For: Application
Development
& Delivery
Professionals

The Forrester Wave™: Big Data Predictive Analytics Solutions, Q2 2015

by Mike Gualtieri and Rowan Curran, April 1, 2015 | Updated: April 1, 2015

KEY TAKEAWAYS

Enterprises Have Lots Of Solid Choices For Big Data Predictive Analytics Solutions

Among the 13 big data predictive analytics solution vendors Forrester evaluated, we found three Leaders, eight Strong Performers, and two Contenders.

Modern Tools Bring Predictive Power To More Classes Of Users

Organizations in every industry are perking up to the value of predictive analytics. With a growth in demand, predictive analytics vendors are providing tools that lower the barrier to entry and increase appeal for those with less statistics skills.

Predictive Analytics Enable Organizations To Embed Intelligence And Insight

Predictive analytics has limited value unless the exposed insights can be deployed directly into software applications and business processes. API calls, web services, and predictive model markup language (PMMLs) are some of the methods that companies are using to seamlessly integrate predictions into their business.

Download The Forrester Wave Model Spreadsheet For Deeper Insight

Use the detailed Forrester Wave model to view every piece of data used to score participating vendors and create a custom vendor shortlist. Access the report online and download the Excel tool using the link in the right-hand column under "Tools & Templates." Alter Forrester's weightings to tailor the Forrester Wave model to your specifications.

The Forrester Wave™: Big Data Predictive Analytics Solutions, Q2 2015

Predict And Prosper With One Of These 13 Solutions

by Mike Gualtieri and Rowan Curran
with Holger Kisker, Ph.D. and Sophia Christakis

WHY READ THIS REPORT

Good news! Predictive analytics is within easy reach for all enterprises if they choose the right big data predictive analytics solution to meet their needs. In Forrester's 45-criteria evaluation, we identified 13 big data predictive analytics solutions providers — Alpine Data Labs, Alteryx, Angoss Software, Dell, FICO, IBM, KNIME.com, Microsoft, Oracle, Predixion Software, RapidMiner, SAP, and SAS — and researched, analyzed, and scored their current market offerings. This report details our findings about how well each vendor fulfills our criteria and where they stand in relation to each other to help application development and delivery (AD&D) professionals select the right solution to grace their enterprise with the power to predict.

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Notes & Resources

Forrester established evaluation criteria, conducted comprehensive product evaluations, interviewed vendors, and surveyed users and customers about the evaluated solutions.

Related Research Documents

Instant Insight: The Truth About Advanced Analytics

The Forrester Wave™: Big Data Streaming Analytics Platforms, Q3 2014

Predictive Analytics Can Infuse Your Applications With An "Unfair Advantage"

PREDICTIVE ANALYTICS IS A BUSINESS GAME CHANGER

Predictive analytics has never been more relevant, and easier, than it is now. Big data, gobs of compute power, and modern tools are making predictive models more efficient, accurate, and accessible to enterprises. Why do it? Because enterprises that predict will win, retain, and serve customers better than those that don't. That's the bottom line of every business — serve customers better than your competitors. Enterprises must gain predictive powers in three areas:

1. **Provide direct insights about customers and business processes.** Dashboards and reporting are the most common use for predictive analytics within organizations today. Exposing information on causative trends and projections into the future, many traditional business intelligence vendor tools contain simple predictive models. These tools surface valuable information to managers and executives, but often lack the link to business decisions, process optimization, customer experience, or any other action based on the predictive insights.

2. **Intelligent, adaptable customer interactions and business processes.** If organizations don't use predictions to change the future, then they're making their data scientists as helpless as Troy's Cassandra. Today's top predictive analytics tools can deploy their models or scoring engines into the applications where there is a need for insights. Today, organizations are using predictive to enhance business processes by detecting fraud at the moment of swiping at point-of-service, automatically adjusting digital content based on user context, or initiating proactive customer service for at-risk revenue sources.

3. **Reimagine customer engagement and inspire new digital products**. The potential utility of predictive analytics goes far beyond the mainstream uses most companies focus on today. Model building and deployment continue to accelerate, enabling application developers to use predictive analytics quickly and with increasing ubiquity in deployed applications. Compounded with the use of app data, developers are able to focus features and bugs that predict the greatest customer value and anticipate the impact of new app functionality or aesthetics.

