IDC MarketScape

IDC MarketScape: Asia/Pacific (Excluding Japan) Vision Artificial Intelligence Software Platform 2021 Vendor Assessment

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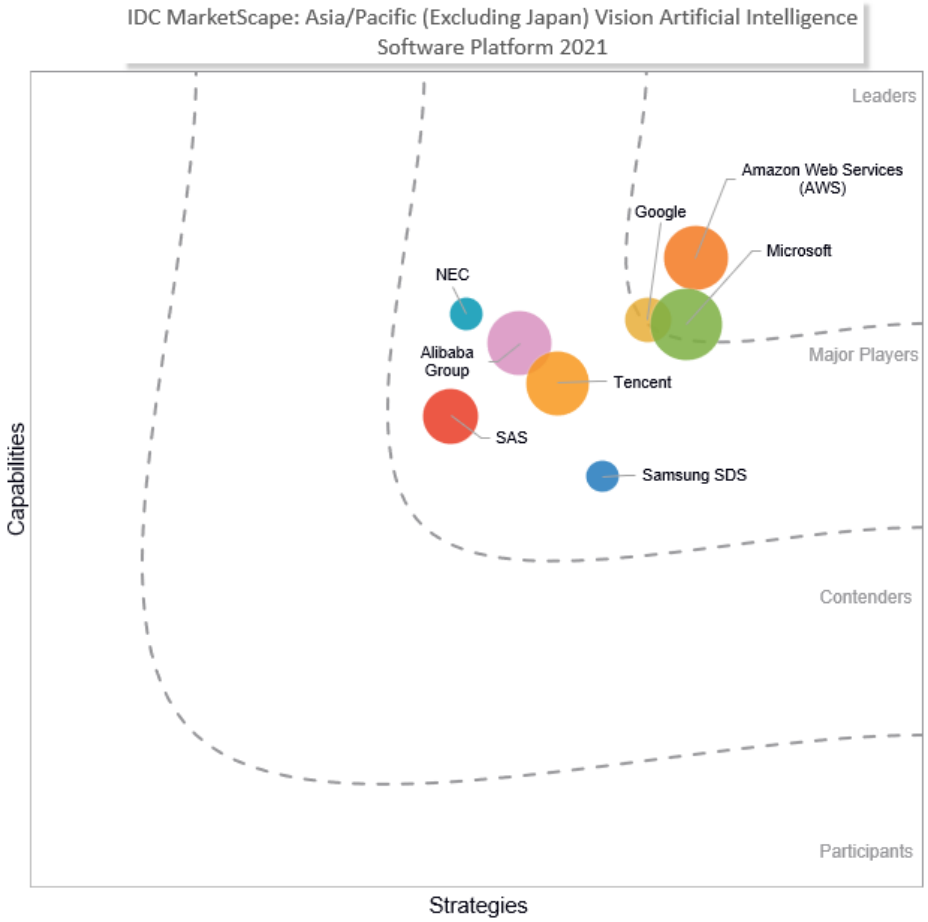
THIS MARKETSCAPE EXCERPT FEATURES: GOOGLE

IDC MARKETSCAPE FIGURE

FIGURE 1

Asia/Pacific (Excluding Japan) Vision Artificial Intelligence Software Platform 2021 Vendor Assessment



Source: IDC, 2021

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

IN THIS EXCERPT

The content for this excerpt was taken directly from IDC MarketScape Asia/Pacific (Excluding Japan) Vision Artificial Intelligence Software Platform 2021 Vendor Assessment (Doc #47490521). All or parts of the following sections are included in this excerpt: IDC Opinion, IDC MarketScape Vendor Inclusion Criteria, Advice for Technology Buyers, Featured Vendor Profile, Appendix and Learn More. Also included is Figure 1 and Table 1.

