

The Forrester New Wave™: Computer Vision Platforms, Q4 2019

The 11 Providers That Matter Most And How They Stack Up

by Kjell Carlsson, Ph.D.

November 26, 2019

Why Read This Report

In Forrester's evaluation of the emerging market for computer vision platforms, we identified the 11 most significant providers in the category — Amazon Web Services, Chooch AI, Clarifai, Deepomatic, EdgeVerve, Google, Hive, IBM, Microsoft, Neurala, and SAS — and evaluated them. This report details our findings about how well each vendor scored against 10 criteria and where they stand in relation to each other. AD&D professionals can use this review to select the right partner for their computer vision needs.

Key Takeaways

Google, Microsoft, Clarifai, And AWS Are “Vision-ary” Leaders

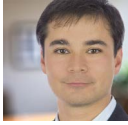
Forrester's research uncovered that Google, Microsoft, Clarifai, and AWS are Leaders; IBM, Deepomatic, Hive, Chooch AI, and Neurala are Strong Performers; and SAS and EdgeVerve are Contenders.

Breadth Of Capabilities, Customization, And Ease Of Use Are Key Differentiators

Forrester found that support for a wide range of standard and custom computer vision use cases — and capabilities for democratizing deep learning across developers, data scientists, and end business users — were key differentiators for Leaders in the computer vision platforms market.

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November 26, 2019

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The Computer Vision Platform Market Is Moving At Light Speed

Computer vision (CV) platforms help you with the end-to-end process of developing and deploying a broad range of CV models at scale. And they are quickly becoming a must have for enterprises. In a Forrester survey, 83% of data and analytics decision makers whose firms are adopting AI reported that they have implemented or are implementing a CV solution or are planning to do so in the next 12 months.¹ CV platforms typically offer features that streamline CV tasks — like object detection, object tracking, semantic/instance segmentation, facial recognition, visual search, and OCR — and pretrained CV models that you can customize for your specific use case, or use out of the box for things like moderating user-uploaded content, recognizing celebrities, or detecting brands and logos.

CV platform vendors fall into two main camps. Many public cloud vendors and other pioneers of deep-learning-based CV offerings are best known for their pretrained CV models, that are typically accessed via the cloud and geared toward developers. All have since built capabilities to customize models, and most are enabling the deployment of their models on-premises and on edge devices. Other CV platform vendors focus on enabling end-to-end CV solutions. They offer integrated tools that span the CV model development and deployment lifecycle, and their pretrained models are to kickstart the development of custom models. They typically provide more professional services as well as support for on-premises and edge deployment.

Computer Vision Platforms Evaluation Overview

The Forrester New Wave™ differs from our traditional Forrester Wave™. In the New Wave evaluation, we assess only emerging technologies, and we base our analysis on a 10-criterion survey and a 2-hour briefing with each evaluated vendor. We group the 10 criteria into current offering and strategy (see Figure 1). We also review market presence.

We included 11 vendors in this assessment: Amazon Web Services, Chooch AI, Clarifai, Deepomatic, EdgeVerve, Google, Hive, IBM, Microsoft, Neurala, and SAS (see Figure 2 and see Figure 3). Each of these vendors has:

- › **A full lifecycle computer vision platform for multiple enterprise use cases.** The platform includes capabilities that assist in both the development and deployment of computer vision models. It must be marketed toward enterprises and support many computer vision use cases rather than one specific horizontal or vertical business solution.
- › **Install base and revenue requirements.** The included vendors have at least five paying, named enterprise customers using the version of the computer vision platform that will be evaluated. Included vendors have a proven stream of revenue generated by customer adoption of their computer vision platform.

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

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FIGURE 1 Assessment Criteria

Evaluation criteria	Criteria explanation
Data	What capabilities exist to annotate and label training data; preprocess and augment data; protect sensitive data during annotation; visualize and describe the distribution and other attributes of the data; and validate models against test and ground truth data sets? How wide a variety of inputs does the platform support?
Capabilities	What capabilities does the platform have to support common image analysis tasks? What capabilities does it have to support tasks specific to video analysis? What are the platform's capabilities to support augmented/virtual/mixed reality and image generation tasks, if any?
Pretrained models	What pretrained models exist for extracting insights from image/video; face detection/recognition/analysis; OCR and handwriting detection and recognition; extracting structured data; or other types of document analysis? What other domain-specific models and languages does the platform support?
Development	What are the platform's features for transfer learning, neural network search, and model performance comparison? What support is there for common neural network framework architectures?
Deployment	What capabilities exist to streamline the deployment of computer vision models? What capabilities support the management of models across many devices, model ops, deployment on mobile devices, and real-time/streaming capabilities? What deployment environments/types of cameras/hardware does the platform support?
Solutions	What capabilities exist for designing pipelines or hierarchies of models? What accelerators exist for common vertical or horizontal use cases? What professional services and partnerships does the platform offer? What are its security and interoperability capabilities?
Ease of use	What features exist for continuous improvement, explainability, and sample use cases? What do Forrester and customers think of the user interface? To what degree are developer/data science skills necessary for implementing and maintaining computer vision solutions using the platform?
Vision	How well does the product vision align with customer needs for computer vision? How well does the vision align with current customer trends and future customer needs?
Roadmap	What is Forrester's level of confidence in the vendor's roadmap to increase adoption by enterprise buyers in terms of planned product enhancements during the next 12 months? Does the company have the resources and capabilities to deliver on its stated roadmap?
Market approach	Is the company executing a successful go-to-market approach? Does the vendor have a well-thought-out technology and channel partner strategy?

