The Forrester Wave™: Big Data Streaming Analytics, Q1 2016

Streaming Analytics Are Critical To Building Contextual Insights For Internet-Of-Things, Mobile, Web, And Enterprise Applications

by Mike Gualtieri and Rowan Curran

March 30, 2016

Why Read This Report

Everybody is talking about real-time contextual app experiences, but nobody is doing anything about it. That's because most AD&D pros aren't fully exploiting real-time streaming data that flows from IoT devices and mobile, web, and enterprise apps. Streaming analytics is essential for bringing real-time context to apps. Start with Forrester's 26-criteria evaluation of 15 leading vendors: Cisco Systems, data Artisans, DataTorrent, EsperTech, IBM, Impetus Technologies, Informatica, Oracle, SAP, SAS, Software AG, SQLstream, Striim, TIBCO Software, and WSO2.

Key Takeaways

Fifteen Streaming Analytics Solutions Vie For Enterprise Adoption

Among the streaming analytics vendors Forrester evaluated, we uncovered a market in which IBM, Software AG, SAP, TIBCO Software, Oracle, DataTorrent, and SQLstream lead the pack. Impetus Technologies, SAS, Striim, Informatica, WSO2, Cisco Systems, data Artisans, and EsperTech offer competitive options.

The API Obsession Is Insufficient

AD&D pros seek APIs to serve the model of request and response. Because of this obsession with "What API can I call?" they ignore the question of "What real-time context can I acquire?"

All Data Is Born Fast

All data originates in a flash, whether it is from Internet-of-Things (IoT) devices, web clicks, transactions, or mobile app usage. But traditional analytics is done much, much later. Why wait? AD&D pros can use streaming analytics embedded in applications to get actionable value tout de suite. So what are you waiting for? Streaming analytics solutions can capture perishable insights on real-time data to bring immediate context to all IoT, mobile, web, and enterprise apps.

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Notes & Resources

Forrester conducted product evaluations in November 2015 and interviewed 15 vendors: Cisco Systems, data Artisans, DataTorrent, EsperTech, IBM, Impetus Technologies, Informatica, Oracle, SAP, SAS, Software AG, SQLstream, Striim, TIBCO Software, and WSO2.

Related Research Documents

Digital Insights Are The New Currency Of Business

The Forrester Wave™: Big Data Hadoop Distributions, Q1 2016

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Applications Need Accurate Insights — And Need Them Now

Forrester defines perishable insights as urgent business situations (risks and opportunities) that firms can only detect and act on at a moment's notice.[1] Streaming analytics solutions can help firms detect such insights in high-velocity streams of data and act on them in real-time. Application development and delivery (AD&D) professionals should not dismiss streaming analytics as a form of "traditional analytics" used for postmortem analysis. Far from it — streaming analytics analyzes data right now, when it can be analyzed and put to good use to make applications of all kinds contextual and smarter. Forrester defines streaming analytics as:

> *Software that can filter, aggregate, enrich, and analyze a high throughput of data from multiple, disparate live data sources and in any data format to identify simple and complex patterns to provide applications with context to detect opportune situations, automate immediate actions, and dynamically adapt.*

Streaming Analytics Pushes Real-Time Contextual Intelligence To Applications

Streaming analytics solutions include both development tools to create streaming flows that applications can use and a scalable runtime platform. The heart of all streaming flows is a sequence of streaming operators that are configured and threaded together to process and analyze the incoming data streams. The following streaming operators are the fundamental building blocks of streaming analytics:

- **Transformation.** Streaming data delivers tremendous volumes of information, and often this can be filled with irrelevant noise rather than signal. Transformation operators allow developers to narrow the incoming stream to include only data relevant to the application. Such operators are often the first set applied to streaming data, and they can serve as a light version of traditional extract, transform, load (ETL) for streaming applications. Filtering operators may filter according to terms, data sources, or location. For example, a banking application may want to drop all events generated in the US if it is trying to detect fraudulent transactions in Canadian branches.
- **Correlation.** Streaming applications almost always combine data from multiple sources. Aggregation/correlation operators allow developers to combine multiple streams into one stream, not unlike tributaries flowing into a larger river. For example, a telecom application may need to link incoming call data records with customer profiles in order to offer an upgrade to a higher-tier calling plan.
- **Enrichment.** Streaming data often requires reference data to provide additional context. Enrichment operators allow developers to pull in reference data from various databases. This reference data adds context for other streaming operators. For example, a data stream from a home improvement store's point-of-sale (POS) system could enrich its transactions against customer records, revealing that a customer is probably working on a roofing project.

