Next-Generation Business Intelligence Platforms

This KuppingerCole Market Compass provides an overview of the products or service offerings in a certain market segment. This Market Compass covers the Next-Generation Business Intelligence (BI) Platforms market, focusing on enabling data-driven insights for business users and decision makers. This depends on interactive features of dashboards and visualization capabilities, data preparation of high-quality datasets, and support of artificial intelligence (AI) and machine learning (ML) to streamline BI workflows. Next-generation BI platforms will be the foundation of data-driven organizations, equipping more employees with cross-cutting organizational insights.

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Content

1 Management Summary

The KuppingerCole Market Compass provides an overview of a market segment and the vendors in that segment. It covers the trends that are influencing that market segment, how it is further divided, and the essential capabilities required of solutions. It also provides ratings of how well these solutions meet our expectations.

This Market Compass covers next-generation business intelligence (BI) platforms, or solutions that move beyond traditional BI. This next generation of solution is marked by self-service and analytics augmented by artificial intelligence (AI) and machine learning (ML) for data preparation, generating insights, or enabling natural language interaction with the platform. Next-generation BI platforms will also increasingly enable immediate action when viewing BI dashboards by embedding automated workflows within the platform or embedding dashboards into enterprise applications.

KuppingerCole is covering technologies that are critical for companies to be successful for digital transformation. BI platforms are a tool of digital organizations, but it is quickly being revealed that data preparation and management is the critical capability that manages high-quality datasets for the data-driven organization. Increasingly, BI solutions will incorporate more advanced data science and preparation elements, since data management is a foundational capability for not only BI, but also AI/ML programs, data governance, and data privacy initiatives.

Readers of this Market Compass will learn about the trends and developments in this market segment, be introduced to and compare the major vendors in this segment and prepare themselves to identify their own requirements for a next-generation BI platform. Readers should consider vendors based on the internal requirements of their own organization's use cases and use this report as a guide to shortlist vendors.

Highlights:

- KuppingerCole predicts that data management and preparation will propel BI to greater heights for digital transformation

- The many innovative ways that action can be triggered from insights will become more important features of BI platforms

- AI/ML capabilities support data preparation, generation of insights, and enable natural language interaction in BI platforms

- BI platforms are being designed for many user personas within the organization, and licensing options allow for many more users at lower cost

- Zoho is rated Outstanding in Innovation

- Microsoft is rated Outstanding in Functionality

- Tableau is rated Outstanding in Visualizations

- Dataiku is rated Outstanding in Data Preparation

2 Market Segment

There should be a line drawn between the next-generation BI platform market segment and a traditional BI platform. Next-generation BI platforms should take a distinctly future-oriented approach to delivering their solutions given several trend shifts: that SMEs are increasingly investing in BI platforms, that many more employees are encouraged to make data-driven decisions, that data volumes are increasing drastically, that the cloud makes scalable computing power and storage more accessible, and that modern IT architectures make it possible to weave real-time insight and action into the same interface. This Market Compass report presents several next-generation BI platforms and discusses their strengths, challenges and how we expect this segment to develop.

2.1 Market Description

Data generation and usage has exponentially increased within the business, from SMEs to multinational enterprises. Business intelligence (BI) platforms are an increasingly effective and cost-efficient way to handle the volume of incoming data, centralize data preparation workflows, and generate actionable insights for the organization. BI platforms allow organizations to identify, understand, and act upon trends in enterprise data and metadata, as well as performing functional data preparation and management tasks.

The next generation of BI platforms will expand on the volume of data analysis and the degree of control that a business user has over the process. Artificial intelligence (AI) capabilities will likely provide this, as breakthroughs in computing power have allowed AI to expand into data management, making a natural pairing with business intelligence platforms. Next-generation BI platforms are the new breed of data management platforms that can handle higher volumes of data, assist in essential data preparation steps, perform tasks with more granular control, and combine data insights with enforcing data privacy and management policy.

AI capabilities in next-generation BI platforms typically employ both supervised and unsupervised machine learning (ML) for clustering, classification, and anomaly detection, regression-based predictions, automated recommendations, interactive features, and natural language processing. These are applied to data management tasks such as determining column similarity, entity extraction, parsing regulation into data management policies, and generating recommendations for data management. AI/ML also assists in selecting appropriate visualizations, summarizing visual insights in written form, and enabling data exploration via natural language query. Next-generation BI platforms typically operate on cloud or hybrid deployment models.

This Market Compass includes vendors that provide a BI platform for the purpose of extracting insights from

first-party data for internal use, including privacy compliance or data preparation for use in BI tasks. The solution should include:

- Delivery of accessible insights

- Dashboarding

- Integrations with data sources and enterprise applications

- Ability to be embedded

- Automation and/or AI/ML capabilities

- High data security and privacy protections

Vendors are excluded if they:

- Do not aim to provide BI in a future-oriented way

- Are still in a prototype stage

- Have low maturity that restricts the overall functionality or number of successful implementations

2.2 Major Use Cases

A BI platform may be used to achieve one or multiple business goals. The main applications of next-generation BI platforms are:

- **De-siloed insights:** Dashboards assist departments and teams to make data-driven decisions. Although a dashboard may be configured to one department's KPIs, it draws from the data collected from all across the organization, including workflows from other departments. Questions such as why a metric is lower or higher than usual may be drilled-down and reveal unseen dependencies, leading the user to another department for collaborative problem-solving and improvement.

- **Embedded analytics:** For ease of use, dashboards and analytics are embedded in SaaS and enterprise applications. Accessibility is high, enabling insights to be where decisions are made. Or action workflows can be integrated directly into dashboards, meaning decisions can be made when exploring insights.

- **Scalable BI:** Some organizations want BI to be accessible to many if not all employees. This means

a cloud-first, scalable BI tool often with ML, with low barriers to use and low costs.

- **Augmented Analytics:** This refers to BI that is supported by AI/ML capabilities. This can include forecasting, ML models deployed into visualizations with a few clicks, or natural language querying.

- **Reporting:** Next-generation BI platforms are used to generate pixel-perfect reports per department, region, and requirement, benefiting from high-quality visualizations, interactive and drill-down features, and near real-time data connections.

2.3 Market Direction

The next-generation of BI platforms is being shaped from several trends: the combination of increased organizational data and increased computing power, that maintaining high quality datasets is a foundational capability enabling several projects including BI, the paradigm that everyone should make data-driven decisions, and that insights can be connected to automated decision workflows.
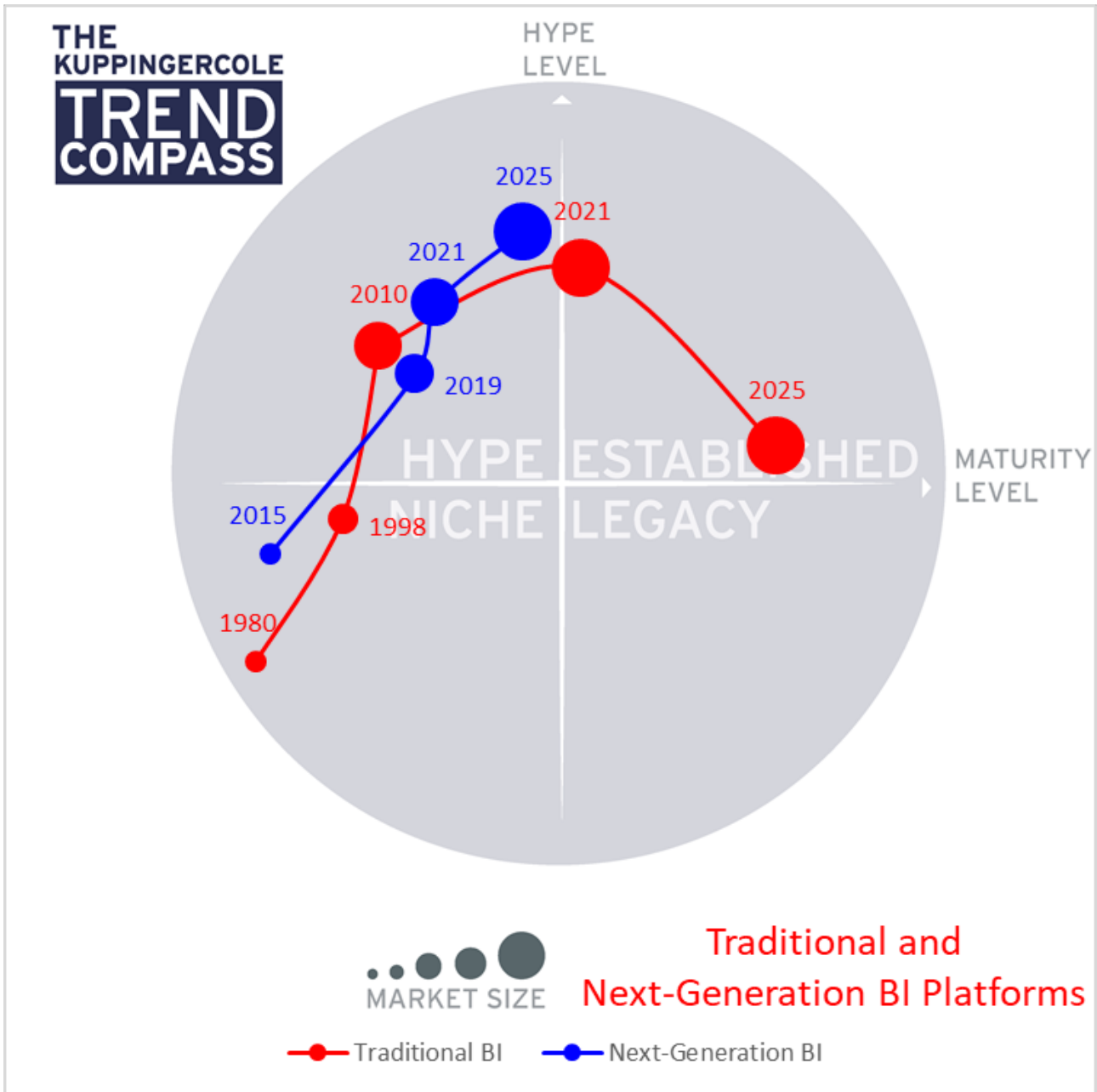
Figure 1: KuppingerCole Trend Compass, Traditional and Next-Generation BI Platforms