FIGURE 2 Forrester New Wave™: Computer Vision Platforms, Q4 2019

THE FORRESTER NEW WAVE™

Computer Vision Platforms

Q4 2019



FIGURE 3 Vendor QuickCard Overview

Company	Data	Capabilities	Pretrained models	Development	Deployment	Solutions	Ease of use	Vision	Roadmap	Market approach
Google	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆
Microsoft	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆
Clarifai	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆
Amazon Web Services	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆
IBM	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆
Deepomatic	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆
Hive	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆
Chooch AI	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆
Neurala	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆
SAS	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆
EdgeVerve	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆	⬆

⬆ Differentiated ⬆ On par ⬆ Needs improvement

Vendor QuickCards

Forrester evaluated 11 vendors and ranked them against 10 criteria. Here's our take on each.

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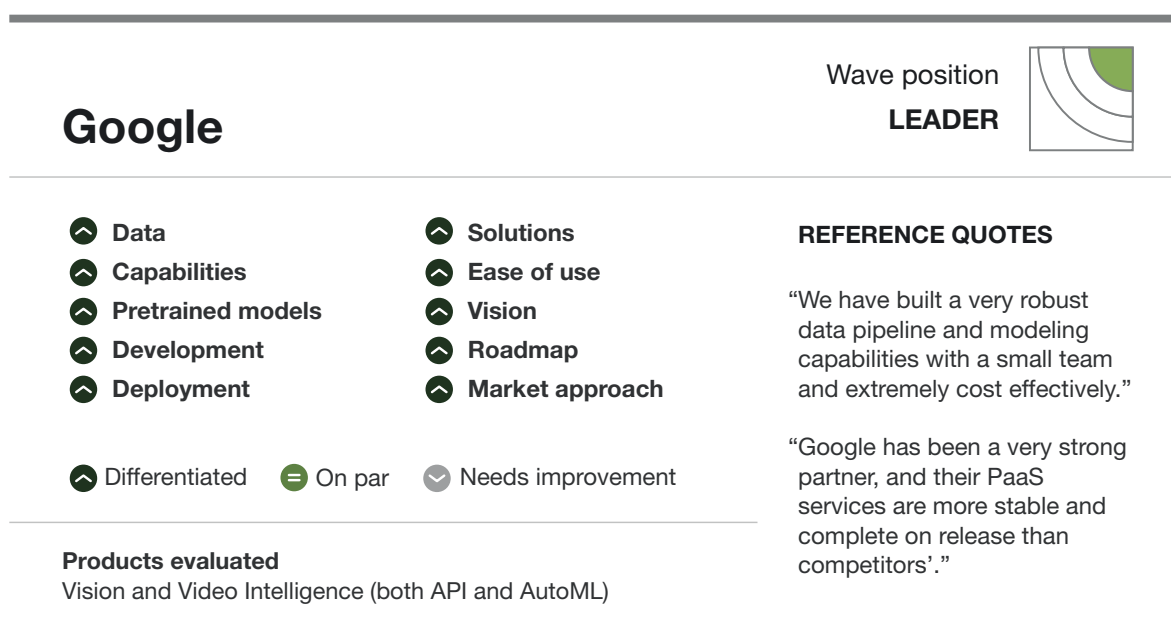
Google: Forrester's Take

Our evaluation found that Google (see Figure 4):

- › **Enables more personas to build a wider, better range of computer vision solutions.** Google's offerings span the full CV solution development lifecycle and enable everyone to easily annotate data, build powerful custom CV models, leverage a wide range of powerful pretrained CV models, and scale CV applications across a host of edge devices.
- › **Has opted out of facial recognition.** Google isn't offering tools that identify individuals in images and video (beyond a heavily restricted celebrity recognition model) due to the potential ethical risks. You will also find pretrained models that can accurately recognize more out of the box from other vendors with fewer scruples about where the data comes from and how it will be used.
- › **Is the platform to pick, that can do the most for the many.** From business users to developers and data scientists, Google has powerful CV tools that all of them can use.

Google Customer Reference Summary

Google received praise from customers for the quality, ease of use, support, and cost effectiveness of its offerings, but customers expressed a desire for even more pretrained models.

FIGURE 4 Google QuickCard

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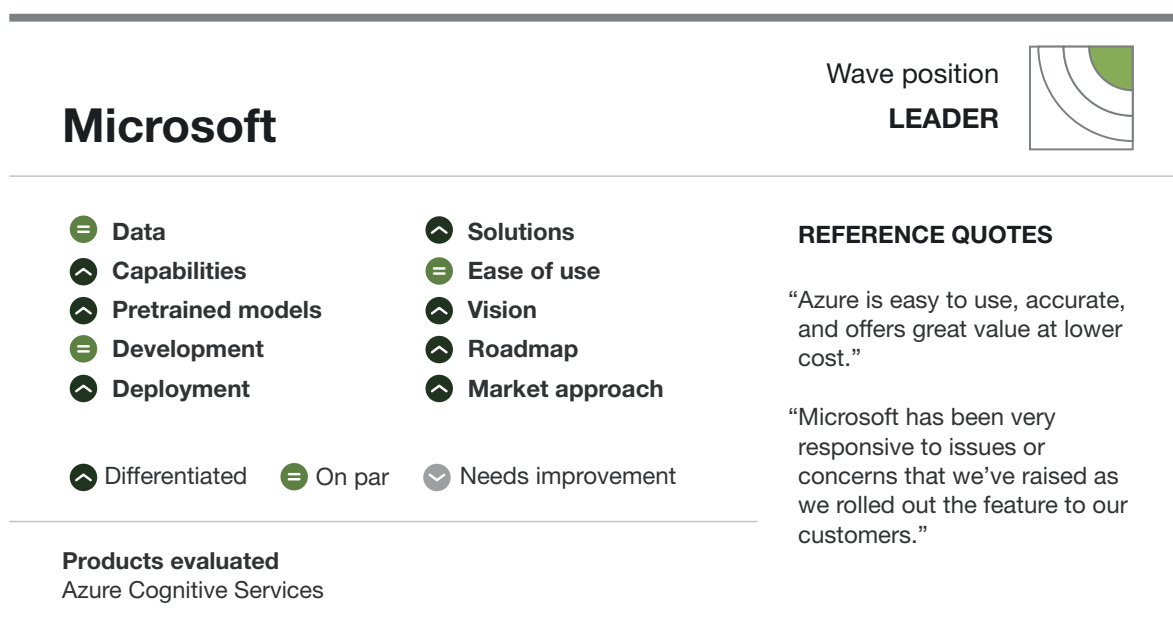
Microsoft: Forrester's Take

