AI Use Cases, Tales From the Trenches: A Gartner Trend Insight Report

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One of the chief obstacles to adopting artificial intelligence is identifying the right use cases — the key business problems that are best-suited for AI capabilities. This Gartner Special Report guides IT leaders in that judgment, based on industries, functions and key technology trends.

Opportunities and Challenges

- IT leaders are leveraging the array of artificial intelligence (AI) technologies in all industries, for numerous and successful use cases. This rapidly growing body of experience is a valuable resource for those just beginning to work with, or expand their use of, AI.
- The most common problems are well-known: identifying optimal use cases, realistically scoping the AI project, sourcing the required staff and skills, and gathering the high-quality data in adequate volume.
- AI resources — tools, platforms, cloud services — are rapidly improving and becoming ever more accessible and affordable. This is a "democratization" of an array of AI technologies that have been used for years and, in some cases, for decades.

What You Need to Know

For IT leaders involved in developing a strategy for AI:

- Start today the work of mastering and deploying AI techniques for business value. Delaying that decision will not make adoption easier and raises the risk of you lagging behind competitors that are moving faster and more purposefully.
- Focus on leveraging AI techniques to deliver business value as the primary success criteria. Gartner clients that are most serious about deploying real-world AI techniques are highly disciplined about defining, measuring and assessing business value outcomes for high-priority AI projects.

- AI use cases are right in front of you — the business problems confronting your organization's digital transformation. You can use proven AI techniques and proven IT and business processes to identify, define, scope, prioritize and implement solutions.

Insight From the Analyst

Use Cases Let You Connect AI Technologies to Real Business Value

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Use cases are a type of storytelling. Humans learn via stories and have done so for thousands of years. Stories distill, explain and express the experiences that constitute our lives, as individuals and as collectives. As such, they enable us to comprehend, grasp, cope with and live through new situations. Use cases also are reminders that "we've done this before." They are both a warning and an inspiration. As such, they enable organizations to share knowledge and experience: "We gained A," "Be careful about B," "Be certain to do X" and "We learned Y."

Use cases spring from your particular business environment: the business model, business objectives, competitive challenges and industry trends. They are a combination of particular domain and business problems where traditional techniques can no longer cope with the growing complexity of data and constantly evolving, interdependent business processes. This context enables you to question, frame, scope and assess specific use cases along with the AI technologies and tools that can be applied to them.

AI techniques are being implemented in every industry. AI is a general purpose technology where use cases — even from very different industries — can illuminate opportunities to apply AI to your own. At one industry conference, the chief engineer of a fighter jet project was describing how the team grappled with "data fusion" in the cockpit. The challenge was to bring together huge amounts of very fast-changing data into an easily comprehensible whole for split-second decisions by the pilot. This case leveraged several AI techniques, such as knowledge representation, optimization (for attention management) and advanced analytics (for data fusion). A banker listened to the details and realized that stock traders were in a somewhat similar position as pilots. This insight was the basis of redesigning trader workstations to exploit the techniques developed for fighter cockpits.

This Gartner Special Report focuses on the AI "stories" that are proliferating in all industries and across all functions. These stories give IT leaders a way to come to grips with AI's potential, its requirements and its relationship to business value.

