SPOTLIGHT

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Artificial intelligence and machine learning technologies are transforming business processes and work in general. Building AI/ML applications is a significant effort for many organizations, which is why vendors are developing enterprise applications with embedded AI to deliver meaningful ROI for their customers.

Using Artificial Intelligence and Machine Learning to Drive Success

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Introduction

Organizations around the world are on digital transformation journeys to achieve various business goals. Such objectives may include the ability to provide differentiated customer experiences (CXs), launch new business models, or run businesses more efficiently. No matter the goal, the ability to harness data for insight is critical to successful digital transformation strategies.

IDC forecasts that by 2026, the Global DataSphere — a measure of all data created and replicated worldwide — will grow to 221ZB, representing a 2021–2026 CAGR of over 20%. As the amount of enterprise data grows significantly each year, organizations require tools that help them find the signals in the noise. As a result, IDC estimates that annual spending on artificial intelligence (AI) will exceed $300 billion by 2026.

AT A GLANCE

KEY STAT

According to IDC, annual spending on AI will exceed $300 billion by 2026.

WHAT'S IMPORTANT

Organizations need to harness AI to stay competitive in current and future market environments.

KEY TAKEAWAY

Organizations should look for enterprise applications and solutions that use AI and ML to provide differentiated results.

There are several reasons organizations are turning to tools such as machine learning (ML) and AI to help them become more intelligent enterprises. AI/ML can solve new types of problems — and more complex problems — because it can analyze a greater volume of data and new types of data faster than ever before. In addition, AI/ML brings a new level of capability within the enterprise by being able to predict events and prescribe the best next steps. Further, AI-based automation is changing the nature of work; leading companies increasingly leverage AI/ML to automate and augment human efforts in business processes. For example, in a recent worldwide survey of IT buyers, 36.8 % of organizations identified automating repetitive manual work as a priority for investment in 2023 (source: IDC's *Future Enterprise Resiliency and Spending Survey, Wave 8,* September 2022; n = 833 [NA = 259, AP = 370, Europe = 204]).

Definitions

For those new to AI, the terminology used can be the first challenge to overcome. What is the difference between AI, conversational AI, and machine learning, or are the terms interchangeable? In fact, they are related in a nuanced manner and support one another when used in concert. The topic warrants a discussion that is beyond the scope of this document. For this analysis, IDC defines the terms as follows:

- **Artificial intelligence (AI)** is the study and research of providing software and hardware that attempt to emulate a human being performing tasks that normally require human intelligence, such as visual perception, speech recognition, decision making, translation between languages, and potentially automation of functions.
- **Machine learning (ML)** is the process of using many types of data to create a statistical model that performs assorted functions without being programmed by a human. ML models are "trained" by various types of data (often lots of data). These models can classify and recommend answers/solutions to business problems as well as provide advisory and predictive capabilities.
- **Deep learning (DL)** is part of the broader family of machine learning methods based on artificial neural networks with representation learning. Learning can be supervised, semi-supervised, or unsupervised. These neural networks attempt to simulate the behavior of the human brain, allowing them to "learn" from large amounts of data.
- **Machine learning operations (MLOps)** technologies and processes help enterprise organizations overcome the aforementioned challenges. IDC's software taxonomy defines machine learning operations tools and technology as those that support model deployment, model management, and model monitoring. The key capabilities of an MLOps platform include model serving, model registry, model tracking, and model monitoring.
- **Conversational AI** software covers language and speech AI software and conversational AI solution development platforms. It includes ML-based tools and APIs for recognizing, understanding, and extracting value from text or using similar technologies to generate human-readable text. This also encompasses natural language processing (NLP) and ML translation as well as text clustering and categorization tools. Conversational AI also includes software for recognizing, identifying, and extracting information from audio, voice, and speech data; speech identification and recognition; and converting sounds into useful text.
- **Computer vision AI** software includes computer vision software services and development platforms that use AI and ML/DL techniques to process, understand, and extract information from digital images or videos. Image/video AI tasks include methods for acquiring, processing, analyzing, and understanding digital images and extraction of high-dimensional data to produce numerical or symbolic information (e.g., in the forms of decisions).