- **Time windows.** Streaming data flows in real time, but applications often need a snapshot of the stream over an arbitrary time period. Time windows operators allow developers to define a time period and the streaming data to include in the "window." Developers can then use them to perform time series analysis in real time, such as running totals, weighted moving averages, Bollinger Bands, and many others. For example, a time window could show all transactions in the last five minutes that exceeded $10,000 in value and calculate a rolling average.
- **Pattern matching.** Streaming data often contains interesting patterns that only emerge as new streaming data arrives. A common pattern occurs when an event A arrives at time t and another event B arrives at time t plus x. Pattern operators allow developers to define arbitrarily complex relationships between streaming events. It's important for developers to remember that in many scenarios, there is a tradeoff between the complexity of the pattern and the latency introduced by needing to process the analytics. An example of pattern detection is traffic analysis, a streaming platform that could, for example, use temporal patterns to note that a set of vehicles all decelerated on a highway within 10 seconds, indicating a possible accident or the presence of a state trooper.
- **Business logic.** The result of stream analysis is to inform applications with real-time context. Business logic allows developers to define if-then clauses to push contextual information to applications or provide services that allow apps to query a relevant real-time state. For example, a peer-to-peer eCommerce site could use streaming analytics to identify illegal behavior among users and send immediate email or desktop alerts to compliance personnel.

Big Data Streaming Analytics Evaluation Overview

To assess the state of the market and see how the vendors stack up against each other, Forrester evaluated the strengths and weaknesses of the 15 top commercial and open source streaming analytics vendors. After examining past research, user requirements, and vendor interviews, we developed a comprehensive set of 26 evaluation criteria, which we grouped into three high-level buckets:

- **Current offering.** We evaluated each product's workload scalability, ingestion throughput, analytical throughput, fault tolerance, stream handling, streaming operations, and application development features to establish the differentiated capabilities of the vendor's current offering. All evaluated products must have been publicly available by December 31, 2015.
- **Strategy.** We reviewed each vendor's strategy to assess its ability to compete and grow in the enterprise streaming analytics market. Key criteria include Forrester's confidence in the vendor's ability to execute on its stated strategy and support current and future customers. We also reviewed each vendor's product road map to assess how this will affect the vendor's competitive position relative to the other vendors in this evaluation.
- **Market presence.** To determine each vendor's market presence, we evaluated overall streaming analytics revenue, installed base, market awareness of the vendor's product, and partnerships with other technology and services firms.

Evaluated Vendors And Inclusion Criteria

Forrester included 15 vendors in this evaluation: Cisco Systems, data Artisans, DataTorrent, EsperTech, IBM, Impetus Technologies, Informatica, Oracle, SAP, SAS, Software AG, SQLstream, Striim, TIBCO Software, and WSO2. Each of these vendors has (see Figure 1):

- **Core streaming analytics functionality.** All 15 vendors provide comprehensive analytics features on streaming data in time windows. We do not consider products that only focus on ingestion of streams without comprehensive analytics functionality (such as messaging platforms) to be streaming analytics solutions. Product features and add-on technologies must aim at the requirements of the world's largest enterprises, organizations, and government agencies.
- **General-purpose technology.** The evaluated solutions are general-purpose streaming analytics products that aren't embedded or functionally focused within domain-specific applications.
- **Options for both on-premises and cloud deployment.** All vendors included in this evaluation provide a software solution that organizations can install on their own on-premises, private cloud, and/or public cloud infrastructure. We excluded cloud-only solutions — such as Amazon Web Services' Elastic MapReduce, Google's Cloud Dataflow, and Microsoft's Azure Stream Analytics — because we will cover them in a separate report.
- **Customer references.** Each vendor provided at least two customer references who were willing to be interviewed by Forrester about their experience using the product.