Predictive Analytics Is Not Limited To Ph.D.-Level Data Scientists

Large enterprises need data scientists to do the heaviest predictive analytics lifting. However, application development professionals and businesspeople are also using today's tools — the more people that can do predictive analytics, the better.[1] Some examples include:

- **Data scientists forging predictions with flexible, powerful tools.** Data scientists have never been more popular, which has placed increasing demands on them to build more models more accurately and in far less time. They need tools to make them more productive and to analyze data sets of unprecedented size. Once the analysis executes, the insights must be operationalized through API calls, PMMLs, or other documentation for creating scoring engines and embedding predictive actions in applications.

- **App developers looking to the future to enhance software experiences and business processes.** Even though every organization can benefit from predictive analytics, the demand for data scientists is far outpacing the number available, and inevitably not everyone will be able hire their own. Recognizing this growing chasm, vendors are providing tools for users who may only have a computer science or undergraduate statistics backgrounds. These tools use modern development interfaces that will be familiar to application developers who have experience working in integrated development environments like Visual Studio or Eclipse. When it comes time to deploy the models, APIs, web services, and PMMLs all allow for the smooth integration of predictive insights into applications.

- **Business analysts exploring and consuming well-baked predictions.** Predictive insights need to be elucidated from data when neither data scientists nor app developers are available, which would have previously left organizations in a lurch. Today, the demand for predictive analytics capabilities is becoming so ubiquitous that options are available for the most naïve users. Some vendor tools provide "one-click predictive modeling," generating predictive models automatically by running a series of algorithms against the data and finding the one with the highest accuracy. There are also an increasing number of exchanges and marketplaces for prebuilt predictive applications, such as the Alteryx Analytics Gallery and the Azure Machine Learning Marketplace.

### The Predictive Analytics Life Cycle Starts With Great Questions

Predictive analytics uses algorithms to find patterns in data that might predict similar outcomes in the future. A common example of predictive analytics is to find a model that will predict which customers are likely to churn. For example, telecommunications firms can use customer data such as calls made, minutes used, number of texts sent, average bill amount, and hundreds of other variables to find models that will predict which customers are likely to change mobile carriers. If a carrier can predict the reasons why customers are likely to churn, it can try to take preemptive action to avoid this undesirable outcome.

This isn't a one-time operation; firms must rerun their analysis on new data to make sure the models are still effective and to respond to changes in customer desires and competitors. Many firms analyze data weekly or even continuously. Game-changing insights start with asking creative, deep questions. Once the question has coalesced, use these six steps to answer them in a continuously improving predictive discipline (see Figure 1):

- **Identify data from a variety of sources.** Potentially valuable data often exists in multiple hard-to-access locations, both internally (data silos in enterprise applications) and externally (social media, government data, and other public or licensed data sources). Advanced data visualization tools can help to explore the data from various sources to determine what might be relevant for a predictive analytics project.

- **Wrangle the data.** Data preparation for predictive analytics is a key challenge. Many users of predictive analytics spend more than three quarters of their time preparing the data: calculating aggregate fields, stripping extraneous characters, filling in missing data, or merging multiple data sources.

- **Build a predictive model.** Predictive analytics tools like the ones evaluated in this Forrester Wave include dozens of different statistical and machine-learning algorithms that data scientists or knowledgeable AD&D professionals can choose to run the best predictive model. The best algorithm(s) to choose depend on the type and completeness of the data and the type of prediction desired. Analysts run the analysis on a subset of the data called "training data" and set aside "test data" that they will use to evaluate the model.

- **Evaluate the model's effectiveness and accuracy.** Predictive analytics is not about absolutes; it is about probabilities. To evaluate the predictive power of the model, data analysts use the model to predict the "test data" set. If the predictive model can predict the test data set, it is a candidate for deployment.

- **Use the model to deliver actionable prescriptions to your business peers.** There is little value in a prediction if it doesn't enable the seizing of a predictive opportunity or avoiding a negative event. Business peers need to learn to trust in the predictions of models and those creating the models need to learn from their partners in the business what the most actionable insights may be.

- **Monitor and improve the effectiveness of the model.** Predictive models are only as accurate as the data fed into them, and over time they may degrade or increase their effectiveness. To monitor models for ongoing effectiveness and value, newly accumulated data is rerun through the algorithms. If and when the model becomes less accurate, AD&D pros will have to adjust the model (e.g., by adjusting parameters in the algorithms) and/or seek additional data.

