Market Forecast

Worldwide Artificial Intelligence Software Forecast, 2023–2027

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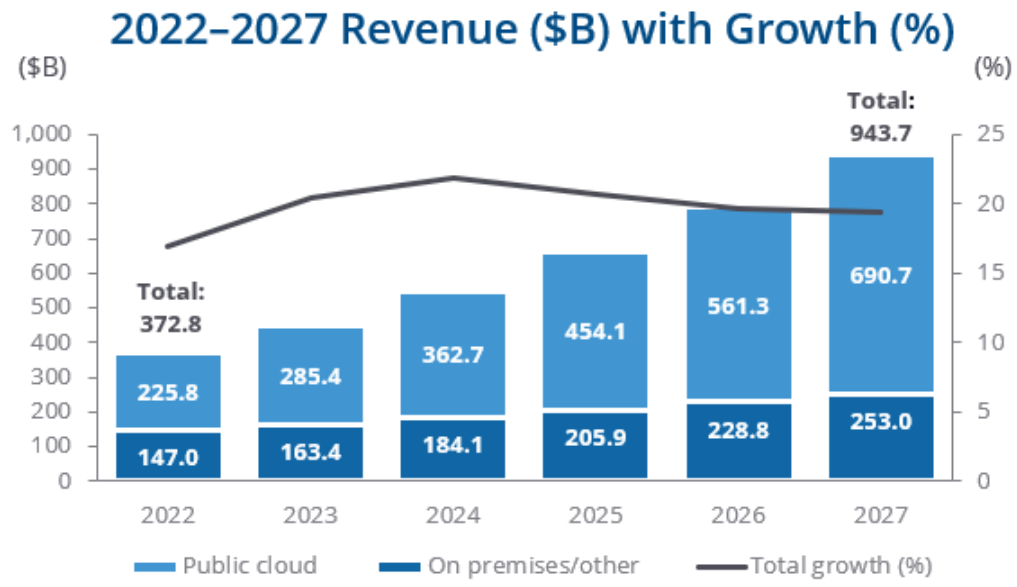
IDC MARKET FORECAST FIGURE

FIGURE 1

Worldwide Artificial Intelligence Software Revenue Snapshot



Selected Segment Growth Rate

- On premises/other CAGR 11.5%
- Public cloud CAGR 25.1%

Total Market CAGR

20.4%

Note: Chart legend should be read from left to right.

Source: IDC, 2023

September 2023, IDC #US50027023

EXECUTIVE SUMMARY

IDC predicts the worldwide artificial intelligence (AI) software market will grow from $372.8 billion in 2022 to $943.7 billion in 2027 at a compound annual growth rate (CAGR) of 20.4%. The projected growth of the global AI software market is a reflection of the expanding recognition and adoption of AI across industries.

IDC's AI software market is made up of AI platforms, AI applications, AI systems infrastructure software (SIS), and AI application development and deployment (AD&D) software (excluding AI platforms).

Note that this forecast document does not include native generative AI platforms as they have not yet been integrated into IDC's Worldwide Semiannual Software Tracker. In the interim, you can reference this asset for insights on the generative AI platforms software market (see *Generative AI Platforms and Applications: Market Trends and Forecast, 2Q23,* IDC #US50700423, May 2023).

AI is pushing things to a whole new level. AI-powered applications have demonstrated their utility in a variety of industries, enabling businesses to streamline operations, boost productivity, and achieve superior results. From healthcare to finance, manufacturing to retail, AI is transforming traditional practices and paving the way for more efficient operations. Continuous advancements in AI capabilities are a key factor in this growth's exponential nature. AI technology has evolved swiftly over the years due to continuous research and development efforts.

Organizations are using more advanced algorithms, machine learning models, and deep neural networks than ever before, helping them to accurately evaluate massive datasets and enabling them to achieve unprecedented levels of efficiency by leveraging these AI capabilities.

IDC's *Industry AI Path Survey* provides valuable insight into the preferences of businesses with regard to adopting AI solutions. In the next 12 months, approximately 32% of respondents believe that organizations will prefer to buy AI software from a vendor or use in-house support alongside vendor-supplied AI software for specific use cases or application areas. This indicates a growing demand for AI solutions and highlights the need for customized approaches based on individual business requirements. Furthermore, as more and more AI start-ups emerge in the market, it becomes evident that this trend is gaining momentum. The rise of these start-ups brings fresh ideas and innovative solutions to the table, contributing to further advancements in artificial intelligence. It's clear that organizations are recognizing the potential benefits of generative AI and are willing to allocate a significant portion of their budget toward this field.

According to respondents in the same survey mentioned previously, approximately 25% of their overall technology spending will be dedicated specifically to AI within the next 12 months. This demonstrates a strong belief in its transformative power and its ability to drive future growth.

In 2022, generative AI made significant strides, demonstrating its potential in numerous domains. It demonstrated significant progress in natural language processing, image generation, and even music composition. The ability of technology to produce highly realistic and coherent outputs had a lasting impact on industries, such as the creative arts, content creation, and customer service.