Our evaluation found that Microsoft (see Figure 5):

- › **Has unique “vision-ary” tricks up its sleeve.** In addition to a broad stack of conventional CV capabilities — e.g., a wide array of pretrained CV models, facial recognition and document analysis capabilities, a full-featured CV training platform — Microsoft is pushing the envelope by integrating technologies such as AR/MR, and synthetic data.
- › **Needs to do more to accelerate custom model development.** Microsoft does little to streamline the data annotation process and lacks easy tools for creating custom models.
- › **Will be an easy choice for its many enterprise customers.** With so many existing agreements in place, and more implementation partners than you can shake a stick at, combined with a broad set of capabilities — many of which are already being embedded in Microsoft's business apps — Microsoft will be the CV starting point for many enterprises.

Microsoft Customer Reference Summary

Customer references gave Microsoft high marks for the accuracy of its models, ease of use, as well as support and responsiveness, though they suggested improvements in specific models, like brand detection.

FIGURE 5 Microsoft QuickCard

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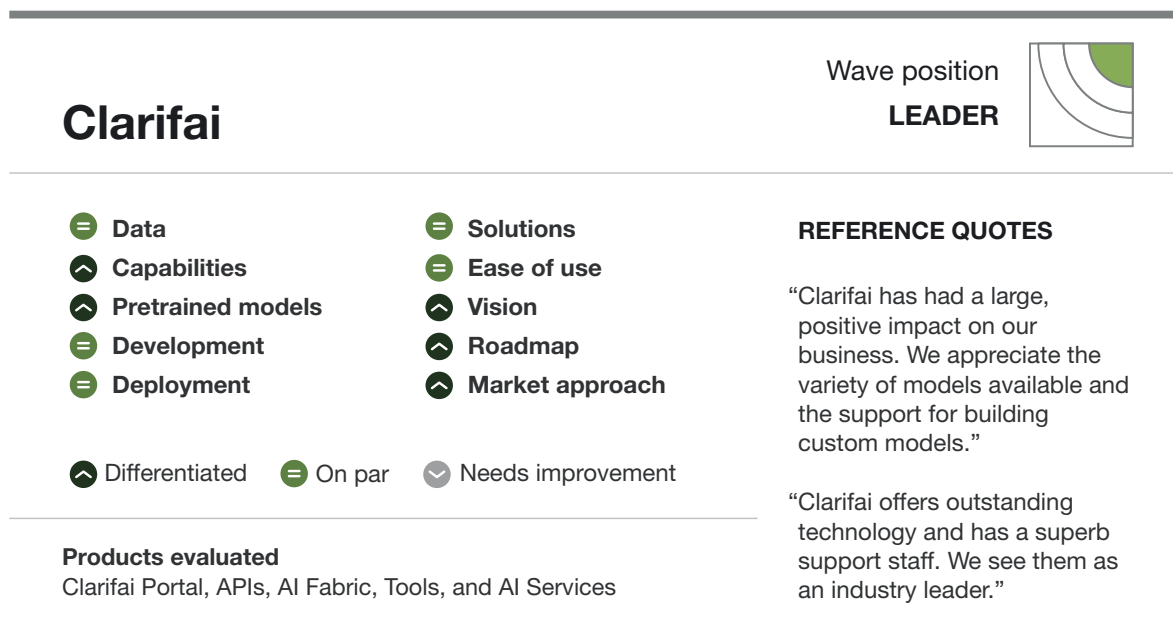
Clarifai: Forrester's Take

Our evaluation found that Clarifai (see Figure 6):

- › **Offers military-grade computer vision.** A pioneer in deep learning-based computer vision, Clarifai can tackle near-real-time visual search, facial recognition use cases, and deployment in the most secure, air-gapped environments that nearly all other vendors can't match.
- › **Is on its way to becoming a self-service computer vision platform.** For now, Clarifai's workbench offers an easy-to-use but limited set of capabilities for labelling data and developing custom models. The rest of its capabilities are through professional services.
- › **Is a particularly good fit for security, surveillance, and safety use cases.** Need secure custom models that can be trained continuously and do extremely fast visual search? Clarifai should be on your list, whether you're a government entity or enterprise.

Clarifai Customer Reference Summary

Customers praise Clarifai for its helpful staff and variety of pretrained models, but some expressed difficulty with troubleshooting technical problems and keeping models up to date.

