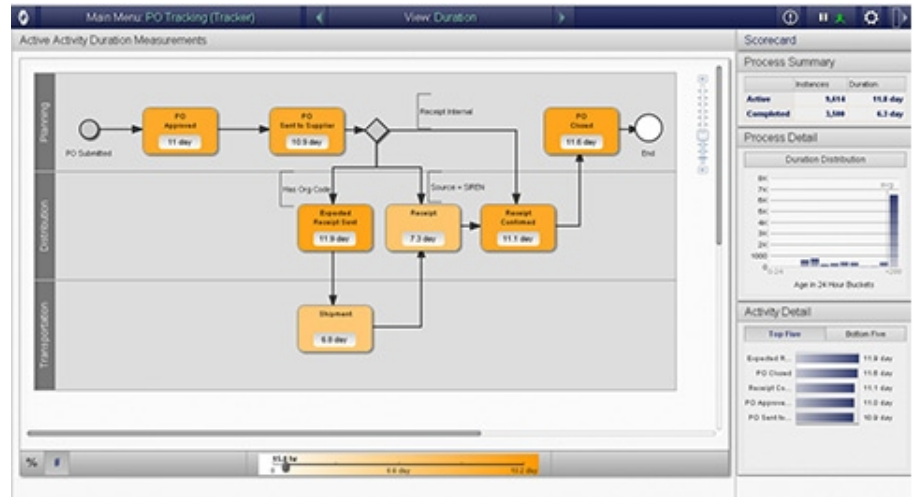
B. Bind significant events to the milestones

The graphical tracking process hides technical complexity from users – for instance, dealing with late, out-of-order and duplicate events, guaranteeing processing, and recovery from failure. With traditional BAM solutions, enterprises were left with no alternative but to write code to incorporate these more advanced capabilities into their tracking application.



Graphically bind events to milestones

C. Continuously monitor business activity against a base tracking model

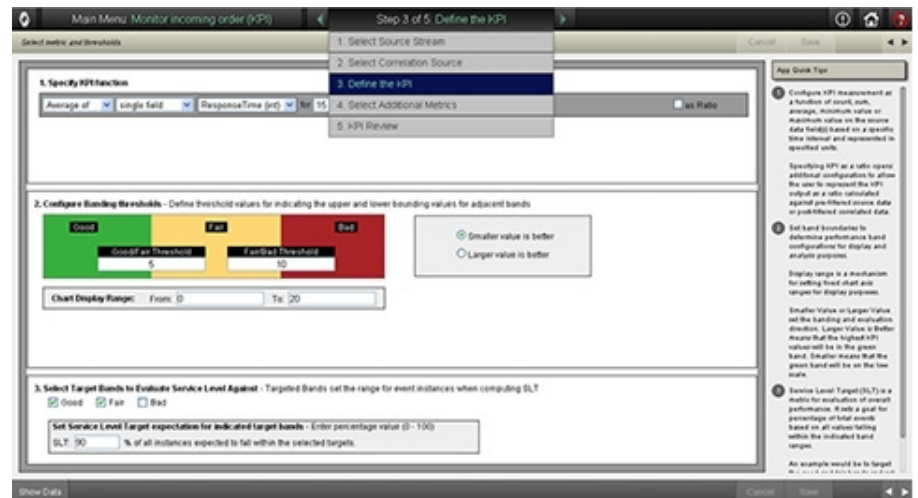


Continuously track business activity across application and silos

3. KPI Builder

The KPI Builder App uses the latest enhancements in stream processing to make it easier than ever before for data analysts and power users to define and monitor key performance indicators (KPIs) over streaming data. It helps them easily see trends, predict problems, and optimize outcomes using auto-generated dashboards. Users can easily define event-, process- or activity-specific KPIs and then track performance by establishing thresholds and service level targets using various “window” constructs based on time, count or specific attributes.

Whereas process-based KPIs can be directly modeled within the Activity Tracker App, the KPI Builder App enables users to compute KPIs from non-process related streaming data.