The KuppingerCole Trend Compass shows how traditional BI solutions have reached their peak, and that next-generation platforms are still climbing in hype, and the technology will still be developing and maturing beyond 2025. The 1980s and 90s showed development of analytical software and the development of relational databases, OLAP cubes, and other analytics foundations. By the 2010s, these were gaining popularity with the rise of Big Data. But traditional BI solutions, based on premise and requiring extensive experience are being outperformed by the next generation of solutions. The mid-2010s saw early use of AI/ML to augment analytics and data science, and matured into commercialized tools by the end of the 2010s. Currently these solutions are experiencing strong hype, high functionality because of AutoML,

recommendations, natural language query, and many more features. KuppingerCole's perspective is that most BI tools will have significant capabilities based in AI by the mid-2020s. But the underlying machine learning, governance of training data, and presentation as a BI solution will have to mature, even as hype continues to grow.

Data is being generated at exponentially higher rates now than even a few years previously. This originates from customer interactions and transactions, consent and marketing signals, product and supply chain tracking, communications with partners, and much more. This coincides with the rise of cloud storage, computing, and deployment. Cloud data storage solutions are highly scalable to match the organization's increasing data generation and cloud computing enables AI/ML models to be deployed in enterprise solutions without excessive on-premise investment. AI/ML also becomes attractive to organizations because of the high volume of first-party data, meaning that they likely own sufficient data to train models for their specific circumstance. BI platforms, especially the new generation that leverages AI/ML capabilities, is being driven by this increase in data generation and cloud deployment.

Lower costs due to more available computing power, automated support and AutoML, and higher capacity to derive insights from data make it more appealing for enterprises to make BI visualizations and dashboards available for more -- and sometimes all -- employees. Relevant decision makers can have real-time alerts when a KPI is not meeting the defined thresholds, or explore data to reveal a likely cause of an anomaly. Data insights that are accessible by the entire organization is a marked change from the previous generation of BI, which was often sold as software licenses to only a few trained individuals who would author the dashboards and reports. Today, BI platforms are designed with the reader and decision maker in mind.

The BI market segment is also converging with previously distinct areas of expertise: analytics and reporting, and to some degree data science as well. Each used to be laborious processes all separate from each other, but with modern architectures that enable smooth integrations from data science tools to analytics and reporting tools, the relationship has turned into a workflow rather than a distinct field. We expect to see data preparation and maintenance of high-quality datasets becoming the foundation for multiple workflows that stem from it, including BI, reporting, ML training, data governance, and data privacy exercises.

A final trend that we expect to become a prominent feature of BI platforms in the future is the ability to view and insight, and take direct action without navigating to another app, screen, or tool. Integrating automated workflows to react to an insight instantly translates data-driven insight into data-driven decisions. Customized automation and numerous integrations and connectors will become increasingly important to BI platforms.

3 Capabilities

The Market Compass is designed to profile and compare vendors across numerous capabilities. This section details the capabilities that one should expect to see in this market segment, and breaks them down according to relevance per use case.

3.1 All Capabilities

The next-generation BI platform market segment has a collection of standard capabilities that most solutions should include. These are listed in the table below.

Capability	Description
Analytics Functionality	The solution's main purpose is to perform analytics functions on connected datasets. This capability should include the range of traditional functions: • Online analytical processing (OLAP) for multidimensional analysis, trend analysis and data modelling • Ad-hoc analysis for one-off queries and data exploration by business decision makers • Advanced analytics that construct predictive and prescriptive analytical models • Operational analytics that process real-time data streams • Augmented analytics that integrate AI/ML to prep data, generate insights, and enable interactive querying with natural language capabilities
Visualizations	Modern BI is effective largely due to its ability to deliver insights visually. A wide variety of chart types and visualizations enable authors to select the most appropriate and compelling visualization. Interactive components like drill-down and drill-through, and strong dashboarding capabilities are needed here.
Reporting	The solution should generate reports specific to teams, departments, regions, and for compliance purposes. This requires pagination and other formatting features, distribution and output formats, and interaction with non-static content should be provided.
Data Preparation	The solution should have the ability to organize, prepare, model, and query the data in preparation for analysis. If this is not provided by the solution, then adequate connectors must be included.

Capability	Description
Automation	The BI solution should have some level of automation, with options for data integration, preparation, generating insights, suggesting visuals, embedding action workflows. Automation may be supported by AI/ML or for example with RPA workflows.
Reference Patterns	The solution may have pre-designed models for common scenarios, targeted to particular industries or for horizontal use cases like churn rate.
Data Protection	The solution must be oriented towards data protection, often by using data access policies that restrict access to and manipulation of datasets.
Governance	Governance of BI platforms includes data and platform access governance, auditing capacity, and governance of any AI/ML that is used to power the platform.
Artificial Intelligence/ Machine Learning	AI/ML is not a required capability of next-generation BI platforms, but often plays a strong supporting role in automating and expanding BI capabilities. AI/ML can be used to support data preparation steps, to generate insights, and natural language for querying and analysing unstructured data. More detailed capabilities include: • Support data preparation tasks with mining, domain/entity discovery, data profiling, data similarity, classification • Support insights generation with anomaly detection, regression forecasting and recommendations (for visualizations, appropriate datasets, etc.), what-if scenarios, root cause analysis, sentiment analysis • Support for interactive ad-hoc exploration with natural language generation for conversational searches, summarized insights

Table 1: Standard Capabilities of Next-Generation BI Platforms

3.2 Capabilities Recommended per use case

The next-generation BI segment is evolving to meet several distinct use cases, as described in section 2.2. Below, the capabilities are displayed according to their relevance for each use case.
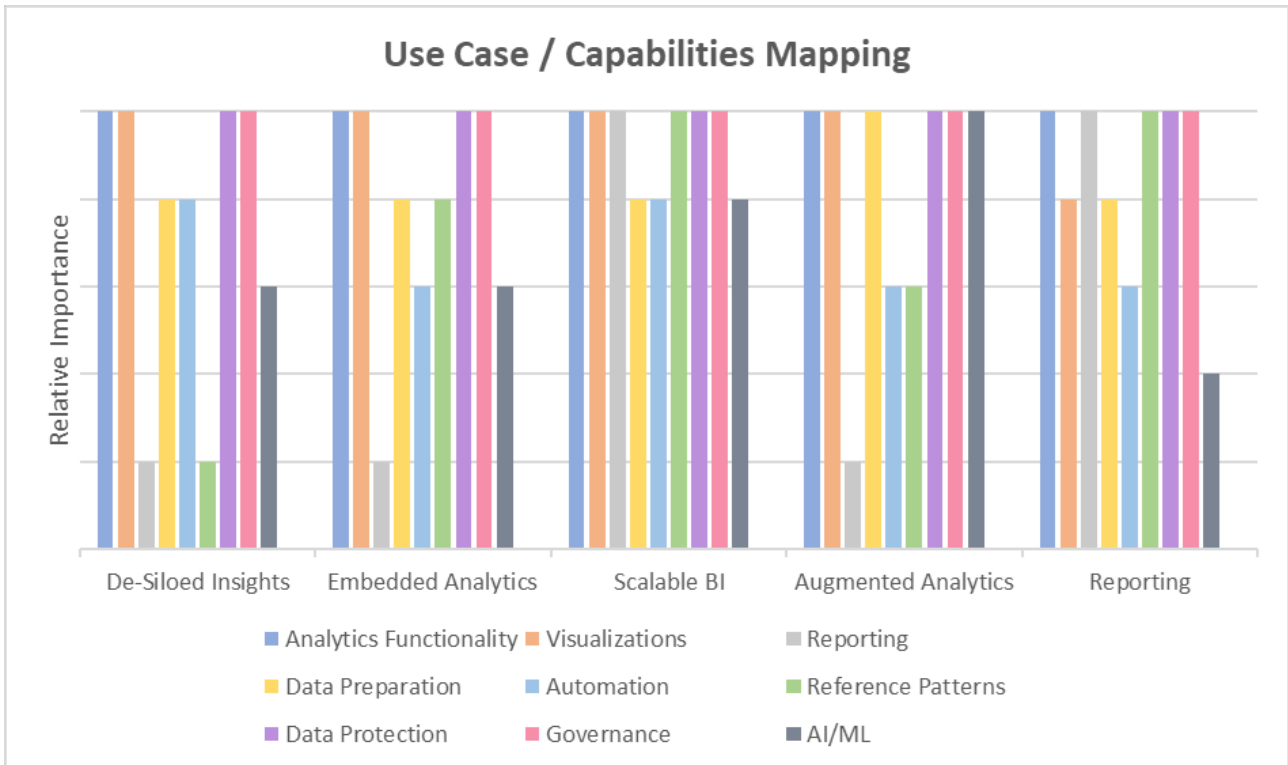
Use Case / Capabilities Mapping

Figure 2: Capabilities Prioritized by Use Case for Next-Generation BI Platforms

3.2.1 De-Siloed Insights

In order for cross-departmental data to be combined for insights that promote discussions with people from other teams and decisions based on a wider perspective than just the data that a single department is responsible for, there must be strong analytics functionality and visualizations to actually provide the data insights. Data protection and governance are must haves when mobilizing data to extract value from it. Supporting and nearly-essential capabilities are data preparation and automation, which first ensure the high quality of datasets and second better enable direct action from insights.