FIGURE 1 Evaluated Vendors: Product Information And Selection Criteria

Vendor	Product evaluated	Product version evaluated	Version release date
Cisco Systems	Cisco Connected Streaming Analytics	1.1	December 31, 2015
data Artisans	Apache Flink	0.10	December 31, 2015
DataTorrent	DataTorrent RTS Apache Apex	3.2 3.2	December 31, 2015
EsperTech	Esper Enterprise Edition	5.3	December 31, 2015
IBM	IBM Streams	4.1	December 31, 2015
Impetus Technologies	StreamAnalytix	1.2	December 31, 2015
Informatica	Informatica Intelligent Data Platform	10	December 31, 2015
Oracle	Oracle Stream Explorer	12.2.1.0.0	December 31, 2015
SAP	SAP Hana SAP Event Stream Processor	SPS 11	December 31, 2015
SAS	SAS Event Stream Processing	3.2	December 31, 2015
Software AG	Apama Streaming Analytics Platform	9.9	December 31, 2015
SQLstream	SQLstream Blaze	5.0	December 31, 2015
Striim	Striim	3.2	December 31, 2015
TIBCO Software	StreamBase, BusinessEvents, Live Datamart, LiveView Desktop, LiveView Web	7.6, 5.2, 2.1, 2.1, 1.0	December 31, 2015
WSO2	WSO2 Complex Event Processor (CEP)	4.0.0	December 31, 2015

Vendor selection criteria

The vendor must provide comprehensive analytics features on streaming data on time window. We do not consider products that only focus on ingestion of streams without comprehensive analytics functionality (such as messaging platforms) to be streaming analytics solutions. Product features and add-on technologies must aim at the requirements of the world's largest enterprises, organizations, and government agencies.
The vendor must offer solutions that are general-purpose streaming analytics products that aren't embedded or functionally focused within domain-specific applications.
The vendor must provide a software solution that organizations can install on their own on-premises, private cloud, and/or public cloud infrastructure.
The vendor must have provided at least two customer references who were willing to be interviewed by Forrester about their experience using the product.

Choose Among A Diverse Mix Of Mature Vendors And Startups

Forrester's evaluation of big data streaming analytics solutions uncovered a market with seven Leaders and eight Strong Performers (see Figure 2):

- **Leaders.** The seven Leaders are IBM, Software AG, SAP, TIBCO Software, Oracle, DataTorrent, and SQLstream. It is not surprising that five of the seven Leaders are enterprise software companies. They bring years of experience with customers, research and development (R&D) might, industry solutions, developer tooling, and comprehensive analytics including complex event processing (CEP). Startup DataTorrent offers a platform inspired by the scalability of Internet giants and wisely added tooling and a breadth of analytics operators to become a Leader. SQLstream has become a Leader after successfully beefing up all aspects of its platform.
- **Strong Performers.** The eight Strong Performers are Impetus Technologies, SAS, Striim, Informatica, WSO2, Cisco Systems, data Artisans, and EsperTech. Don't ignore these vendors. They have very capable solutions with sweet spots that differentiate them from the Leaders. Read the Strong Performer vendor profiles below.