FIGURE 6 Clarifai QuickCard

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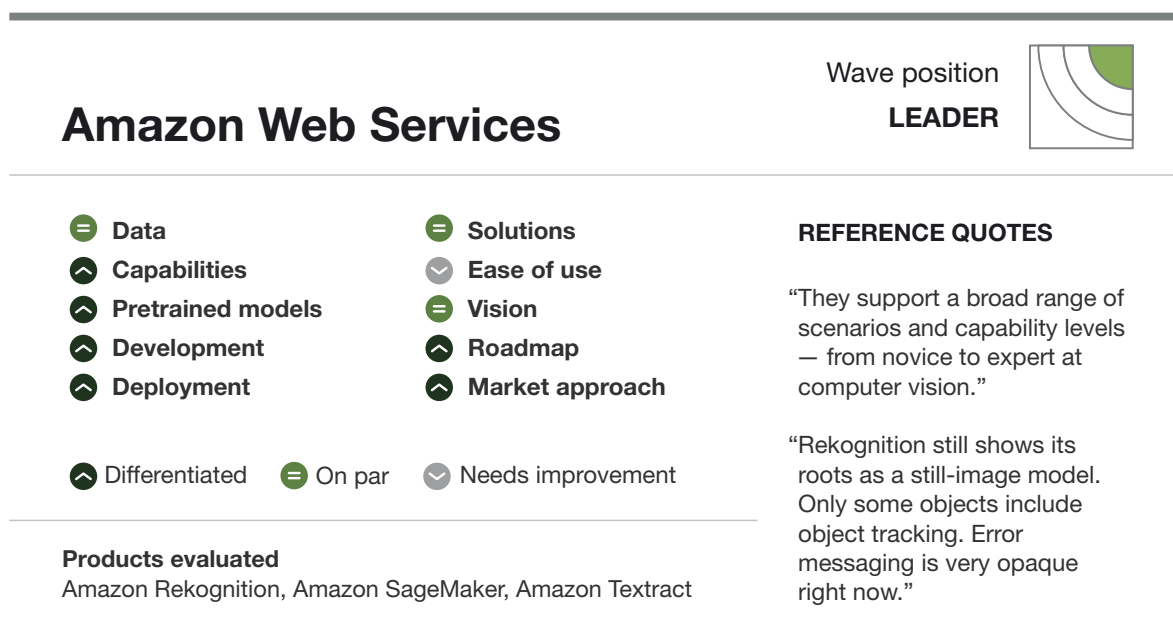
Amazon Web Services: Forrester's Take

Our evaluation found that Amazon Web Services (see Figure 7):

- › **Turns developers into CV application developers.** With robust pretrained models, powerful hyperparameter tuning capabilities for custom model development, scalable deployment, and a bevy of templates for creating CV applications, AWS gives your developers all the essential tools to rapidly add CV functionality to apps at any scale.
- › **Isn't easy for nondevelopers.** With barely any workbench, business users — and many data scientists — will have to get comfortable with coding API calls and Python notebooks in order to access most of AWS's CV capabilities.
- › **Is the best fit for ISVs and your in-house dev team.** For enterprises looking to add CV capabilities to their applications, AWS is a one-stop shop for both application development and hosting as well as model development and deployment.

Amazon Web Services Customer Reference Summary

Customers praise AWS for its ability to support a broad range of use cases and developer skill levels but note opportunities to improve ease of use and video analysis.

FIGURE 7 Amazon Web Services QuickCard

IBM: Forrester's Take

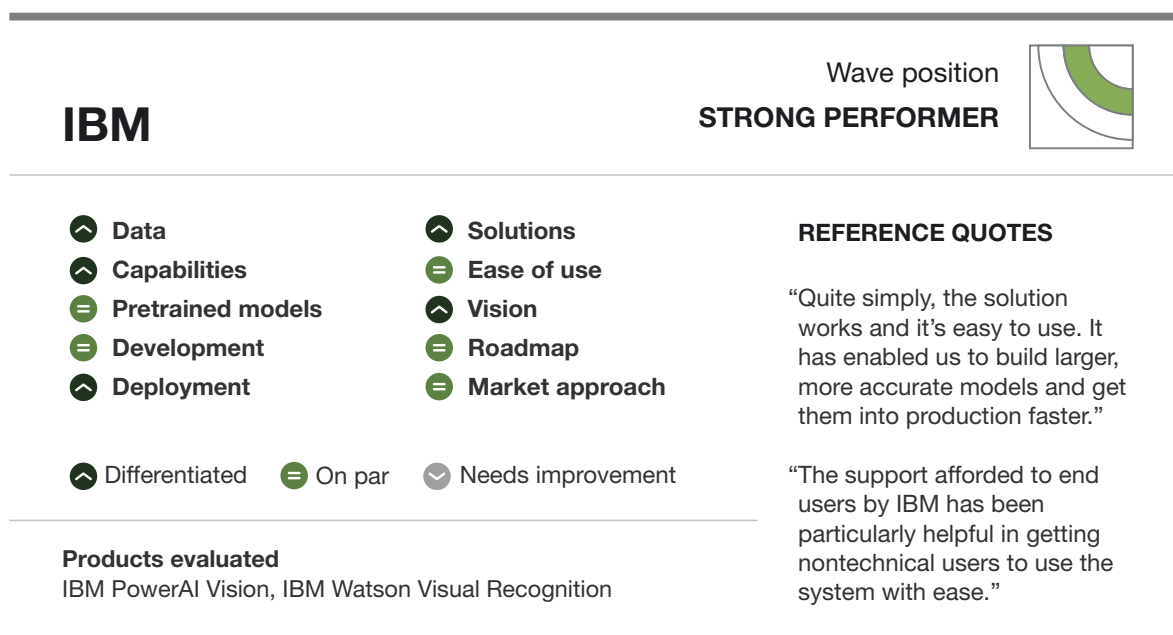
Our evaluation found that IBM (see Figure 8):

- › **Has the capabilities and services for your CV solution needs.** IBM has an impressive array of CV offerings that span most use cases, environments, and stages of the CV lifecycle — from annotation to edge deployment.
- › **Can be hard to navigate.** IBM's CV offerings are split across different products with significantly different capabilities. Some use cases will fall through the gaps, and though most can be still be solved, they will require more effort.
- › **Is the best fit if you need integrated hardware, or services.** IBM has one of the few CV offerings with integrated hardware for on-prem deployments, and it has the services to help you develop, deploy, and integrate CV models and solutions for greater business impact.