On the responsible AI front, ethical considerations are crucial as AI technologies advance, with concerns such as privacy, data security, algorithmic bias, and transparency. Data quality and availability are crucial for successful AI deployment, but organizations often face issues such as

incomplete or biased data sets. Governments are working on establishing regulations for AI technologies, and organizations may face challenges in navigating evolving frameworks related to AI governance, data protection, algorithmic accountability, and intellectual property rights.

This IDC study presents a forecast of the worldwide artificial intelligence (AI) software market for 2023–2027.

"The momentum behind investments in AI and automation technologies remains unwavering despite economic uncertainty and shifting market dynamics. Businesses are realizing that utilizing cutting-edge technology is not only a strategic necessity but also a crucial factor in achieving long-term success. Despite potential challenges and risks, organizations are confident that adopting AI will continue to be crucial for future proofing their business operations and remaining ahead of the competition," says Raghunandhan Kuppuswamy, research manager, Artificial Intelligence and Automation Research with IDC's software market research and advisory practice.

ADVICE FOR TECHNOLOGY SUPPLIERS

- **Data management and governance:** Assist organizations in establishing strong data management and governance practices. This may involve the provision of AI-based software solutions that facilitate data cleansing, data integration, and data lineage monitoring. To ensure compliance with legal and ethical standards, vendors should also prioritize data privacy and security functions.
- **Model performance and optimization:** Assist organizations in optimizing AI models for enhanced performance and precision. Provide AI software tools that facilitate model fine-tuning, hyperparameter optimization, and automatic feature engineering. This will assist businesses in achieving improved outcomes and maximizing the value of their AI initiatives.
- **Scalability and integration:** Offer AI software that is scalable and simple to integrate with existing systems. When it comes to scaling AI initiatives and incorporating AI capabilities into workflows, businesses frequently face difficulties. Vendors can provide software frameworks and APIs that facilitate integration, thereby assuring a seamless transition and minimizing disruption.
- **Support and collaboration:** Offer companies ongoing support and opportunities for collaboration throughout their AI journey. This can involve access to a dedicated support team, user communities, and online forums where businesses can share knowledge, best practices, and troubleshooting advice. Collaboration with AI specialists can also aid businesses in overcoming specific obstacles and developing innovative solutions.
- **Ethical AI practices:** Promote responsible AI deployment and ethical AI practices. Assist businesses in comprehending and implementing ethical standards in their AI projects. This could entail incorporating fairness, transparency, and accountability into AI models and providing companies with tools to detect and mitigate bias.
- **Continuous innovation:** Continuously invest in R&D to remain ahead of AI's ever-changing challenges. The AI landscapes of businesses are constantly evolving, and vendors have to adapt their software solutions accordingly. By keeping abreast of the most recent AI advancements and addressing emergent challenges, vendors can offer valuable guidance and assistance to businesses.

MARKET FORECAST

The overall AI software market will grow to $943.7 billion in 2027 at a CAGR of 20.4%. Table 1 shows the AI software forecast by AI type – AI-centric and AI noncentric software. The differences are reflective of the rapid pace at which AI is being infused into existing software offerings and are AI noncentric software. In contrast, AI-centric software is the new breed of disruptive software where AI is central to the functioning of the software and will cease to exist if AI capabilities are withdrawn. Table 2 shows the AI software market breakdown by technology category. AI is pervasive and will be infused across the technology stack.

TABLE 1

Worldwide Artificial Intelligence Software Revenue by Type, 2022-2027 ($M)

	2022	2023	2024	2025	2026	2027	2022 Share (%)	2022–2027 CAGR (%)	2027 Share (%)
AI centric	64,039.4	83,044.3	109,582.4	144,579.5	190,582.6	250,806.4	17.2	31.4	26.6
AI noncentric	308,733.2	365,717.2	437,245.5	515,418.3	599,442.4	692,904.2	82.8	17.5	73.4
Total	372,772.6	448,761.6	546,827.9	659,997.8	790,025.0	943,710.6	100.0	20.4	100.0

Source: IDC's Worldwide Semiannual Artificial Intelligence Tracker, 2H22

TABLE 2

Worldwide Artificial Intelligence Software Revenue by Technology Category, 2022–2027 ($M)

	2022	2023	2024	2025	2026	2027	2022 Share (%)	2022–2027 CAGR (%)	2027 Share (%)
AI application development and deployment	50,623.6	65,215.8	85,932.4	112,799.5	146,892.6	188,299.3	13.6	30.0	20.0
AI applications	196,319.6	232,045.7	276,185.9	323,892.5	376,260.1	435,135.0	52.7	17.3	46.1
AI system infrastructure software	106,654.0	125,795.5	149,654.4	175,522.3	201,804.4	231,594.9	28.6	16.8	24.5
Artificial intelligence platforms	19,175.4	25,704.6	35,055.2	47,783.5	65,067.7	88,681.3	5.1	35.8	9.4
Total	372,772.6	448,761.6	546,827.9	659,997.8	790,025.0	943,710.6	100.0	20.4	100.0

Source: IDC's Worldwide Semiannual Artificial Intelligence Tracker, 2H22

AI AD&D Software

The AI AD&D technology category includes analytics and business intelligence software, data management, integration and orchestration, application development, software quality and life-cycle software, and application platforms. In the ever-evolving world of data management, AI-infused software has emerged as a game changer. These innovative solutions, which combine the power of artificial intelligence with robust data management capabilities, have seen remarkable success in 2022. Leading industry players such as Google, Microsoft, Oracle, Snowflake, and Salesforce have been at the forefront of this revolution. Their cutting-edge software offerings have not only transformed how organizations handle and analyze their data but also paved the way for enhanced efficiency, accuracy, and scalability in this critical domain.