AI/ML capabilities can help deliver this use case successfully, but this use case can be fulfilled without the use of AI/ML too. Reporting capabilities and use of reference patterns are not necessary here.

3.2.2 Embedded Analytics

Visualizations and full dashboards that are embedded in SaaS and enterprise apps still require the highest quality analytics and visualization capabilities, as well as sufficient data protection and data governance. Reference patterns are more helpful here, as particular apps used by different teams or departments may have standard KPIs and metrics to be measured, meaning that ready-made reference patterns and dashboard templates can speed up time-to-value.

Automation and AI/ML capabilities can add value to an embedded analytics use case, but are not required. Reporting capabilities are not needed here.

3.2.3 Scalable BI

Scalable BI is often made available to many employees in an organization, not just department heads or key decision makers. This requires strong versioning of reports, dashboards, and visualizations, strong access management and restrictive permissions, and licensing models that match the high number of users. For BI that is still interactive, delivering actionable insights, and is meeting the needs of varied employee personas, all basic capabilities are required or highly supportive in delivering this use case.

3.2.4 Augmented Analytics

When inserting AI/ML into the BI platform and workflows, data protection and governance targeting AI/ML models must be included. Naturally strong AI/ML capabilities for data prep, delivering insights, and natural language interaction must be included. Data preparation is a key area that AI/ML can support BI, but not necessarily through automation. Reference patterns can support with pre-trained models.

3.2.5 Reporting

Reporting requires competent analytics and visualizations, and of course capabilities pertinent to reporting delivery, pagination, data connectors, etc. Reference patterns are more important here as they can serve as an increased time-to-value when designing reports for particular compliance needs or standard use cases. AI/ML and automation can support here but are not required.

4 Ratings at a Glance

This chapter provides a comparative overview of the participating vendors for five categories: security, deployment, interoperability, usability, and market standing. It also highlights outstanding performers in distinct categories.

4.1 General Product Ratings

Based on our evaluation, a comparative overview of the ratings of the general standing of all the products covered in this document is shown in the table below.

Product	Security	Interoperability	Usability	Deployment	Market Standing
Apache Superset	🟡 neutral	🟡 neutral	🟢 positive	🟢 positive	🟡 neutral
AWS Amazon QuickSight	🟢 strong positive	🟢 positive	🟢 strong positive	🟢 strong positive	🟢 strong positive
Dataiku AI Platform	🟢 positive	🟢 positive	🟢 strong positive	🟢 positive	🟡 neutral
IBM Cognos Analytics	🟢 strong positive	🟢 positive	🟢 strong positive	🟢 positive	🟢 strong positive
Microsoft Power BI	🟢 strong positive	🟢 strong positive	🟢 strong positive	🟢 strong positive	🟢 strong positive
SAP Analytics Cloud	🟢 strong positive	🟢 positive	🟢 positive	🟢 positive	🟢 strong positive
Tableau	🟢 positive	🟢 positive	🟢 strong positive	🟡 neutral	🟢 positive
Zoho Analytics	🟢 strong positive	🟢 positive	🟢 strong positive	🟢 strong positive	🟢 positive
Legend			🔴 critical 🟠 weak 🟡 neutral	🟢 positive	🟢 strong positive

Table 2: Comparative Overview of the Ratings for the General Standing of All Products

General product ratings do not measure the functionality of the product. For functionality ratings, see the spider graphs displayed per vendor in section 5. These spider graphs provide comparative information by showing the areas where the products are stronger or weaker for the list of features described in section 3.1. The vendors presented in this Market Compass are strong performers, though none reach the highest possible score because of the anticipated technological advances we expect in the coming years.

4.2 Noteworthy Vendors for Specific Capabilities

Some vendors are better positioned to meet narrow use cases, while others have stronger offerings across the range of this market segment. We have identified a few vendors that are notable for their strengths for specific capabilities. A vendor has been selected as outstanding based on information collected during our neutral research and rating process.

4.2.1 Outstanding in Innovation: Zoho

Zoho Analytics displays an innovative approach toward data preparation and data exploration. All actions and data transformations are saved as a ruleset, which can be deployed automatically every time data is imported. Natural language query is also deployed, where questions are asked with short statements such as "show me sales". Context is able to be maintained, so that a separate query "by product" is added to the context of previous queries for a combined result.

Figure 3: Outstanding in Innovation: Zoho

4.2.2 Outstanding in Functionality: Microsoft Power BI

Across the board, Power BI has strong functionality. It is one of the few BI platforms that supports real-time analytics, has native integrations into the Microsoft Office Suite, and has compelling automations for connecting insights to action. The support from its Azure AI products and information protection offering, the breadth of functionality and robust security from Power BI is noteworthy.

Figure 4: Outstanding in Functionality: Microsoft Power BI

4.2.3 Outstanding in Visualizations: Tableau

Tableau is a crowd favorite, seen from its active community of users. It is an easy-to-use solution with visually dynamic, unique, and pleasing dashboards with interactive features. Tableau Public is a free version for non-enterprise individual use that enables citizen data scientists to explore, visualize, and publish their work. Salesforce integrations mean that Tableau can be easily embedded in critical workflows.

Figure 5: Outstanding in Visualizations: Tableau

4.2.4 Outstanding in Data Preparation: Dataiku

Data Preparation will become a more critical part of every data-driven organization, to support BI projects but also to prepare datasets for AI/ML initiatives, data governance programs, and other projects to actionize data. Automated and repeatable data pipelines are available, along with the necessary connectors to other BI platforms and to AI/ML notebooks.

Figure 6: Outstanding in Data Preparation: Dataiku

5 Product/ Service Details

In the following section, each participating vendor is profiled with particular attention paid to the functionality of its product. The important capabilities for providing next-generation BI platforms - described in section 3.1 - have been rated and displayed as a spider chart.

These spider graphs provide comparative information by showing the areas where the products are stronger or weaker. Some products may have gaps in some areas, while being strong in others. These might be a good fit if only the specific features are required by your organization. Other services deliver strong capabilities across all areas, thus being a better fit for strategic choice of product. The vendors presented in this Market Compass are strong performers, though none reach the highest possible score because of the anticipated technological advances we expect in the coming years.

5.1 Apache

The Apache ecosystem, including its BI product Superset, is open source. Superset is a BI web application that joined the Apache Foundation in 2017 for the incubator phase and released V1.0 in February 2021 with an Apache License. Superset provides a means to visualize datasets and build dashboards. Superset handles real-time data, tabular, and advanced analytics for forecasting.

Superset is an SQL and no code interface. It can query data from any SQL database or data engine that has a SQLAlchemy dialect and a Python DB-API 2.0 driver. New dashboards are created by first connecting to the desired database and adjusting column properties. Tabular data can then be explored with a no-code visualizer or SQL querying. Over 60 chart options supported by Apache ECharts are available, including pivot tables and geographical charts. Charts can be saved to a dashboard and arranged via drag-n-drop. Published dashboards can then be shared.

Superset has role-based access management to both platform and dashboards and Row Level Security. An API for programmatic customization is provided, and external or own APIs can be used as well. Superset is a good option for data analysts and scientists with a need for a highly customizable platform.

|		
Security	● ● ● ○ ○	
Interoperability	● ● ● ○ ○	
Usability	● ● ● ● ○	
Deployment	● ● ● ● ○	
Market Standing	● ● ● ○ ○	