IDC OPINION

It has been estimated that more than 50% of the cortex of the human brain is dedicated to sight and vision — more than all the other senses combined. Sight and vision are different. Vision is how the mind, an aspect of the brain, interprets the images captured by the sense of sight. About 80% of what we learn about our world is because of perception and cognition through vision, and 30% of the brain's neurons are dedicated to visual processing, compared with just 8% for touch and 3% for hearing (refer to Sells, S.B. and Fixott, R. S., *Evaluation of Research on Effects of Visual Training on Visual Functions,* Elsevier, American Journal of Ophthalmology, 44(2), 1957, 230–236). Vision enables us to act on what we see and respond to it either with our muscles or through our intellect. Therefore, it is no surprise that computer vision, also known as vision artificial intelligence (AI), has long been a priority of AI research. Over the last 20 years, the advent of deep learning (DL) algorithms, the investment in systematically labeled image libraries, together with the spread of charge-coupled vision-capture devices, and the availability of massive storage and high-performance compute capabilities have revolutionized vision AI and made a host of applications practical — from fault detection to facial recognition.

In this study, we profile and evaluate the major vision AI software platform vendors according to the IDC MarketScape model. It uses surveys and interviews conducted between March and August 2021 and incorporates indicative market shares of vendors in Asia/Pacific (excluding Japan) (APEJ) as reflected in IDC's tracker products. The assessment methodology, including scoring dimensions, items, and criteria, is detailed in the Appendix section.

In this research, we have identified three basic categories of vision AI use cases from those frequently mentioned by reference customers or customer stories:

- **Vision AI for productivity.** Productivity use cases tend to support existing business-critical operations. AI is used to augment or automate tasks that are traditionally performed by people, thereby relieving or reducing their workload or lowering the level of attention required, thus making the work safer, easier, and more productive. Apart from improving productivity, vision AI in this category also improves work outcomes with better accuracy and reliability. These use cases typically have well-defined scope and outcomes (pass/fail, hit/miss, and so forth), well-established criteria for success, and restricted implementation. Common use cases include in-scene text extraction (DL-based optical character recognition [OCR]) for process automation; visual quality and conformity inspections for discrete manufacturing, logistics, and construction; crowd behavior, social distancing, missing child search, and criminal detection for public safety and law enforcement; and so on.

- **Vision AI for end-user experience**. In this category, vision AI is used to achieve less intrusive or more differentiated services and offerings for customers and end users at scale. The adoption drivers of these use cases are typically not only about productivity but also the user's broader digital experience. The ongoing COVID-19 pandemic has also accelerated the adoption of use cases in this category. It follows that buying organizations mostly look out for performance indicators, such as the scope and speed of end users adopting and sharing these experiences. The scope of adoption is less predictable, making the software service's capability in latency and scalability more important. Such experience use cases often trigger innovations within the larger ecosystem. Examples of use cases include identity authentication for customer onboarding or transaction; image and video content annotation, curation, search, and moderation for media and entertainment; video and three-dimensional (3D) image content augmentation and generation for media and entertainment; and so forth.
- **Vision AI for decision recommendation.** Decisioning use cases tend to solve more cognitively demanding problems. Traditionally, they would have been performed heuristically by experts or executives based on cumulative experience and limited data. These use cases often require multiple AI and analytics technologies in addition to vision AI, such as search, forecasting, and optimization, to produce a nontrivial recommendation regarding an action or solution. It follows that solutioning is more complex, and the contribution to business outcomes may take more time to realize. Their functionality can be high value-add and can often lead to more distributed decision making within the enterprise. Such use cases include shelf and route analysis for retail store operations, behavior detection and analysis for online education and videoconferencing, medical image analysis for healthcare, and aerial image analysis for resource surveying, among others.

These categories are not exhaustive, but they span the space of major use cases and help organizations in search of vision AI solutions make more effective like-for-like comparisons. All participating vendors produce effective vision AI solutions; however, each has its own strengths and weakness, making a particular client challenge more or less appropriate. Hence, we discourage a simplistic reading of the charts, such as looking for the "one best vendor for all use cases", because there is no such thing.

Other key findings in this research include:

- **The significance of data gravity.** Not surprisingly, some customers indicated that their vendor selection decision was partly because the target application in which the vision AI service is incorporated already ran on the vendor cloud/enterprise platform. The choice of a machine learning (ML) development platform also influences the vendor selection process.
- **The value of solutioning and customization.** Because not all buyer organizations invest in in-house software development, having a readily usable solution is often more important than the specific technical competencies of software products. Abilities in model customization, solution integration and implementation, and continuous management of model quality also contribute significantly to a vendor's current success. A lot of these capabilities depend on vendors' strengths in their technical sales and partner networks.
- **Performance from edge to cloud.** Solution performance, including model quality, response latency, and service availability, is key to support customer-facing and mission-critical use cases, and many of these use cases run on edge devices (this trend will continue to grow). Vendors need to architect their models for edge-to-cloud deployment, incorporating flexibility in their resource usage and optimization.