Benefits

Data lies at the heart of digital transformation projects. Most organizations have been collecting various sets of data for many years. However, they have been able to analyze the data only after it was stored rather than analyzing the data as it is produced. The ability to analyze historical data is foundational because it helps organizations understand what events happened, why specific events happened, and under which conditions the events are likely to happen again. In addition, these data sets are used to build and train ML models. However, historical data analysis alone does not give organizations the ability to react to events as they happen — or before they happen. Organizations that want to become more

predictive and proactive must be able to sense the signals being emitted within an environment in real time and have the right analytic models in place to decipher what those signals mean. This is where the value in the combined capabilities of the Internet of Things (IoT) and AI truly comes to life.

The combined capabilities of IoT, AI, and edge computing have unlocked the power of Edge AI, unleashing automation wherever it is needed. Think of IoT serving as a body of nerves that captures data on the current state of a thing, a process, or an environment. Now, imagine AI as the brain that analyzes that data and suggests the next best action based on the current or projected status of the thing, process, or environment. Edge computing then provides the right environment in which to operate that analysis or automation. Organizations can leverage this combination of sensing and analysis for a variety of business goals. Working with IoT, edge computing, and AI, businesses can:

- **Make better-informed decisions and plans.** When an organization understands what is happening or projected to happen in each situation, it can make an informed decision about the next best action. For example, logistics companies can use the combination of IoT and AI to figure out the most efficient routes to take and to offer real-time information to their customers about the location of trucks and the condition of the cargo within the truck. For instance, if a refrigeration unit were to fail within a truck, a logistics provider could use temperature sensors to learn about the problem and use an AI model to predict the condition of the cargo for each degree it diverts from the optimal temperature. This knowledge about the condition of the cargo at arrival will allow the logistics provider to know if it needs to send out another truck and would also allow the provider to alert the cargo recipient of any possible delays in receiving the goods, which may have farther-reaching effects within the supply chain.

- **Improve product quality/service.** The manufacturing industry has been a significant proponent of IoT, which is not surprising given that manufacturing companies can use IoT data to improve product designs as well as create more efficient factories, supply chains, and service organizations. The combination of IoT and AI can be leveraged on production lines to detect signals that indicate possible issues with product quality — and stop the production in real time as required. This capability also aids in reducing scrap, which can cost manufacturers millions of dollars each year, and it also helps them avoid shipping defective products to customers, which can negatively impact the bottom line. Manufacturers that service their products can also use IoT and AI to gain visibility into how their products are functioning in customer environments and to catch potential product failures before they happen, therefore providing predictive and prescriptive service to those customers.

- **Provide safer working environments.** In past IDC surveys, respondents have indicated that people-centric use cases are the top type of IoT projects. This makes sense because these use cases can run across a variety of industries. In the past, industrial organizations that required people to be around dangerous equipment or working conditions were most interested in leveraging IoT analytics for worker safety, a concern that grew due to the pandemic. In terms of assisting with worker safety, IoT devices can take in information about the status of things or people and AI models can give guidance on the next best action. For instance, if an IoT device senses that a machine is about to malfunction and that it could harm a nearby human, it needs to be shut down or dealt with immediately. In other cases, the signal may indicate only that a part will need replacement sometime within the next month and immediate action does not need to be taken. Being able to pinpoint the urgency of the issue is critical, especially if that machine or thing is tied to revenue generation.

- **Deliver better customer experiences.** Improved customer experience is often a key goal of digital transformation projects. The highly competitive retail landscape is always focused on this metric given that customers have many

choices of where they can spend their hard-earned money. One of the ways in which retailers look to improve customer experience is with personalization. IoT and AI can be leveraged in the retail environment to sense who is in the store, where they are in the store, and what might appeal to their personal preferences given their demographic information. Using digital displays or mobile applications, retailers can then offer targeted promotions or information to shoppers in real time.

Trends

Organizations have adopted next-generation technologies such as cloud, mobile, social, and AI as the foundation for their digital transformations. We are now in the era of multiplied innovation, in which organizations accelerate these strategies across a distributed computing environment by leveraging key innovation accelerators such as IoT and AI. However, other technology trends, including edge computing and 5G, are increasingly underpinning IoT and AI initiatives. As organizations undertake such initiatives, they will also need to deal with new challenges.