AI Applications

Collaborative, content workflow and management, enterprise resource management (ERM), supply chain management, production and operations, engineering, and customer relationship management (CRM) applications are included in the AI application technology category. AI-centric software, workflow content management, and supply chain management performed well in 2022. In AI noncentric, content workflow management and CRM software performed well. On this market, companies such as OpenText, Microsoft, Hyland Software, and Adobe have performed well.

AI Platforms

Artificial intelligence platforms facilitate the development of artificial intelligence models and applications, such as intelligent assistants that can mimic human cognitive abilities. In 2022, AI life-cycle software and intelligent discovery knowledge software have performed well, providing essential tools and capabilities for data scientists, machine learning developers, and knowledge employees. These technologies enable them to accomplish efficiency and productivity at various stages of AI development and knowledge discovery. Their success reflects the growing demand for innovative solutions that facilitate experimentation, production deployments, and data retrieval in today's fast-paced technological environment. On this market, companies such as Microsoft, AWS, Google, and Palantir have performed well.

AI Systems Infrastructure Software

In 2022, the AI SIS technology category has shown strong performance due to its diverse applications and capabilities. This includes analytics, business intelligence software, data management, integration, orchestration, application development, software quality, life-cycle software, and application platforms. Growth of AI SIS can be attributed to the increasing demand for AI-powered solutions across industries, advancements in AI algorithms and computing power, and the integration of AI SIS technology with existing software systems. This integration allows organizations to derive valuable insights from vast amounts of data, making informed decisions and optimizing operations. Continuous investment in research and development within the AI SIS domain has fueled innovation and the introduction of new solutions. Overall, the strong performance of AI SIS technology in 2022 can be attributed to its versatility, increasing demand, technological advancements, and ongoing innovation efforts. On this market, companies such as Dynatrace, BMC, Microsoft, and Darktrace have performed well.

Table 3 shows the AI applications market breakdown by AI type (AI centric and AI noncentric) and technology category (AI CRM, AI ERM, and rest of AI applications).

TABLE 3

Worldwide Artificial Intelligence Applications Revenue by AI Type and Technology Category Detail, 2022–2027 ($M)

	2022	2023	2024	2025	2026	2027	2022 Share (%)	2022–2027 CAGR (%)	2027 Share (%)
AI centric									
AI content workflow and management applications	5,187.8	5,866.4	6,779.3	7,814.8	9,046.7	10,512.6	2.6	15.2	2.4
AI customer relationship management applications	6,097.3	7,437.0	9,125.9	11,110.0	13,438.2	16,036.7	3.1	21.3	3.7
AI enterprise resource management applications	3,887.5	4,879.3	6,239.9	7,976.5	10,210.4	13,038.5	2.0	27.4	3.0
Rest of AI applications	7,580.8	9,142.9	11,064.9	13,394.2	16,253.4	19,728.9	3.9	21.1	4.5
Subtotal	22,753.3	27,325.6	33,210.0	40,295.5	48,948.7	59,316.7	11.6	21.1	13.6
AI noncentric									
AI content workflow and management applications	66,352.7	73,453.4	82,590.7	92,372.5	102,756.4	114,000.5	33.8	11.4	26.2
AI customer relationship management applications	27,614.7	32,932.2	39,361.4	46,398.3	54,109.2	62,195.9	14.1	17.6	14.3
AI enterprise resource management applications	26,841.4	32,963.6	40,944.8	50,138.3	60,870.3	73,510.2	13.7	22.3	16.9
Rest of AI applications	52,757.5	65,370.9	80,079.0	94,688.0	109,575.5	126,111.7	26.9	19.0	29.0
Subtotal	173,566.3	204,720.1	242,975.9	283,597.1	327,311.4	375,818.3	88.4	16.7	86.4
Total	196,319.6	232,045.7	276,185.9	323,892.5	376,260.1	435,135.0	100.0	17.3	100.0

Source: IDC's Worldwide Semiannual Artificial Intelligence Tracker, 2H22

The following provides the AI applications breakdown by technology category:

- **AI CRM applications** will continue to develop at a CAGR of 21.3% between 2022 and 2027, due to the increasing demand for personalized customer experiences, targeted marketing strategies, and the vast quantity of customer data generated by a variety of sources. These applications analyze customer data using AI to gain insights and increase customer interaction. The automation capabilities of AI CRM applications streamline mundane tasks, allowing sales and marketing teams to concentrate on high-value tasks. Moreover, advancements in AI technologies, such as natural language processing and sentiment analysis, allow AI CRM applications to extract valuable insights from unstructured data, thereby addressing issues, enhancing products or services, and nurturing better customer relationships.
- **AI ERM applications** are anticipated to grow at a 27.4% CAGR between 2022 and 2027. This expansion is fueled by the increasing complexity of organizational operations, the demand for efficient resource management, sophisticated analytic capabilities, and the emphasis on risk management and compliance. AI ERM applications automate and optimize processes, resulting in increased operational efficiency, cost reductions, and improved decision making. In addition to generating valuable insights from large data sets, AI ERM applications enable businesses to make data-driven decisions and identify trends. AI ERM is anticipated to outpace CRM due to its broader applicability and impact in resource management and operational optimization.
- Under the **rest of AI applications category**, including collaborative markets, content workflow and management, supply chain management, production, and operations and engineering is expected to grow. AI technology can enhance teamwork, communication, and productivity in collaborative markets, while content workflow and management can streamline processes and deliver personalized experiences. AI tools such as predictive analytics, demand forecasting, and intelligent inventory management optimize supply chain management. Production and operations can benefit from AI systems that automate repetitive processes and enable predictive maintenance. The engineering sector can benefit from AI applications in design optimization, simulation modeling, and predictive maintenance. As businesses recognize the transformative potential of AI, the market is expected to experience significant growth.

Table 4 shows the AI software market breakdown by three macro regions. The regional differences are characterized by differences in significant technology vendor presence versus start-ups that have minimal revenue. Regulations are a critical differentiator. While Europe has the strictest stance on fair and ethical use of data and AI, the United States is operating more on guidelines, and there is lack of regulations in APAC; for example, China, which has the second-largest number of AI leaders in APAC behind Japan, has lax privacy regulations, allowing China-based businesses to access large data pools to train their AI algorithms.

TABLE 4

Worldwide Artificial Intelligence Software Revenue by Region, 2022-2027 ($M)

	2022	2023	2024	2025	2026	2027	2022 Share (%)	2022–2027 CAGR (%)	2027 Share (%)
Americas	235,862.3	288,560.9	352,725.8	426,236.8	509,325.1	607,279.1	63.3	20.8	64.4
Asia/Pacific	47,322.4	54,994.6	66,917.3	80,571.5	95,970.0	113,655.7	12.7	19.2	12.0
EMEA	89,588.0	105,206.1	127,184.8	153,189.5	184,729.8	222,775.7	24.0	20.0	23.6
Total	372,772.6	448,761.6	546,827.9	659,997.8	790,025.0	943,710.6	100.0	20.4	100.0

Source: IDC's Worldwide Semiannual Artificial Intelligence Tracker, 2H22

Table 5 shows the AI software market breakdown by deployment type. Public cloud platforms offer advanced machine learning frameworks, prebuilt models, and data management tools to help design and deploy AI applications. Public cloud deployments help enterprises maximize AI technology's potential by seamlessly integrating with other cloud services. Public cloud use will rise as firms realize its agility, cost-effectiveness, scalability, and collaborative benefits.

TABLE 5

Worldwide Artificial Intelligence Software Revenue by Deployment Type, 2022-2027 ($M)

	2022	2023	2024	2025	2026	2027	2022 Share (%)	2022–2027 CAGR (%)	2027 Share (%)
On premises/other	147,002.4	163,355.5	184,085.9	205,867.8	228,756.7	253,032.2	39.4	11.5	26.8
Public cloud	225,770.2	285,406.1	362,742.1	454,130.0	561,268.2	690,678.3	60.6	25.1	73.2
Total	372,772.6	448,761.6	546,827.9	659,997.8	790,025.0	943,710.6	100.0	20.4	100.0

Source: IDC's Worldwide Semiannual Artificial Intelligence Tracker, 2H22

MARKET CONTEXT

In 2022, the AI software market was made up of several large vendors as well as numerous start-ups jumping into the AI software market. A broad set of incumbents are embedding AI/ML capabilities in their existing software or are offering standalone AI business services or solutions and are factored in the 2023–2027 forecast period. Incumbents and established players include Microsoft, Adobe, Google, VMware, Oracle, Workday, AWS, IBM, Zoom, Synopsys, Splunk, and ServiceNow. Some of them lead in the AI centric applications, while others have the majority play in the AI noncentric applications.

Some of the companies that had good growth in 2022 include Snowflake, Hyland Software, Acquia, and iManage.

Drivers and Inhibitors

Drivers

Meaningful Intelligence — Differentiated Decision Power

- **Assumption:** Every organization's strategic capability now revolves around data. It is now expected to facilitate better decisions, increase organizational efficiency, and enhance organizational knowledge. To keep up with the rate of change, real-time insight is a critical component of differentiated decision power. Ethical data strategies require a balance between the potential of data and the utmost respect for the privacy and preferences of individuals. Speed and experimentation are also essential for meaningful intelligence, making digital twins a commonplace strategy.
- **Impact:** Data literacy and democratization have shifted the organizational emphasis from the simple distribution of data to the discovery and application of genuinely differentiated decision-making power. Metadata is a crucial instrument for decision support, providing context through workflow links and automation. Data optimization and democratization are fundamental strategies for mitigating skills constraints, generating data-driven decision value, and achieving a substantial competitive advantage.