Executive Overview

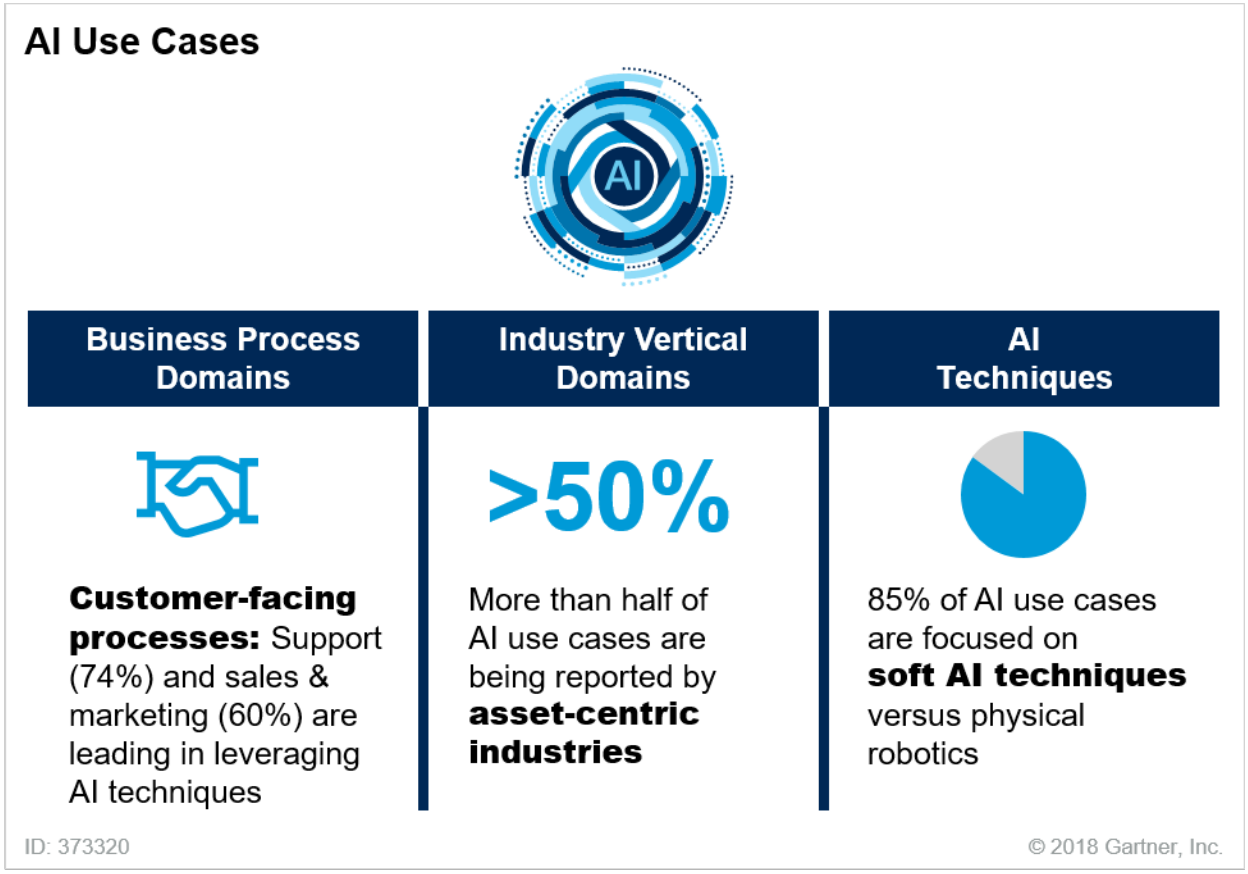
Definition

In numerous talks with Gartner clients, one consistent and persistent problem emerges: IT leaders simply do not know where to start with AI in a practical sense and they lack meaningful examples of how it can drive business value. Identifying the right use cases is one of the biggest challenges to adopting AI techniques.

> Your business context nurtures the use cases that are most pressing, most important and most urgent for your organization's business outcomes. For AI, start with the use cases before you — with what you, as an organization, are striving to accomplish. Once you identify and scope the business problem, then you can identify the required skills, the data requirements and the relevant AI techniques.