Edge computing allows organizations to perform computing tasks closer to the point of where data is generated. This capability can be useful for IoT projects in multiple ways, from reducing the expense of sending data to the cloud to improving security to enabling offline computing in environments with unreliable network connectivity. In addition, another major impetus behind edge computing is the ability to reduce latency for real-time business processes. This is where the connection between IoT, AI, and edge comes to life as analytic tools running on the edge can enable very near-real-time action. However, the final piece to this puzzle is the networks IoT/edge devices use to communicate with each other and other computers. While Ethernet still offers a very fast option for use cases where wired networks are possible, 5G is much faster than previous wide area technologies and will enable new types of IoT use cases inside and outside the four walls of the enterprise. The coalescence of IoT, AI, edge computing, and 5G will allow organizations to move from the era of multiplied innovation into the next major chapter of IT — autonomous systems.

AI adoption has passed the tipping point, with CY20 driving an acceleration as organizations had to confront everything from real-time liquidity forecasting to processing massive amounts of structured and unstructured data associated with pandemic protocols.

According to IDC's 2021 *AI StrategiesView Survey* (a global buyer-view sentiment and adoption survey of 2,000 enterprises), the leading drivers for AI adoption are to accelerate innovation, improve operational efficiency, and deliver a better CX. Early adopters report an improvement of almost 25% in customer experience, accelerated rates of innovation, higher competitiveness, higher margins, and better employee experience with the rollout of AI solutions.

That said, AI is not a panacea and holds inherent risks for organizations deploying it. According to IDC's 2021 *AI StrategiesView Survey,* enterprises report the cost of the solution is the number 1 challenge for implementing AI. They are looking for price/performance optimizations and best practices to reduce cost overhead across the ML life cycle. A major gap is the shortage of AI skills, not just the data scientists and ML developers but also business practitioners who understand the implications and use of AI. Reskilling and training are an investment priority, along with the demand for the democratization of AI tools and technologies.

At the same time, AI has been pushed to the top of the corporate agency due to its ability to empower business agility, resilience, and relevance. AI is becoming ubiquitous across all the functional areas of a business. Advancements in ML, NLP, conversational AI, and computer vision AI are at the forefront of AI software innovations, architecting converged

business and IT process optimizations, predictions, and recommendations and enabling transformative customer and employee experiences.

TD SYNNEX as a Supplier of AI and Edge Solutions

TD SYNNEX is a global supplier of data analytics, AI, and IoT/edge computing solutions. The company provides channel partners with the expertise and market reach to help bring solutions to market in an efficient way. TD SYNNEX acts as a solution aggregator, working with a broad ecosystem of vendors, ISVs, SIs, and SPs to simplify the complex and accelerate their partners' ability to bring AI solutions to market and maximize value to their end users. These solutions span several vertical markets, including manufacturing, energy, healthcare, retail, and Smart Cities.

TD SYNNEX offers a full suite of capabilities for building AI applications, including AI software services, AI platforms, and MLOps tools as well as the application development platforms from the various technology vendors with whom the company works. TD SYNNEX's process is to develop repeatable, scalable, market-ready, or custom solutions with partners through a methodology called the Solutions Factory. In the Solutions Factory, TD SYNNEX works with ecosystem partners to develop these solutions through the following steps:

1. Ideation and requirements
2. Design thinking
3. Solution design and planning
4. Project requirements and management
5. Build and test
6. Go live and optimize

After this process is completed, the aggregated solution can be included in the TD SYNNEX Solutions Catalog Playbook. The company offers partners three levels of solutions (starter, transformer, accelerator) based on the technical expertise and industry acumen required to successfully deliver a given offering. The Solution Catalog lowers partners' barriers to entry and speeds their time to market by delivering proven enterprise AI solutions focused on specific business outcomes to fulfill their partners' customer needs.

The ability for an organization to leverage a pre-integrated and pretested solution (or work with a trusted partner to develop one) offers a variety of benefits in terms of speed to market, cost reduction, and risk avoidance. The intensive process TD SYNNEX goes through to ensure each solution component works well with other components, can scale over time, and is secure by design is required for any successful AI and edge computing project. Organizations that leverage these solutions reduce the time it would take for them to go through each of these steps themselves, with no guarantee of success on the first try. They also avoid the cost associated with trial and error and/or developing a solution that fails to scale. Business risk is decreased by relying on a pretested solution and by working with partners with experience in deploying these solutions, which can be fraught with complexity.