IBM Customer Reference Summary

Customers praise IBM for its ease of use, reliability, time-to-value, and support but give it mixed reviews regarding custom model development.

FIGURE 8 IBM QuickCard



Deepomatic: Forrester's Take

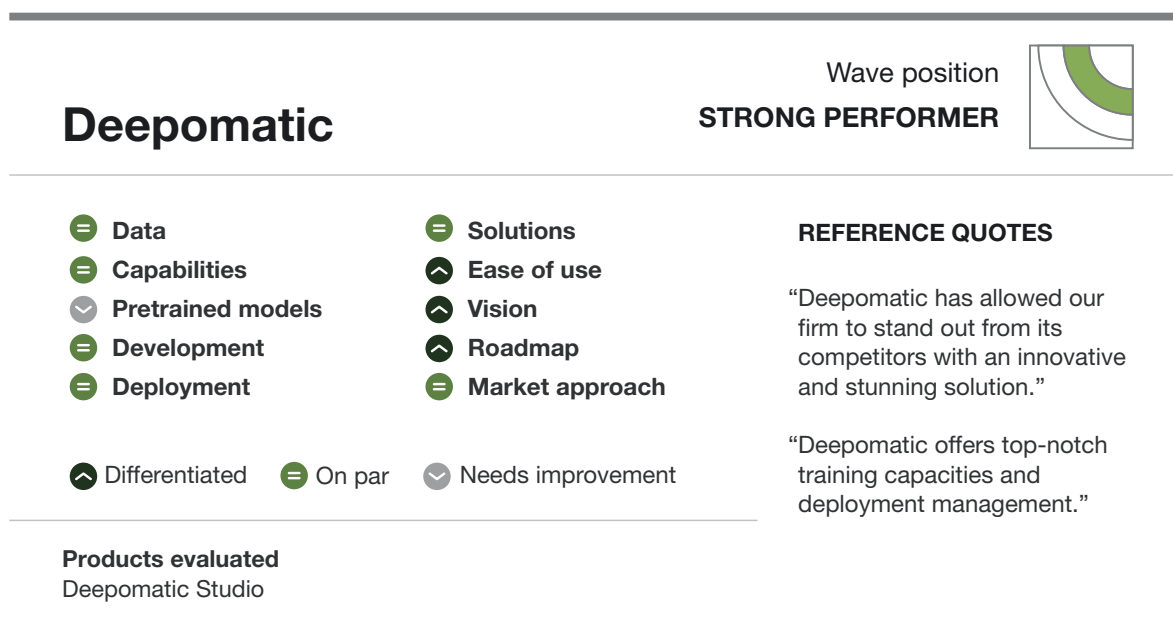
Our evaluation found that Deepomatic (see Figure 9):

- › **Makes it easy to develop a continuously improving CV solution.** Deepomatic has one of the easiest-to-use interfaces for navigating the process of annotating, developing, deploying, and, above all, continuously improving a CV solution with additional training from end users.
- › **Is not for many CV use cases.** Looking for pretrained models that you can use with little or no customization (e.g., for content moderation)? That isn't what Deepomatic does.
- › **Is the best fit for developing a custom physical-world CV solution.** Deepomatic is especially well designed for CV solutions in retail, manufacturing, healthcare, and similar situations where end users — without developer or CV expertise — will need to retrain the models on an ongoing basis.

Deepomatic Customer Reference Summary

Deepomatic received high marks for ease of use, tools for quantitatively and qualitatively evaluating model performance and model deployment at scale, and for providing excellent support, but would like more video and automated model training capabilities.

FIGURE 9 Deepomatic QuickCard



Hive: Forrester's Take

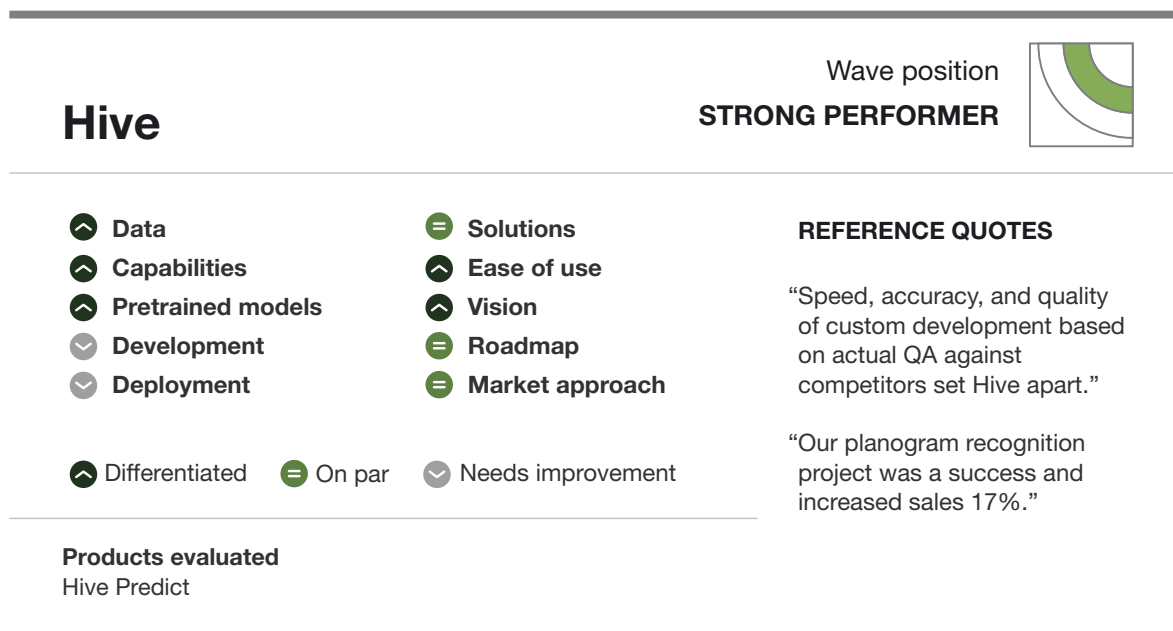
Our evaluation found that Hive (see Figure 10):