- **A virtuous cycle of learning**. Many reference customers resonate that they can no longer work without the functions enabled by vision AI, and they have seen the model accuracy improve over time. This positive feedback loop of greater use, more data, and improved model capabilities, leading to even greater use, augers well for the future of vision AI capabilities and strengthens the competitive position of early movers and adopters in this space.
- **The importance of governance.** Open source libraries and projects of vision AI can be leveraged by all. However, there is a great divide between open source resources and enterprise-grade solutions, which is largely defined by the way these solutions handle data and model governance. For example, all major vendors make efforts to ensure data privacy protection, and data encryption is a default when persistence on the cloud platform is required.
- **Tailwinds in face-based authentication**. We have noted that face detection and recognition use cases are controversial in the United States and Europe but much less so in Asia/Pacific. There are, of course, international vendors that have chosen to exclude such capabilities, leaving the field open for regional players. At the same time, the ongoing COVID-19 pandemic has provided a tailwind to accelerate face-based authentication by enabling safer, touchless digital experiences for both consumers and gig economy workforce.

IDC MARKETSCAPE VENDOR INCLUSION CRITERIA

Eight vendors are included in this report. The criteria for their inclusion include:

- The vendor provides vision AI software platform products under independent product SKUs or as part of a general AI software platform.
- The platform product provides pretrained or customized models based on computer vision technologies, including scene detection, object detection, recognition, DL, event detection, and so forth, which customers can use as a software service. The platform product supports both still image and video processing. DL-based text extraction, more commonly known as DL-based OCR, is also included as an option.
- The platform product is based on the company's own IP.
- The platform product has generated software license revenue or consumption-based software revenue for at least 12 months in APEJ as of March 2021.

We have tried to capture the most significant vision AI players operating in the APEJ market, especially those based in Asia/Pacific locations.

ADVICE FOR TECHNOLOGY BUYERS

Vision AI will be a basic component of many future software applications and is expected to enhance productivity, customer experience (CX), decision making, and knowledge discovery across industries and geographies. It is already necessary to highlight the major vendors and more mature solutions in the market because early movers in this market tend to consolidate their strengths with greater access to training data, more iterations of algorithm variations, deeper understanding of operational contexts, such as constraints and noises, and more systematic approaches to work with solution partners in the ecosystem.

We recommend the following to technology buyers:

- Refer to vision AI use cases, as mentioned at the start of this report, to gather ideas about product and service innovations that can enhance productivity, experience, and decision making. Many of these use cases are entering the mainstream.
- Have a clear understanding about the three types of competitive spaces for vision AI use cases and closely associated capabilities to look out for as summarized in Table 1 in the next section.
- Be conscious of the ongoing challenges associated with vision AI solutions, such as data residency, data privacy, model drift, model bias, model robustness, and so on, and always maintain some human oversight over more critical or controversial aspects of the technology.
- Synergize the adoption of vision AI solutions with other technology investments, such as smart edges, application modernization, and business process automation (BPA).

TABLE 1

Core Capabilities Associated with Use Case Categories

Use Case Category	Characteristics	Closely Associated Capabilities
Productivity	▪ This targets frontline workers. ▪ This includes scenario-specific objects to be detected, classified, or recognized. ▪ The next-step actions are clearly given according to the original business process. ▪ These use cases typically have well-defined outcomes and established criteria for success, and they face restrictions in implementation. ▪ System availability and real-time performance are more important.	▪ Provision of model training using customers' own image data ▪ Architecture of a model for optimal edge deployment ▪ Model drift and feedback management ▪ Image data annotation ▪ Synthetic data generation ▪ Data encryption and protection
Experience	▪ This targets mostly consumers. ▪ This includes common objects to be detected, classified, or recognized, such as faces, product types, and ambience types. ▪ The next-step actions are embedded in a CX application or interface. ▪ Indicators of success are the scope and speed of end users adopting and sharing these experiences. ▪ Apart from system availability and latency, the robustness and scalability of such services are also important.	▪ Provision and deployment of pretrained models ▪ Fine-tuning of pretrained models for enhanced accuracy and robustness against noises and constraints ▪ Data encryption and protection ▪ Model fairness management ▪ Model drift and feedback management ▪ Image/Video data repository
Decisioning	▪ This targets business users and, often, team leads, managers, and executives.	▪ Provision of model training using customers' own image data

