IDC MarketScape


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THIS IDC MARKETSCAPE EXCERPT FEATURES: SAS

IDC MARKETSCAPE FIGURE

FIGURE 1

IDC MarketScape Worldwide Advanced Machine Learning Software Platforms Vendor Assessment

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Please see the Appendix for detailed methodology, market definition, and scoring criteria.

**IN THIS EXCERPT**

The content for this excerpt was taken directly from IDC MarketScape: Worldwide Advanced Machine Learning Software Platforms 2020 Vendor Assessment (Doc #US45358820). All or parts of the following sections are included in this excerpt: IDC Opinion, IDC MarketScape Vendor Inclusion Criteria, Essential Guidance, Vendor Summary Profile, Appendix and Learn More. Also included is Figure 1.

**IDC OPINION**

In this document, IDC has evaluated vendors offering the tools and frameworks for developing advanced machine learning (ML) models and solutions.

To be clear about these topics, it helps understand how IDC defines machine learning and related processes:

- **Machine learning** is a subset of artificial intelligence (AI) techniques that enables computer systems to learn from previous experience (i.e., data observations) and improve their behavior for a given task. It is the process of creating a statistical model from various types of data that performs various functions without having to be programmed by a human.

- **Neural networks** (NNs) or artificial NNs are a subset of ML techniques, loosely inspired by biological neural networks. They are usually described as a collection of connected units, called artificial neurons, organized in layers.

- **Deep learning (DL)** is a subset of NNs that makes the computational multilayer NN feasible. Typical DL architectures are deep neural networks (DNNs), convolutional neural networks (CNNs), recurrent neural networks (RNNs), generative adversarial networks (GAN), and so forth.

Collectively, we define these topics as aspects of advanced machine learning. Advanced machine learning platforms provide a range of ML methods primarily working with structured and semi-structured data to create predictive and prescriptive models that are then used in applications.

Organizations across a variety of industries are using these techniques as a catalyst for business process disruption, digital transformation, and the creation of new economies of scale. There is an increasing influence of machine learning in business applications, with many solutions already implemented and many more being explored. Enterprises are embracing machine learning applications across all lines of business. Implementations vary across a breadth of use cases from intelligent financial closing to sales next best action and from production recommendations to personalized recommendations for learning and career. Large healthcare organizations are examining machine learning to predict illness and treatment to help physicians and payers intervene earlier, predict population health risk by identifying patterns and surfacing high risk markers and model disease progression and more. Application of machine learning in the management of banking risks such as credit risk, market risk, operational risk, and liquidity risk is being explored. For the modern marketing team, ML allows you to uncover predictive knowledge. By harnessing data analyzing ability, your team can use ML to your advantage to engage with hyper-targeted prospects at multiple touch points along the sales funnel. These are just a few of the hundreds of use cases that organizations are beginning to examine as their marketplaces and competition begin to embrace advanced machine learning and deep learning models and applications.
At the same time as these advanced machine learning-enabled applications are beginning to emerge, we are seeing a growing market for machine learning tools and solutions based on open source running in a variety of deployments: on premises, private cloud, public cloud, and even at the edge. A powerful combination of motivated, capable developers; multiple open source community development models and vibrant open source community; and the need and desire for agile just-in-time advanced machine learning software development and execution environments has led to a growing market segment producing advanced machine learning/deep learning software libraries and tools.

**IDC MARKETSCAPE VENDOR INCLUSION CRITERIA**

This IDC MarketScape evaluated advanced machine learning platforms. Advanced machine learning platforms provide a range of ML methods primarily working with structured and semi-structured data to create predictive and prescriptive models that are then used in applications. These platforms facilitate the development of advanced machine learning models and applications. Advanced machine learning platforms can also include development, training, and deployment tools, including pretrained models and automatic machine learning methods that help developers and business users to experiment, automate machine learning, and build and deploy artificial intelligence models into production. The platforms provide functionality to apply a broad range of supervised, unsupervised, reinforcement, and transfer learning methods into models and applications put into production and can be deployed in several ways.