Apache Superset™

Strengths

- Open source with active community

- Cloud native and highly scalable

- Extensive documentation

- Customizable solution

- Supports standard analytics as well as real-time data analytics

- Numerous visualization options from Apache ECharts

- APIs provided, and own customized APIs can be developed

- Cost-effective

Challenges

- Is limited to SQL databases

- Less suited to handling unstructured, geospatial, or log data

- Contributor steering of open source project often means less frequent releases

- Limited support for AI/ML functions at this time

- Embedding visualizations and dashboards is on the roadmap

APACHE
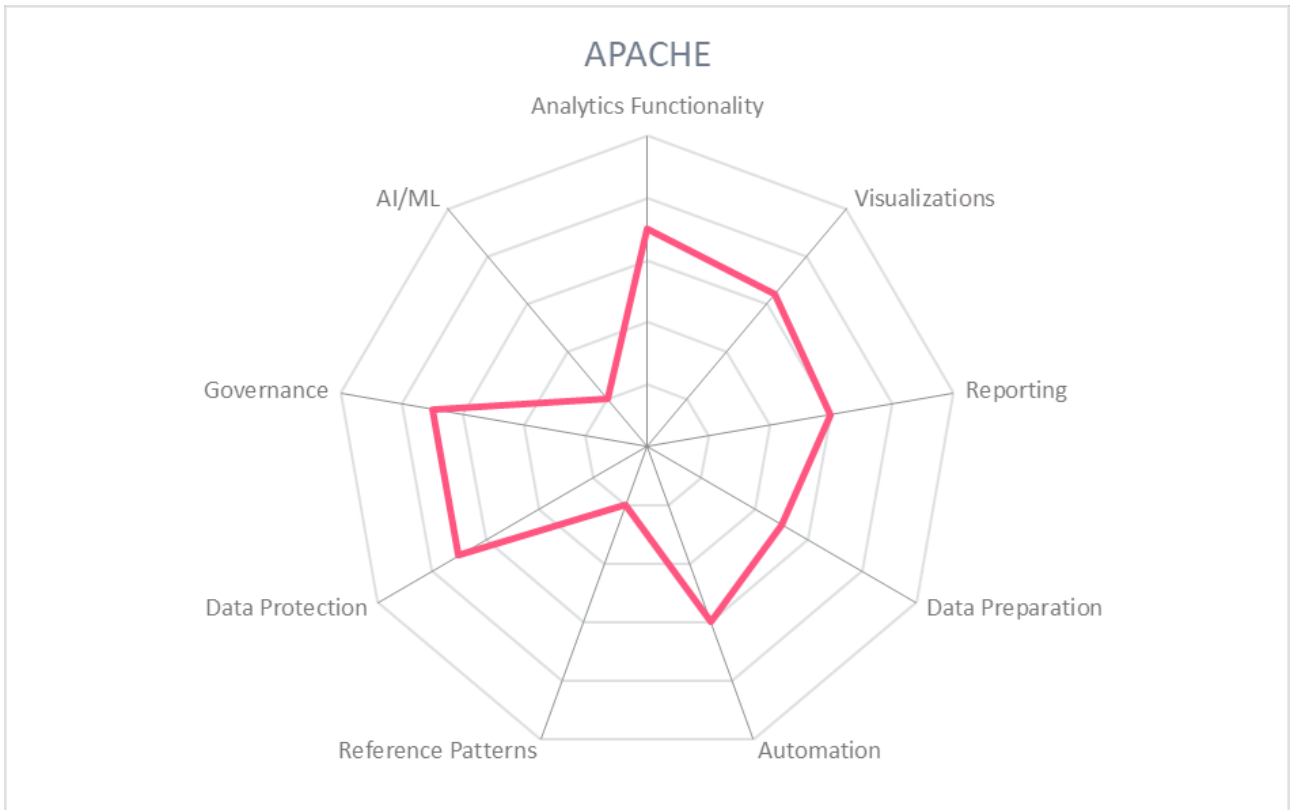
5.2 Amazon Web Services

Amazon Web Services (AWS) is a multinational cloud service provider headquartered in Seattle, USA. It provides a cloud-native BI product called Amazon QuickSight -- launched in 2016 -- to provide scalable insights to everyone in the organization. Amazon QuickSight has been developed from the ground up by the AWS team. Amazon QuickSight is designed with the author and end user in mind, with capabilities to boost the usability for each.

Amazon QuickSight connects to a variety of data sources (databases, data warehouses, SaaS apps and flat files) in the AWS ecosystem, third-party clouds, or on-premises. Data preparation can occur when a dataset is uploaded or be joined together with other datasets after upload. Fields can be excluded, calculated fields can be created by selecting from preset options, filtered, and joined. Datasets can also be created from other datasets for governed sharing of data for exploration and analysis in the UI. Users select the relevant fields and a visualization is automatically selected and generated. Visualizations can be formatted and customized, hierarchies for drill-downs defined, and inserted into a dashboard. Dashboards contain multiple sheets and can be embedded into business apps and websites. With embedded authoring, each user can design their personalized dashboard in the embedded app with persistent settings for subsequent viewings, even when sold via an independent software vendor (ISV). When consuming dashboards, users can set their own language preference as well asalert thresholds. Throughout the analysis, Amazon QuickSight is supported by the ML capabilities of Amazon SageMaker, including natural language querying, and auto narratives for BI and embedded use cases.

QuickSight is a serverless option that scales easily. There are new releases of features every two weeks. Data is protected with row or column-level security, datasets can be shared for analysis while the owner retains governance control, and shared dashboards are protected with read-only permissions. Datasets and dashboards can operate in direct query mode to the data source, or can utilize SPICE, Amazon Quicksight's in-memory data stroe which allows fast, concurrent access for thousands of users without additional infrastructure management. Readers must authenticate to view dashboards. Datasets and dashboards are synced by refreshing data at defined intervals.

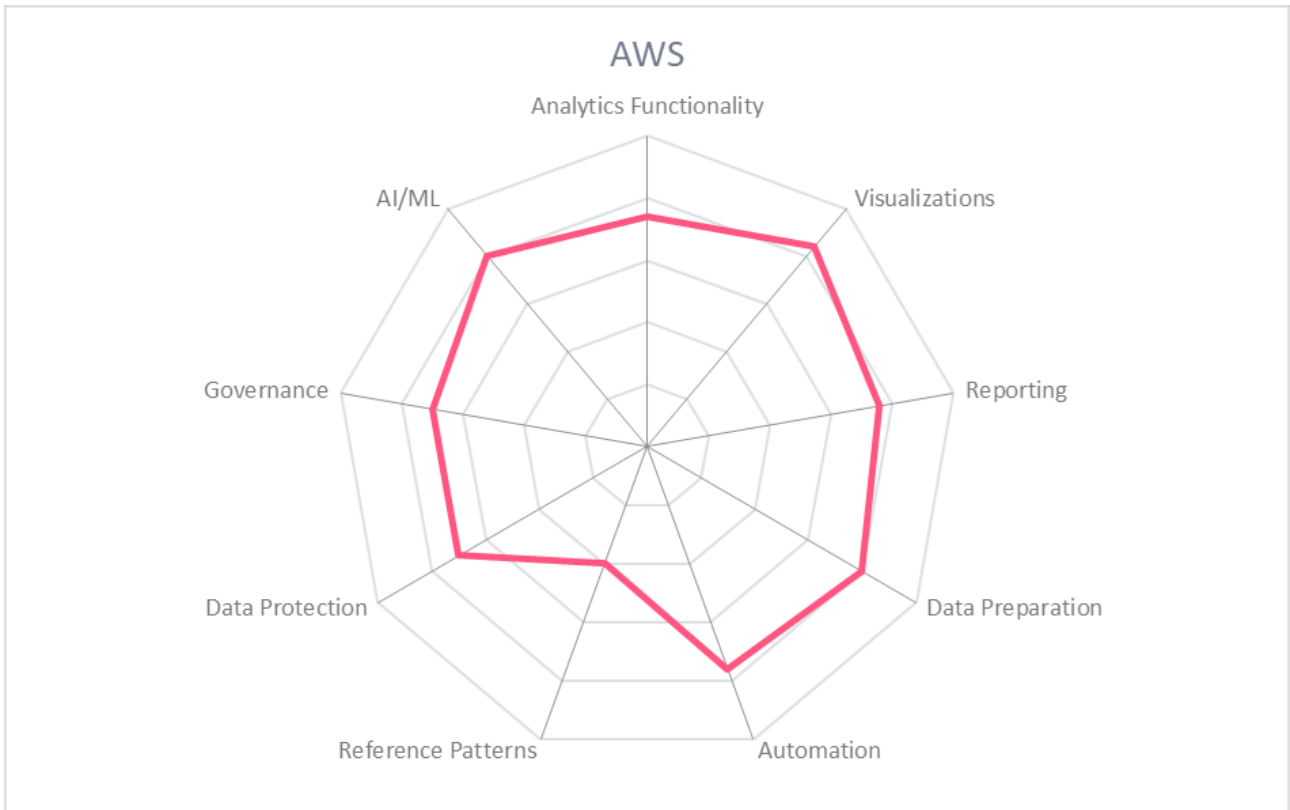|	
Security	● ● ● ● ●
Interoperability	● ● ● ● ○
Usability	● ● ● ● ●
Deployment	● ● ● ● ●
Market Standing	● ● ● ● ●

Strengths

- Persistent settings and self-defined alerts for users

- Pricing is per session rather than static licenses

- Strong natural language capabilities for capabilities like auto narratives and auto query

- AI/ML capabilities supported by Amazon SageMaker

- Provides high control over thresholds and term definitions rather than providing pre-defined templates

- Dashboards can be specified to fit both desktop and mobile viewing environments

Challenges

- Extensive use of AWS datastores and other products to support Amazon QuickSight may enable vendor lock-in

- Report formatting and customization capabilities could be expanded

- Reports can be shared with Amazon QuickSight subscription holders only

- Could expand real-time analytics capabilities

AWS

Analytics Functionality · Visualizations · Reporting · Data Preparation · Automation · Reference Patterns · Data Protection · Governance · AI/ML

5.3 Dataiku

Founded in 2013 and headquartered in New York, Dataiku is an end-to-end data science platform that is technology agnostic with flexibility in coding languages, dashboarding, and data sources. It brings expertise in data preparation and automating data pipelines from ingestion to dashboarding. Dataiku has connectors to major visualization and dashboarding platforms to expand those capabilities.