FIGURE 2 The Forrester Wave™: Big Data Streaming Analytics, Q1 '16

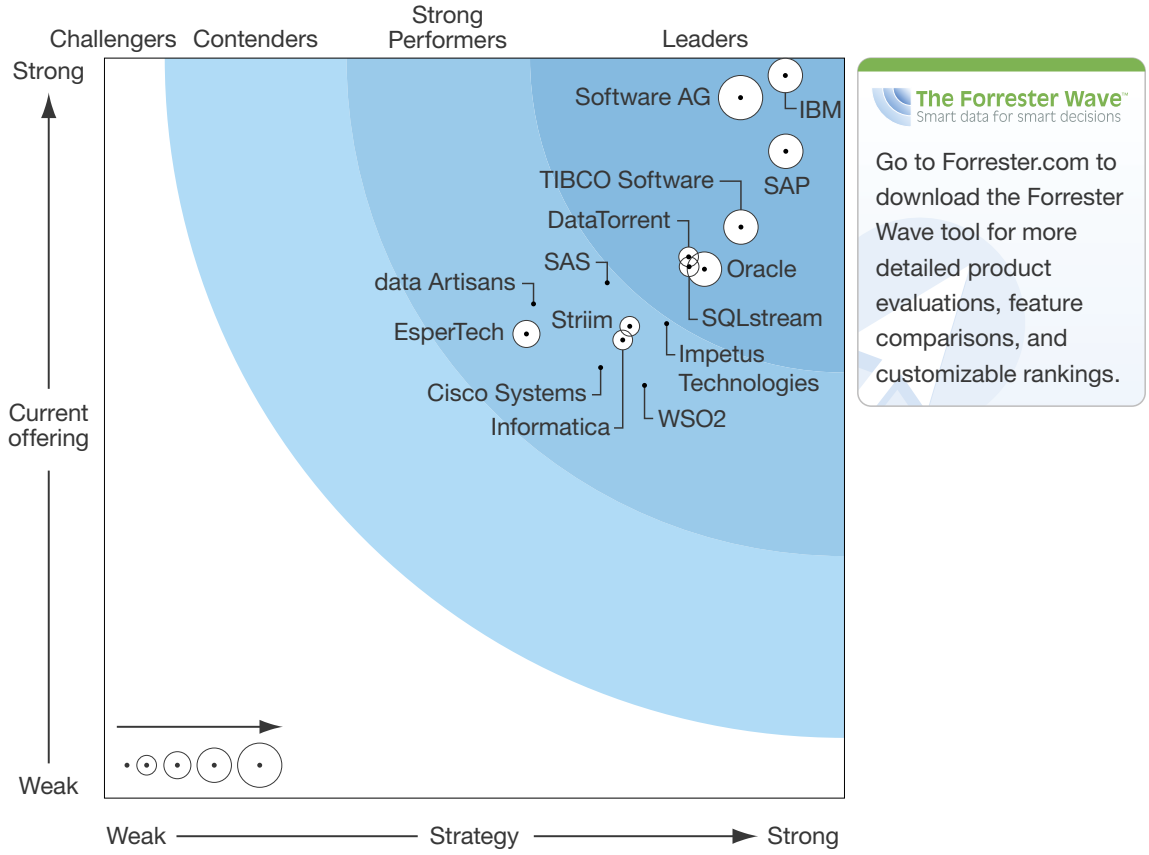

FIGURE 2 The Forrester Wave™: Big Data Streaming Analytics, Q1 '16 (Cont.)

	Forrester's Weighting	Cisco Systems	data Artisans	DataTorrent	EsperTech	IBM	Impetus Technologies	Informatica	Oracle	SAP	SAS	Software AG	SQLstream	Striim	TIBCO Software	WSO2
CURRENT OFFERING	50%	2.91	3.34	3.65	3.14	4.88	3.20	3.10	3.57	4.37	3.48	4.73	3.60	3.19	3.86	2.79
Architecture	40%	3.00	4.50	4.75	3.00	5.00	3.50	2.25	3.25	4.25	3.50	4.75	3.50	3.50	3.50	3.25
Operational management	5%	0.00	3.00	5.00	3.00	5.00	5.00	5.00	3.00	5.00	1.00	5.00	5.00	3.00	5.00	1.00
Stream handling	15%	3.00	3.00	3.00	3.00	4.20	1.80	3.40	3.40	4.20	3.40	5.00	3.40	3.00	4.20	2.20
Streaming operators	20%	3.60	2.80	2.40	3.80	5.00	3.60	3.80	4.00	4.40	4.20	4.60	3.80	3.60	3.40	3.60
Application development	15%	2.60	2.50	3.80	3.50	5.00	3.70	3.50	4.40	4.40	3.50	4.40	3.50	2.80	5.00	2.60
Business applications	5%	3.00	0.00	0.00	1.00	5.00	0.00	3.00	3.00	5.00	3.00	5.00	3.00	1.00	3.00	0.00
STRATEGY	50%	3.35	2.90	3.95	2.85	4.60	3.80	3.50	4.05	4.60	3.40	4.30	3.95	3.55	4.30	3.65
Acquisition and pricing	20%	1.00	5.00	5.00	5.00	3.00	3.00	3.00	3.00	3.00	1.00	3.00	5.00	3.00	3.00	5.00
Solution road map	30%	3.00	3.00	4.00	2.00	5.00	4.00	3.00	4.00	5.00	4.00	4.00	4.00	4.00	4.00	3.00
Ability to execute	25%	5.00	3.00	4.00	3.00	5.00	4.00	4.00	5.00	5.00	5.00	5.00	4.00	4.00	5.00	4.00
Implementation support	25%	4.00	1.00	3.00	2.00	5.00	4.00	4.00	4.00	5.00	3.00	5.00	3.00	3.00	5.00	3.00
MARKET PRESENCE	0%	0.48	0.25	1.35	2.18	3.80	0.23	1.88	3.05	3.58	1.00	4.10	1.23	1.35	3.95	0.63
Vendor sizing	75%	0.30	0.00	0.80	1.90	3.40	0.30	1.50	2.40	3.10	1.00	3.80	1.30	0.80	3.60	0.50
ISV and services partners	25%	1.00	1.00	3.00	3.00	5.00	0.00	3.00	5.00	5.00	1.00	5.00	1.00	3.00	5.00	1.00