TABLE 1

Core Capabilities Associated with Use Case Categories

Use Case Category	Characteristics	Closely Associated Capabilities
	▪ The next-step actions require a separate engine to predict and recommend. ▪ The contribution to business outcomes may take more time to realize. ▪ These use cases often lead to more distributed decision making within the enterprise. ▪ System availability and real-time performance are less important.	▪ Complex solutioning that involves multiple data science building blocks ▪ Data integration and management ▪ Image data annotation ▪ Model drift and feedback management ▪ Data encryption and protection

Source: IDC, 2021

FEATURED VENDOR PROFILE

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

Google

Google is positioned as a Leader in this IDC MarketScape: APEJ Vision AI Software Platform 2021 Vendor Assessment study.

Google provides vision AI capabilities through products such as Cloud Vision Application Programming Interface (API), Vision API Product Search, AutoML Vision, AutoML Video Intelligence, and AutoML Vision Edge as part of its recently rebranded Vertex AI platform. They are referred to as "Google products" for the rest of this document. Google's vision AI products were first released in 2017.

Google products have been adopted by regional customers, including FIH Mobile (telecommunications, Hong Kong), Searce Technologies (technology consulting, India), Bank Rakyat Indonesia (BRI) (financial services, Indonesia), Ananda Development (construction, Thailand), Kia Motors (manufacturing, South Korea), Sport Singapore (government, Singapore), LG CNS (IT services, South Korea), and GIC (financial services, Singapore), among others.

Strengths

Google's strengths include:

- **Core capability categories.** Google has similar presence in both competitive spaces of **experience** and **productivity**. Deployed use cases include building and facility inspection for real estate development and management, optical defect inspection for manufacturing, digital shelf for retail, OCR for intelligent process automation (IPA), image-based product search for

ecommerce and retail business, automated ID authentication for financial services, image-based manual search for consumer products, and augmented reality (AR) for consumer experience, among others.

- **Closely associated capabilities for productivity.** AutoML Vision provides an automated training console for customers to leverage their own image sets. Customers can start with a relatively small number of training images, with options to balance model accuracy and performance latency, to specify data encryption methods and indicate a stop threshold to avoid the overuse of compute resource at the training stage. The company's AutoML capabilities are empowered by neural architecture search (NAS) and supported by automated data labeling services.
- **Closely associated capabilities for experience.** AutoML Vision Edge simplifies mobile device deployment as required in consumer-facing use cases. Google products cover a wide range of pretrained models, including common accessories, brands and logos, flora and fauna, vehicles and license plates, explicit content, landmarks, and a wide variety of languages for OCR. In addition, it covers explainable AI services.
- **Regional availability and direct sales and service.** Google products are provisioned on public cloud, which are available for customers in many APEJ locations. Google Cloud has recently announced additional availability regions in Melbourne (Australia) and New Delhi (India). Google already has direct sales and service support in most APEJ locations. For Vietnam, the sales and service team sits in Singapore. Google provides onboarding, training, and end-to-end professional services for large accounts and/or those requiring customized solutions. Google plans to expand their direct sales and service presence in APEJ.
- **Partner network.** Apart from direct sales, Google products go to the market with global partners, such as Accenture, Alteryx, Cisco, Deloitte, Intel, KPMG, SAP, and UiPath. It also works with many regional/local partners, including Aliz, Ankercloud, Brio, CloudCover, CloudMile, Cloocus, Contino, Databricks, Datacom Group, Riley Datalabs, Devoteam, Fronde, Infofabrica/Cloud Kinetics (CK) Intelia, Kasna, Katana1, Larsen & Toubro Infotech (LTI), Max Kelsen, Metrodata Electronics, Megazone Cloud, MediaAgility, Niveus Solutions, Pluto7, Quantiphi, Searce Technologies, Servian, Shine Solutions Group, SoftServe, Thinking Machine Systems, Thoughtworks, Tech Mahindra, and Trax, among others. Google plans to continue strengthening its partner networks in India, Australia and New Zealand (ANZ), North Asia, and Southeast Asia.
- **Product strategy.** Google continues to strategize product development around its AutoML capabilities that primarily support use cases in **productivity** and **experience** categories. For productivity use cases, Google prioritizes synthetic data generation and functionalities to support edge devices, ranging from drones, and robotics to autonomous vehicles. There is also the continued emphasis on the use of NAS to allow customers to identify a best-model architecture. For experience use cases, Google prioritizes media metadata management and search for companies to make use of its images and videos assets better.
- **Growth.** Data-wise, as one of the very large cloud platform providers in APEJ, Google benefits from the effect of data gravity. Thought leadership-wise, Google emphasizes responsible AI to ensure its users' own control of their data and the enhanced transparency of the overall data-to-model process. Engagement-wise, Google Developer Groups and Google Developer Student Clubs are active in this region to engage with the regional developer community.
- **Research and innovation.** Google has a dedicated research lab for AI/ML in most Google office locations in APEJ. These labs work closely with the Google Cloud India Developer Center to translate research works for the global market.