Digital Business — A Stepping Stone to the Future Enterprise

- **Assumption:** Digital business is the next stage for the enterprise of the future, with CEOs predicting that digital product and service revenue will increase from 30% to 40% by 2027. Digital businesses are committed to a digital-first strategy that generates value and growth by aligning all business and IT landscape components with digital workflows. Regulatory factors are also driving the concentration on digital business, where the use of data and trusted engagement with automation drives new risk mitigation investments.
- **Impact:** Businesses that are launched or relaunched in the digital universe gain measurable operational and competitive advantages, spurring digital-native considerations throughout most industries. Digital business is integrating business and digital strategy, where technology serves as both a common denominator and a dominant driver of value and growth.

Inhibitors

Economic Instability — Flurry, Snowball, or Avalanche?

- **Assumption:** After nearly 15 years of low interest rates and inexpensive corporate debt, the global economy is experiencing a fundamental transition. Along with the emergence of inflation, interest rates have increased. Organizations are reorienting themselves to use technology as a hedge against inflation, but the rising costs of essential components are likely to exceed budgets.

- **Impact:** Labor market inequities, protectionism, and widening digital, education, and skills disparities exacerbate the digital divide, further separating relative "winners" and "losers." The disparities are exacerbated by each new crisis.

Global Supply Shock — Refocusing on Multisource and Resilience

- **Assumption:** Policymakers and business leaders are struggling to find an appropriate new equilibrium between global and local solutions, shortening supply chains and diversifying to reduce risk in the current global business environment. Capital is being redistributed to resolve component shortages due to concerns over national economic security, inflation and interest rates, data sovereignty, cybersecurity, and climate change.
- **Impact:** Strategies aim to reconfigure supply in the direction of "profitable proximity," with a greater emphasis on self-reliance, partner ecosystems, and cost management. Multisource is the supply-side strategy for distributing risk and dependence across multiple suppliers, providers, and vendors as the difficulties of sensing and forecasting demand increase.

Significant Market Developments

Over the past year, several trends have begun to exert pressure and changes on the AI software market. AI adoption is past the tipping point. The major developments in the artificial intelligence applications market driving and supporting the demand include:

- **Low code/no code:** Reduce development and deployment times and improve communication and coordination between data scientists and business analysts by using low-code/no-code solutions. In addition to being adaptable to a variety of use scenarios, the solution should be easy to incorporate into the larger AI risk management and governance infrastructure of the enterprise.
- **Embedded AI applications/solutions:** To add an extra layer of intelligence to their technology stacks, major technology providers are incorporating AI. This is crucial in assisting firms in reducing the time they take to realize value and filling the resulting skill gap. However, the dependability of AI systems depends on the embedded AI applications/solutions being technically sound and correct. The algorithms and data sets utilized during development should be tested, inspected, and certified as part of the conformity assessment for AI applications. In addition, there should be straightforward procedures for businesses to tailor it to their specific needs and meet the organizations' responsible AI needs.
- **AI-infused operations:** AI-infused processes will be mature, trusted, and proven to drive positive results by 2026. 75% of large organizations will rely on AI-infused processes to shift to digital-first operations. AI will streamline supply chains, improve product quality, and transform the healthcare industry. IT departments will need to work closely with line-of-business leads to add new AI-infused use cases. Digital infrastructure to support AI-infused processes may have specific requirements, such as GPUs or HPC, location, and environment considerations.
- **Generative AI:** ChatGPT has put generative AI on the radar for businesses and has the potential for maximum disruption and transformation of work and creativity across horizontal business functions and industries.
- **Multimodal AI:** Multimodal AI is a new AI paradigm in which diverse data types (such as image, text, speech, video, and numerical data) are combined with multiple intelligence processing algorithms to achieve greater performance. Humans perceive the world as multimodal, whereas AI applications and solutions are typically unimodal today. Multimodal AI posits that by utilizing a variety of data modalities, we are able to better understand and analyze information dynamically, thereby simulating human intelligence. Large, multimodal models that integrate vision and text will dominate in 2021. Multimodal AI typically outperforms

single-modal AI in a variety of real-world problems and demonstrates promise for a wide range of real-world applications and use cases. There are numerous strategies for combining data from various modalities to improve the output of a multimodal AI solution, but it can be difficult to ensure data fusion and quality.

- **Sustainable AI:** AI has made significant progress in assisting in the resolution of some of the world's most pressing issues, including disease identification, assisted transportation, and accessibility solutions. Unfortunately, the quantification of the financial and energy costs required to train, validate, deploy, utilize, manage, and update today's AI and ML models is an often overlooked aspect of the AI life cycle. To support a greater number of tasks and/or improve the model's overall accuracy, AI models require an enormous number of layers, and these costs will become a significant issue in the future. Organizations that develop and deploy AI at scale should consider how to incorporate this cost-benefit analysis into AI governance. The benefits of doing so extend beyond the further prioritization of use cases through the lens of a profit-and-loss statement, as it assists consumers, businesses, and even governments in understanding the true carbon impact of technology.