Define KPIs over streaming data in minutes

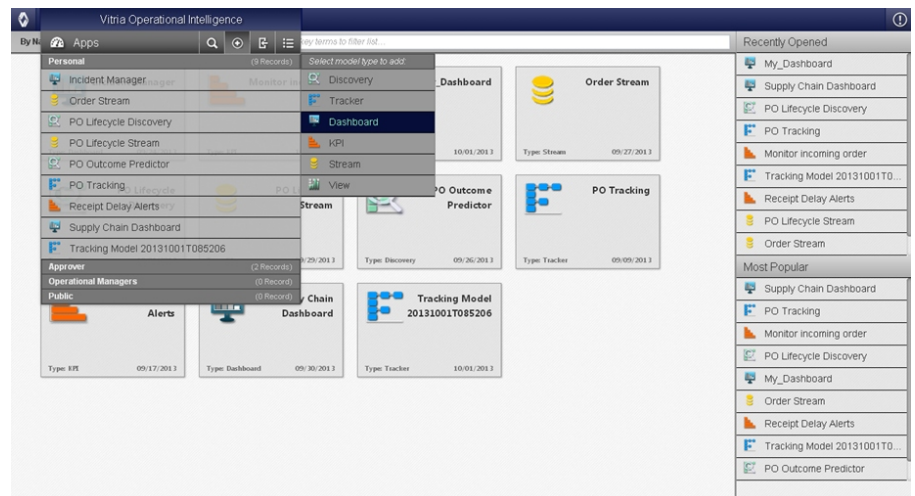
The KPI Builder App continuously and incrementally computes and displays KPIs using several out-of-the-box reports, including those that track duration and aging metrics, backlogs, outliers, distribution, trends, top-N, and volume metrics.



Displaying live dashboards

4. Dashboard Builder

The Dashboard Builder App lets users create highly interactive and intuitive live dashboards that can be shared in seconds. It helps users construct custom dashboards by assembling existing analytical resources produced from KPIs, tracking processes or the Vitria OI Development Workbench.



Easily configure and share dashboards in seconds

Instant dashboards such as KPI scorecards, distribution charts, Top-N paths and trend graphs can be displayed alongside other performance metrics overlaid on tracking processes. The dashboards are HTML5 compliant allowing them to be viewed using iPad or Android devices.



Live dashboards built using Dashboard Builder

Assembling and Sharing Dashboards using Spaces

Users can share both dashboards and the underlying models, data resources and analytics that they create with other users using spaces. A space is a defined community of users with privileges assigned to them to view, contribute or serve as an administrator.

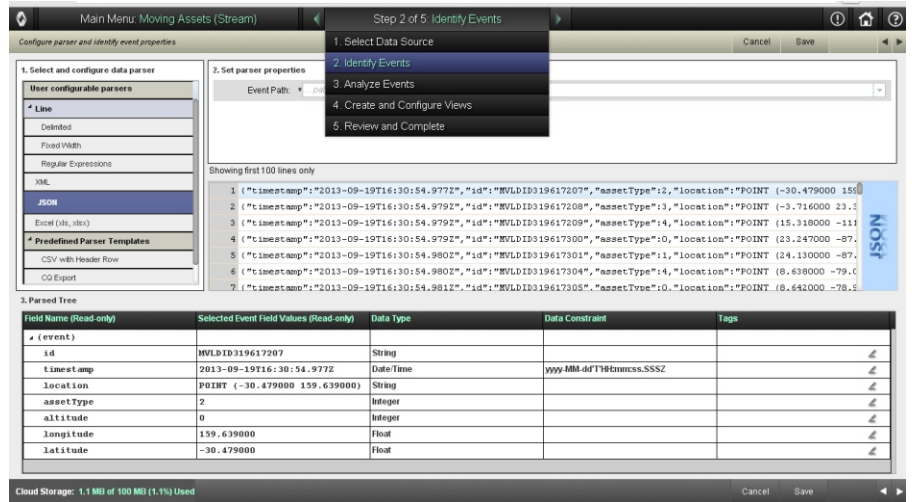
Working in spaces, users can mash up real-time analytic results to create new analytics or dashboards. These analytics can also be made available using REST interfaces for consumption by third-party applications. Event streams can also be shared and used to create new analytical applications using the OI Apps or the Development Workbench.

Notifications

Vitria OI's Notification Manager allows users to directly subscribe to notifications. Tracking Processes and KPIs emit notification streams that users can subscribe to, thereby eliminating the need to hard code notification policies within the application logic. It also enables users to choose how and when they are notified, thereby keeping them up to date on events that are of importance to them.