- › **Has extraordinary data capabilities and pre-trained models.** Hive's data platform allows you to field an incredible array of data collection, labelling and annotation jobs to people around the world, and verify the quality of that data. Using this data advantage, Hive offers pre-trained CV models that are particularly accurate out of the box.
- › **Isn't a platform for developing your own CV models.** Hive will build custom CV models to support your use cases, but at the end of the day that model is theirs.
- › **Is the best for CV use cases that everyone has.** Hive is an excellent choice for common CV use cases that are not especially unique to your business. Think content moderation, celebrity recognition, and recognizing a broad range of company logos.

Hive Customer Reference Summary

Hive received rave reviews for its speed, accuracy, and service. Customers expressed some frustration at deprecation of older data feeds as the product has updated and feel the interface could use work.

FIGURE 10 Hive QuickCard



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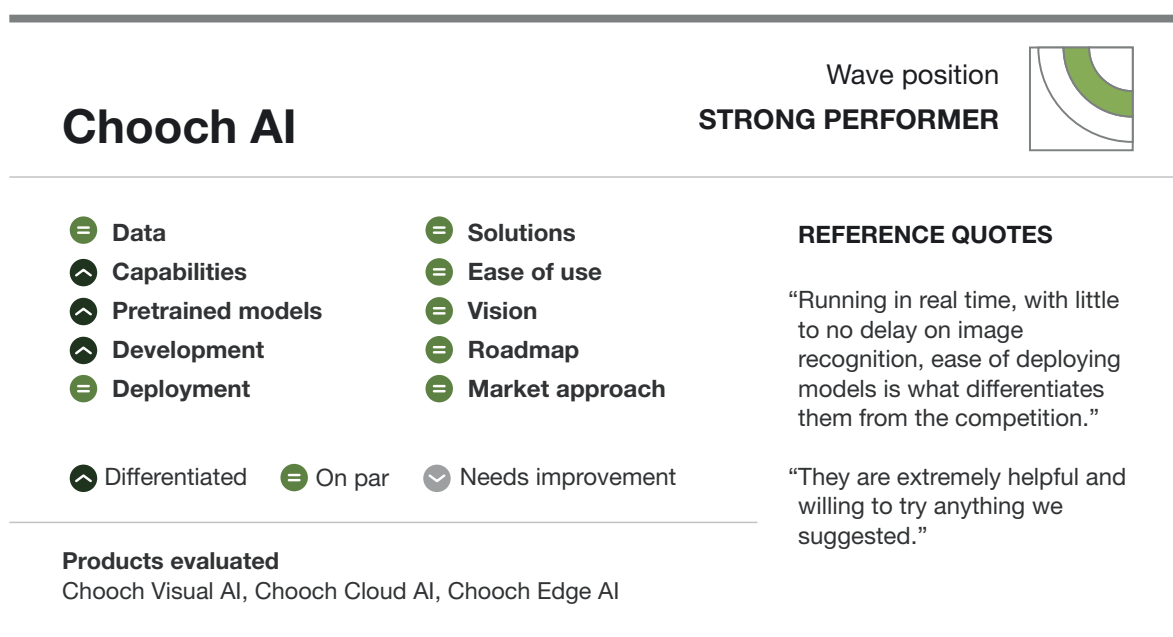
Chooch AI: Forrester's Take

Our evaluation found that Chooch AI (see Figure 11):

- › **Recognizes a staggering number of objects and concepts, fast.** Thanks to its proprietary approach, Chooch AI can recognize more — roughly 160,000 — types of objects and concepts in images and video at high speed. It also offers facial recognition capabilities with antispoofing features, like liveness detection.
- › **Has limited deployment options.** Given Chooch AI's proprietary framework, Chooch AI models must be deployed on their cloud and their new edge offering — which is optimized for speed and efficiency, but supports a limited set of the models available on their cloud.
- › **Is the best fit if you want a cloud model that recognizes as much as possible.** With expansive pretrained models, and easy-to-use tools for customizing models, Chooch AI helps you train, deploy, and host models that recognize a wide range of classes quickly.

Chooch AI Customer Reference Summary

Customers liked Chooch AI's ability to deliver results with low latency, the ease of deployment, and the capabilities of their vehicle make/model detection model. However, they did want more investment in Chooch AI's user interface.

