The Advanced Analytics Survey 19
Sample, Products, Methodology and KPIs

The world's largest survey of advanced analytics software users

This document provides background information to help gain a clearer understanding of The Advanced Analytics Survey 19

BARC
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Introduction

The Advanced Analytics Survey 19 is the largest and most thorough fact-based analysis of the advanced analytics market currently available. It is not based on anecdotal accounts or personal opinions, unlike much analyst research, neither is it intended to be a measure of market shares. Instead, it sets out to analyze market trends and produce meaningful comparisons of competing products across a wide range of critical software and vendor-related criteria. The Advanced Analytics Survey also provides a detailed quantitative analysis of why customers buy advanced analytics tools, what they are used for, what problems they experience with the tools and how successful they are.

This is the first edition of The Advanced Analytics Survey. It features 10 products from 8 different vendors and includes not just products from well-known global giants such as IBM or Microsoft, but also tools from much smaller vendors that ordinarily don't get much press but which, in many cases, offer outstanding value to customers.

After data cleansing and removing responses from participants unable to answer specific questions about their use of advanced analytics products, we were left with a sample of 386 end users, 110 consultants and 70 vendor and reseller employees. Participants from all over the world took part in The Advanced Analytics Survey 19. 14 percent of respondents stated they have a data lab job function; 32 percent have an IT job function and the remainder perform various line-of-business roles.

The findings from The Advanced Analytics Survey 19 are presented in several documents, each focusing on a specific set of the survey results.

Document	Description
The Advanced Analytics Survey 19 – The Results	An overview and analysis of the most important findings and topical results from The Advanced Analytics Survey 19. Includes advice to buyers of analytics software as well as users of existing analytics solutions based on the results of our analysis.
The Advanced Analytics Survey 19 – Sample, Products, Methodology and KPIs	Provides details of the sample, the products included and an overview of our methodology. Descriptions of the KPIs used in The Advanced Analytics Survey 19 are also provided, including details of our calculation methods.
The Advanced Analytics Survey 19 – Vendor Performance Summaries	A series of executive reports on each product featured in The Advanced Analytics Survey 19. Each report contains a short vendor and product overview by BARC's analyst team plus a summary of the relevant product-related results from The Advanced Analytics Survey 19.

The sample

Most surveys are conducted or sponsored by an organization based in, and focused on, one country. However, advanced analytics is a worldwide market and we wanted to capture a larger international sample.

The net result was an extraordinarily international panel. Respondents were located in 68 countries. The countries with the most respondents are Germany, the United States and the United Kingdom. The regions with the most respondents are Europe, North America and Asia Pacific.

The online questionnaire was published in two languages: English and German.

Sample size and make-up

Many thousands of people around the world were invited to participate in The Advanced Analytics Survey 19, using BARC's online research panel and the support of vendors and various websites. The questionnaire offered different sets of questions for vendors and users (or consultants answering on behalf of users).

The results of the online data collected are shown in the following chart, with the numbers of responses removed also displayed.

Table 1: Responses to the survey

	Responses	
Total responses	686	100%
Filtered during data cleansing	-9	-7%
Remaining after data cleansing (total answering questions)	**677**	**93%**
Non-user (did not answer questions about products)	-111	-4%
Vendor (did not answer questions about using products)	-70	-12%
Total answering product-related questions	**496**	**77%**

The number of responses is split between users, consultants, vendors and non-users. Vendors answered a different set of questions to those answered by end users. This document focuses on the analysis of the user results.

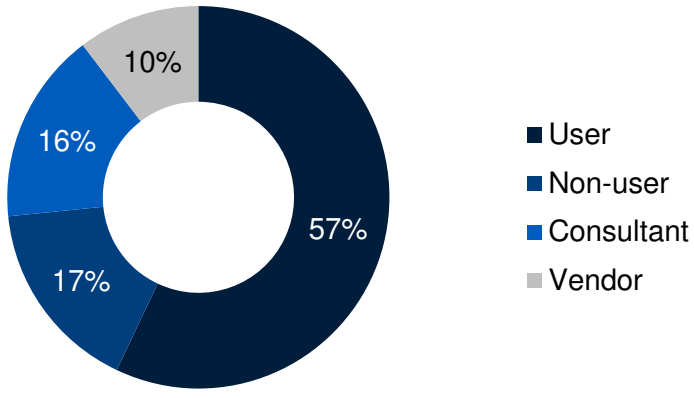

Figure 1: Is your organization using, or has it considered using, any advanced analytics, data discovery or data preparation products or applications? (n=677)

Organization sizes by headcount

Specialized advanced analytics software is most commonly found in medium and large organizations (see Figure 2). A high percentage of the responses we received are from users in companies with more than 2,500 employees (see Figure 3).