The temptation is to create experimental AI laboratories. But these often have little connection with real-world business problems, opportunities or outcomes. IT leaders already focus AI investments on decisions and processes, which offer the greatest business benefit (see Figure 1), according to the 2018 Gartner Artificial Intelligence Enterprise Perceptions, Plans and Implementation survey (all percentages are from the survey).[1]

Figure 1. Customer-Facing Processes Are Leading the Charge in Leveraging AI Techniques

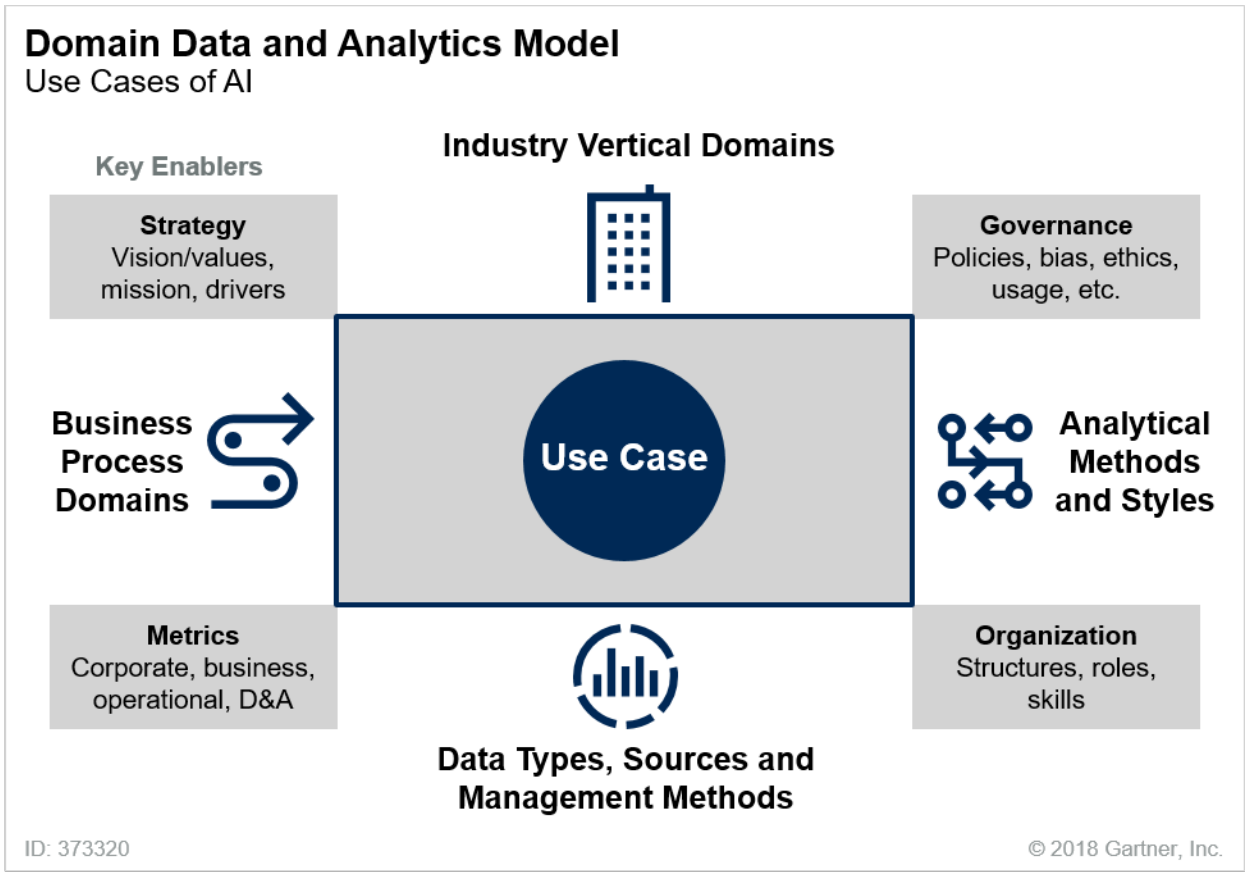


Source: Gartner (October 2018)

These IT leaders realize an important truth: They may have little experience with AI's underlying science and mathematical foundation, but they understand how emerging techniques can deliver differentiated business outcomes. This business-grounded approach enables IT leaders to forge links between business value, particular use cases and AI platforms and tools (see Figure 2).