The inclusion criteria are as follows:

- The offering must be commercially available for use as a single product or a suite of services and purchased by customers for at least one year (i.e., calendar year 2019).
- It must have the ability to develop custom advanced machine learning models and APIs or microservices that developers can include in their applications. It should also support third-party recipes.
- The product must have at least 10 commercial customers that used this product in calendar year 2019.
- The product must be offered and available on a worldwide basis.
- The offering must include development tools for creating, developing, testing, and deploying advanced machine learning applications and models into production. The offering should include the following capabilities:
  - Must support data collection/ingestion natively in the platform or through third-party integration
  - Experimentation and feature identification/extraction
  - Building models
  - Training models
  - Model tuning
  - Deploying models
- The vendor must have at least $25 million in software revenue in calendar year 2019.
ADVICE FOR TECHNOLOGY BUYERS

The emergence of tools, frameworks, and libraries that provide services for machine learning and deep learning is setting the stage for a low-cost enabler of machine learning-enabled applications to be built by developers today. Organizations are looking at these services to replace rule- or heuristics-based approaches that must be extensively programmed and maintained today. The combination of high-performance compute resources, tremendous agility to adapt resources to needs, and cloud-based frameworks and libraries for machine learning/deep learning is solving problems and challenges without the need to resort to traditional heuristic programming.

The vendors evaluated and profiled in the sections that follow are being used for an ever-wider array of use cases, from pricing optimization to predictive analytics and product recommendations to intelligent accruals and reconciliations. Machine learning/deep learning is a key component of most AI applications and is also being added to many enterprise applications. Improvements in the variety, efficiency, and reliability of machine learning will make these applications more usable and stable and help increase their popularity.

These vendors offer a very wide array of tools and capabilities for collecting, exploring, and evaluating data for machine learning, identifying features, choosing, and developing algorithms and models as well as testing and deploying models into production. A number of these vendors also offer capabilities as an integrated or standalone offering for creating and determining the explainability and trust of advanced machine learning models. Some of them also support monitoring capabilities to detect model drift and other anomalous results.

IDC believes that the market for AI in general and advanced machine learning platforms in particular is evolving at a very rapid pace and that the next two to four years will be pivotal for these vendors as the techniques and approaches for developing and deploying models advance. Organizations should be aware of this and carefully select a vendor or vendors that they believe will evolve along with the market. Some of the key areas to consider:

- The offering helps you democratize AI — serves the needs of both the advanced machine learning developers/data scientists and the business analysts with intuitive tools and techniques.
- The offering is open and helps you extend the capabilities with the ecosystem of partners/integrators.
- The offering supports natively or through third-party integrations’ ability to deploy models at scale from core to edge to cloud, building on and integrating with existing DevOps tools and best practices.
- The offering supports natively or through third-party integrations the foundational elements of trustworthy AI — fairness, explainability, adversarial robustness, data lineage, and transparency to help mitigate associated business risks.
- The offering is optimized for performance and cost to balance the needs of use cases and deployment variances.
VENDOR SUMMARY PROFILES

This section briefly explains IDC’s key observations resulting in a vendor’s position in the IDC MarketScape. While every vendor is evaluated against each of the criteria outlined in the Appendix, the description here provides a summary of each vendor’s strengths and challenges.

SAS

SAS is positioned in the Leaders category in the 2020 IDC MarketScape for worldwide advanced machine learning software platforms.

Artificial intelligence and machine learning are the most transformative technologies of our time, and SAS is committed than ever to investing in its potential for enterprises. SAS reinvests a significant chunk of its revenue back into R&D to fuel innovation, and in 2019, it has also committed $1 billion investment in AI over the next three years.

SAS Viya enables an end-to-end data mining and machine learning process with a comprehensive visual – and programming – interface. Its automated feature engineering and modeling selects the set of features for modeling by ranking them to indicate their importance in transforming your data. Visual pipelines are dynamically generated from your data yet are editable to remain as a white-box model. In addition, SAS has embraced and incorporated open source languages and tools such as R, Python, and Jupyter Notebooks and integrated them into the SAS Viya product so that AI/ML developers and data scientists can utilize their learning and skills with these open source frameworks and languages. They can also add the power of SAS to other applications with SAS Viya REST APIs. SAS decisioning solutions with embedded AI are focused on industries such as banking, government, retail, manufacturing, health care, and life sciences.