FIGURE 11 Chooch AI QuickCard

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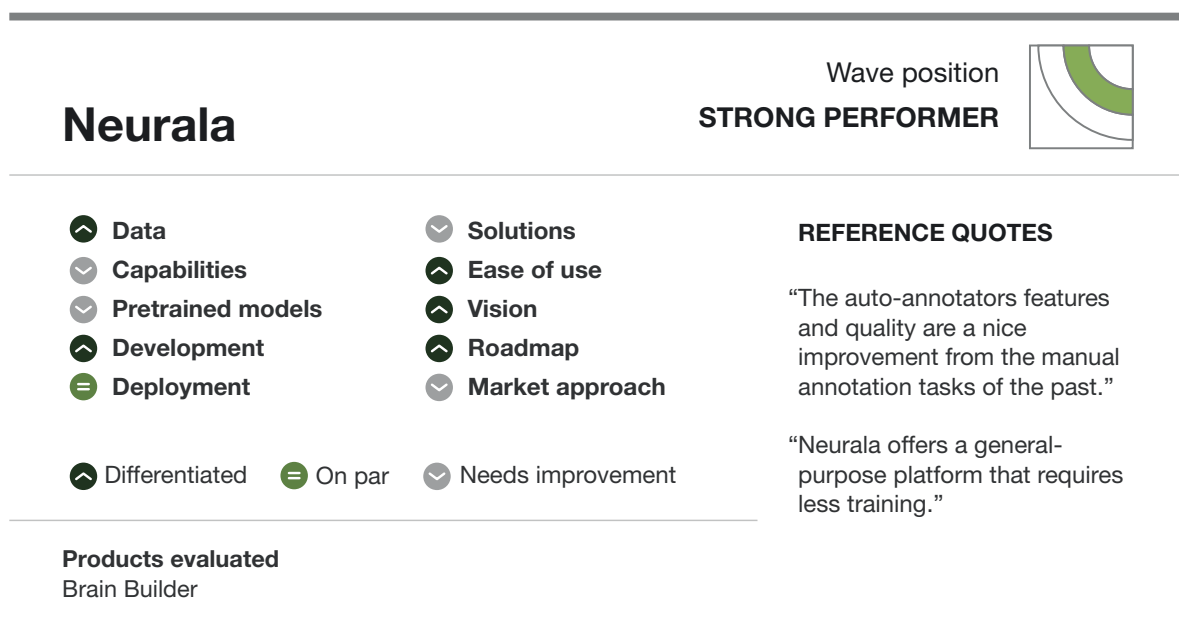
Neurala: Forrester's Take

Our evaluation found that Neurala (see Figure 12):

- › **Performs amazing data annotation feats and edge deployment.** Leveraging its proprietary framework, Neurala can automatically segment and track objects like no other vendor and build lightweight, accurate CV models that require less data to train.
- › **Is for a focused set of CV use cases.** While you can use their automatic detection and segmentation capabilities to annotate data, you can only train custom recognition models for now. And this isn't a platform for pretrained models that you can use out of the box.
- › **Is the best fit for CV on edge devices and annotating video.** Neurala's CV models can run, and even learn, on edge devices with highly limited processing power — making them uniquely well suited for smart devices, robotics, drones, and industrial machinery use cases. And anyone training video models will delight in their auto segmentation capabilities.

Neurala Customer Reference Summary

Customers liked Neurala's auto-annotation features, ease of use, customer support, and the need for less training data. However, they felt there were opportunities to improve the product, particularly in further refining the interface for manual annotation and making it easier to correct false positives.

FIGURE 12 Neurala QuickCard

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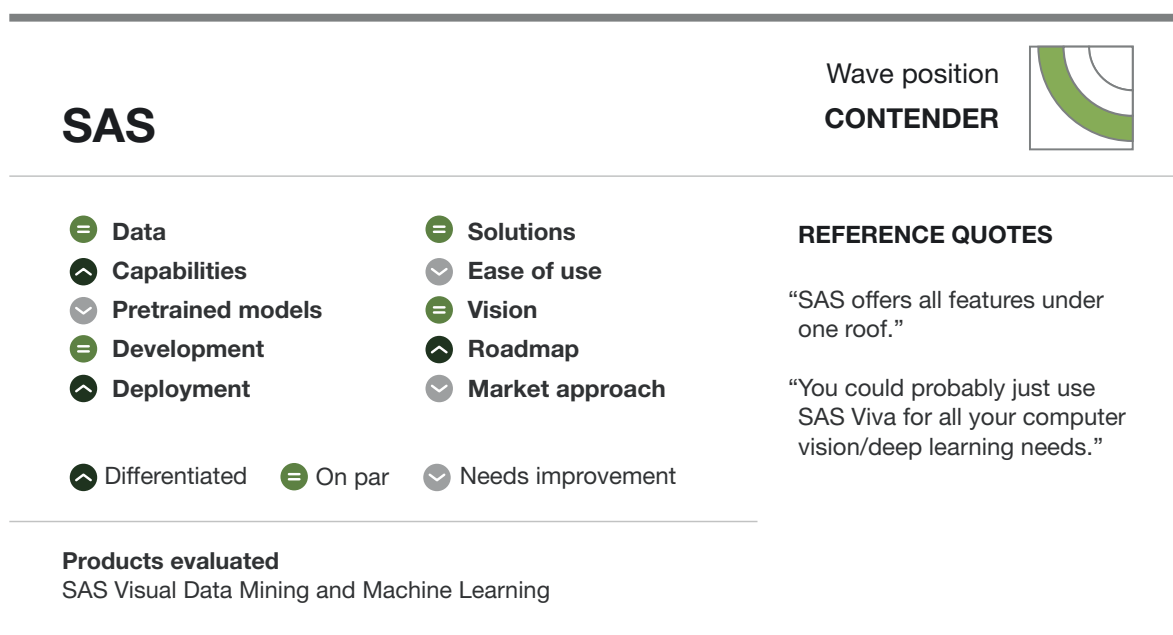
SAS: Forrester's Take