This Gartner Special Report explores three of the four dimensions in the domain data and analytics model, as these bear on AI use cases and innovation: industry vertical, business process (or function), and analytical methods (or technology).

Figure 2. The Domain Model Relates Key Enablers to Four Vectors That Identify AI Use Cases



Source: Gartner (October 2018)

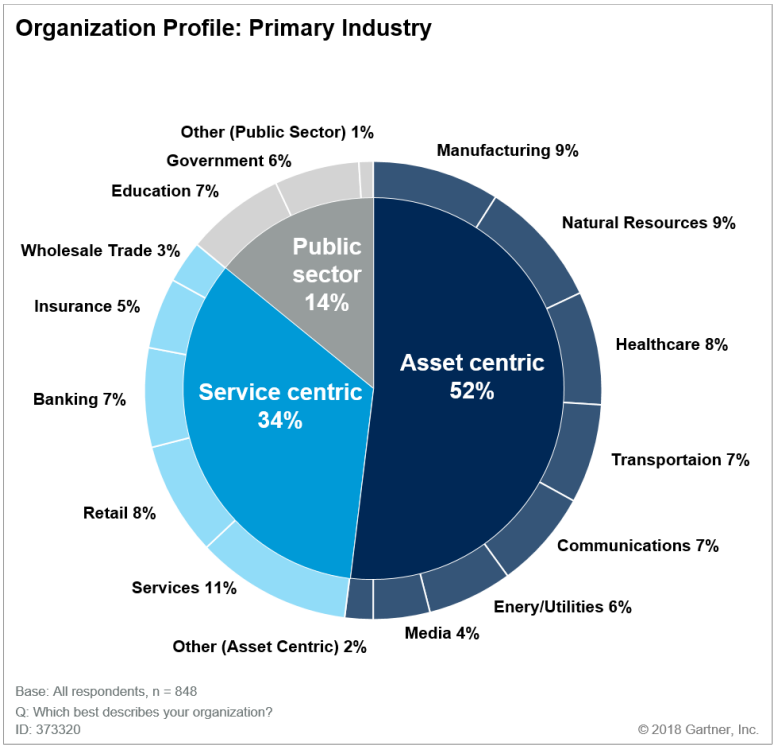
Research Highlights

Industry-Based Use Cases: The Hunt for AI's Competitive Edge

The breadth of AI innovation across industries is remarkable. It is this widespread experimentation and innovation that can inspire and guide innovation in your own industry. As an IT leader, you should be relentlessly curious to discover and evaluate these efforts. Looking only to your business rivals or partners needlessly limits the potential of AI techniques to impact your own business.

The 2018 Gartner Artificial Intelligence Enterprise Perceptions, Plans and Implementation study found that respondents were distributed across a wide swath of industry verticals in three main sectors (see Figure 3). In all these verticals, the survey found intense AI investment activity. (The study was conducted online in January and February 2018, with 848 respondents.)

Figure 3. Organization Profile by Primary Industry



Source: Gartner (October 2018)

The following research reports look at industry- or region-based AI initiatives, such as smart cities, healthcare and utilities. Your organization may be in a completely different industry. But the problems facing IT leaders in other verticals — and the AI solutions they develop — can overlap with your own to varying degrees. A different perspective can give you insight into similar problems and opportunities, as well as a competitive edge over your business rivals.

Related Research

"Leverage AI-Empowered IoT to Drive Successful Smart City Deployments" — Combining artificial intelligence and the Internet of Things (IoT) will drive the next transformation wave in smart city administration and citizen services. To enable this shift, technology product managers should manage city expectations, introduce viable financing models and work with city leaders to optimize data sharing strategies.

"Lessons Learned From Chinese Companies' AI Projects" — China's early AI adopters believe that being fast and first with an AI solution establishes industry leadership and competitive advantage. Enterprise architecture and technology innovation leaders can apply these lessons in their own AI projects to improve the odds of success.