All scores are based on a scale of 0 (weak) to 5 (strong)

Vendor Profiles

This evaluation of the big data streaming analytics market is intended to be a starting point only. We encourage clients to view detailed product evaluations and adapt criteria weightings to fit their individual needs through the Forrester Wave Excel-based vendor comparison tool. Clients can also schedule an inquiry with the authors to have a conversation about the market and specific vendor products.

Leaders

› **IBM Streams enables cognitive solutions.** Cognitive computing encompasses all of intelligence — natural interfaces, situation awareness, smart decisions, and learning to become more effective. Streams can ingest and understand the always-on stream of data from applications and IoT devices needed to make the decisions that underlie cognitive solutions. IBM's architecture can flex to handle any streaming challenge, and the development environment provides one of the richest set of operators in the market.

- **Software AG's Apama powers real-time, digital business transformations.** When it comes to streaming, Software AG's platform has nearly every base covered. Its Apama Streaming Analytics product delivers the scalability, management, operators, and application development tools that world-class enterprises need to make the right decisions in the right moment. The patented HyperTree maintains the state needed for ultra-low-latency event pattern detection, and the vendor provides some of the more robust capabilities in this evaluation. Long-running pattern detection is also well supported via integration with Software AG's own in-memory data grid, Terracotta, and its integration platform, webMethods. The vendor offers a comprehensive set of capabilities for companies that wish to undergo a fast digital transformation.
- **SAP's smart data streaming becomes an engine for IoT.** Smart data streaming (SDS) is an integrated add-on to SAP Hana. A standalone product is also available. With SDS, customers can build sophisticated end-to-end applications. SAP currently includes two machine learning algorithms — one supervised, one unsupervised — which can incrementally train on data running through the system, delivering true real-time analysis. The company has also released Streaming Lite, a small-footprint version of the engine that customers can deploy on devices closer to the edge.
- **TIBCO Software sees fast data in every solution.** Most streaming solutions gloss over the human insights needed to inspire great streaming applications. Not TIBCO. It recognizes that ideas come from human insight and domain knowledge. That's why its streaming solution includes TIBCO Live Datamart, a real-time view of streaming data. Customers can also use TIBCO Spotfire to analyze streaming data to find new ideas for analytics and patterns to inform applications in real time. The vendor also focuses on both vertical and horizontal solutions to accelerate time-to-production for its customers. Enterprises looking for a software company that has end-to-end analytical tools and a track record of delivering mission-critical solutions should look at TIBCO.
- **Oracle offers streaming business intelligence and starter solutions.** Oracle's streaming solution includes two distinct pieces that are critical for the future of analytics: Stream Explorer for ingesting and interrogating data as it lands in the cloud or the enterprise; and Oracle Edge Analytics (OEA) for filtering, aggregating, and preprocessing data on embedded devices. Oracle offers customers a unique pattern library that provides out-of-the-box analytics for detecting patterns in streams for specific verticals, such as utilities and finance. The vendor focuses on empowering more business users to build their own solutions, and it introduced a user-friendly solution to explore streams in real time and create streaming apps.
- **DataTorrent aims for enterprise and open source dominance.** DataTorrent is the streaming startup to beat in Silicon Valley. The Yahoo-trained founders built a streaming platform to handle the world's biggest, fastest data. But enterprises have additional needs, and DataTorrent is delivering them. In addition to providing a distributed streaming analytics platform, the vendor also delivers accruements including a visual development tool and a library of over 400 operators. The core of DataTorrent is now open sourced as Apache Apex, but making its voice heard over the chorus of other open source streaming options will be a significant challenge.