Datasets are sampled and registered in Dataiku from over 25 data sources on-premise or in the cloud, including metadata, to a new project. Data flows can be built with code or no-code options to streamline data preparation, computations, and ML training tasks. Recipes of particular data transformations can be easily reused. Data preparation and cleaning steps are supported with for example automated flagging of missing data values, suggesting appropriate functions, and more. Dataiku has AutoML capabilities for feature engineering, training open source models and running predictions. Statistical analysis and forecasts can be visualized, presented, and shared as a dashboard. For further BI capabilities, Dataiku integrates with other BI tools such as PowerBI, Tableau, and Qlik. Dataiku remains technology agnostic by providing connectors to various notebooks and clouds, allowing customers to use the tools and environment they prefer.

Dataiku is available as a managed service, and can be installed on major clouds or deployed on-premise. Workloads can be distributed by pushing compute down to the underlying platform with managed clusters and SQL engines. Target user personas are tech experts, business experts, and enterprise leaders. New versions are released two to three times per year. Although the solution is much more focused on data science, Dataiku is a representative of next-generation BI platforms by offering robust AI/ML preparation and modeling to support data insights for the organization.

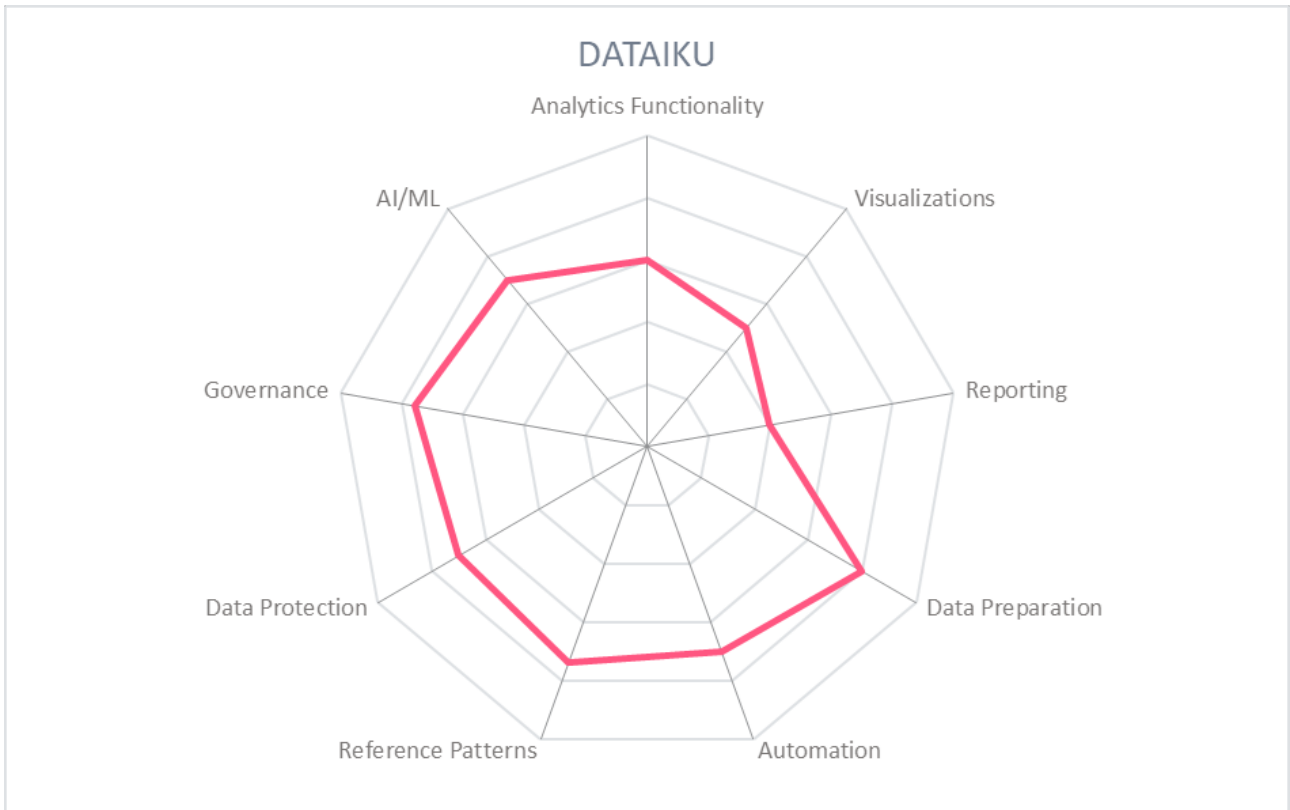|	
Security	● ● ● ● ○
Interoperability	● ● ● ● ○
Usability	● ● ● ● ●
Deployment	● ● ● ● ○
Market Standing	● ● ● ○ ○

data iku

Strengths

- Data pipeline tool for automated and repeatable data prep

- Automated and manual MLOps capabilities

- Strong integrations with open data sources and ML notebooks and resources

- Academy for training users

- Extensive product documentation

- Includes 8 pre-built notebooks for ML data analysis

- Provides automatic model documentation

- Dashboards and visualizations can be embedded

Challenges

- Primarily a data science tool, with ability to connect to BI tools to upscale their data preparation

- Could include more integrations with enterprise CRM and ERP applications

- Built-in visualizations are more focused on statistical analysis and less on BI by design

- Reporting is handled by downstream partners or other BI integrations

DATAIKU

Radar chart with axes: Analytics Functionality, Visualizations, Reporting, Data Preparation, Automation, Reference Patterns, Data Protection, Governance, AI/ML

5.4 IBM

IBM is a global information technology company with operations in over 170 countries. Its BI offering, Cognos Analytics, aims to be the AI copilot to the enterprise bringing AI and self-service capabilities with planning and analytics for competitive advantage. Cognos draws on the AI and data preparation services in CloudPak for Data, and rearchitects them for a BI and reporting tool. The user personas for Cognos are the self-service business analyst, and a managed reporting use case which is highly customizable with fine-grain controls.

Cognos provides self-service BI with OLAP capabilities, ad-hoc analysis and data exploration, advanced analytics, and augmented analytics. Data is pulled via API call from data warehouses or uploaded in the form of spreadsheets. Preparation including shaping and cleansing occurs from the relationship models. Self-service BI dashboards can be created from pre-designed templates. KPIs are automatically generated based on the selected datasets. Chart types and variables are selected via a drag-n-drop interface. Natural Language queries are available, which generate a visualization based on the user's question. Speech-to-text conversion is available in the mobile app, also yielding a visualization from the user's spoken question. Summarized insights are generated with NLP that describe notable points in the datasets. Visualization is linked to action by enabling push notifications when user-defined thresholds are or are not met. Cognos's reporting capabilities are pixel perfect and paginated and can be presented as a dashboard-style report. Reports can be exported as HTML, PDF, Excel, CSV, XML. They can be annotated and shared easily via Slack for collaboration, or downloaded, emailed, and printed. Reports are subject to access management with read, run, and execute permissions. Single versions of a report are issued, but with customizations based on the reader's role, geography, etc.

Cognos can be deployed on-premise or in the cloud, with multi-tenancy, microservices, and containerized options. It is integrated in over 50 IBM products for reporting and is integrated with other reporting solutions to present them in the same report. Dashboards can be embedded in business apps and websites, and the solution can be white labeled. Automation supports the user throughout the experience, from data preparation to generating insights with pre-built ML models. The solution is well suited to financial services but is not industry specific.

Security	● ● ● ● ●	
Interoperability	● ● ● ● ○	
Usability	● ● ● ● ●	
Deployment	● ● ● ● ○	
Market Standing	● ● ● ● ●	

Strengths

- Strong and highly mature enterprise reporting offering

- Data in reports can be selectively presented based on roles and permissions, yet maintained as a single version

- Visualization is linked to action using push notifications

- All features are available on all deployment models

- Summaries of top insights are provided with natural language generation

- Dashboard elements can be embedded or whitelabeled

Challenges

- On shared devices, the app account must also be shared

- Could include more functionality for real-time analytics, requires separate product

- Could improve governance and transparency of pre-built ML models

IBM

5.5 Microsoft

Microsoft, founded in 1975 and based in Redmond, Washington, USA, is a multinational technology company. Power BI aims to create a data culture so that everyone can make decisions based on data. Power BI is free and available to all individuals, and targets business users in an enterprise. Power BI is natively integrated into the Microsoft ecosystem, is included in Microsoft Office offerings, with native integrations for PowerPoint, Excel, SharePoint Online, Teams for sharing and collaboration, and with Microsoft Information Protection.

Data is ingested from connected data sources or from the data marketplace of selected and suggested datasets, with over 150 out of the box connectors. Dataflows connect to these many sources to clean, transform, enrich, and schematize data. Automation can support in the data prep stage for example to reconcile values. Power BI has 33 native visuals and a custom visual marketplace. Natural Language Querying in 43 languages is available for data exploration. AI is put to use in Power BI to yield Key Driver Analyses, Smart Narratives, Root Cause Analyses, Anomaly Detection and Automated Insights. Reports can be paginated, exported, embedded, compiled with customized layouts with drill down and through functions, and with access management controls including Row Level Security, localization, and authentication. Reports can be exported via a REST API to .pptx, .pdf, and .png for printing, attaching to email, and embedding in a website or app. Power Apps can be embedded in reports and dashboards apps to take immediate action when viewing insights, and reports and dashboards can be integrated in workflows to make insights available during decision making.