Our evaluation found that SAS (see Figure 13):

- › **Can tackle most computer vision use cases.** SAS has an extremely broad range of CV capabilities for preprocessing, augmentation, model development, deployment, and monitoring — as well as many features to support open source deep learning, such as calling SAS CV methods from Python and importing and exporting ONNX models.
- › **Requires a lot of expertise and hard work.** Though SAS offers sample code, users need to build their computer vision solution from the ground up, requiring both computer vision and developer expertise.
- › **Is the best fit for companies that already use SAS.** SAS users will be delighted to find that they don't need to use different frameworks or platforms to build fully fledged CV solutions. SAS and non-SAS users alike can benefit from leveraging SAS's CV features in tandem with its other AI and machine learning capabilities, e.g., text analytics or optimization.

SAS Customer Reference Summary

Customers offered mixed reviews of SAS's CV offering. They recognized the one-stop shop nature of the platform but felt the stack needs further development.

FIGURE 13 SAS QuickCard

EdgeVerve: Forrester's Take

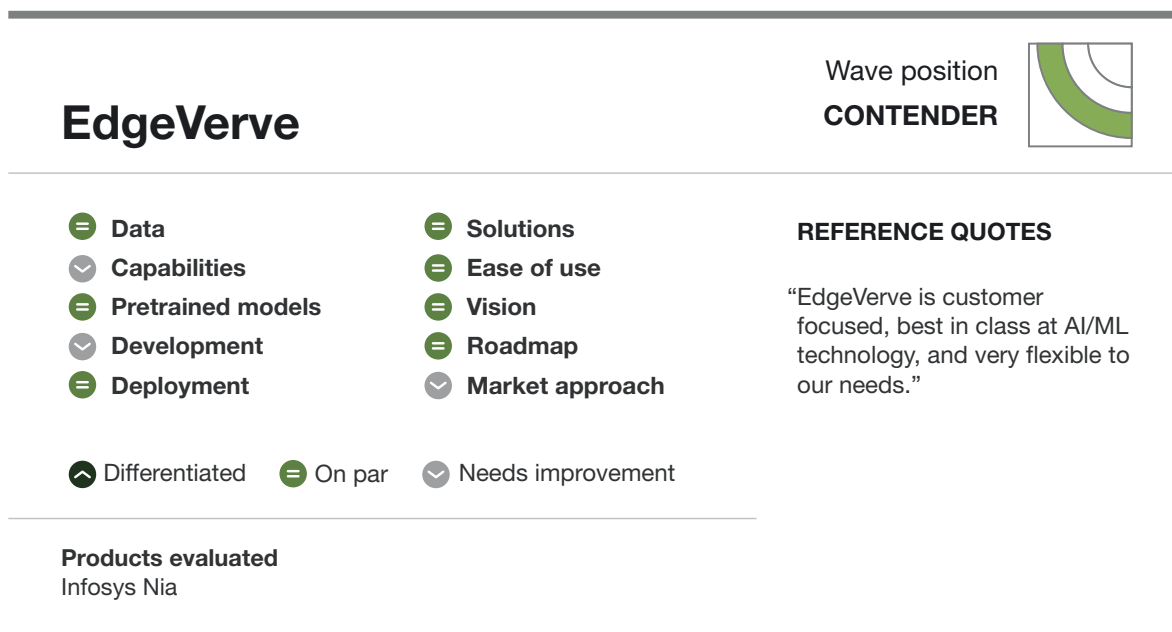
Our evaluation found that EdgeVerve (see Figure 14):

- › **Is specialized on documents and text.** EdgeVerve has a particularly rich set of capabilities for managing data annotation jobs, document preprocessing and augmentation, and running document analysis pipelines in parallel — and has integrated natural language processing and querying capabilities.
- › **Is starting to support other CV use cases.** EdgeVerve has plenty of built-in capabilities for tackling a broad range of CV use cases but has limited tooling to accelerate the process of building other types of CV models.
- › **Is the best fit for building rich document analysis solutions.** More than any other vendor in this evaluation, EdgeVerve is aligned around developing and implementing computer vision-based document analysis solutions and has the capabilities to match.

EdgeVerve Customer Reference Summary

EdgeVerve's customer reference praised its accuracy at text extraction and the performance of its pretrained models but noted the opportunity to improve the user interface's ability to scale for handling millions of documents.

FIGURE 14 EdgeVerve QuickCard



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Supplemental Material

The Forrester New Wave Methodology

We conducted primary research to develop a list of vendors that met our criteria for the evaluation and definition of this emerging market. We evaluated vendors against 10 criteria, seven of which we based on product functionality and three of which we based on strategy. We also reviewed market presence. We invited the top emerging vendors in this space to participate in an RFP-style demonstration and interviewed customer references. We then ranked the vendors along each of the criteria. We used a summation of the strategy scores to determine placement on the x-axis, a summation of the current offering scores to determine placement on the y-axis, and the market presence score to determine marker size. We designated the top-scoring vendors as Leaders.

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Integrity Policy

We conduct all our research, including Forrester New Wave evaluations, in accordance with the [Integrity Policy](#) posted on our website.

Endnotes

¹ Base: 1,623 data and analytics decision makers whose firm is adopting AI. Source: Forrester Analytics Global Business Technographics® Data And Analytics Survey, 2019.

We work with business and technology leaders to develop customer-obsessed strategies that drive growth.

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