"Market Trends: Artificial Intelligence Boosts CSP Positioning Toward the Enterprise" — Communications service providers have hundreds of individual opportunities to add AI into

products that deliver business value to their enterprise customers. Technology business unit leaders should focus on implementing the more mature AI technologies, and productizing those that the communications service provider (CSP) already uses internally.

"AI Adoption by Healthcare Providers Requires a Higher Degree of Trust" — Introducing AI into a healthcare organization's fabric and culture demands profound cultural sensitivity and ethical transparency, especially when AI is augmenting medical decision making. Healthcare provider CIOs should act to develop and nurture trust in the technology's use and ensure the trust is warranted.

"Market Trends: Planning Beyond the Hype of Artificial Intelligence and Automation" — CSPs can leverage AI to deliver value in three key areas: network intelligence, process automation and virtual customer assistants. CSP technology strategic planners should start by defining tactical AI projects — such as network planning, trouble ticketing and contact center processes — for which business value can be easily demonstrated.

"Toolkit: How to Select and Prioritize AI Use Cases Using Real Domain and Industry Examples" — Choosing the right use cases to deliver business value in a particular domain is essential for seizing new AI opportunities. This Toolkit guides data and analytics leaders in selecting and prioritizing the most promising areas for AI, using sample domains and industry use cases.

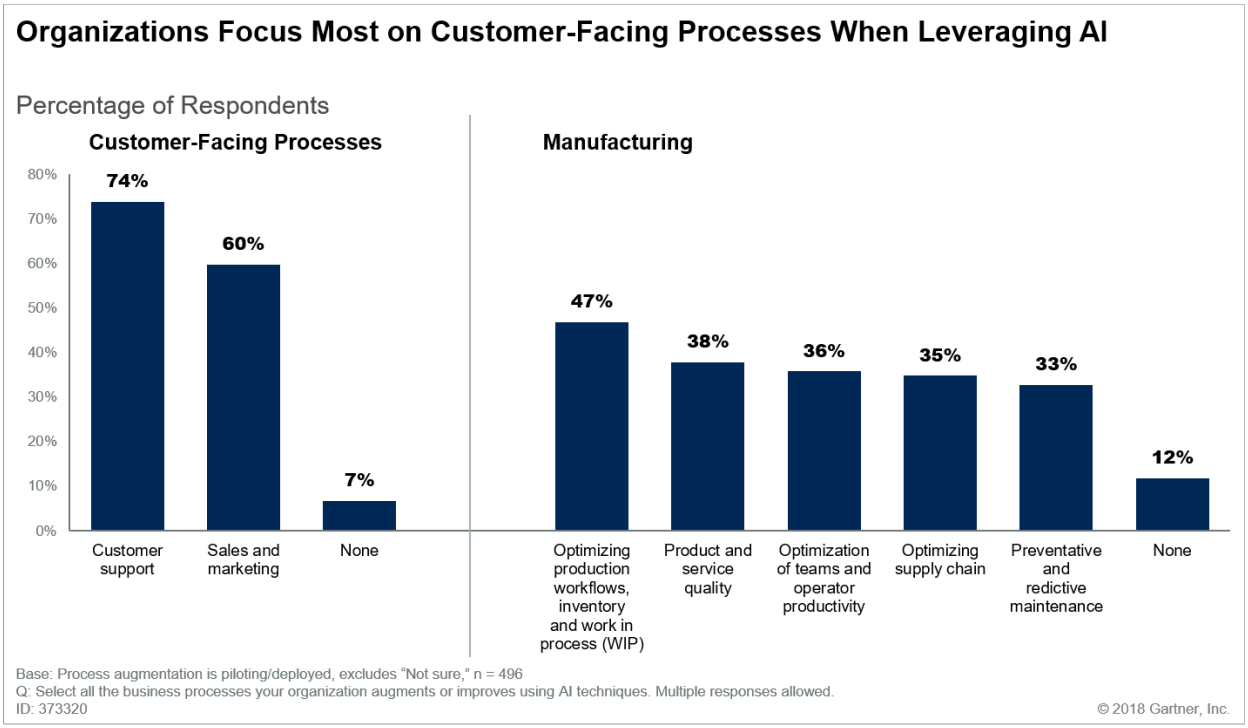
Functional Use Cases: Problems That Demand an AI Solution