Power BI is a SaaS product, with on-premise capacity. Power BI benefits from the Microsoft ecosystem and has a robust partner network that creates specialized Power BI solutions for vertical and horizontal use cases. Power BI also uses Microsoft Information Protection (MIP) and data loss prevention for labeling, classification, and protection of sensitive data. Power BI has access to 50+ data centers around the world. Power BI is on a rapid schedule for new releases, with new features released every week and a new release of Power BI Desktop every month.

|					
Security	●	●	●	●	●
Interoperability	●	●	○	○	○
Usability	●	●	●	●	●
Deployment	●	●	●	●	●
Market Standing	●	●	●	●	●

Strengths

- Strong approach to enable action from insights

- Performance management is offered with Power BI Goals

- Spatial Anchoring feature enables Power BI insights to be consumed with a HoloLens-like experience using a mobile device

- Driven by community requests for feature releases

- Strengths in real-time analytics

- Can be embedded for end user/customer functionality, or for internal use with appropriate authentication for each

Challenges

- Could improve data discovery capabilities for unstructured data

- Version control should be better available for reports

- On-premise functionality is secondary to SaaS offering

MICROSOFT
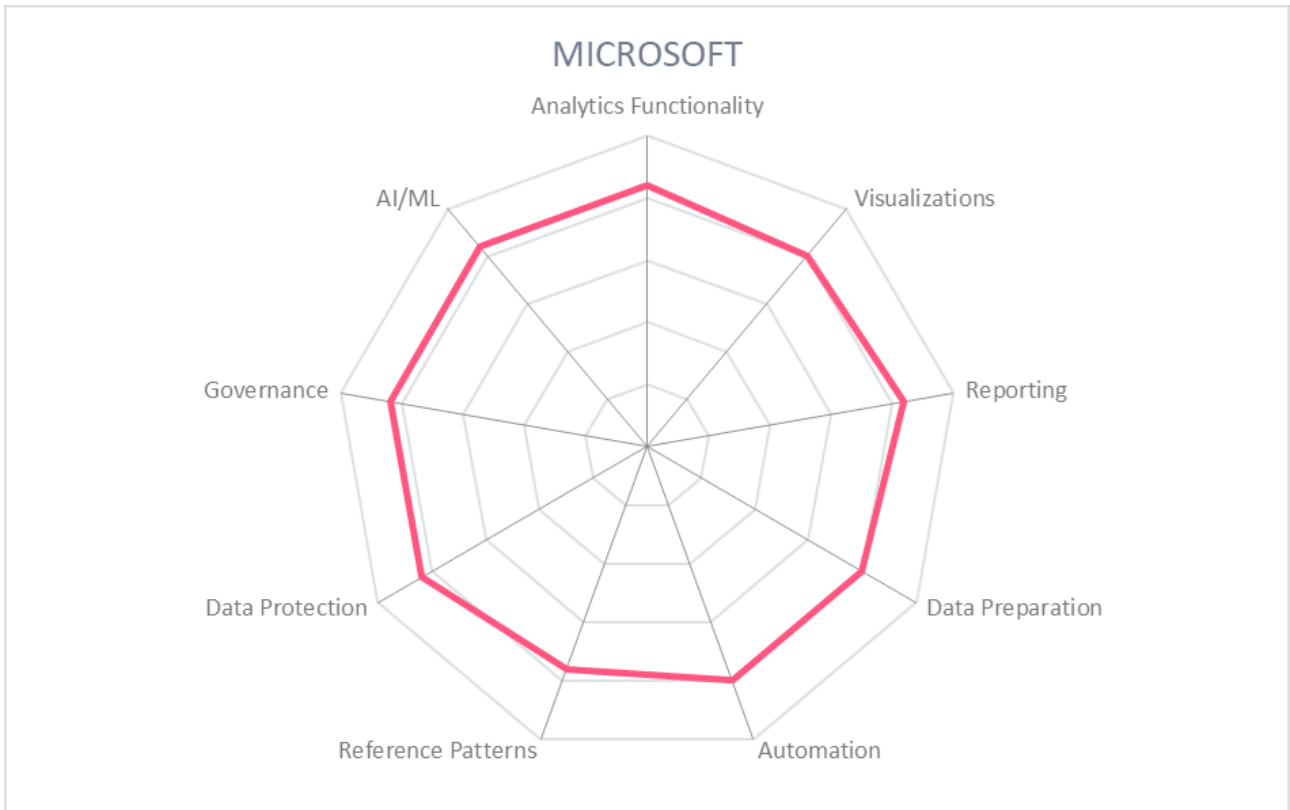
5.6 SAP

SAP is a multinational technology company founded in 1972 and based in Germany. SAP Analytics Cloud, its BI and analytics product, compliments SAP's strengths in ERP by harnessing the underlying data for informed decision making and is part of the SAP Business Technology Platform (BTP). SAP Analytics Cloud includes BI with augmented analytics and enterprise planning.

Data can be ingested from data sources in SAP's ecosystem, and from other cloud systems including Google BigQuery, Google Drive, OData Services, Salesforce, and SQL. Data can be modeled and prepared for use in visualizations with standard data cleaning and transformations, as well as smart transformations. Prepared data then becomes the basis for the presentation-style visualizations called Stories. Charts, tables, and maps are "pixel perfect" with drill-down features, filters to narrow and change the scope of a Story, ability to embed RSS feeds or other external content, and more. Value Driver Trees particularly support in planning scenarios to explore potential outcomes. Story templates are also available. SAP Analytics Cloud is well integrated into SAP's enterprise planning and budgeting features, enabling interactive, exploratory, and forecastable budgets to be used across the enterprise. Strategic plans, once approved, can be copied directly into the active budget. A natural language query function is available, working with synonyms and autocorrect to better answer a command that perhaps is misspelled.

Analytics Cloud is a SaaS product and is available in the SAP environment and major cloud providers such as AWS, Alibaba, and Microsoft Azure. Access control based on roles is supported for read and write permissions. Data catalogs and Stories have a single source of truth and versioning control. Integrations into Microsoft Teams allow for Stories to be shared in chats via an URL. SAP Analytics Cloud can be embedded into SAP applications and has an expanding set of APIs.

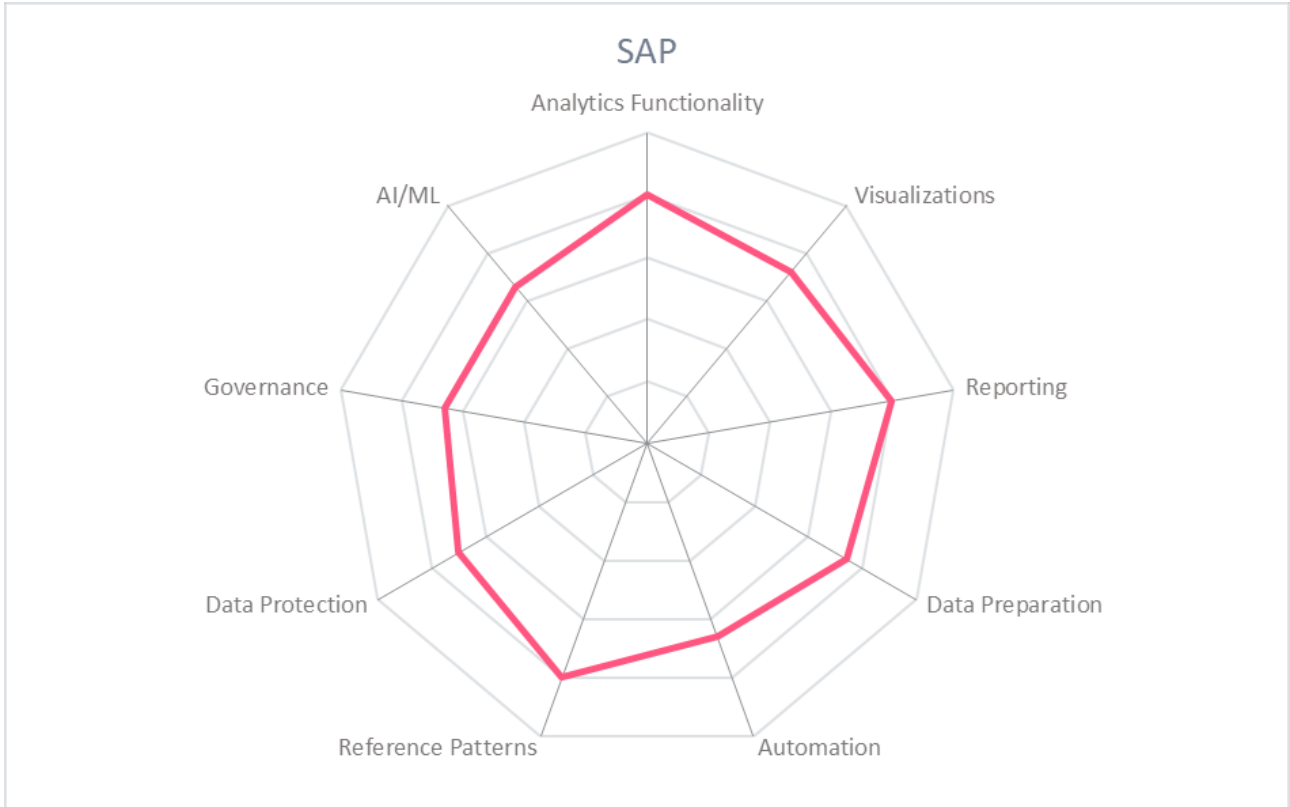|	
Security	● ● ● ● ●
Interoperability	● ● ● ● ○
Usability	● ● ● ● ○
Deployment	● ● ● ● ○
Market Standing	● ● ● ● ●