5. StreamBuilder

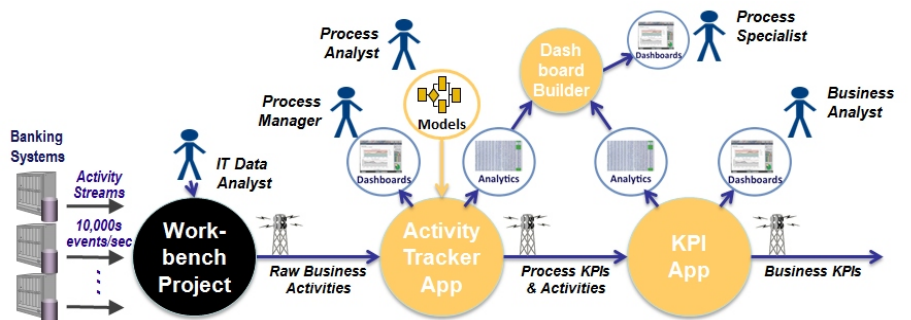
The StreamBuilder App makes it easy for power users to access live streams of data for immediate analysis and action. The result is continuous and incremental updates to the analysis which significantly eliminates the latency in decision-making.



Easily tap into live streams of data

OI Apps and the Information Pipeline

By combining the OI Apps, users can realize a powerful design pattern in stream processing – the creation of an information pipeline. Using this approach to event processing, analytics and insight are fine-tuned at every stage. An action may be triggered at any stage in this information pipeline to respond to opportunities and threats, or to enforce regulations, for instance.



Intelligent BPM

Vitria's integrated action framework lets enterprises take immediate automated action based on pre-defined business rules – while a transaction is still in process (for example, when a failure occurs in a customer on-boarding process). A complete process management engine within Vitria OI makes it easy to define response processes and automatically execute them based on discovered insights (for example, trigger a fraud investigation process, a repair process, or a targeted marketing program).

Development Workbench

The Development Workbench, a unified modelling environment, lets IT architects graphically compose sophisticated, custom operational intelligence applications complete with feeds, complex event processing queries, processes, policies and dashboards.

Vitria OI for BAM vs. Other Approaches – Why it's Different

Traditional approaches to BAM have involved monitoring individual applications or processes that are, very often, orchestrated by a workflow or business process management (BPM) solution. However, true business activity spans multiple applications, perhaps even multiple BPM systems. In addition, organizations often do not have a clear understanding of the actual sequence of events that take place during the course of a complete business process.

With Vitria Operational Intelligence, organizations can achieve the 'panoramic' visibility required to monitor business processes end to end, in addition to discovering and monitoring the progress and performance of previously 'hidden' processes. Vitria OI tracks significant milestones against KPIs displayed in live dashboards. When established thresholds are met or exceeded, they can be immediately and automatically acted on using the built-in business process management engine. The following table illustrates how Vitria OI stacks up against the BAM capabilities within BPM solutions as well as other open-source options:

	Vitria OI for BAM	Traditional BAM/ BPM	Open Source Tools
Continuously monitor business activity across silos	●	●	●
Correlate, analyze and act on streaming events	●	●	●
Uncover true activity patterns from streaming data	●	●	●
Discover typical and exception paths from streaming data	●	●	●
Predict the next best action from streaming data - continuously computed	●	●	●
Easily create baselines from discovered processes	●	●	●
Define KPIs and live dashboards in minutes with little IT involvement	●	●	●
Easily tap into live data streams	●	●	●
Supports resource sharing & collaboration	●	●	●
Benefit from a unified analytics and action platform	●	●	●
Delivers business value in days	●	●	●
Leverage Apps that empower business users	●	●	●
Supports advanced features (e.g., Correlation chains, out of order events)	●	●	●

Summary:

Vitria Operational Intelligence is the only completely integrated solution that can continuously monitor business activity across applications, spot bottlenecks and speed corrective action through alerts and guided workflows. It can integrate, correlate and analyze streaming events for richer, real-time insight in context. It eliminates latency in decision-making with continuous and incremental event analysis and the OI Apps accelerate business user adoption with self-service BAM capabilities.



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