

# Artificial Intelligence in Every Sector

Artificial intelligence (AI) is a powerful tool that is used every day to solve complex problems and improve modern life. BSA members help businesses and consumers harness the benefits of AI in every sector, transforming people's lives in incredible ways. From helping farmers protect their crops from the impact of climate change to unlocking new insights that shape our cities and enable researchers to find the next medical breakthrough, AI is driving innovation across the globe.



## Improving Healthcare and Quality of Life

The rapid digitalization of health information has created tremendous opportunities for AI to transform how clinicians care for patients, how consumers manage their health, and how researchers discover breakthroughs in the treatment and prevention of diseases.

### Detecting Life-Threatening Medical Conditions

[Intel technology](#) helps clinicians leverage AI to streamline workloads, inform personalized treatment plans, and enhance patient experiences. For example, Intel partnered with GE Healthcare to create an AI system that analyzes X-ray images for urgent medical conditions such as pneumothorax, a condition that causes collapsed lungs, during patient triage. The results generated by the

AI system help doctors reduce wait times and prioritize care for patients with life-threatening conditions.

### Combatting the Opioid Crisis

Splunk [partnered](#) with NewYork-Presbyterian, a leading research hospital, to create a platform for monitoring the flow of controlled substances and other medications as they are distributed to pharmacies and administered to patients. Diversion of controlled substances, such as OxyContin, out of the healthcare system has been a key source of drugs driving the opioid epidemic. Correlation and machine learning in Splunk's software products help to monitor a variety of data sources, including pharmacy dispensing systems and electronic prescription records, for unusual activity and flags instances where medications are possibly being misused or incorrectly prescribed, thereby helping the hospital combat opioid abuse.

“AI has become one of the most impactful technologies of the 21st century, providing both opportunities and challenges in nearly every sector of society.”

—Dr. Lynne Parker, Director of the National Artificial Intelligence Initiative Office



According to a 2021 McKinsey and Company survey, **56% of business leaders across the globe report using AI in at least one business function.**

## Advancing Accessibility

For people with visual impairments, AI is turning the visual world into an audible experience. Microsoft's Seeing AI app [helps](#) people who are blind or visually impaired recognize objects, people, and text via a phone or tablet's camera and describes what it recognizes to the user. With this new layer of information, users can navigate the world more independently.



## Strengthening Security

Although data security is core to the management of most organizations, cyber threats continue to evolve at a breakneck pace. AI helps organizations stay a step ahead of hackers by predicting potential attacks, mitigating attacks in real-time, managing access to resources, and encrypting sensitive data.

## Benefiting Cybersecurity Teams

With the help of AI, IBM QRadar SIEM correlates large volumes of data with network activity to identify malicious files and suspicious IP addresses easily missed by humans due to the sheer volume. It adapts based on 15,000 new documents a day, so security professionals can confidently identify and eliminate threats faster than ever before.

## Enabling Fast Action Against Threats

Oracle software [uses](#) machine learning to forecast, detect, prevent, and respond to threats automatically, as well as correlate and distill vast amounts of security event data into actionable intelligence. This enables enterprises to take swift action to resolve cybersecurity threats.

## Protecting Business Transactions

Consumer report and risk scoring provider TransUnion uses data analytics and machine learning capabilities provided by Splunk to [monitor](#) customer traffic and transactions. TransUnion monitors and manages customer traffic to its website and detects when unusual activity takes place so it can alert customers about security concerns and ensure seamless customer experiences.



## Building 21st Century Infrastructure

Whether it's creating smarter and safer cities by integrating sensors in bridges and highways to monitor their safety or increasing efficiency by cutting travel time and fuel expenses, AI plays an instrumental role in creating an infrastructure designed for the 21st century.

## Optimizing Manufacturing

Generative design tools can optimize the manufacturing process to reduce waste and improve products. Autodesk [partnered](#) with General Motors to use AI-based generative technology to redesign a seat belt bracket that is 40% lighter and 20% stronger than the previous iteration. Changes like these can help reduce the amount of material needed to build a car and make vehicles more fuel efficient.

## Making Transit More Efficient

Microsoft has helped Lufthansa use AI products to greatly improve the efficiency with which planes are cleaned, refueled, and reloaded with passengers, catering, and luggage. Video analysis software [monitors](#) each step of the turnaround process, helping Lufthansa pinpoint the source of slowdowns and mitigate their potential impact on passengers.

## Streamlining Building Projects

Companies are using AI to streamline the building design and construction processes. Bentley Systems has [teamed](#) with Hyundai engineering on an AI system that automates design processes for steel and concrete structures, reducing the time needed to create designs and the cost of building a structure.