Figure 1 The Six Steps Of Predictive Analytics
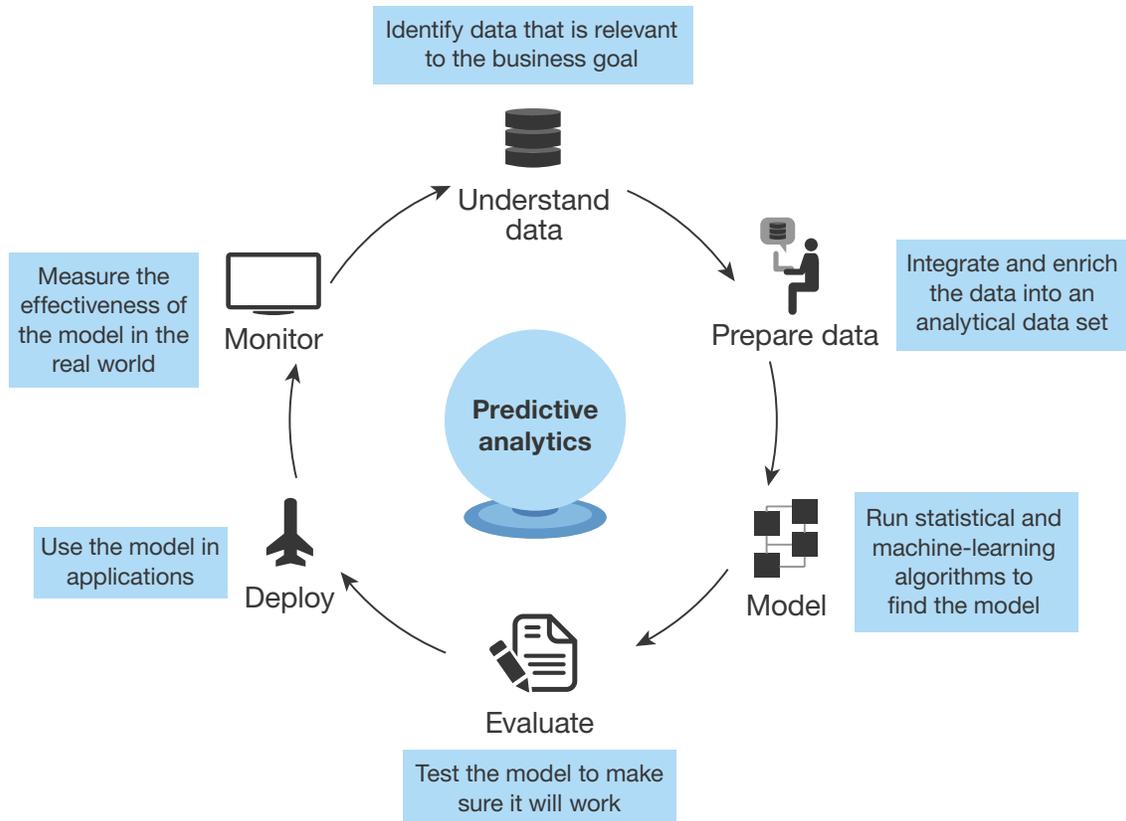
Source: Forrester Research, Inc. Unauthorized reproduction or distribution prohibited.

MARKET OVERVIEW: BIG DATA PREDICTIVE ANALYTICS SOLUTIONS

The vendors evaluated in this Forrester Wave provide general purpose big data predictive analytics solutions to facilitate the predictive analytics process and ease the burden of this never-ending, continuous cycle of data preparation, model building, deployment, and optimization that can be applied to most industries and business domains. In addition to the general purpose solutions evaluated in this Forrester Wave, firms that wish to benefit from big data predictive analytics solutions can also choose among:

- **Vertical or horizontal solutions.** Many vendors provide solutions that focus on specific industry or horizontal domains, such as customer analytics. For example, Qubit and Certona specifically focus on customer-focused programs and initiatives that drive acquisition, retention, cross-sell/upsell, and targeted marketing campaigns. Companies like Apigee make building predictive software simple with APIs. Other examples of vertical solutions include cloud-based

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offerings such as BloomReach, which uses predictive analytics to help eCommerce companies sell more online by showing customers more relevant content, and FusionOps, which uses big data predictive analytics to help companies improve logistic processes.

- **Open source programming solutions.** The open source software (OSS) community is a powerful force driving predictive analytics into the mainstream for programmers. R, the open source programming language for statistics and predictive analytics, is ubiquitous in university settings and every vendor evaluated in this Forrester Wave supports it. Application developers also have a plethora of API libraries available to prepare data and build predictive models using Java, Python, and Scala. Apache Mahout and WEKA have Java APIs. Apache Spark MLlib includes APIs for Java, Python, and Scala.[2] Python developers can use NumPy and SciPy to prepare data and build predictive models.