› **SQLstream makes cities smarter and heads to the cloud.** SQLstream's Blaze delivers a solid platform for companies to build real-time applications, especially for customers that have a lot of machine data and prefer a declarative SQL syntax to operate on streaming data. Blaze's StreamLab gives app developers a robust, easy-to-use interface for ingesting, analyzing, and acting on streaming data. The company has found success in delivering applications for governments and municipal bodies that want to make their city's traffic systems smarter. Customers are also drawn to the platform because of its capabilities in real-time location intelligence and the strong support from SQLstream, despite the company's relatively small size compared with other vendors.

Strong Performers

› **Impetus Technologies future-proofs Apache Storm.** Impetus takes a different approach from the other vendors in this Forrester Wave. Instead of offering a core streaming engine, Impetus' solution abstracts many of the details of deploying, management, and building applications that run on Apache Spark and Esper (a CEP engine). Its pleasant and efficient user interface hides the gory details underneath, but it also provides a mechanism for developers to add custom code. StreamAnalytix's strategy and architecture is to make its solution pluggable with other open source processing engines as they become popular. StreamAnalytix is new, so it only has a few installs, but the product is backed by the 1,000-plus-employee Impetus Technologies, a product development, software services, and solutions company with the resources to provide enterprise support and build solutions.

› **SAS goes real time.** Although SAS launched its event stream processor in 2014, it has been developing it and using it behind the scenes as an engine for other SAS solutions for several years. The product's architecture focuses tightly on low-latency, high-throughput complex analytics, so it is well positioned to embed many of SAS's highly regarded advanced analytics algorithms, including text analytics and machine learning. SAS has also developed a smaller-footprint version that can bring the same sophisticated analytics to edge IoT devices.

› **Striim's platform captures and analyzes data as it is born.** Striim is a Silicon Valley startup founded in 2012 by former executives from GoldenGate Software (acquired by Oracle in 2009). Its platform focuses equally on the continuous capture of data at its point of origin and on upstream real-time analytics. It can ingest streaming data from many sources, including streaming change data capture (CDC) from transactions in databases. These streams can be processed and correlated to immediately trigger real-time analytics, alerts, and workflows. Developers use SQL that has been extended to include streaming semantics to create continuous queries for both in-stream ETL and analytics. Striim's initial customer success has been in financial services and large telecoms — a great proving ground for new technologies. Striim's philosophy, to provide insights the moment they are born, positions it well for IoT applications.