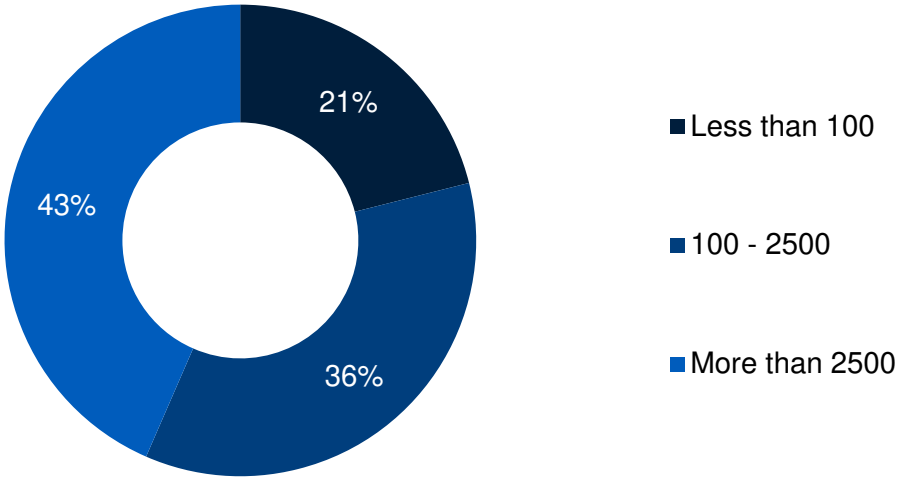

Figure 2: How many employees are there in your entire organization, including all of its branches, divisions and subsidiaries? (n=389)

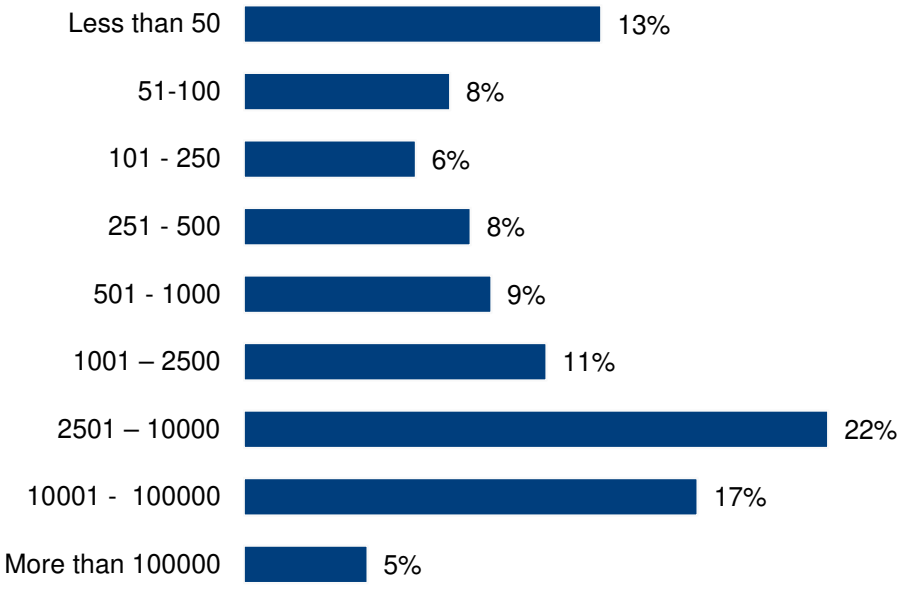

Figure 3: How many employees are there in your entire organization, including all of its branches, divisions and subsidiaries? (n=389)

Vertical markets

We asked all respondents which industry sector their company operates in. The chart below shows the results of this question. Most respondents work in services, followed by manufacturing and the public sector.

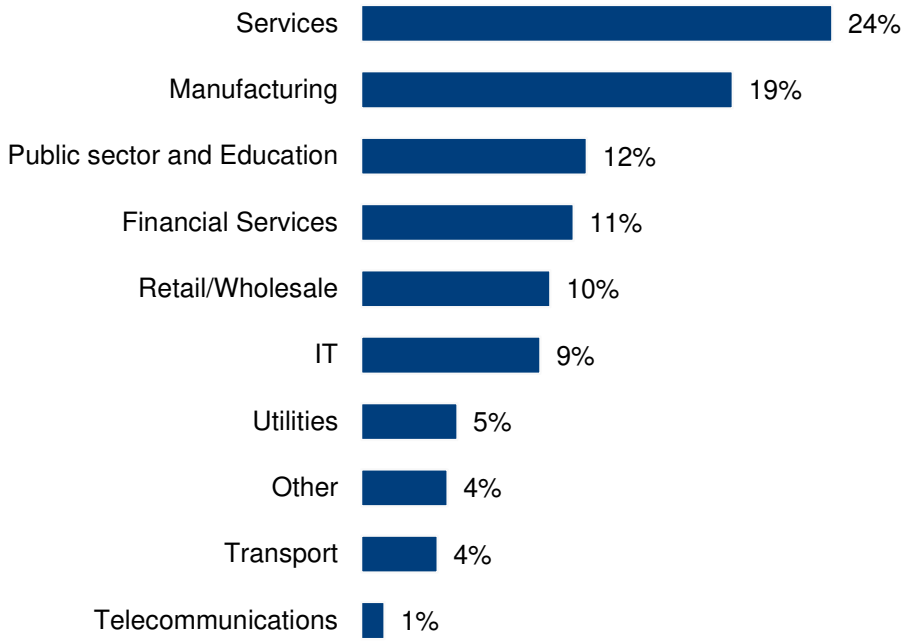

Figure 4: Which of the following best describes your organization's industry sector? (n=582)

Featured products

When grouping and describing the products featured in The Advanced Analytics Survey, we did not strictly follow the naming conventions the vendors use. Note that the names we use in this document are our own and are not always the official product names used by the vendors.