- **BI platforms that include some predictive analytics capabilities.** Most BI platforms offer varying degree of integration with R. Information Builders, MicroStrategy, and Tibco Software offer tight R integration by providing GUI for R model development and execution, passing BI parameters to/from R routines, specialized scalable servers to run R, and import/export of predictive routines via PMML.[3] The open source nature of R-based BI platforms from OpenText BIRT and Tibco Jaspersoft make them a natural process to integrate with open source R and HDS (Hitachi Data Systems) Pentaho with open source WEKA.[4]

- **Offerings from consulting firms.** Enterprises that lack expertise in predictive analytics or that wish to outsource can choose from among many mainstream or boutique consulting firms that focus on predictive analytics. Large consulting companies such as Accenture, Deloitte, Infosys, and Vurtusa have big data and/or predictive analytics practices and solutions. Boutique firms Beyond The Arc, Cognilytics, Fractal Analytics, Opera Solutions, Salford Systems, and Think Big, a Teradata company, provide focused expertise in predictive analytics. These firms will often use general purpose solutions such as those evaluated in this Forrester Wave, but they also provide deep knowledge and expertise in analyzing data and building predictive models.

BIG DATA PREDICTIVE ANALYTICS SOLUTIONS EVALUATION OVERVIEW

To assess the state of the predictive analytics platform market and see how the vendors stack up against each other, Forrester evaluated the strengths and weaknesses of general purpose predictive analytics solution vendors.

Evaluation Criteria: Current Offering, Strategy, And Market Presence

After examining past research, user need assessments, and vendor interviews, we developed a comprehensive set of evaluation criteria. We evaluated vendors against 45 criteria, which we grouped into three high-level buckets:

- **Current offering.** We evaluated each solution's architecture, security, data acquisition and wrangling, data set preparation, supported algorithms and methods, evaluation capabilities, tool usability, business applications, and other features to establish the capabilities of the vendor's current offering. All products evaluated must have been publicly available by October 1, 2014.

- **Strategy.** We reviewed each vendor's strategy to assess how their plans will meet current and emerging customer demands. The core criteria for this category are acquisition and pricing options of the solution, the vendor's support for implementation, as well as their road map and go-to-market strategy.

- **Market presence.** The vendor's financials, global reach, industries served, market awareness, technology, and service partnerships are the core criteria for evaluating the weight of the vendor's presence in the market.

Predictive Analytics Wave Evaluation Assessed The Capabilities Of 13 Vendors

Forrester included 13 vendors in the assessment: Alpine Data Labs, Alteryx, Angoss, Dell, FICO, IBM, KNIME, Microsoft, Oracle, Predixion Software, RapidMiner, SAP, and SAS. Each of these vendors has (see Figure 2):

- **Comprehensive core predictive analytics functionality.** We included vendors that offer one or more solutions that were available for customers to use by October 1, 2014 and that provide at least the following core predictive analytics functional components, tools, and features: They have the ability to connect, extract, transform, cleanse, load, and otherwise prepare analytical data sets; develop and evaluate predictive models using both statistical and machine learning algorithms; deploy predictive models; manage the predictive modeling life cycle; and they have tools for data scientists, business analysts, and application developers to manage the predictive analytics life cycle.

- **An original, cross-domain predictive analytics solution.** The products included in this evaluation are general purpose predictive analytics solutions that aren't technologically or functionally focused upon particular functional or horizontal applications — such as enterprise resource planning (ERP); customer analytics; customer relationship management (CRM); business intelligence (BI); data warehousing (DW); extract, transform, load (ETL); or the middleware stack. The vendor must develop, market, sell, and implement the solution as a self-sufficient, general purpose big data predictive analytics offering that can stand alone, meaning that it does not need to be embedded in other applications.

- **Sparked client inquiries and/or has technologies that put the vendor on Forrester's radar.** Forrester clients often discuss the vendors and products through inquiries; alternatively, the vendor may, in Forrester's judgment, warrant inclusion in this evaluation because of technology trends or market presence.