AI enables both automation of business activities and processes, and augmentation of human capabilities at scale. It can create and sustain process efficiencies and faster and better decision making. The following research reports examine specific examples of functional AI use cases and the resulting benefits. They also guide IT leaders in introducing and managing AI capabilities in existing functions.

Focus on the most urgent or important problems in key functional areas. As you identify and clarify the problem, you can start to scope your staffing and skills needs. Next, identify the data required to address the problem — high-quality data in high volumes for AI projects. Finally, turn to the specific AI techniques that you can apply in a solution. Document a pool of use cases that are pain points because they are repetitive or because they involve complex decision making.

Figure 4 shows how IT leaders focus on customer-facing processes as prime candidates for AI-powered improvements, followed by a variety of manufacturing processes.

Figure 4. AI-Powered Improvements Focus on Customer-Facing and Manufacturing Processes



Source: Gartner (October 2018)

Related Research

"Invest in Operational Efficiency and Quality Improvement for AI Use Cases in China" — The top three drivers of AI use in China are improving efficiency, reducing costs and improving the customer experience, according to a recent Gartner survey. For AI adoption in China, CIOs should prioritize use cases that demonstrate business value in operational efficiency or quality improvement, and begin with small, narrow tasks before scaling the project.

"Artificial Intelligence Maturity Model" — Successfully implementing AI over the long term for business value entails complex decisions about technology and skills investments and organizational and process changes. CIOs can use Gartner's AI maturity model to accelerate and optimize their AI strategy and implementation to achieve the best value.

"Artificial Intelligence for IT Operations Delivers Improved Business Outcomes" — Most current application performance monitoring (APM) tools deliver advice with limited business context, leaving infrastructure and operations (I&O) leaders without a way to connect APM output to business outcomes such as improved revenue, risk and cost. I&O leaders should apply AIOps to APM and other data sources to gain insights that improve business outcomes.

"Augment and Automate Supply Chain Decision Making With Advanced Analytics and Artificial Intelligence" — The use of AI decision making in supply chain processes lags that of predictive and prescriptive analytics, but supply chain leaders expect increased use within the next two years.

Supply chain leaders in charge of advanced analytics and AI strategy should start planning now for AI adoption to support supply chain automation.

“How Advanced Automation Is Transforming Workforce Scheduling” — Most organizations have yet to invest in automated workforce scheduling tools, despite the proven value of machine learning and AI techniques in driving greater workforce management efficiency. Application leaders for human capital management (HCM) transformation should re-evaluate workforce management (WFM) strategies to incorporate AI-powered scheduling functions, including automation.

“How to Increase Chance of Success for Digital Commerce AI Projects” — AI initiatives for digital commerce are easily undermined by unrealistic expectations, and rely on custom development despite inadequate skills and lengthy project timelines. Application leaders can improve the odds for AI success by adopting the minimum viable product (MVP) approach to evaluate complex business problems, develop targeted AI solutions for business objectives, and optimize existing technologies and processes.

“Maverick* Research: Return on Happiness Is the AI-Enabled Metric You Need for Digital Business” — The well-being of an organization’s employees drives greater innovation than any individual technology. CIOs should demonstrate how AI frees employees from routine, tedious tasks to work on those with meaning and purpose. Doing so will boost employee happiness and other AI-enabled key performance indicators. *(Maverick research exposes unconventional thinking and advice.)*

“How Data Analytics and AI Can Drive Customer Retention for IoT Businesses” — Analyzing customer behavior via Internet of Things (IoT) data promises to improve customer retention programs, but traditional analytics struggle with IoT data volumes and complexity. Application leaders should explore and assess how AI technologies can improve IoT data analysis to better understand customer needs and support renewal and upsell/cross-sell opportunities.

