

PREDICTIVE ANALYTICS FOR APAMA

How businesses can unleash the power of Apama



Maximizing the value of hidden patterns in streaming data

Leading organizations in every industry and government sector have come to realize that their operations depend on data. Large data sets and high-velocity streaming data have become an integral part of the information technology environment and form a critical part of the business model. Ignoring data is no longer a viable option and organizations that don't embrace advanced analytics to extract the maximum possible insight from their data increase their risk of missing market opportunities, suffering losses, or suffering sub-optimal financial results and experiencing diminished competitive advantage.

Predictive insight for intelligent and agile decisions

Predictive analytics play a key role in helping world-class organizations achieve success and sustain competitive advantage over time by making it possible to spot hidden and often unexpected patterns within data to build a complete picture of how and why critical events occur.

Predictive analytics enables organizations to build highly accurate models of, for example:

- Customer buying behavior to increase customer lifetime value
- Spending patterns on a credit card that is indicative of unauthorized or fraudulent
- Data from vibration sensors that is symptomatic of imminent part failure in order to prevent unplanned shutdowns

These models can then be used to act on risks and opportunities immediately, while the outcome can still be influenced.

By helping organizations unlock the true value of their big data, predictive analytics makes business insights more accurate, more relevant, and more nuanced. With better insights, organizations can make decisions and take actions faster and with far less risk, leading to greater positive business impact.

Software AG recognizes the opportunity that advanced analytics represents, as well as the challenges that organizations face in harnessing the power of analytics to derive critical insights from their data to drive business results.

This understanding led Software AG to develop its flagship Digital Business Platform that allows businesses to quickly create highly customized yet lightweight applications that effectively address business challenges and create capabilities that drive competitive differentiation.

A key component of the Digital Business Platform is the Apama Streaming Analytics that manages streaming analytics and enables intelligent, automated action on fast-moving big data.

Apama Streaming Analytics helps organizations take control of big data in motion by:

- Processing high-volume data that supports business operations and customer interactions in real time
- Correlating, aggregating and detecting patterns across large volumes of fast-moving data from multiple sources
- Enabling organizations to take informed, insightful action at the right place and at the right time

Enterprise-grade predictive analytics

Predictive Analytics for Apama is a powerful predictive analytics deployment solution and execution engine that complements and enhances the other capabilities and overall business value of Apama Streaming Analytics.

Enhancing Apama Streaming Analytics with Predictive Analytics for Apama helps organizations by:

- Accelerating the deployment of predictive analytics models from the laboratory into an operating environment
- Enabling the seamless operation of complex predictive models in real time
- Enriching the business and technology value of both Apama and Software AG's broader Digital Business Platform

The connector is tightly integrated with Apama to minimize data throughput and latency and reduce time-to-insight. This is not only critical for ensuring high levels

of technical performance, it is also critical for driving business performance and competitive advantage.

How it works

Apama Streaming Analytics is built on an in-memory architecture that enables real-time processing of extremely fast, large data volumes—orders of magnitude larger than traditional database-based IT architectures.

Data science teams build predictive models in whatever data mining tools they prefer to use, then use Predictive Analytics for Apama to load the models in Predictive Model Markup Language (PMML) format. This step takes a fraction of the time that model deployment ordinarily requires, and eliminates the need for manual coding, cross-checking and error correction. Apama Streaming Analytics ingests these models rapidly, making them instantly available to the business process that they support, as defined by various Apama applications.

Apama Streaming Analytics then probes incoming event data from any device, social media stream or business system with extremely low latency against the imported predictive models for real-time scoring. Predictive Analytics for Apama analyzes this streaming data, which can also be enriched with historic and contextual data-at-rest where necessary, to identify business patterns that have happened or are likely to happen.

The platform's visualizations and visual analytics for business users support both human-oriented and automated intelligent actions, alerts and notifications.

Drawing insight from big data and streaming data

Organizations of all types face a common set of challenges when they attempt to extract insights from their data in order to make informed, accurate and timely business decisions. Large data sets and high-velocity, streaming data amplify the magnitude of the challenge.

These challenges affect both business decision makers and data science professionals.

Business challenges

Insufficient insight. Large data sets and high-velocity data streams are potentially rich sources of business insight, but organizations that lack the technology to tap these sources with advanced analytical tools obtain at best a partial picture of underlying patterns within the data, or at worst, an inaccurate picture of data patterns.

Elongated time-to-insight. When high-velocity, high-volume streaming data meets a slow predictive analytics scoring engine, the analytics platform becomes a bottleneck. This bottleneck can delay the business' ability to take pre-emptive action that shapes events or to react swiftly to events that have occurred.