Figure 2 Evaluated Vendors: Product Information

Vendor	Product evaluated	Product version evaluated	Version release date
Alpine Data Labs	Alpine Chorus	5.0	September 15, 2014
Alteryx	Alteryx Analytics	9.1	September 4, 2014
Angoss	KnowledgeStudio	9.3	September 9, 2014
	KnowledgeSeeker	9.3	September 9, 2014
	KnowledgeReader	8.7	April 12, 2013
Dell	Statistica	12.5.192.11	July 30, 2014
	Kitenga Analytic Suite	2.5	December 9, 2013
	Toad Data Point	3.6	September 23, 2014
	Toad Intelligence Central	2.4	September 23, 2014
	Boomi AtomSphere	2014.08	August 13, 2014
FICO	FICO Model Builder	7.4	August 16, 2013
	FICO Analytic Modeler Scorecard	1.0	May 27, 2014
	FICO Analytic Modeler Scorecard Professional	5.0	June 30, 2014
	FICO Analytic Modeler Decision Tree Professional	1.7.2	August 2, 2014
	FICO Model Central	5.0	August 1, 2014
	FICO Blaze Advisor Business Rule Management System	7.2	August 2, 2013
IBM	IBM SPSS Modeler	16.0	December 10, 2013
	IBM SPSS Modeler	Gold Edition	December 10, 2013
	IBM SPSS Statistics	22.0	August 13, 2013
	IBM SPSS Analytical Server/IBM SPSS Analytic Catalyst	1.0.1	December 10, 2013
	IBM Social Media Analytics	1.3	March 18, 2014
	IBM SPSS Data Collection	7.0	March 12, 2013
	IBM SPSS Predictive Analytics Enterprise	2.0	June 13, 2014
	IBM Decision Optimization (CPLEX Optimization Studio)	12.6	March 27, 2014

Figure 2 Evaluated Vendors: Product Information (Cont.)

Vendor	Product evaluated	Product version evaluated	Version release date
KNIME	KNIME Analytics Platform	2.10	July 9, 2014
Microsoft	SQL Server	2014	April 1, 2014
	Excel	2013	January 29, 2013
	Power BI		February 10, 2014
	Azure Machine Learning		July 2014
Oracle	Oracle Advanced Analytics	12cR1	July 2013
	• Oracle Data Mining	12cR1	July 2013
	• Oracle R Enterprise	1.4.1	September 2014
	• Oracle Data Miner	4.0.3	September 2014
	Oracle Big Data Connectors	4.0	September 2014
	• Oracle R Advanced Analytics for Hadoop	2.4.1	April 2014
Predixion Software	Predixion Insight	4.0	September 15, 2014
RapidMiner	RapidMiner Studio	6.1	May 6, 2014
SAP	SAP Predictive Analysis	1.0.21	October 2014
	SAP InfiniteInsight	7.0.1	July 2014
	SAP Hana	SP08	May 2014
SAS	SAS Analytics Suite	13.2	August 5, 2014

## ENTERPRISES HAVE LOTS OF SOLID CHOICES

Forrester's evaluation of general purpose big data predictive analytics solutions uncovered a market with three Leaders, eight Strong Performers, and two Contenders (see Figure 3):

- **Leaders.** IBM and SAS have unmatched breadth and depth in their solutions. Both have extremely mature products and neither company has rested on its laurels. Both have high scores in every category. SAP is also a leader rising to challenge IBM and SAS with continued aggressive investment in predictive analytics capabilities.

- **Strong Performers.** Alpine Data Labs, Alteryx, Angoss, Dell, FICO, KNIME, Oracle, and RapidMiner are Strong Performers. All of these Strong Performers have a sweet spot that make them excellent choices for enterprises (see vendor profiles below). With better strategy scores, Alteryx, Angoss, FICO, Oracle, and RapidMiner, would have been Leaders.

- **Contenders.** Microsoft and Predixion Software are Contenders. Both start from a niche but have plenty of running room to grow and unique value for enterprises. Microsoft is pure cloud and Predixion Software empowers Excel to predictive analytics capabilities in the cloud.

This evaluation of the predictive analytics solutions 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.