One of the key reasons for this is that the products we analyze are not necessarily the latest version of the tool. Vendors often change the product name between versions, making it difficult to have a single official name for several versions of the same product. The point is not to challenge the naming conventions of the vendor, but simply to reduce the complexity of the survey findings for the convenience of the reader. In some cases, we also shorten the names of the products to improve the formatting of the charts.

We asked respondents explicitly about their experiences with products from a predefined list, with the option to nominate other products. Our predefined list can be found at the end of this document. In cases where respondents said they were using an 'other' product, but from the context it was clear that they were actually using one of the listed products, we reclassified their data accordingly.

The following table shows the products included in the detailed analysis. In this, the first edition of The Advanced Analytics Survey, a minimum of around 15 responses is required for a product to be included in the detailed analysis. The number of responses about 'other' products is not included in the following table.

Table 2: Products included in the sample

Product label	Product name	Respondents
Alteryx	Alteryx Designer	35
Dataiku	Dataiku DSS	33
IBM SPSS/WS	IBM DSX, IBM SPSS Modeler, IBM SPSS Statistics	19
IBM SPSS/WS/CA	IBM DSX, IBM SPSS Modeler, IBM SPSS Statistics, IBM Cognos Analytics	26
Microsoft Azure/SQL Server	Microsoft Azure ML, Microsoft SQL Server R Services/Machine Learning Server	36
Microsoft Power BI	Microsoft Power BI	44
Qlik	Qlik Sense, QlikView	21
RapidMiner	RapidMiner Studio	21
SAS	SAS Base, SAS Enterprise Guide, SAS Enterprise Miner, SAS Visual Analytics/Statistics	28
Tableau	Tableau	24

In this first edition of The Advanced Analytics Survey, ten products (or bundles of products) are featured. The products in the sample vary in their market focus and origin.

Peer groups

The Advanced Analytics Survey 19 features a wide range of advanced analytics tools. Therefore, we use peer groups to help readers identify and compare competing products. The peer groups are defined using the criteria outlined in Table 3.

The peer groups are designed to help readers compare similar tools in terms the scenarios the products are used in. See Table 4 for an overview of the products in each peer group. These functional peer groups are mainly data-driven and based on how customers say they use the product.

Table 3: Peer group descriptions

Peer group	Description
Advanced analytics platforms	Advanced analytics is a generic term for analysis based on mathematical models. Its aim is to identify relationships between variables in order to derive insights from existing data (patterns) as well as new data (forecasts). This peer group contains advanced analytics platforms that provide a broad range of algorithms. They also offer data preparation and visualization functionality, together with options for model deployment.
Data discovery products	Data discovery is the business user/analyst driven process of discovering patterns and outliers in data. This peer group includes products that focus on all the sub-elements of data discovery: data preparation, visual analysis and guided advanced analytics.
Data preparation products	Data preparation is the process of cleaning, structuring and enriching data for use in data discovery and/or advanced analytics. This peer group includes products and vendors that support these tasks.
Software generalists	The ‘Software generalists’ peer group includes products which are part of a vendor’s broader business software portfolio. Customers that standardize on such vendors may be more inclined to select their standard provider’s solutions.

Table 4: Products by peer group matrix

	Advanced analytics platforms	Data discovery products	Data preparation products	Software generalists
Alteryx	x		x	
Dataiku	x		x	
IBM SPSS/WS	x		x	x
IBM SPSS/WS/CA		x	x	x
Microsoft Azure/SQL Server	x	x	x	x
Microsoft Power BI		x	x	x
Qlik		x	x	
RapidMiner	x	x	x	
SAS	x	x	x	x
Tableau		x	x	

Overview of the key calculations in The Advanced Analytics Survey 19

Measuring business benefits

Business benefits are the real reason for carrying out any analytics project. For each potential benefit, respondents are asked to indicate their level of achievement, if any, with five levels. We use a weighted scoring system, as shown in Table 5 below, to derive a composite score for each of the possible benefits, based on the level of benefit achieved. We call this the BBI (Business Benefits Index).

Table 5: The Business Benefits Index weighting system

Level of benefit reported	Weighting
High	10
Moderate	6
Low	2
Not achieved	-2
Don't know	0

This rating system is the basis of the most important index in the survey. It is a dimensionless number with an arbitrary value, but as long as the weighting system remains constant it can be used for comparisons between segments of the sample, such as the sample for individual products or regions, to name just two.

Participants were asked to rate each benefit. Business benefits are calculated by counting the number of each reported level of benefit and multiplying this number by the corresponding weighting. The results are then divided by the number of responses for each particular benefit to find the average response (See Figure 5).

Figure 5 demonstrates that ‘improved time to insight’, ‘increased transparency of data usage’ and ‘increased reuse and use of analytical insights’ are the top three benefits companies achieve with the use of their advanced analytics products.

In contrast to the main benefits, ‘saved headcount’ and ‘reduced costs’ are seen as relatively minor benefits.