TD SYNNEX's AI-enabled solutions leverage a range of advanced analytics technologies, including ML, cognitive services such as vision or natural language processing, and robotic process automation. The company works with a broad variety of hardware and software suppliers, including vertical industry specialists. TD SYNNEX offers 80+ such solutions in its Solutions Catalog Playbook. A sampling of solutions that leverage advanced analytics is provided in Table 1.

TABLE 1: ***TD SYNNEX AI and Edge Solution Examples***

Vertical	Solution Name	Advanced Analytics	Vendors
Healthcare	RPA for Healthcare Revenue Cycle (RCM)	Robotic process automation, behavioral AI, machine learning (ML)	Automation Anywhere, Alteryx
	Smart Telemonitoring, Telesitting, Patient Fall Prevention	AI models, vision AI, natural language processing, ML, Edge AI	Artisight, Chooch, IronYun, VeeOne Health
	AI-Ready Enterprise Platform for Healthcare	AI infrastructure, AI/MLOps management tools, AI/ML accelerators, Edge AI	NVIDIA, VMware, NetApp, Domino Data, Run:ai
Smart City	Intelligent Parking, Interactive Signage, Crowd Management	ML, vision	Hitachi, Axis, Cisco, Verizon, IBM, Microsoft, AWS, WaitTime, meldCX
Industrial	Predictive Maintenance and Optimization, Defect Detection, Process Improvement	ML	Hitachi, IBM, Microsoft, AWS, ADlINK, Megh Computing
	Worker Safety	Vision	AxxonSoft, meldCX, Megh Computing
Retail	WaitTime Monitoring, Occupancy and Traffic Analysis, Interactive Signage, Customer Behavior Analysis	Vision	IronYun, AxxonSoft, WaitTime, meldCX

Source: TD SYNNEX, 2023

In addition to its market-ready solutions, TD SYNNEX helps its partners specialize by building and maturing AI practices through their award-winning Practice Builder methodology, which enables partners to gain the industry credibility with their vertical expertise, solutions consulting, and industry-charged programs. The company can help partners scale efforts and find new opportunities through marketing and demand-gen services leveraging the propensity-to-buy consumption patterns and by providing technical support and financing solutions along the sales journey to meet end-user demands and specific use case needs.

Challenges

The adoption of a new technology such as AI is not without challenges, especially for more established organizations using legacy enterprise applications. It can be challenging for any organization to successfully leverage a cutting-edge

technology such as AI to solve real-world problems across business operations, and vendors such as TD SYNNEX will need to help their customers understand the right use cases and scenarios to leverage AI for the biggest business benefit.

Surveys that IDC has conducted on the adoption of AI have identified several challenges that organizations face when putting AI/ML into practice. They include the following:

- Projects cost too much.
- Data science and machine learning development skills are in short supply.
- Finding the right data for building ML/DL solutions can be time-consuming and costly.
- Many organizations lack the expertise/support for building and implementing AI solutions.

Vendors must provide guidance around these challenges specifically to address issues concerning AI that is embedded in applications. The less that organizations must do to use and maintain these AI capabilities, the more likely it is that they will be used and will be able to generate substantial value and return on investment.

Conclusion

AI is an important tool to help companies enable their digital transformation strategies. It provides organizations with the ability to understand data and act on data in new ways, which allows them to improve planning, decrease risk, offer market-differentiated customer experiences, and bring new products and services to market.

The goal of all businesses is to produce quality, high-performing products or services that lead to a great customer experience. To meet this goal, organizations need to understand and transform their business processes to take advantage of capabilities such as AI and ML. Leveraging digital technologies such as AI enables organizations to make better decisions, respond more effectively to changes, and grow the organization over time.

Leveraging digital technologies such as AI enables organizations to make better decisions and respond more effectively to changes.

About the Analyst



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Dave Schubmehl is Research Vice President for IDC's Conversational Artificial Intelligence (AI) and Intelligent Knowledge Discovery research. His research covers information access and artificial intelligence technologies around conversational AI technologies including speech AI and text AI, machine translation, embedded knowledge graph creation, intelligent knowledge discovery, information retrieval, unstructured information representation, knowledge representation, deep learning, machine learning, unified access to structured and unstructured information, chatbots and digital assistants, and rich media search in SaaS, cloud, and installed software environments. This research analyzes the trends and dynamics of the Text and Audio AI software markets and the costs, benefits, and workflow impact of solutions that use these technologies.

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