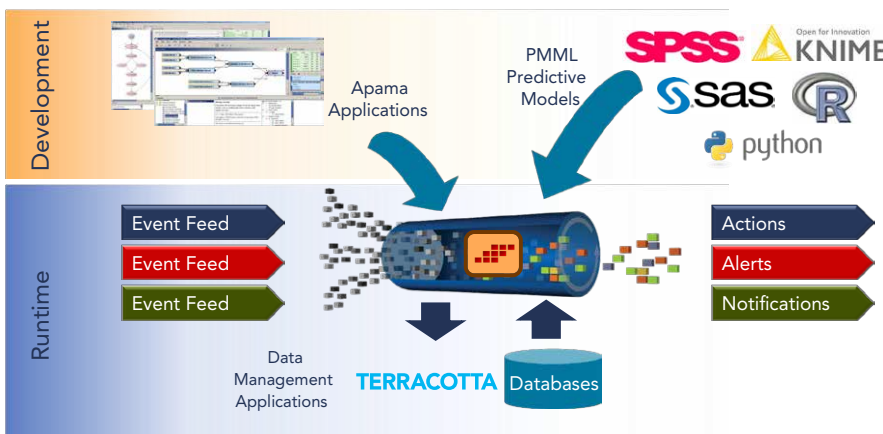
High-risk business decisions.

Organizations that make business decisions based on insufficient insight, an inaccurate understanding of the data picture or elongated time-to-insight experience a severely heightened risk of experiencing adverse business outcomes. Even if the underlying data holds true insights, the net effect of a poor capability to mine those insights is "garbage in, garbage out."

Technology challenges

Complex data environment. Multiple data sources, multiple data formats, large data sets and high-velocity streaming data create data management challenges that both staff and legacy IT systems find difficult to address.

Siloed model development. Data scientists prefer the flexibility to utilize whichever data mining tools they find most effective, but some tools effectively create "walled gardens" by not supporting model portability across tools, limiting team collaboration and potential insight.



Limited validation capability. To validate analytical results from predictive models, data scientists may seek to use different modelling techniques on the same data set, yet some data mining tools only support a limited range of modeling techniques.

Inefficient model deployment. Extensive manual coding, cross-checking and fixing coding errors can turn predictive model deployment into a vicious rework cycle that can last multiple months, delaying an organization's ability to derive insight from models and apply that insight to make informed, accurate and timely business decisions.

Analytics latency. Once a model has been deployed into an operating environment, large data sets and fast-moving streaming data can cause substantial bottlenecks as data flows across the storage, network and compute layers of a typical IT architecture, delaying an organization's ability to put predictive insights to work in critical business processes.

Delivering business results through technology excellence

Predictive Analytics for Apama helps data-driven organizations successfully surmount these challenges and extract the maximum value possible from their data via scalable, enterprise-grade predictive analytics.

What does it do?

Data science professionals and business decision makers using Apama engage in

four principal activity areas to transform large data sets and high-velocity, streaming data into business insight, and from there into meaningful action.

Predictive Analytics for Apama complements and extends Apama's capabilities across each of these activity areas:

Delivering business value

Shorter time-to-insight. Allows organizations to rapidly deploy and operate predictive models that reveal critical insights from their data.

Higher-quality insight. Infuses data science into business operational processes and business decisions, uncovering hidden patterns within data and creating a virtuous cycle of improvement over time via machine learning.

Better business decisions. Allows automated systems to supplement or replace manual processes for statistically derived actions supporting critical business processes, improving speed, content quality and accuracy of decisions.

Stronger, sustainable competitive advantage. Extracts the maximum value from big data in motion or high-velocity event data of any kind, creating repeatable, self-learning processes that adjust dynamically over time. Allows organizations to take actions that drive strong revenue growth, reduce operating costs, lower business risk and create sustainable competitive differentiation.

Delivering technical value

Agile model development. Supports a wide range of commercial and open-source data mining tools and predictive modeling techniques. Data scientists can employ whichever data mining tools they find most effective, collaboratively build and share models, and validate analytical results via multiple models and modelling techniques.