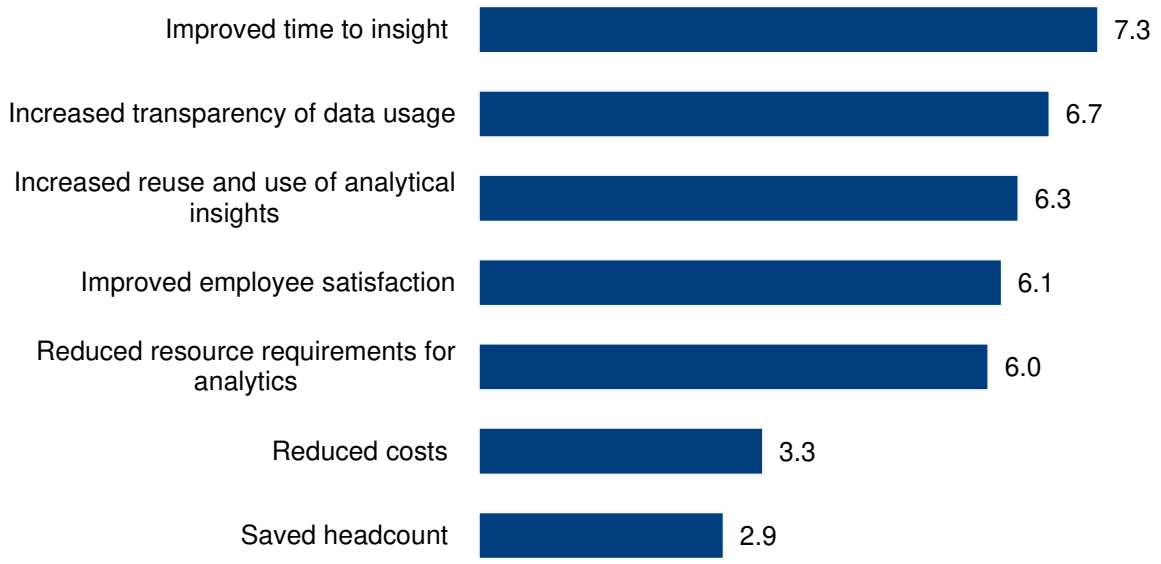

Figure 5: Evaluated business benefits with calculated value (BBI) (n=297)

Project success

The 'Project success' KPI is based on three factors. We asked participants to judge their satisfaction level with their implementations. We also asked the level of success with which their projects were completed on time and on budget and weighted the responses to calculate project success.

The weightings of the possible responses are shown in the following chart.

Table 6: Responses and weightings for PS (Project Success)

Level of project success reported	Weighting
Good	10
Moderate	5
Poor	0

Means and medians

This survey makes frequent references to different forms of averages — means and medians. Just in case your statistical knowledge is a little rusty, here's a quick reminder of the definition of the terms:

The mean is the usual arithmetic average. Its value is affected by every value in the sample, so a single large outlier can materially affect the mean, particularly with small samples.

The median is the value in the middle of the sample; that is, half of the sample is larger than the median, and the other half is smaller. It could be regarded as the 'typical value', and is affected by the number, but not the value, of outliers. One or two large or small outliers therefore do not affect the median.

Understanding multiple response questions

Several questions in The Advanced Analytics Survey 19 allow the user to make multiple responses. For example, we asked users what problems (if any) they encountered in their projects. Because many users had more than one problem, the number of responses is larger than the number of respondents.

This means that there are two ways to calculate the percentage of a given response: based on the total number of responses or based on the total number of respondents. We present The Advanced Analytics Survey results based on the number of respondents.

Calculating percentages based on the number of respondents tells us how likely a given respondent is to have the problem, but results in percentages higher than 100 percent when all the problems are added together (e.g., 47 percent of all respondents reported that they have no significant problems). Conversely, calculating percentages based on the total number of responses would result in a total of 100 percent.

Survey data collection

The survey was conducted by BARC, with data captured from September 2018 to January 2019. All data was captured online from a total of 677 respondents.

Respondents were solicited individually via BARC's own research panel and from dozens of vendor and independent lists, as well as websites from many different countries, with emailed invitations being sent to the lists in a staggered fashion.

At our request, most of the vendors notified their customers about The Advanced Analytics Survey using either their regular newsletters or websites. We also asked some bloggers to mention it. Each list and website had a different survey URL, though in all cases, the same questionnaire (in English or German) was used.

Understanding the KPIs

The goal of this section is to help the reader spot winners and losers in The Advanced Analytics Survey 19 using well-designed dashboards packed with concise information. The Survey includes a set of 28 normalized KPIs for each of the 10 products. These include 6 aggregated KPIs, which aggregate the results of various combinations of 'root' KPIs.

We have calculated a set of KPIs for each of the four peer groups. The values are normalized on the whole sample. Peer groups are used to enable fair and useful comparisons of products that are likely to compete.

The KPIs all follow these simple rules:

• Only measures that have a clear good/bad trend are used as the basis for KPIs.

• KPIs may be based on one or more measures from The Advanced Analytics Survey.

• Only products with samples of at least 15 - 30 (depending on the KPI) for each of the questions that feed into the KPI are included.