SAS works with key technology partners to extend the technology reach. For example, it partners with NVIDIA to enable SAS Viya to train and run inference workloads using GPUs. With combined technology and a shared road map, SAS and Microsoft are partnering to further shape the future of AI and analytics in the cloud. SAS and Microsoft Azure have partnered to make it easy to run your data, analytics, and AI workloads in the cloud. Siemens and SAS partner to deliver AI-embedded IoT analytics for edge and cloud. Its comprehensive list of partners includes AWS, Microsoft Azure, Cisco, Cloudera, Dell EMC, Domino Data Lab, Google Cloud Platform (GCP), Hewlett Packard Enterprise (HPE), IBM, Intel, NVIDIA, Oracle, RedHat, SAP, and Teradata.

SAS provides both sales and technical enablement for all AI partner types (chipmakers, cloud and hardware providers, systems integrators, and regional consultancies) across industry segments globally. SAS partners with Accenture and Deloitte at the global level and additional partners at the regional level. Many of these partners are formally certified to both sell and deliver SAS AI/ML. SAS has more than 500 partners, with SAS-certified consultants covering topics needed to build, customize, and implement AI such as advanced analytics, predictive modeling, text analytics, SAS programming, data integration, data quality, and data science.

Strengths

SAS has strengths in both product and business strategies and capabilities, especially in its R&D pace and productivity, delivery, and capabilities; product functionality; and offering as well as its customer satisfaction.
As per IDC research, customers liked that they could increase process automation and employee productivity with SAS Viya. SAS offers robust text analytics capabilities, which have evolved over the years to its current offering on the SAS Viya platform, and offers both rules-based and machine learning approaches through varied, easy-to-use interfaces. Customers also rate its machine learning technologies that support diverse environments from forecasting to optimization and scale to meet changing business needs, highly.

SAS Model Manager has the capabilities for managing both SAS and open source models. Using SAS Model Manager, customers can store models in a common model repository and organize them within projects and folders. They can also evaluate models for champion model selection, monitor performance of models, and publish models. They can import models that were developed using a SAS application, such as Model Studio, SAS Visual Analytics, and SAS Studio, as well as SAS code, open source programming language such as Python or R, and PMML models through various options. There are robust capabilities to track model performance (model drift, etc.). Customers can also use built-in workflow management to automate retraining and to facilitate collaboration across teams with automated notifications. SAS Workflow Manager complies with the Business Process Model and Notation (BPMN) 2.0 standard. It supports industry standards for visual representation and behavior, and it provides support for established workflow patterns.

In addition, SAS Open Model Manager is a packaging of this functionality targeted to open source users and the capabilities focus on management of open source models. It helps move organizations’ open source models beyond the lab to enable smarter, faster decisions. This new solution streamlines analytical model management to address the "last mile" business challenge.

SAS is incorporating feedback from customer advisory boards, focus groups, beta labs, usability tests, user conferences, customer visits, and so forth to determine the top priorities that drive the road map definition. SAS has an open REST API for developers to access models and score code, which are externally available and consumable by third-party applications, such as marketplaces. SAS enables Python users to access high-level APIs for deep learning functionalities within Jupyter Notebooks via the SAS Deep Learning with Python (DLPy) open source package on GitHub. DLPy supports the Open Neural Network Exchange (ONNX) for easily moving models between frameworks.

**Challenges**

As the adoption of machine learning grows among enterprises, customers are looking for flexible deployment options from edge to core to cloud. Customers have currently noted the lack of this support as a challenge; however, with SAS Viya 4.0.1 to be the containerized, Kubernetes based, and CI/CD capable, this should be aptly addressed.