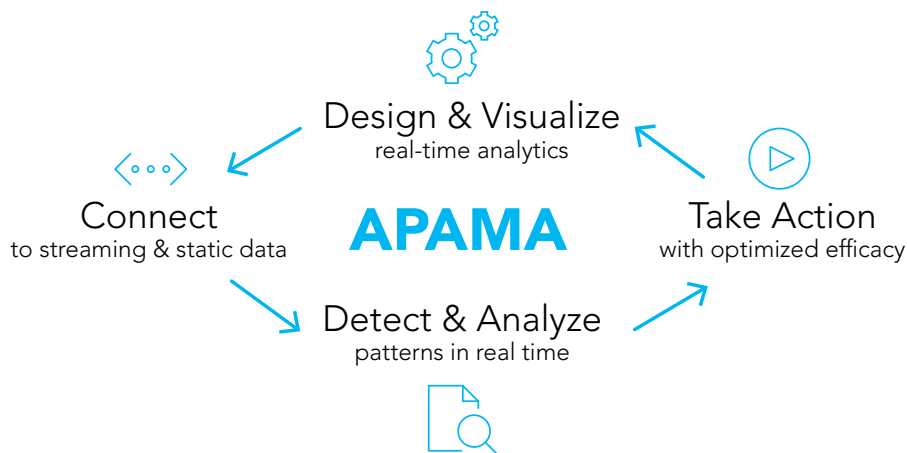
Rapid model deployment. Deploys advanced predictive models quickly and easily to the Apama platform, eliminating the typically long model deployment cycle, expanding the efficiency of data scientists and multiplying the productive throughput of the data science team.

Closes the loop between pattern recognition and detection. Automates the process of the capturing the success or failure of actions taken and feeding the results back into the predictive model to continually build on and improve the model.

Economic efficiency. Reduces IT costs associated with data science, via efficient model development and deployment. This helps increase operating profits and return cash to the business for use elsewhere.

High-performance analytical operations. Delivers high-capacity, real-time predictive analytics in an operating environment, integrating seamlessly with high-volume, high-velocity business operations and customer interactions that Apama supports.

Enterprise-grade performance. Offers the stability, scalability and support that world-class enterprises require to conduct mission-critical operations. The solution combines proprietary technologies with the PMML, the de facto industry standard for defining, sharing and deploying predictive analytics models.





Design & Visualize real-time analytics

- Design continuous real-time analytics scenarios using IT and business-analyst interfaces
- Create end-user business dashboards for monitoring
- **Test on previously captured streams of data before deployment**
- Visualize key performance indicators; drill down into results



Connect to streaming & static data

- **Connect to sources and destinations of streaming event data with low latency and high throughput**
- Cache static data for fast, in-memory access and event enrichment
- Integrate with different event streams and application environments via a robust integration framework and hundreds of adapters



Detect & Analyze patterns in real time

- **Aggregate data, conduct temporal analysis, filter and correlate**
- **Enrich streaming data with cached static data**
- Trigger low-latency actions automatically without human input
- Perform in-depth quantitative analysis on data; access third-party analytics libraries



Take Action with optimized efficacy

- **Drive higher-quality business results, by improving speed, content quality and accuracy of decisions**
- **Extract the maximum value from big data in motion or high-velocity event data**
- **Deliver stronger, sustainable competitive advantage by creating repeatable, self-learning processes that adjust dynamically over time**

Blue text indicates contribution of Predictive Analytics for Apama functionality and value delivered.

Benefits of Using Predictive Analytics for Apama

Put predictive analytics to work

Predictive Analytics for Apama helps organizations in any industry or government sector enable and accelerate intelligent, real-time decision-making. Whether the point of action requires a manual or automated decision, adding predictive analytics to Apama's comprehensive analytics and decision-making platform enhances business insight and agility to drive competitive advantage.

Select use cases include:

Customer analytics

- Customer experience management
- Real-time personalization
- Omni-channel orchestration

Internet of Things (IoT)

- Predictive maintenance
- Connected customer
- Smart logistics
- Smart metering & manufacturing

Risk Management

- Fraud detection
- Market surveillance & monitoring
- Credit risk management

Finance Optimization

- FX e-commerce
- Capital planning & stress testing
- Dynamic asset & liability management

Are you ready to unleash the power of predictive analytics in Apama?

ABOUT SOFTWARE AG

Software AG offers the world's first Digital Business Platform. Recognized as a leader by the industry's top analyst firms, Software AG helps you combine existing systems on premises and in the cloud into a single platform to optimize your business and delight your customers. With Software AG, you can rapidly build and deploy digital business applications to exploit real-time market opportunities. Get maximum value from big data, make better decisions with streaming analytics, achieve more with the Internet of Things, and respond faster to shifting regulations and threats with intelligent governance, risk and compliance. The world's top brands trust Software AG to help them rapidly innovate, differentiate and win in the digital world. Learn more at www.SoftwareAG.com.

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