• For quantitative data, KPIs are converted to a scale of 1 to 10 (worst to best). A linear min-max transformation is applied, which preserves the order of, and the relative distance between, products' scores.

KPIs are only calculated if the samples have at least 15 - 30 data points (this varies from KPI to KPI) and if the KPI in question is applicable to a product. Therefore, some products do not have a full set of root KPIs. It is important to exclude KPIs based on small (and therefore not representative) samples to ensure that the graph scales are not distorted by outlier KPIs. In such cases, the product is still shown in the tables, but with a blank KPI value and no bar in the bullet graph or bar chart.

Table 7: Aggregated and root KPIs

Aggregated KPIs	Root KPIs
Business value	Business benefits
	Project success
	Project length
Customer satisfaction	Price-to-value
	Recommendation
	Vendor support
	Product satisfaction
User experience	Ease of use
	Code-free usage
	User guidance
	Collaboration
	Openness
Data management	Performance satisfaction
	Data volume
	Data variety
	Governance
Analytics	Data preparation
	Data visualization
	Visual analysis
	Advanced analytics breadth
Operationalization	Model scoring
	Model management

Reading the KPI charts

We provide two different types of dashboards for viewing the KPIs. The first type is the Product Dashboard. A Product Dashboard displays all the KPIs for a single product. The second type is the KPI Dashboard, which displays the KPI values for each product in a peer group using simple bar charts. The products are sorted by value in descending order.

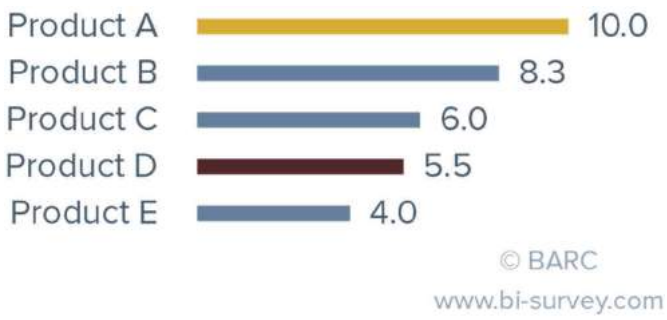

Figure 6: KPI dashboard used for displaying KPIs

In the KPI Dashboards (see Figure 6), the peer group average is indicated by a golden bar.

Figure 7: Product dashboard used for displaying all KPIs for a product in a specific peer group

In Figure 7, the first column shows the KPI name and the middle column indicates the product rank in the specific peer group. As previously mentioned, not every product is represented by the complete set of KPIs. The gray squares show how many products in the peer group have an adequate sample to be classified in each KPI. The next column shows the KPI values for the product in question in each KPI and the blue bars in the final column represent those KPI values against the peer group average, which is indicated by a vertical gray line.

The KPIs (overview)

The following section provides the entire list of KPIs calculated for The Advanced Analytics Survey 19, as well as a description of the calculations.

KPIs are only calculated if the samples have at least 15 - 30 data points (depending on the KPI), so some of the products do not have a full set of KPIs. It is important to exclude KPIs based on small (and therefore unreliable) samples to ensure that the graph scales are not distorted by outlier KPIs based on small data samples. In such cases, the product is still shown in the tables, but with a blank KPI value in the bar chart.

Different readers will have their own views on which of these KPIs are important to them. For example, some people will regard code-free usage as vital, while others may consider recommendation or performance satisfaction to be more important.

The KPIs below provide a good selection from which readers can choose those that best fit their own organization's requirements.

Business benefits

What we measure

We measure the real benefit of projects after implementation whereas other surveys limit their questions to technical or organizational issues.

Why it is important

'Business benefits' is possibly the most important KPI, focusing on the bottom-line benefits of software projects, rather than individual technical aspects.

A software project that does not deliver business benefits is superfluous. Unlike core transaction systems, advanced analytics software projects are optional, not mandatory, so they must pay their way in terms of delivering business benefits.

How we measure

We ask users to judge each project benefit based on a scale of achievement ranging from "high" to "not achieved". Using this information, we weight their responses and calculate the Business Benefits Index (BBI). The KPI is a normalized version of this index.

See Figure 5 for a list of the benefits evaluated by survey participants.

Project success

What we measure

This KPI is based on a combination of three measures: the level of general user and administrator satisfaction with implementations, as well as the frequency with which projects are completed on time and on budget.

Why it is important

The initial success of an analytics project can have a great bearing on the business benefits achieved over time. Our surveys in previous years have consistently found that long-running projects are likely to become costlier than first anticipated, deliver less business benefits and often lead to other significant

problems. Therefore, the speed with which a product is implemented can be crucial. User and administrator satisfaction are also an important indicator that the tool has been adopted as envisaged at the outset of the project.

How we measure

Similar to our business benefit calculations, we ask participants to judge their satisfaction level with their implementations. We also ask the level of success with which projects were completed on time and on budget and weight the responses to calculate project success. The KPI is a normalized version of this index.

Project length

What we measure

We measure how long it takes to implement projects.

Why it is important

Rapid implementation is a key measure of project success. Our research over the years has shown that projects with about a three-month implementation time deliver the greatest business benefits.