**Consider SAS When**

Organizations that are already using SAS for analytics are natural customers for SAS Viya as they already have an ongoing relationship with the company. In addition, as businesses accelerate their digital and business transformation journey, SAS' "Elevate Your Analytics" program and strategic partnerships can be invaluable. SAS' trials program that includes access to an environment with sample data, instructional videos, and a walk-through script can be an effective risk-free way for customers to experiment with SAS AI capabilities. Last, SAS Artificial Intelligence Center of Excellence (SAS AI CoE), a group of Ph.D.-level experts in AI, machine learning, natural language processing, computer vision, forecasting, optimization, and simulation, who are focused exclusively on customer implementations and AI Innovation labs, can be excellent jump starters for AI projects.
For AI applications that require the building of models leveraging both structured data and text analytics or computer vision, SAS Viya should be considered. Finally, SAS Viya's visual interface makes it easier for non-data scientists to work with and develop AI/ML models.

APPENDIX

Reading an IDC MarketScape Graph

For the purposes of this analysis, IDC divided potential key measures for success into two primary categories: capabilities and strategies.

Positioning on the y-axis reflects the vendor's current capabilities and menu of services and how well aligned the vendor is to customer needs. The capabilities category focuses on the capabilities of the company and product today, here and now. Under this category, IDC analysts will look at how well a vendor is building/delivering capabilities that enable it to execute its chosen strategy in the market.

Positioning on the x-axis, or strategies axis, indicates how well the vendor's future strategy aligns with what customers will require in three to five years. The strategies category focuses on high-level decisions and underlying assumptions about offerings, customer segments, and business and go-to-market plans for the next three to five years.

The size of the individual vendor markers in the IDC MarketScape represents the market share of each individual vendor within the specific market segment being assessed.

IDC MarketScape Methodology

IDC MarketScape criteria selection, weightings, and vendor scores represent well-researched IDC judgment about the market and specific vendors. IDC analysts tailor the range of standard characteristics by which vendors are measured through structured discussions, surveys, and interviews with market leaders, participants, and end users. Market weightings are based on user interviews, buyer surveys, and the input of IDC experts in each market. IDC analysts base individual vendor scores, and ultimately vendor positions on the IDC MarketScape, on detailed surveys and interviews with the vendors, publicly available information, and end-user experiences in an effort to provide an accurate and consistent assessment of each vendor's characteristics, behavior, and capability.

Market Definition

Advanced Machine Learning Software Platforms

Advanced machine learning platforms are a segment of the AI software platforms market. Advanced machine learning platforms provide a range of ML methods primarily working with structured and semi-structured data to create predictive and prescriptive models that are then used in applications. These platforms facilitate the development of advanced machine learning models and applications. Advanced machine learning platforms can also include development, training, and deployment tools, including pretrained models and automatic machine learning methods that help developers and business users to experiment, automate machine learning, and build and deploy artificial intelligence models into production. The platforms provide functionality to apply a broad range of supervised, unsupervised, reinforcement, and transfer learning methods into models and applications put into production and can be deployed in several ways.
Related Research

- IDC’s Worldwide Artificial Intelligence Taxonomy, 2019 (IDC #US45013419, April 2019)
- IDC Market Glance: Artificial Intelligence, 1Q19 (IDC #US44808719, February 2019)

Synopsis

This IDC study represents a vendor assessment of the advanced machine learning software platforms market through the IDC MarketScape model. This assessment discusses both quantitative and qualitative characteristics that provide guidance about advanced machine learning software platform vendors and their offerings. This IDC MarketScape covers a variety of vendors participating in the advanced machine learning software platforms market. The evaluation is based on a comprehensive and rigorous framework that assesses vendors relative to the criteria and to one another and highlights the factors expected to be the most influential for success in the market in both the short term and the long term.

"Success in the rapidly evolving AI software platforms market requires advanced machine learning software platform vendors to continue to innovate and provide tools to help customers accelerate development and deployment and monitoring of machine learning models," says David Schubmehl, research director, AI Software Platforms at IDC.

"AI adoption is past the tipping point. The rapid rise of digital transformation has pushed AI to the top of the corporate agenda and machine learning infusion is ubiquitous across all business processes," adds Ritu Jyoti, program vice president for AI Research. "However, as we accelerate into the mainstream, organizations will need to embrace innovative machine learning platforms to realize AI/ML at scale and enjoy sustainable competitive advantage."
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