Changes from Prior Forecast

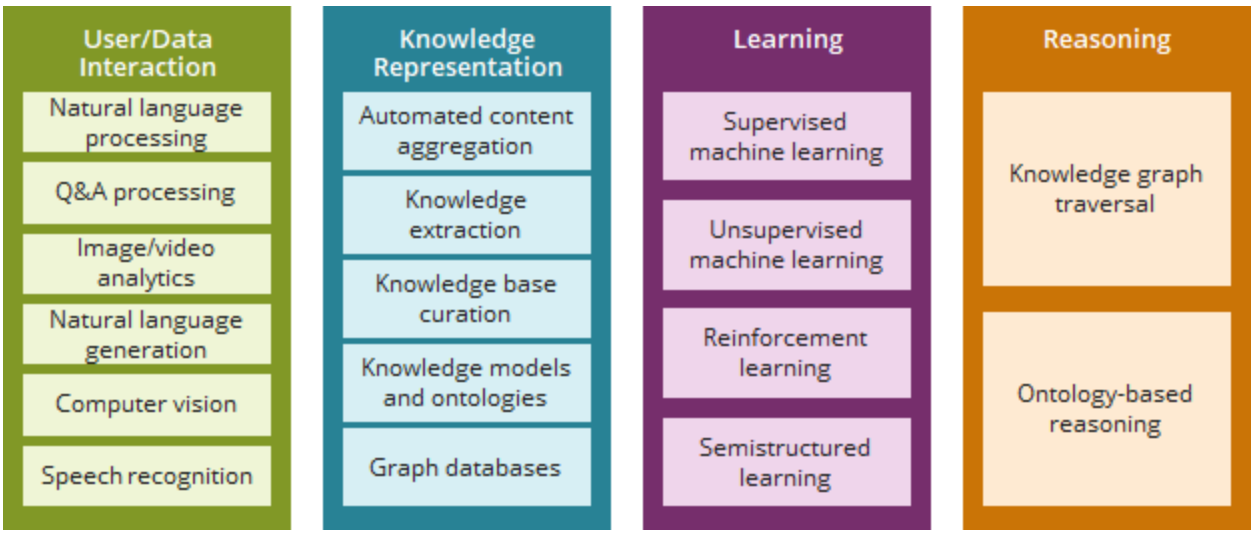
A five-year forecast was last published in *Worldwide Artificial Intelligence Software Forecast, 2022-2026* (IDC #US49571222, August 2022). The change in the forecast is due to the addition of two new technology categories: AI AD&D software and AI SIS.

The AI tracker has added two new technology categories: AI SIS and AI AD&D software (excluding AI platforms).

In the past, three of the four sets of AI software technologies were required to qualify as AI-centric software (see Figure 2). Now, it must have some sort of machine learning and either some sort of user/data interaction or knowledge representation capability.

FIGURE 2

Artificial Intelligence Software Technologies



Source: IDC, 2023

Table 6 and Figure 3 compare the previous forecast with the current forecast.

TABLE 6

Worldwide Artificial Intelligence Software Revenue, 2019-2027: Comparison of August 2022 and September 2023 Forecasts ($M)

	2019	2020	2021	2022	2023	2024	2025	2026	2027
September 2023 forecast	224,725.0	264,715.0	318,682.0	372,772.6	448,761.6	546,827.9	659,997.8	790,025.0	943,710.6
August 2022 forecast	243,712.1	283,797.7	340,409.6	397,095.0	472,023.3	561,421.3	666,382.9	791,463.8	NA

Notes:

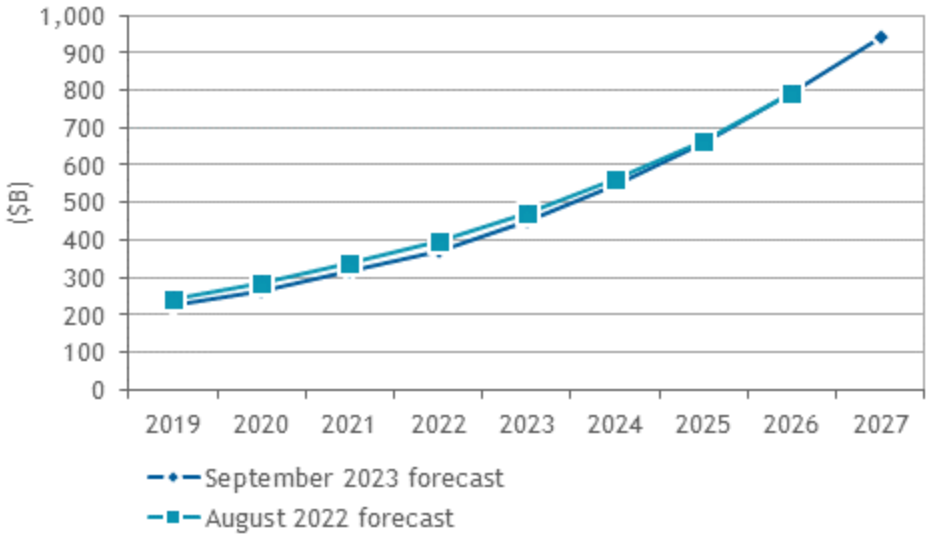
See *Worldwide Artificial Intelligence Software Forecast, 2022-2026* (IDC #US49571222, August 2022) for prior forecast.

Historical market values presented here are as published in prior IDC documents based on the market taxonomies and current U.S. dollar exchange rates existing at the time the data was originally published. For more details, see the Methodology section.