Strengths

- Natural emphasis on enterprise planning that dovetails with SAP's main line of business

- Integrated forecasts into budgets and financial planning across the enterprise

- Strategic planning can be made actionable by inserting the approved plan into the budget

- Previous 10 searches are remembered to enable offline data exploration

- Real-time analytics is available, but only for data in SAP on-premise databases

- Audit logs of security info are maintained

Challenges

- If an on-premise solution is needed, customer should opt for SAP BusinessObjects or SAPBPC rather than SAP Analytics Cloud

- Group reporting is not handled by SAP Analytics Cloud

- May require customization to embed analytics into non-SAP applications

SAP

Analytics Functionality · Visualizations · Reporting · Data Preparation · Automation · Reference Patterns · Data Protection · Governance · AI/ML

5.7 Tableau (was acquired by Salesforce in 2018/11)

Tableau, acquired by Salesforce in 2019, was founded in 2003 and is headquartered in Seattle, WA, USA. It sees data culture as a foundational element to data-driven organizations, and works to make its product, Tableau, and the active community around it a data culture enabler. Tableau brings specific benefit to data analysts but can be used by all employees to give data-driven insight into their daily activities.

Tableau connects to data sources, with close connection to Salesforce data and Mulesoft as they belong to the Salesforce ecosystem. Data from cloud sources, databases, and files can also be ingested. Data is prepared and cataloged either with a command line interface and APIs or self-service with Tableau Prep Builder and Conductor. Analysis is supported with visualizations and advanced analytics. Augmented analytics are integrated from Salesforce Einstein, working towards expanded functionality and a native-level offering. Natural language querying is available, allowing ad-hoc data exploration and automatically generated visualizations. Tableau's strong visualizations and dashboarding capabilities can be accessed online or on a desktop or mobile device when published, or embedded.

Tableau is historically an on-premise solution, but now offers parity in the cloud. Data security and governance are a high priority, with row-level permissions that restrict viewers to reading data in reports and dashboards that is pertinent to their role. Data access policies can be enforced like read only or edit. Data catalogs help monitor data quality. Published dashboards and reports enable viewers to transparently see the source of data, data of publication, and author.

| Security | ● ● ● ● ○ |
Interoperability	● ● ● ● ○
Usability	● ● ● ● ●
Deployment	● ● ● ○ ○
Market Standing	● ● ● ● ○

+‡+ +ableau®

Strengths

- A vibrant and active community

- Can create action from insight by automating workflows in Salesforce triggered by insights in Tableau

- Data details are available in published workbooks for readers to better understand the sources

- Strong visualizations and data storytelling offering

- Has row-level security to govern access to data

- Salesforce ecosystem benefits from embedded and soon integrated Tableau functionality

Challenges

- Augmented analytics are integrated, and are working towards a native status within Tableau

- Should have more nuanced versioning controls

- Functionality, such as self-service data prep or augmented analytics may require licenses for other Tableau products

- Less suited to operational/real-time analytics

TABLEAU
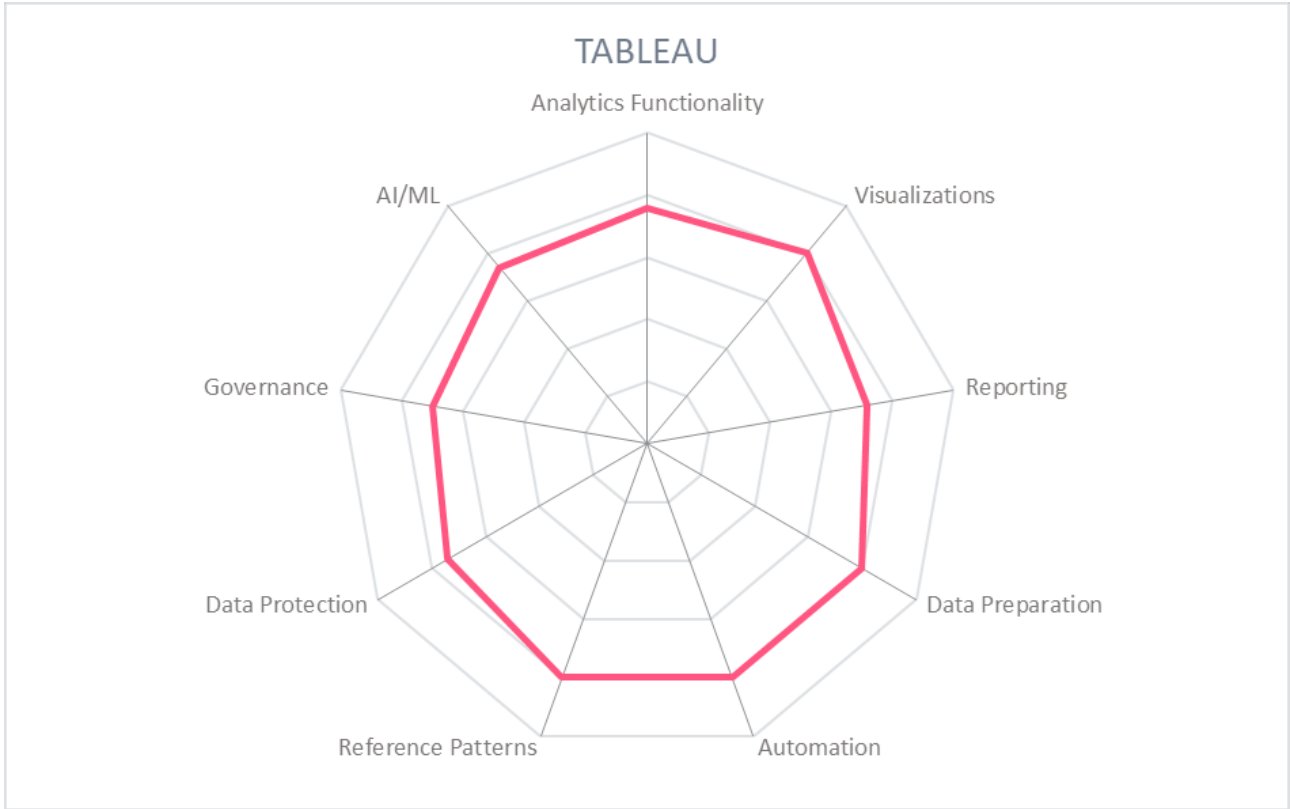
5.8 Zoho

Zoho was founded in 1996 and is headquartered in San Francisco, USA. Zoho provides a suite of over 45 applications for business productivity, collaboration, and analytics. Zoho Analytics, its BI offering, stems from the data-heavy systems of records kept by its other business applications as a means of delivering actionable insights to customers. With integrations into external data sources, on-premise or cloud databases, files, real-time feeds, and customized connectors, Zoho Analytics is a BI solution that can work independently from - as well as along with - the Zoho data ecosystem.

In Zoho Analytics, data is first integrated from structured and unstructured data sources and stored in Zoho's data warehouse or an external one of the customer's choice. Data preparation is supported by machine learning (ML) capabilities, creating a self-service and automated experience for cleansing, modeling, enriching, and transforming data. Rulesets are created from an initial manual preparation and transformation of a dataset, and the ruleset is applied automatically every time that data is imported. Data is then cataloged and labelled as ready for consumption - datasets that are not given this label by an authorized admin cannot be exported for use as a safety precaution. To create charts, visualizations, and dashboards, a user can use a drag-n-drop UI or interact with Zia, the natural language analytics assistant, by typing in questions or commands. Analytics functionality includes standard analytical functions and equations, ad-hoc querying (no SQL needed), advanced, and augmented analytics. Within charts and visualizations, the user can drill down and explore data.