Figure 3 The Forrester Wave™: Big Data Predictive Analytics Solutions, Q2 '15
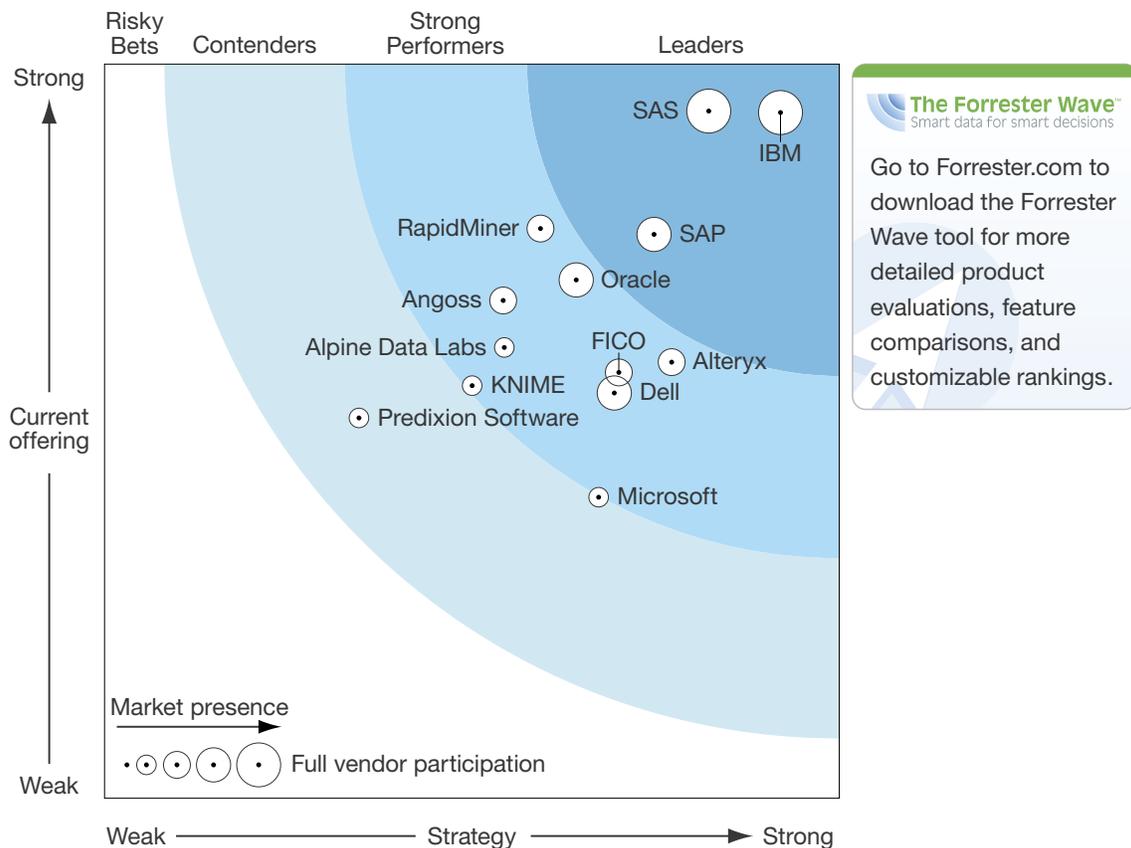
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Figure 3 The Forrester Wave™: Big Data Predictive Analytics Solutions Q2 '15 (Cont.)

	Forrester's Weighting	Alpine Data Labs	Alteryx	Angoss	Dell	FICO	IBM	KNIME	Microsoft	Oracle	Predixion Software	RapidMiner	SAP	SAS
CURRENT OFFERING	50%	3.07	2.97	3.39	2.76	2.90	4.67	2.81	2.05	3.53	2.59	3.88	3.84	4.68
Architecture	25%	2.40	1.80	3.40	1.60	2.60	4.60	1.20	1.80	3.80	1.80	3.40	3.60	4.20
Security	5%	1.50	1.50	2.00	2.50	2.50	4.00	2.50	2.50	5.00	3.00	2.00	3.00	4.00
Data	5%	5.00	5.00	4.40	5.00	0.90	5.00	5.00	0.90	4.40	4.40	5.00	4.40	5.00
Analysis	25%	3.25	3.30	2.55	2.80	2.35	4.50	3.20	1.95	3.55	3.18	4.25	3.80	4.85
Model management	15%	2.60	2.60	4.00	3.50	5.00	5.00	3.10	2.60	3.10	2.00	4.10	3.50	5.00
Usability and tooling	20%	4.20	3.80	4.60	3.00	3.40	5.00	4.20	2.60	3.00	2.60	4.20	4.20	5.00
Business applications	5%	2.00	4.40	1.20	3.20	1.20	3.80	0.60	0.60	3.20	3.20	3.20	5.00	4.40
STRATEGY	50%	2.72	3.86	2.71	3.47	3.50	4.60	2.50	3.36	3.21	1.73	2.97	3.74	4.11
Acquisition and pricing	20%	1.60	2.30	2.55	3.35	3.50	3.00	3.50	2.80	3.05	3.65	3.85	2.70	2.55
Ability to execute	20%	3.00	5.00	3.00	3.00	3.00	5.00	3.00	5.00	5.00	1.00	3.00	5.00	5.00
Implementation support	20%	3.00	4.00	4.00	5.00	5.00	5.00	2.00	1.00	4.00	2.00	2.00	5.00	5.00
Solution road map	20%	3.00	3.00	3.00	3.00	3.00	5.00	1.00	3.00	1.00	1.00	3.00	3.00	5.00
Go-to-market growth rate	20%	3.00	5.00	1.00	3.00	3.00	5.00	3.00	5.00	3.00	1.00	3.00	3.00	3.00
MARKET PRESENCE	0%	1.83	2.83	2.28	3.65	2.10	4.85	1.78	1.65	3.80	1.70	2.50	3.98	5.00
Company financials	30%	1.00	2.00	1.00	3.50	3.00	4.50	0.00	2.50	4.00	1.00	0.50	5.00	5.00
Customer base	50%	2.25	3.25	2.75	4.00	2.00	5.00	2.75	1.00	4.00	2.00	3.50	3.75	5.00
Partnerships	20%	2.00	3.00	3.00	3.00	1.00	5.00	2.00	2.00	3.00	2.00	3.00	3.00	5.00