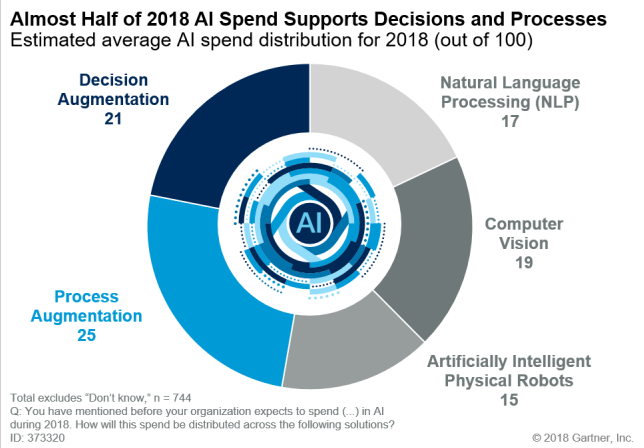
Technology in Use Cases: Align AI Capabilities With the Problem Type

AI techniques and tools are rapidly improving, becoming more affordable and available. The underlying science and math for many AI capabilities and techniques is well-established and well-understood. But the evolution of implementation of best practices still lies ahead, so the learning curve to effectively implement AI technology can be steep.

Some digital leaders are making bold investments in emerging AI techniques via in-house development, partnerships or acquisitions. Forward-looking IT leaders monitor the pulse of new developments to quickly capitalize on the latest AI developments. As a result, their organizations are ready to exploit new opportunities when AI technologies are ripe for large-scale deployment.

Forward-looking IT leaders are evaluating the full range of AI techniques, with the majority of their spending allocated to augmenting processes and decisions (see Figure 5).

Figure 5. Almost 50% of 2018 AI Spend Supports Decisions and Processes



Note: Percentages may not add up to 100% because of rounding.

Source: Gartner (October 2018)

AI is a general purpose set of technologies and this technology diversity gives IT leaders the freedom to "just do it" — to quickly launch small-scale, highly-focused AI initiatives that tackle well-scoped business problems. Results — both successes and failures — can be seen and evaluated in weeks, building up confidence, expertise and best practices for larger-scale solutions in the future.

These research reports focus on the intersection of AI and various other technology trends and opportunities.

Related Research

"Develop Better Immersive Experiences With AI" — High-impact use cases for applying AI technologies to immersive experiences are still evolving alongside the hardware devices that will enable them. This research helps technology product managers of augmented reality (AR) and virtual reality (VR) products assess how to incorporate potentially transformational AI technologies.

"Market Insight: Voice AI in Higher Education Is an Opportunity for VPA Device Vendors" — Voice-enabled AI enables higher education institutions to enhance student lifestyle experiences and curricula. Technology product management leaders selling virtual private assistant (VPA) devices to this emerging market should create a product mix of AI voice technologies, designed around the institutions' AI requirements and learning management system vendors.

"5 Questions That CISOs Must Answer Before Adopting Artificial Intelligence" — Gartner client security inquiries over the past 12 months show a steeply rising interest in how AI will affect security issues. Security and risk management leaders and chief information security officers (CISOs) in early-adopting organizations address five key questions in assessing the potential benefits and risks of machine learning techniques.

"Conversational Artificial Intelligence Will Drive 'Citizen-Centric' Services for Smart Cities" — AI leads to a more "citizen-centric" services model by enabling smart conversational interfaces and chatbots that personalize and contextualize city services. CIOs should exploit conversational AI for smart services delivery and improved operations efficiency.