Reports can be consumed online, embedded in an app, or exported as CSV, Excel, PDF, HTML, image. When consumed online, dashboards and reports have a single version, meaning that when a user drills down, they do not create conflicting versions of the same report. Zoho takes a strong security stance on protecting access to data and dashboards, as well as securing the use and transport of data. Zoho works only with metadata when helping users design charts and visualizations, meaning that data does not need to be stored in Zoho's analytics data warehouse. Automation and self-service analytics are prominent features of this solution, ranging from automated data syncs, data prep, and Auto-Analysis to create models and suggest suitable visualizations. Zoho Analytics serves small business through enterprise customers, deployed as SaaS, embedded, or on-premise.

|	
Security	● ● ● ● ●
Interoperability	● ● ● ● ○
Usability	● ● ● ● ●
Deployment	● ● ● ● ●
Market Standing	● ● ● ● ○

Strengths

- Offers solution in various app marketplaces for embedding

- Does not require knowledge of SQL

- Focus on collaboration on reports

- Rulesets for data preparation automate repeated data imports

- Real-time analytics is available, but only for data in cloud-connected databases

- Able to be embedded and whitelabeled

Challenges

- Could increase security positioning even more by adding attribute-based access control (ABAC)

- Smart analytics assistant is currently only available in English and Spanish

- Could expand and improve the visualizations for forecasting

- A mature but relatively unknown product

ZOHO
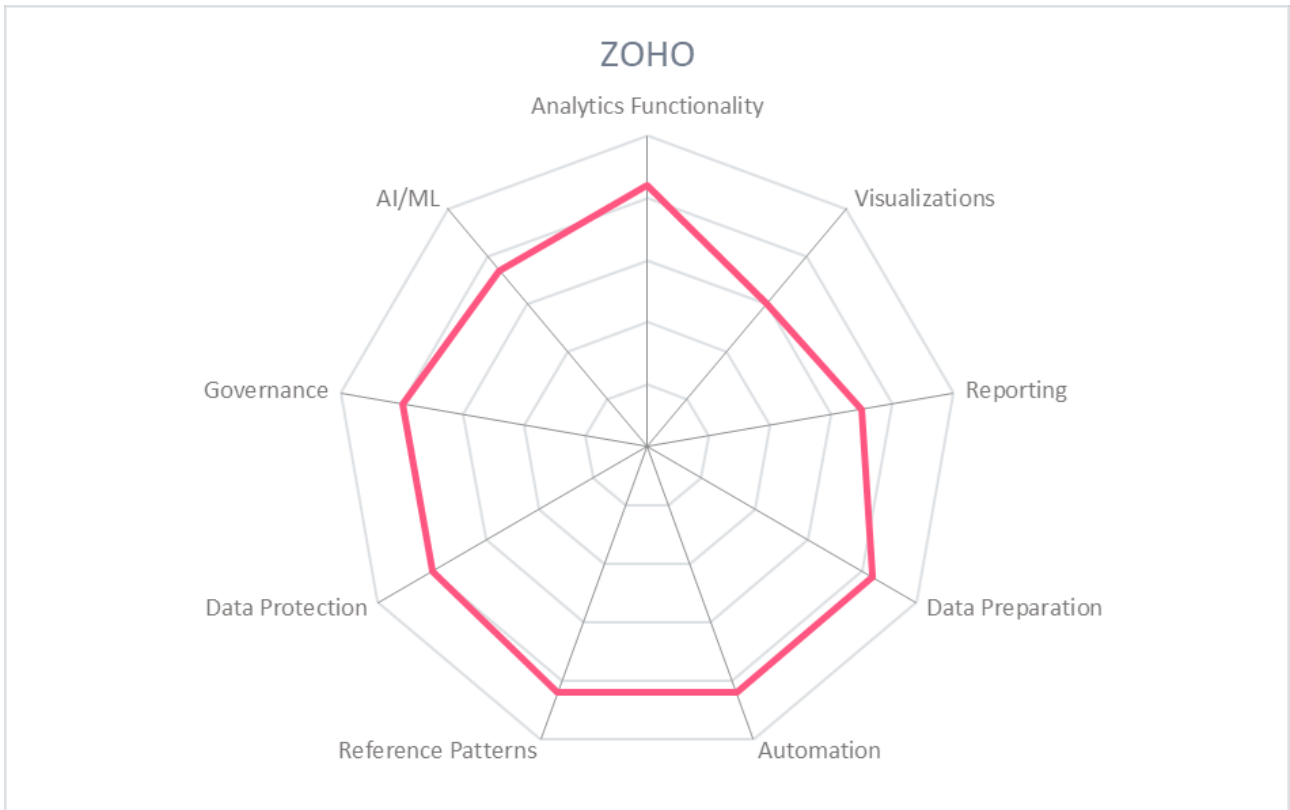
6 Vendors to Watch

Besides the vendors covered in detail in this document, we observe some other vendors in the market that readers should be aware of. These vendors may not fully fit the market definition but offer a significant contribution to the market space. This may be for their supportive capabilities to the solutions reviewed in this document, for their unique methods of addressing the challenges of this segment, or may be a fast-growing startup that may be a strong competitor in the future.

- Domo: This vendor provides cloud BI with a wide variety of integrations for fast insights. **This vendor will be a strong competitor in future years.**

- Looker: Belonging to the Google ecosystem, Looker BI provides data modeling, a data-level view of customers, and dashboarding for insights. **This vendor has the force of a strong ecosystem behind it.**

- Oracle: Oracle aims to break down data silos and streamline analytics with its BI platform and mobile solutions. **This vendor is innovating in voice-optimized searches and interfaces for BI.**

- Qlik: This vendor is a long-time BI and analytics performer, making strides towards AI supported workflows and natural language query. **This vendor will continue to rise in the BI market space.**

7 Related Research

Leadership Compass: API Management and Security - 70311

Market Compass: Data Governance Platforms - 71137

Market Compass: AI Service Clouds - 80360

Leadership Brief: The Role of AI in Modern Business Intelligence Platforms - 80383

About KuppingerCole's Market Compass

KuppingerCole Market Compass is a tool which provides an overview of a particular IT market segment and identifies the strengths of products within that market segment. It assists you in identifying the vendors and products/services in that market which you should consider when making product decisions.

While the information provided by this report can help to make decisions it is important to note that it is not sufficient to make choices based **only** on the information provided within this report.

Customers must always define their specific requirements and analyze in greater detail what they need. This report doesn't provide any recommendations for picking a vendor for a specific customer scenario. This can be done only based on a more thorough and comprehensive analysis of customer requirements and a more detailed mapping of these requirements to product features, i.e., a complete assessment.

Product Rating

KuppingerCole Analysts AG as an analyst company regularly evaluates products/services and vendors. The results are, among other types of publications and services, published in the KuppingerCole Leadership Compass Reports, KuppingerCole Executive Views, KuppingerCole Product Reports, and KuppingerCole Vendor Reports. KuppingerCole uses a standardized rating to provide a quick overview on our perception of the products or vendors. Providing a quick overview of the KuppingerCole rating of products requires an approach combining clarity, accuracy, and completeness of information at a glance.

KuppingerCole uses the following categories to rate products:

- Security
- Deployment
- Interoperability
- Usability
- Market Standing

Security is a measure of the degree of security within the product / service. This is a key requirement and evidence of a well-defined approach to internal security as well as capabilities to enable its secure use by the customer are key factors we look for. The rating includes our assessment of security vulnerabilities and

the way the vendor deals with them.

Deployment is measured by how easy or difficult it is to deploy and operate the product or service. This considers the degree in which the vendor has integrated the relevant individual technologies or products. It also looks at what is needed to deploy, operate, manage, and discontinue the product / service.

Interoperability refers to the ability of the product / service to work with other vendors' products, standards, or technologies. It considers the extent to which the product / service supports industry standards as well as widely deployed technologies. We also expect the product to support programmatic access through a well-documented and secure set of APIs.

Usability is a measure of how easy the product / service is to use and to administer. We look for user interfaces that are logically and intuitive as well as a high degree of consistency across user interfaces across the different products / services from the vendor.

Market Standing is a measure of financial strength and market position. This is based on publicly available information, and takes the amount of funding received, the profitability, and the private or public status of the vendor into consideration.

We focus on security, deployment, interoperability, usability, and market standing for the following key reasons:

- Increased People Participation—Human participation in systems at any level is the highest area of cost and the highest potential for failure of IT projects.
- Lack of excellence in Security, Functionality, Ease of Delivery, Interoperability, and Usability results in the need for increased human participation in the deployment and maintenance of IT services.
- Increased need for manual intervention and lack of Security, Functionality, Ease of Delivery, Interoperability, and Usability not only significantly increase costs, but inevitably lead to mistakes that can create opportunities for attack to succeed and services to fail.

KuppingerCole's evaluation of products / services from a given vendor considers the degree of product Security, Functionality, Ease of Delivery, Interoperability, and Usability which to be of the highest importance. This is because lack of excellence in any of these areas can result in weak, costly and ineffective IT infrastructure.

Rating scale for products

For vendors and product feature areas, we use a separate rating with five different levels. These levels are:

- **Strong positive**

Outstanding support for the subject area, e.g. product functionality, or security etc.)

- **Positive**
Strong support for a feature area but with some minor gaps or shortcomings. Using Security as an example, this could indicate some gaps in fine-grained access controls of administrative entitlements.

- **Neutral**
Acceptable support for feature areas but with several of our requirements for these areas not being met. Using functionality as an example, this could indicate that some of the major feature areas we are looking for aren't met, while others are well served.

- **Weak**
Below-average capabilities in the area considered.

- **Critical**
Major weaknesses in various areas.

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KuppingerCole supports IT professionals with outstanding expertise in defining IT strategies and in relevant decision making processes. As a leading analyst company KuppingerCole provides first-hand vendor-neutral information. Our services allow you to feel comfortable and secure in taking decisions essential to your business.

KuppingerCole, founded in 2004, is a global, independent analyst organization headquartered in Europe. We specialize in providing vendor-neutral advice, expertise, thought leadership, and practical relevance in Cybersecurity, Digital Identity & IAM (Identity and Access Management), Cloud Risk and Security, and Artificial Intelligence, as well as for all technologies fostering Digital Transformation. We support companies, corporate users, integrators and software manufacturers in meeting both tactical and strategic challenges and make better decisions for the success of their business. Maintaining a balance between immediate implementation and long-term viability is at the heart of our philosophy.

For further information, please contact clients@kuppingercole.com.