Challenges

Google plays relatively less in the decisioning space. The company is also evolving its horizontal capabilities to address the unique needs of different industries.

Considerations

Consider Google when:

- The targeted use cases fall in the spaces of productivity and experience.
- Model optimization for consumption on edge and mobile devices is considered a priority.
- Flexible ways of cost control are required.
- Composite capabilities for AI, data management, and cloud are required.

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 or 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 (GTM) plans for the next three to five years.

The size of the individual vendor markers in the IDC MarketScape represent the market share of each individual vendor within the specific market segment being assessed. For this IDC MarketScape, vendor size was partially determined by IDC's 2020 Software Tracker, which represents an estimate of each vendor's 2020 software revenue. Because not all vendors have vision AI as an independent SKU to report revenue, the revenue from the general AI software platform is used as a proxy and subsequently put into four t-shirt size categories: very large, large, medium, and small.

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

The AI software services market is divided into three submarkets that handle different aspects of unstructured information analysis and processing: text and audio AI, image and video AI, and document understanding AI. An extended reading about the market definition can be found in *IDC's Worldwide Software Taxonomy, 2021* (IDC #US47588620, April 2021). This study looks primarily at the image and video AI submarket and, supplementally, the document understanding AI submarket using the term of vision AI. It includes computer vision technologies that use DL techniques to process, understand, and extract information from digital images or videos.

The elements of this submarket include scene reconstruction, object detection and recognition, pose and gesture recognition, image annotation, text extraction, video tracking, and so forth using DL neural network algorithms.

To cater to the actual delivery of vision AI software services, we have included the delivery of both pretrained vision models and customized models based on the user's own image sets. These models can then be deployed or integrated in other software solutions to process images and videos in the targeted workflows to detect, classify, or recognize content, object, face, or activity in the context of front-end user interaction, middle-desk analytics, or back-end metadata management. Vision AI services are usually provided as part of a general-purpose AI software platform. The output is primarily used by software developers in the form of APIs or system development kits (SDKs), allowing various types of integration and deployment.

LEARN MORE

Related Research

- *Tackling Artificial Intelligence Solutions' Trust Issues* (IDC #AP47386521, June 2021)
- *Asia/Pacific (Excluding Japan) Artificial Intelligence Applications Spending Forecast, 2019-2024* (IDC #AP46313020, May 2021)
- *IDC's Worldwide Software Taxonomy, 2021* (IDC #US47588620, April 2021)
- *IDC MaturityScape Benchmark: Artificial Intelligence in Asia/Pacific (Excluding Japan), 2021* (IDC #AP47369521, March 2021)

Synopsis

This IDC MarketScape provides an assessment of vision artificial intelligence (AI) software platform service vendors, covering multiple Asia/Pacific (excluding Japan) (APEJ) locations and discussing the important success factors for companies looking to leverage vision AI for improved productivity, user experience (UX), and decision recommendation.

"Vision AI is one of the emerging technology markets," says Christopher Lee Marshall, associate VP, AI and analytics strategies, IDC Asia/Pacific. "It is critical to watch major vendors and more mature market solutions because the early movers tend to consolidate their strengths with greater access to training data, more iterations of algorithm variations, deeper understanding of the operation contexts that are inclusive of constraints and noises, and more systematic approaches to work with solution partners in the ecosystem," he adds.

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