"Market Guide for AI-Related Consulting and SI Services for Intelligent Automation" — The market for intelligent automation consulting and system integration (C&SI) services — mainly focused on AI technologies — is highly fragmented among many vendors and vendor types. Enterprise architecture and technology innovation leaders should use this report, which includes 70 AI case projects among 24 service providers, to identify the providers that are best suited to their organization's AI goals.

"Maverick* Research: What Is the Opposite of Artificial Intelligence?" — The confusion and doubt about the meaning of "artificial intelligence" undercuts organizational efforts to create a unified understanding that informs AI strategy, business value and adoption. By asking the counter-intuitive question "What is the opposite of AI?", data and analytics leaders can start developing a common language to explain AI's nature, communicate its value and ease its adoption throughout the organization. *(Maverick research exposes unconventional thinking and advice.)*

"Market Insight: 10 Use Cases to Differentiate AI-Powered Smartphones" — It is dangerous to go for an "all in" strategy in developing AI-powered smartphones, because today's AI technology may be outdated within 12 months. Use cases for AI smartphones are still in very early stages. Technology product managers should focus on building a scalable, flexible and open collaboration model with end-to-end AI frameworks based on 10 key use cases.

Related Priorities

Table 1. Related Priorities

Priority	Focus
Customer Relationship Management and Customer Experience	CRM and customer experience are business strategies that optimize profitability, operational efficiency, customer satisfaction and loyalty through the implementation of customer-centric processes.
Analytics and BI Strategies	The analytics and BI strategies initiative focuses on the strategies, practices, technologies and products needed to support a variety of users across different types of business problems.
Internet of Things	Internet of Things (IoT) enables business value creation by reducing operational costs, better managing risk or developing new revenue streams via digital business models and advancing technologies.

Source: Gartner

Gartner Analysts Supporting This Trend


Whit Andrews


Pieter Den Hamer


Bern Elliot

Related Resources

Webinars

"State of Cloud Computing and Its Next Disruptions"

"The Power of AI: Real AI Use Cases"

"How AI Will Impact the Customer Experience of the Future"

"Strategic Workforce Planning for Emerging Skills"

Articles

"13 Surprising Uses for Emotion AI Technology"

"What's Ahead for AI, Smart Speakers and Smartphones?"

"Make Application Development Cool Again"

"Use AI to Make Cities Smarter"

"How Artificial Intelligence Will Drive Transformative Change in Marketing"

Gartner Recommended Reading

Some documents may not be available as part of your current Gartner subscription.

"Artificial Intelligence Hype: Managing Business Leadership Expectations"

"Toolkit: How to Select and Prioritize AI Use Cases Using Real Domain and Industry Examples"

“Maximize the Value of Your Data Science Efforts by Empowering Citizen Data Scientists”

“How to Operationalize Machine Learning and Data Science Projects”

Evidence

[1] The results presented are based on the 2018 Gartner Artificial Intelligence Enterprise Perceptions, Plans and Implementation survey, conducted online in January and February 2018 among 848 respondents in the U.S. and Canada (n = 208), U.K. (n = 217), China (n = 213) and India (n = 210).

All respondents were screened for active employment in organizations that are piloting or deployed/are using at least one of the following AI technologies:

- Natural language processing (NLP)
- Computer vision
- Artificially intelligent physical robots
- Process augmentation
- Decision augmentation

Respondents were required to be at least at a manager level and to have knowledge of the AI budget for 2018. Other requirements included the following:

- They should have knowledge about adoption plans for AI solutions.
- Depending on the AI technology above mentioned, respondents should also have knowledge of its strategy, business objectives, business requirements, technology requirements, selection and/or use of providers, effectiveness/ROI measurement, operations management, and/or solutions design and implementation.

At the country level, soft quotas were established to guarantee a good distribution in terms of AI technologies adoption, company size and industry.

The results of this study are representative of the respondent base and not necessarily the market as a whole.

The survey was developed collaboratively by a team of Gartner analysts and was reviewed, tested and administered by Gartner’s Research Data and Analytics team.

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