How we measure

We divide the number of projects implemented in under three months by the total number of projects. A weighting is then applied whereby products are classified (based on the median number of users) as either small, medium or large in order to produce fair comparative ratings in this KPI.

Business value

Business value is a combination of the ‘Business benefits’, ‘Project success’ and ‘Project length’ KPIs

Price-to-value

What we measure

We ask participants to judge the price-performance ratio of their chosen product.

Why it is important

Price-to-value is an important metric in today’s cost-conscious age. As many an advanced analytics tool user has found, the costs of buying and supporting analytics software quickly add up, especially when attempting to cost-justify adding new users. As more analytics capabilities are pushed out to the business, this perception of value becomes even more critical.

How we measure

We ask participants to rate the price-performance ratio of their chosen product. To obtain the final KPI, we calculate an average weighted score per product.

Recommendation

What we measure

We measure whether customers already using a product would recommend that product to others.

Why it is important

No one knows more about how a product performs in the real world than the customers already using it. All too often, they find that products don't live up to expectations, or that the vendor does not support the product properly. Therefore, if existing users say they would recommend the product, we regard this as a positive indicator of its value.

How we measure

Users are asked whether they would recommend the product they are most familiar with. This measure is based on the degree and proportion of positive responses.

Vendor support

What we measure

We measure user satisfaction with the level of support provided for the product by the vendor.

Why it is important

Product support from the vendor is a key determinant for project success. This is an area where there are major differences between vendor ratings.

How we measure

We ask participants to rate the quality of the vendor's support. To arrive at the final KPI, we calculate an average weighted score per product.

Product satisfaction

What we measure

We measure the level of satisfaction with the product.

Why it is important

If a product proves unreliable at a critical time, the results can be debilitating, and can even render an application unusable. However, not all customers have the same dependency on reliability, as some applications are not mission critical or time critical.

How we measure

We ask respondents to name the problems they have encountered in their use of the product. Afterwards we count the sum of all product-related problems. Product problems are a negative factor, so the product satisfaction KPI rises as problem rates fall.

Customer satisfaction

We combine the 'Price-to-value', 'Recommendation', 'Vendor support' and 'Product satisfaction' KPIs to calculate this aggregated KPI.

Ease of use

What we measure

We measure the degree to which respondents consider their advanced analytics software to be easy to use.

Why it is important

Ease of use is often considered the holy grail of software. It is an important consideration for any vendor seeking to expand its footprint within enterprise sites. Business decision-makers don't want to have to spend a lot of time in training or attempting to learn new interfaces.

How we measure

This KPI is based on two factors: (1) the frequency with which 'ease of use for business analysts' and 'ease of use for data scientists' was cited as a reason for purchasing an advanced analytics product; and (2) the frequency of complaints that the software is difficult to use. Each of the above is given equal weighting in calculating a normalized KPI value.

Code-free usage

What we measure

This KPI is based on how often the product was chosen for its code-free environment, and on the level of complaints about limited code-free usage.

Why it is important

Most business users are not used to writing code. Together with new methodological approaches, this represents an entry barrier to data analysis for business analysts. Code-free environments are important in reducing this barrier and encouraging less technical users to prepare and analyze data. This is an important criterion given that ease of use for business analysts is such a commonly cited reason for choosing an analytics product.

How we measure

This KPI is based on two factors: (1) the frequency with which 'code-free environment' was cited as a reason for purchasing an advanced analytics product; and (2) the frequency of complaints about limited code-free usage. Each of the above is given equal weighting in calculating a normalized KPI value.

User guidance

What we measure

We measure user satisfaction with the on-screen guidance the software offers to users.

Why it is important

Data preparation and analysis can be very technical. On-screen guidance to assist users in making proper and effective use of the software is important to encourage less technical users to prepare and analyze data. This is an important criterion given that ease of use for business analysts is such a commonly cited reason for choosing an analytics product.

How we measure

We ask participants to rate their satisfaction with the user guidance capabilities of their software. We calculate an average weighted score per product to arrive at the final KPI.

Collaboration

What we measure

We measure user satisfaction with the software‘s collaboration capabilities.

Why it is important

Analytics projects require collaboration between data scientists, business analysts, data engineers and other IT roles. Sharing code, datasets, graphics and other results as well as working collaboratively on use cases is important to move projects forward.

How we measure

We ask participants to rate their satisfaction with the collaborative capabilities of their software. We calculate an average weighted score per product to arrive at the final KPI.

Openness

What we measure

This KPI is based on how often the product was chosen for its openness to other programming languages, and on the level of complaints about a lack of support for other programming languages.

Why it is important

Open source languages are popular among data scientists as they offer a huge variety of functionality for all kinds of use cases. Open source software is also a driver of innovation when it comes to new methodologies and visualizations. Integration of these languages is therefore required by most data scientists.

How we measure

This KPI is based on two factors: (1) the frequency with which ‘openness and support of different programming languages’ was cited as a reason for purchasing an advanced analytics product; and (2) the frequency of complaints about missing support of additional languages. Each of the above is given equal weighting in calculating a normalized KPI value.

User experience

User experience is a combination of the ‘Ease of use’, ‘Code-free usage’, ‘Collaboration’, ‘User guidance’ and ‘Openness’ KPIs.