- **Informatica delivers streaming within a rich business rules engine.** Informatica's streaming capabilities come in the form of a real-time rules engine built to enable enterprises to immediately act on huge volumes of data. Events are handled by the vendor's rules engine, which offers critical enterprise requirements around security, encryption, operational management, and data lineage. For enterprises that need a powerful, secured solution that can automate actions in many different business scenarios, Informatica delivers. The vendor has a proven track record in a large number of industries, with customers as varied as oil and gas, finance, and high-tech equipment providers.
- **WSO2 is a one-stop shop for application middleware, including event processing.** WSO2 is an open source middleware provider that includes a full spectrum of architected-as-one components such as application servers, message brokers, enterprise service bus, and many others. Its streaming analytics solution follows the complex event processor architectural approach, so it provides very low-latency analytics. Enterprises that already use WSO2 middleware can add CEP seamlessly. Enterprises looking for a full middleware stack that includes streaming analytics will find a place for WSO2 on their shortlist as well.
- **Cisco Systems' streaming solution starts at the edge of IoT.** Cisco Systems has made a name for itself in the networking and device space for decades, and it is poised to capitalize on this by providing streaming analytics for IoT applications. The vendor's acquisitions of ParStream and Truviso give it the power to collect data as close to the edge as possible and to efficiently parse and pass it back to the center for analysis. Cisco plans to leverage its wide installation base of networking customers, but it still has gaps to close to deliver a complete enterprise streaming platform: in CEP, business applications, and scalability of the workload.
- **Data Artisans engineered Apache Flink for all data flows.** Berlin-based data Artisans is the commercial force behind the open source Apache Flink project for distributed stream and batch processing. A tiny, young company of fewer than 15 engineers, data Artisans is only beginning to think about how to evolve into a company that can support enterprise customers. Its current modus operandi is to engineer the best open source streaming analytics (that can also do batch processing). Apache Flink is squarely set against the popular Apache Spark project that came out of UC Berkeley's AMPLab. While Spark uses micro-batches to enable fast processing, Flink is a true streaming engine that can also do batch processing by treating a stream of events as a data set with a beginning and an end. Data Artisans has great potential, but the company needs a healthy dose of investment capital to increase its marketing, sales, and professional management.
- **EsperTech provides an enterprise-grade open source CEP engine.** EsperTech's event processing offering provides enterprises with a flexible basis for building applications that require complex pattern matching with sophisticated time windows. Its engine is open source and battle-tested. Customers love the flexibility and freedom the platform gives them to build customizations — and the price. But EsperTech must close gaps in its enrichment and management capabilities to maintain its presence in this competitive market.

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Supplemental Material

Online Resource

The online version of Figure 2 is an Excel-based vendor comparison tool that provides detailed product evaluations and customizable rankings.

Data Sources Used In This Forrester Wave

Forrester used a combination of three data sources to assess the strengths and weaknesses of each solution. We evaluated the vendors participating in this Forrester Wave, in part, using materials that they provided to us by March 3, 2016:

- **Vendor surveys.** Forrester surveyed vendors on their capabilities as they relate to the evaluation criteria. Once we analyzed the completed vendor surveys, we conducted vendor calls where necessary to gather details of vendor qualifications.
- **Product briefings and demos.** We asked vendors to conduct briefings and demonstrations of their product's functionality. We used findings from these product briefings and demos to validate details of each vendor's product capabilities.
- **Customer reference calls.** To validate product and vendor qualifications, Forrester also conducted reference calls with two of each vendor's current customers.

The Forrester Wave Methodology

We conduct primary research to develop a list of vendors that meet our criteria to be evaluated in this market. From that initial pool of vendors, we then narrow our final list. We choose these vendors based on 1) product fit, 2) customer success, and 3) Forrester client demand. We eliminate vendors that have limited customer references and products that don't fit the scope of our evaluation.

After examining past research, user need assessments, and vendor and expert interviews, we develop the initial evaluation criteria. To evaluate the vendors and their products against our set of criteria, we gather details of product qualifications through a combination of lab evaluations, questionnaires, demos, and/or discussions with client references. We send evaluations to the vendors for their review, and we adjust the evaluations to provide the most accurate view of vendor offerings and strategies.

We set default weightings to reflect our analysis of the needs of large user companies — and/or other scenarios as outlined in the Forrester Wave document — and then score the vendors based on a clearly defined scale. These default weightings are intended only as a starting point, and we encourage readers to adapt the weightings to fit their individual needs through the Excel-based tool. The final scores generate the graphical depiction of the market based on current offering, strategy, and market presence. Forrester intends to update vendor evaluations regularly as product capabilities and vendor strategies evolve. For more information on the methodology that every Forrester Wave follows, go to http://www.forrester.com/marketing/policies/forrester-wave-methodology.html.

Integrity Policy

All of Forrester's research, including Forrester Wave evaluations, is conducted according to our Integrity Policy. For more information, go to http://www.forrester.com/marketing/policies/integrity-policy.html.

Endnotes

[1] Streaming analytics is anything but a sleepy, rearview mirror analysis of data. No, it is about knowing and acting on what's happening in your business at this very moment — now. Forrester calls these perishable insights because they occur at a moment's notice and you must act on them fast within a narrow window of opportunity before they quickly lose their value. See the "The Forrester Wave™: Big Data Streaming Analytics Platforms, Q3 2014" Forrester report.

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