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

VENDOR PROFILES

Leaders

- **IBM assembles an impressive set of capabilities, putting predictive at the center.** No matter how an organization wants to get started with predictive analytics, IBM has an option for them. The solution offers one of the most comprehensive set of capabilities to build models, conduct analysis, and deploy predictive applications: both on-premises and in the cloud. With customers deriving insights from data sets with scores of thousands of features, IBM's predictive analytics has the power to take on truly big data and emerge with critical insights.

- **SAS continues to be an analytics powerhouse.** With a strategic focus on analytics since 1973, it is no surprise that SAS offers predictive analytics solutions that offer almost every feature a data scientist or business user could ever want. SAS also keeps up with the evolving needs of analytics users. SAS Visual Analytics provides data scientists with an all-in-one visualization tool and predictive analytics solution. SAS solutions are also integrated with open source R, Python, and Hadoop.

- **SAP's relentless investment in analytics pays off.** SAP provides a comprehensive set of predictive analytics tools for both business users and data scientists that use SAP Hana behind the scenes. SAP offers a visual predictive analytics tool that lets users analyze data on a number of databases. SAP Hana customers can leverage SAP's Predictive Analysis Library (PAL) to analyze big data. SAP also provides a tool that lets business users create predictive models without any knowledge of statistical or machine learning algorithms.

Strong Performers

- **RapidMiner is a rock-solid enterprise solution with cloud capability.** With a platform including more than 1,500 methods across all stages of the predictive analytics life cycle, RapidMiner has the breadth and flexibility that enterprises need to consume data and serve insights across the business. RapidMiner helps reduce time-to-insights and guide best practices for data analysts, analyzing the behavior of their users to create "wisdom of the crowds" guidance: The platform helps users avoid repeating the mistakes of the past. With a single-click integration to run processes on the cloud, RapidMiner offers one of the most tightly integrated cloud capabilities of the assessed vendors.

- **Alteryx empowers businesspeople to quickly get their hands dirty in predictive.** Predictive analytics is not just for data scientists. Alteryx's focus is on providing business users with predictive capabilities by helping then overcome what is often the hardest part — data preparation. For predictive analytics, Alteryx uses R behind the scenes to provide a rich set of analysis algorithms. Data scientists can collaborate with business users by hiding R scripts behind nodes in their visual tool. Alteryx also provides an analytical apps gallery that lets users share their data prep and modeling workflows with other users.

- **Oracle makes scalable predictive analytics at home in SQL Developer.** If you are an Oracle shop, then predictive analytics is easily achieved with Oracle's predictive analytic solution. Rather than create a separate predictive analytics solution, Oracle's SQL Developer tool includes a visual interface to allow data analysts to create analytical workflows and models. Behind the scenes, Oracle has tightly integrated these workflows with the Oracle database. Oracle's predictive solution leverages open-source R for analysis, and Oracle has reworked a number of algorithms to take advantage of Oracle's database architecture and Hadoop to analyze big data.

- **FICO brings experience and trust to the cloud.** FICO has incredibly deep knowledge about what it takes to make predictive models actionable. This is apparent in their solution that is geared toward data scientists who are continuously building and deploying models. The FICO solution is also cloud-based to make adoption and use as frictionless as possible.

- **Dell's Statistica puts them in the game.** Dell acquired long-time analytics vendor StatSoft to add Statistica to their expanding portfolio of enterprise software solutions. Statistica has a comprehensive library of analysis algorithms and modeling tools and a significant installed base. Dell plans to aggressively invest in predictive analytics as part of its big data offering that includes database tool Toad and enterprise search and knowledge discovery tool Kitenga.