Source: IDC's Worldwide Semiannual Artificial Intelligence Tracker, 2H22

FIGURE 3

Worldwide Artificial Intelligence Software Revenue, 2019-2027: Comparison of August 2022 and September 2023 Forecasts



Source: IDC, 2023

MARKET DEFINITION

AI Software

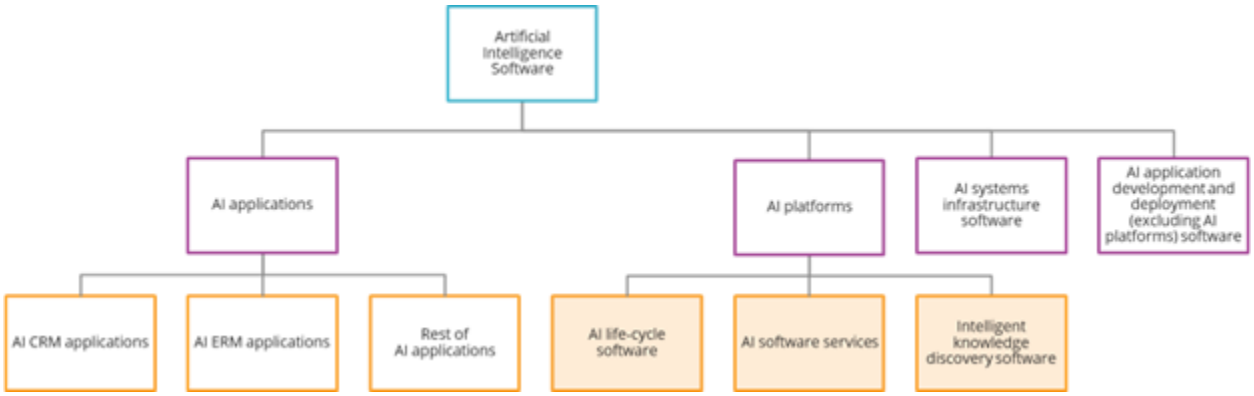
Artificial intelligence software (AI) utilizes a set of technologies that include machine learning, conversational AI, natural language processing (NLP), computer vision, and other technologies to automate processes, answer questions, discover insights, optimize operations, and provide recommendations. These systems hypothesize and formulate possible answers based on available evidence, can be trained through the ingestion of vast amounts of content, and automatically adapt and learn from their mistakes and failures.

IDC tracks and reports AI software technology categories and associated technology category details (see Figure 4).

Note that this document focuses on AI applications while providing top-line numbers for all the four markets: AI platforms, AI applications, AI systems infrastructure software (SIS), and AI application development and deployment (AD&D) software (excluding the AI platforms market), along with the top-line overall AI software market.

FIGURE 4

Artificial Intelligence Software Technology Categories and Details



Source: IDC, 2023

AI Applications

The AI applications market includes process and industry applications that automatically learn, discover, and make recommendations or predictions. The functionality for AI applications may span a variety of areas including finance, sales, risk management, R&D, procurement, HR, marketing, and performance management. Anti-money laundering, patient outcomes, telco churn, retail pricing, asset management, and logistics are just some examples of industry AI applications. AI applications learn about us, our likes, our dislikes, and what we do and then use that learning to answer questions, predict actions, and make recommendations. These applications use natural language processing, search, and machine learning to provide expert assistance in a wide range of areas.

AI applications can be AI-centric applications or AI noncentric applications:

- **AI-centric applications** are AI applications or modules where AI technologies are central and critical to the function of the application, and if you eliminate the AI technologies, the application will cease to exist. They need to have some sort of machine learning (supervised, unsupervised, reinforcement, etc.) and either some sort of user/data interaction (NLP/NLG, Q&A processing, image/video analytics, computer vision, etc.) or knowledge representation capability. AI applications have an SKU, and their revenue can be tracked and reported. They may sometimes be bought only in conjunction with another business application (ERP, customer relationship management [CRM], supply chain management [SCM], HCM, etc.).
- **AI noncentric applications** are where AI is being infused/embedded into various business applications (ERP, CRM, SCM, HCM, etc.) – where AI technologies are integral to certain workflows of the application, but if those technologies were removed, the application would still be able to function. They have either machine learning or user/data interaction or knowledge representation capability. Also, they do not have an SKU.

AI Platforms

Artificial intelligence platforms facilitate the development of artificial intelligence models and applications, including intelligent assistants that may mimic human cognitive abilities. The technology components of AI platforms include machine learning, deep learning, natural language processing, text analytics, rich media analytics, tagging, searching, categorization, clustering, hypothesis generation, question answering, visualization, filtering, alerting, and navigation. The AI platforms secondary market is made up of three functional markets: AI life-cycle software, AI software services, and intelligent knowledge discovery software (refer back to Figure 4).

AI SIS

AI systems infrastructure software includes AI-powered software solutions that provide the basic foundational layers of software that enable bare metal infrastructure hardware resources to host higher-level application development and deployment software and application software and provide the virtualization and management software used to configure, control, automate, and share the use of those resources across heterogeneous applications and user groups (e.g., AI-powered IT service management, AI-powered IT operations management, and network management).

AI AD&D Software

AI application development and deployment software represents AI-powered tools and platforms used primarily by developers to build, test, and deploy software as well as process, integrate, govern, and analyze data (e.g., AI-powered application development, AI-powered data management, AI-powered applications platforms, and AI-powered RPA). This market excludes the AI platforms market.