Performance satisfaction

What we measure

This KPI is based on user feedback about the reasons the product was chosen and complaints about the system’s performance.

Why it is important

Performance satisfaction is crucial when training new models on large datasets or when scoring data in near-real time. In some ways, complaints about performance are more important than performance measured in seconds, because acceptable delays can vary depending upon how the system is used.

How we measure

This KPI is based on two factors: (1) the frequency with which ‘convincing performance of software’ was cited as a reason for purchasing an advanced anayltics product; and (2) the frequency of complaints about slow performance. Each of the above is given equal weighting in calculating a normalized KPI value.

Data variety

What we measure

This KPI is based on the variety of data sources and formats the software is used with.

Why it is important

More and more data sources can now be used for analysis. These data sources differ in format and volume. Being able to make use of this diversity is important in order to enrich internal transactional data over time with sources such as geodata, log data, text and images.

How we measure

We ask participants which data sources/formats they use. The KPI is based on the proportion of data sources that are used with the product.

Data volume

What we measure

This KPI is based on how often the product was chosen for its ability to handle large data volumes, and on the level of complaints about its data handling capacity.

Why it is important

Training models and querying data can be time-consuming tasks when large or big data is involved. When software has the capability to handle large data volumes well, it can significantly accelerate these processes and help to shorten the iterations needed to arrive at a good model.

How we measure

This KPI is based on two factors: (1) the frequency with which 'large data handling capacity' was cited as a reason for purchasing an advanced analytics product; and (2) the frequency of complaints about inability to handle the company's data volumes. Each of the above is given equal weighting in calculating a normalized KPI value.

Governance

What we measure

This KPI measures user satisfaction with the software's governance capabilities.

Why it is important

As the number of data sources increases, more and more analytical assets are built up and used in organizations. This leads to more users collaborating in this process and, in turn, tasks such as governing assets, curating data and tracking results assume additional importance. Governance functionality helps to keep track of these issues.

How we measure

We ask participants to rate their level of satisfaction with the governance capabilities of their software. We calculate an average weighted score per product to arrive at the final KPI.

Data management

Data management is a combination of the 'Performance satisfaction', 'Data variety', 'Data volume' and 'Governance' KPIs.

Data preparation

What we measure

This KPI is based on the variety of data preparation steps the software is used for.

Why it is important

Data preparation is a crucial step in data analysis. A large part of the time in analytical projects is spent on data preparation. Software should have extensive functionality to profile, cleanse and join data sources as well as provide ways to add new information by feature engineering.

How we measure

We ask participants which functions they use for data preparation. The KPI is based on the proportion of data preparation functions that are used with the product.

Data visualization

What we measure

This KPI measures the extent to which the software is used for data visualization.

Why it is important

Visualizing data is an essential part of data preparation. Making distributions, relationships and specific properties transparent via visualizations enables humans to digest information faster than they would be able to by viewing tables for instance. Depending on the types of data being analyzed, different visualization types can be used to help users understand it. For instance, time series data is easier to grasp by displaying it in a line chart.

How we measure

We ask participants whether the tool they are most familiar with is being used for data visualization by their organization. The KPI is based on the probability that products are being used in this way.

Visual analysis

What we measure

This KPI measures the extent to which the software is used for visual analysis.

Why it is important

Visual analysis is all about exploring data visually. In contrast to data visualization, which focuses on finding the right display format to represent data, the goal of visual analysis is to support the iterative process of finding patterns and outliers in data by visually exploring it. Especially when used on large amounts of data, anomalies and outliers can be detected faster and more easily than trying to search for them in a table. Chart types such as bubble charts and line diagrams are well suited to showing peaks and noticeable data points in a large data set.

How we measure
We ask participants whether the tool they are most familiar with is being used for visual analysis by their organization. The KPI is based on the probability that products are being used in this way.

Advanced analytics breadth

What we measure

This KPI measures the breadth of analytical applications the software is used for.

Why it is important

Advanced analytics platforms should be able to cater for a broad spectrum of methods and use cases. To provide full flexibility for data scientists, in addition to open source integration, a variety of algorithms for supervised and unsupervised learning and functionality for prescriptive analytics should be available. Some platforms even offer pre-packaged solutions for specific use cases.

How we measure

We ask participants which use cases they have addressed with their product. The KPI is based on the proportion of use cases that are addressed with the product.

Analytics

Analytics is a combination of the 'Data preparation', 'Data visualization', 'Visual analysis' and 'Advanced analytics breadth' KPIs.

Model scoring

What we measure

This KPI measures the extent to which the software is used for model scoring.

Why it is important

Analytical models need to be integrated into operational applications to add value in processes. Therefore, software platforms must offer functionality to integrate models and score new data on a regular basis. Analytics software offers various options such as APIs, standardized interfaces and direct integrations into systems and databases.

How we measure

We ask participants whether the tool they are most familiar with is being used for model scoring by their organization. The KPI is based on the probability that products are being used in this way.

Model management

What we measure

This KPI measures the extent to which the software is used for model management.

Why it is important

Data changes over time. Once analytical models have been developed and are used in operational processes, they need to be updated regularly. Keeping track of model versions, enabling retraining of models and governing analytical assets is the focus of model management.