- **Angoss branches out beyond decision trees.** Adding predictive analytics discipline can be extremely challenging for companies without the requisite skillsets, and Angoss focuses on bridging that gap. A strong emphasis on support services combined with their intuitive interface for developing predictive models enables organizations to hit the ground running with predictive analytics. For years Angoss has been one of the leaders in decision tree algorithms, and they continue this focus with their Strategy Tree capability, allowing advanced users to generate complex cohorts from trees.

- **Alpine Data Labs makes analytics collaboration easy.** Alpine knows that simpler, smoother collaboration leads to better questions, better predictions, and better business results. The Alpine offering provides the most comprehensive collaboration tools of all the vendors in the Forrester Wave, and still manages to make the interface simple and familiar to users of any mainstream social media site. The collaboration tools also enable strong version control on the models, particularly useful in regulated industries where models may be audited. Alpine also implements algorithms from the start to run natively in Hadoop.

- **KNIME is your open source option in the enterprise.** The KNIME Analytics Platform supplies the market with the robust modeling and customization capabilities on par with many of the proprietary solutions evaluated in an open source package. KNIME's flexible platform is supported by a community of thousands of developers who drive the continued evolution of the platform by contributing extensions essential to the marketplace: such as prebuilt industry APIs, geospatial mapping, and decision tree ensembles. Organizations can run KNIME for free on their desktop. For heavier lifting, KNIME offers a server version that includes additional functionality in life cycle, collaboration, and security.

Contenders

- **Microsoft Azure Machine Learning is an impressive new entrant with a lot of potential.** Introduced last year, Microsoft's offering is the least mature of those evaluated, and consequently offers more limited capabilities in their current offering. Despite this, Forrester believes that

with ongoing investment (e.g., the acquisition of Revolution Analytics), Microsoft has the potential to become a significant player in the market. The only assessed vendor offering their solution exclusively as a cloud service, Microsoft is able to leverage the scale and flexibility of the Azure platform for building models and running analysis. The Azure Marketplace offers a distinctive single source for data and analytics services built with Azure Machine Learning.

■ **Predixion Software empowers business users and data scientists in the cloud and beyond.** Predixion Software leverages Microsoft Excel as a user interface to allow both business users and data scientists to effortlessly build predictive models in the cloud. Predixion also uniquely offers what they call a machine learning semantic model (MLSM) that packages up transformations, analysis, and scoring of data that can be deployed in any .NET or Java OSGI container. This means that users can embed entire predictive workflows in applications.

SUPPLEMENTAL MATERIAL

Online Resource

The online version of Figure 3 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:

■ **Vendor questionnaires.** 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 demos.** We asked vendors to conduct demonstrations of their product's functionality. We used findings from these product demos to validate details of each vendor's product capabilities.

■ **Customer surveys.** To validate product and vendor qualifications, Forrester also fielded a customer references survey to 32 of the vendors' 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 Waves, is conducted according to our Integrity Policy. For more information, go to http://www.forrester.com/marketing/policies/integrity-policy.html.

ENDNOTES

[1] Predictive analytics is a key capability to make better decisions, avoid risks, and create differentiated, more individualized customer experiences. Every application development and delivery (AD&D) professional and every technology management leader should know what predictive analytics is. This report gets AD&D professionals up to speed quickly so that they can lead the charge. For more information, see the "Predictive Analytics Can Infuse Your Applications With An "Unfair Advantage"" Forrester report.

[2] You'll often hear Hadoop and Spark mentioned in the same breath. That's because, although they are independent platforms in their own right, they have an evolving, symbiotic relationship. Application development and delivery professionals (AD&D) must understand the key differences and synergies between this next-generation cluster-computing power couple to make informed decisions about their big data strategy and investments. For more information, see the "Apache Spark Is Powerful And Promising" Forrester report.

[3] Most leading BI vendors now claim that they provide out-of-the-box integration with predictive analytics capabilities. However, Forrester finds that such integration is not always created equal. In this report, Forrester reviews key questions application development professionals should ask when evaluating integration of one of the most popular predictive analytics languages — open source R — with BI platforms. For more information, see the "Q&A: How To Energize Your Enterprise BI Platform With Integrated Predictive R Models" Forrester report.

[4] Three leading business intelligence (BI) vendors whose software and business models are to various degrees based on open source have been acquired within the last nine months. However, Forrester predicts that open source BI will continue to play a significant role in the embedded BI, custom-developed BI applications, and as tools and components offered by systems integrators as project accelerators and/or client solutions that require no commercial licenses. Application development and delivery (AD&D) pros should use recommendations provided in this report on when to consider open source versus commercial BI platforms in the light of the recent acquisitions. For more information, see the "Brief: It's Not Your Grandfather's Open Source BI Market Any Longer" Forrester report.

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