Technology Group Detail

Technology group detail covers the functional markets as it relates to IDC's software taxonomy (see *IDC's Worldwide Software Taxonomy, 2023,* IDC #US50513623, April 2023). For example, for the AI applications segment, the functional markets reported at the granular level are the AI customer relationship management and AI enterprise resource management markets. The rest of the functional markets – collaborative, content workflow and management, supply chain management, production, and operations and engineering – are grouped under the rest of AI applications category.

METHODOLOGY

The IDC artificial intelligence software market sizing and forecasts are presented in terms of commercial software revenue. The source for this information is IDC's 2H22 Worldwide Semiannual Artificial Intelligence Systems Tracker, which is a comprehensive global data tool that details vendor share and forecast information on all major artificial intelligence markets and geographies. It is an essential guidance that enables companies to effectively plan and deploy resources and improve market competitiveness. The information in the tracker allows companies to benchmark their performance against competition, reference market share growth data as a KPI to sales performance, publicize their top spots and growth success stories, understand the presence and product scope of their competition, set sales quotas through IDC forecast information, and review potential acquisitions or partnership.

The AI tracker methodology is top down and bottom up:

- Vendor modeling is based on a variety of sources, ranging from direct guidance to secondary research including SEC filings and services contracts database.
- It involves collaboration with IDC regional and local analysts on vendor data reconciliation.
- Data sources include interviews and survey results, which are incorporated into market size and forecasts.
- Other factors include revenue recognition and published filings:
- Revenue recognition and accounting conventions for services and products vary by company.
- Accounting policies provide the basis by which revenue is recorded; IDC relies on the integrity and trustworthiness of the reported financial data.

Note: All numbers in this document may not be exact due to rounding.

Historical and Forecast Market Values and Exchange Rates

Historical market values presented here are as published in prior IDC documents based on the market taxonomies and current U.S. dollar exchange rates existing at the time the data was originally published. For markets other than the United States, these as-published values are therefore based on a different exchange rate each year.

Forecast market values are built using a bottom-up approach in which our country analysts develop forecasts in local currencies. These local currency forecasts are converted into U.S. dollars to produce a forecast in one consistent currency. The latest quarterly exchange rate is applied to the forecast period (2023–2027) to better reflect the impact of the most recent known economic situation in each country. In this document, the quarterly exchange rates used are based on the average quarterly exchange rates from October 1 to December 31, 2022. The data represented in this document uses this methodology, unless otherwise stated, and is termed *current currency.*

The data in this document is based on IDC's Worldwide Semiannual Software Tracker. IDC tracks historical vendor revenue and develops forecasts in 53 individual countries and subregions. Because of the detailed geographical granularity of the underlying data, we have also provided a *constant currency* revenue estimate for the total worldwide market in the years reported in this document. Constant currency eliminates exchange rate fluctuation effects by applying the same exchange rate to all historical and forecast time periods. Note that IDC relies on company and market models built quarterly.

See Table 7 for a description of the average exchange rates applied to the local currency historical and forecast estimates in the current currency and constant currency revenue numbers reported.

TABLE 7

Exchange Rates, 2018-2027

	2018	2019	2020	2021	2022	2023–2027
June 2022 forecast						
Current USD	1H18 + 2H18	1H19 + 2H19	1H20 + 2H20	1H21 + 2H21	4Q21	4Q21
Constant USD	4Q21	4Q21	4Q21	4Q21	4Q21	4Q21
June 2023 forecast						
Current USD	1H18 + 2H18	1H19 + 2H19	1H20 + 2H20	1H21 + 2H21	1H22 + 2H22	4Q22
Constant USD	4Q22	4Q22	4Q22	4Q22	4Q22	4Q22

Source: IDC, June 2023

RELATED RESEARCH

- *Worldwide Artificial Intelligence Platforms Software Forecast, 2023-2027* (IDC #US51044723, July 2023)
- *Unlocking Business Success with Generative AI* (IDC #US50789223, June 2023)
- *IDC's Macroeconomic Forecast Assumptions, April 2023* (IDC #US50604423, May 2023)
- *Worldwide Artificial Intelligence Software Forecast, 2022-2026* (IDC #US49571222, August 2022)
- *AI StrategiesView 2022: Executive Summary* (IDC #US49506222, July 2022)
- *IDC Perspective: The Business Value of Natural Language Processing Applications in Enterprises* (IDC #US49070222, May 2022)
- *IDC PeerScape: Artificial Intelligence Practices for Moving Beyond Pilots to Achieve Enterprise AI at Scale* (IDC #US47534621, March 2021)

About IDC

International Data Corporation (IDC) is the premier global provider of market intelligence, advisory services, and events for the information technology, telecommunications, and consumer technology markets. With more than 1,300 analysts worldwide, IDC offers global, regional, and local expertise on technology, IT benchmarking and sourcing, and industry opportunities and trends in over 110 countries. IDC's analysis and insight helps IT professionals, business executives, and the investment community to make fact-based technology decisions and to achieve their key business objectives. Founded in 1964, IDC is a wholly owned subsidiary of International Data Group (IDG, Inc.).

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