How we measure

We ask participants whether the tool they are most familiar with is being used for model management by their organization. The KPI is based on the probability that products are being used in this way.

Operationalization

Operationalization is a combination of the 'Model scoring' and 'Model management' KPIs.

Product picklist used in The Advanced Analytics Survey 19

Alteryx Designer
Amazon Sage Maker
Angoss Insights Optimizer
BearingPoint HyperCube
Blue Yonder Price Optimization
Blue Yonder Replenishment Optimization
Cloudera Data Science Workbench
Comma Soft Infonea
Dataiku DSS
Datameer
DataRobot
Datawatch
Datawatch Angoss
Datawatch Monarch Designer
Datawatch Panopticon
Dundas
Dymatrix Consulting Group Customer Insight Suite
ESRI ArcGIS
FICO Analytics Workbench
FICO Application Fraud Manager
FICO Decision Optimizer
FICO Insurance Fraud Manager
FICO Xpress/Insights
Gpredictive Scores out of the Box
Gurobi Optimizer
IBM Cognos Analytics
IBM CPLEX
IBM DSX
IBM SPSS Modeler
IBM SPSS Statistics
IBM Watson Analytics
Informatica REV/Cloud Services
Kisters Belvis Pro
KNIME Analytics Platform
Lavastorm
Llamasoft Network Optimization
Matlab Optimization Toolbox
Microsoft Cognitive APIs
Microsoft Azure ML
Microsoft Excel
Microsoft Power BI
Microsoft SQL Server R Services/Machine Learning Server
MicroStrategy
Open Logic Systems Preisprognose
OpenText Analytics Suite
OpenText Big Data Analytics
OpenText Magellan
Oracle Analytics Cloud
Oracle BI
Oracle Crystal Ball
Oracle Data Miner
Oracle R Enterprise

Pentaho
pmOne Analytics Wundermailing
PROS PricingPro
PROS RevenuePro
PROS SellingPro
Qlik Sense
Qymatix Predictive Sales Analytics
RapidMiner Studio
Reactive Search LIONoso
remira LogoMate
robotron*epredict
Salesforce Einstein
SAP Analytics Cloud
SAP APO
SAP Predictive Analytics
SAS Base
SAS Enterprise Guide
SAS Enterprise Miner
SAS Intergrated Merchandise Planning
SAS OR
SAS VDMML
SAS Visual Analytics/Statistics
Sisense
Splunk Enterprise Security
Splunk IT Service Intelligence
Squirro Cognitive Search
Squirro CRM Insights
Squirro Service Insights
Tableau
ThoughtSpot
TIBCO S+
TIBCO Spotfire
TIBCO Statistica
TIBCO TERR
Trifacta

About BARC

BARC — Business Application Research Center
A teknowlogy Group Company

BARC is a leading enterprise software industry analyst and consulting firm delivering information to more than 1,000 customers each year. Major companies, government agencies and financial institutions rely on BARC's expertise in software selection, consulting and IT strategy projects.

For over twenty years, BARC has specialized in core research areas including Data Management (DM), Business Intelligence (BI), Customer Relationship Management (CRM) and Enterprise Content Management (ECM). BARC's expertise is underpinned by a continuous program of market research, analysis and a series of product comparison studies to maintain a detailed and up-to-date understanding of the most important software vendors and products, as well as the latest market trends and developments.

BARC research focuses on helping companies find the right software solutions to align with their business goals. It includes evaluations of the leading vendors and products using methodologies that enable our clients to easily draw comparisons and reach a software selection decision with confidence. BARC also publishes insights into market trends and developments, and dispenses proven best practice advice. BARC consulting can help you find the most reliable and cost-effective products to meet your specific requirements, guaranteeing a fast return on your investment. Neutrality and competency are the two cornerstones of BARC's approach to consulting. BARC also offers technical architecture reviews and coaching and advice on developing a software strategy for your organization, as well as helping software vendors with their product and market strategy.

BARC organizes regular conferences and seminars on Business Intelligence, Enterprise Content Management and Customer Relationship Management software. Vendors and IT decision-makers meet to discuss the latest product updates and market trends, and take advantage of valuable networking opportunities.

Along with CXP, Pierre Audoin Consultants (PAC) and Ardour Consulting, BARC forms part of teknowlogy Group – the leading European IT research and consulting firm with 155 staff in eight countries including the UK, US, France, Germany, Austria and Switzerland. CXP, PAC and Ardour complement BARC's expertise in software markets with their extensive knowledge of technology for IT Service Management, HR and ERP.

BARC research reports bring transparency to the market

BARC's BI Trend Monitor 2019 reflects on the trends currently driving the BI and data management market from a user perspective. We asked close to 2,700 users, consultants and vendors for their views on the most important BI trends.

'BI and Data Management in the Cloud': A BARC and Eckerson Group study on current attitudes, issues and trends relating to the use of BI and DM technologies in the cloud. Download here.

The BI Survey 18 is the world's largest annual survey of BI users. Based on a sample of over 3,000 survey responses, The BI Survey 18 offers an unsurpassed level of user feedback on 36 leading BI solutions. Find out more at http://bi-survey.com.

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