## Monitoring Vehicle Fleets

Oracle's anomaly detection software uses AI to [monitor](#) the operation of complex systems and detect potentially concerning incidents. Transportation and logistics company SS Global LLC uses Oracle's software to monitor their fleet of vehicles and get alerts when there are early signs of potential safety issues. By detecting the early onset of tire baldness and air leaks, the system helps SS Global perform predictive maintenance that keeps their fleet safer and more efficient.

## Advancing Power Grid Reliability

AI is helping make our increasingly complex power grids smarter. Siemens' automation and smart grid technology is [helping](#) us control and monitor electrical networks so that it's easier to classify and localize disruptions in the grid. In India, Siemens systems monitor transformers for oil leaks—a key factor in power outages—to give operators advance warning if problems exist in the system.



## Creating New Ways to Learn

AI applications are enabling personalized learning resources for every stage of life, including adaptive learning programs, digital tutoring, curriculum recommendations, and more. There are more digital resources available to instructors and students than ever before, and AI is affording them the ability to access relevant tools quickly and easily.

## Enriching Math Education

Educators are [using](#) IBM's Teacher Advisor With Watson AI to access the math resources they need in seconds, including proven lesson plans, activities, standards information, and teaching strategies for students with varying degrees of preparation and ability. This can save valuable time for teachers throughout the school year.

## Tailoring Workplace Learning

Employers are [using](#) Workday Learning, an application that uses machine learning to personalize workplace learning for individuals, to recommend professional development content and courses based on employee position, tenure at the company, interactions with the content, and other factors. This helps companies adjust learning strategies and programming to ensure employees learn new skills, continue to grow in their roles, and prepare for what's ahead.



## Improving Agricultural and Environmental Practices

Increases in air temperatures, changes in precipitation levels, pests, and crop diseases are all factors that can greatly affect the agricultural community and expose farmers to significant risks. AI can help many farmers across the globe gain greater control over the growing process, from planting times and crop monitoring to more advanced applications, such as price forecasting.

## Refining Weather and Climate Forecasts

Microsoft researchers in Massachusetts [partnered](#) with a climate risk company to develop AI models capable of providing more accurate long-range weather predictions. Traditional weather forecasting methods can provide accurate predictions for a seven-day window. By leveraging AI, the researchers are developing new forecasting models to provide accurate predictions of weather trends two- to six-weeks out from a given date. By providing reliable extended forecasts, these tools will help water managers predict snowpack and water availability for irrigation, hydropower, and other critical agricultural and environmental uses.



Global spending on "smart" agriculture, including AI and machine learning, is projected to **triple to \$15.3 billion** by 2025.



## Enhancing the Customer Experience

For businesses with large customer bases that are processing a high volume of purchases—such as banks, restaurant chains, and large retailers—analyzing the massive amount of data collected every day is impossible without the computing and predictive power of AI. By using machine learning tools, businesses across a wide range of industries can analyze customer preferences and their own business performance to improve end-user experiences and increase efficiencies. Software also helps businesses generate optimal product designs by using data to produce and analyze far more iterations than humans alone could create.

### Customizing Care Experiences

Powered by Salesforce AI technology, [Eli Lilly](#) has reimagined patient care with its Patient Connect Platform app. The app helps customers learn to use products, access information about their medications, and record how well they are feeling. The desktop and mobile apps also allow patients to consult with a healthcare concierge—a specialist who provides one-on-one support to guide patients toward beneficial health outcomes.

### Scaling Community Impact

Twilio provides AI chatbot services to help businesses [interact](#) with customers. The United Way Worldwide worked with Twilio to help scale and route inbound calls and texts to more than 200 agencies nationwide that use their 211 system to help people locate essential needs like housing, financial assistance, food, childcare, transportation, and more. Using the AI-assisted interactive voice response menu built with Twilio Autopilot, the United Way and Twilio built a system that enables a caller to access a single 1-800 number or be transferred by their local 211 to access assistance. The result is a centralized system that efficiently reduces the call volume nationwide but increases the time staffers are able to devote to mission critical calls.

SAP provides chatbot solutions that are seamlessly integrated into other business functions, giving customers, partners, and employees a bird's-eye

view of business operations. For example, SAP provides software services to Hewlett Packard Enterprise Company, including an AI-based chatbot system that can reference serial numbers, packing slips, and shipment dates drawn from cloud services, thereby getting the right information to the right people at the right time.

### Empowering Creativity

AI and machine learning within Adobe's Creative Cloud tools help artists, photographers, designers, and content creators around the world handle the time-consuming aspects of their work that can easily be automated, so they have more time to be creative. From removing unwanted objects like mics and logos from videos in Adobe After Effects, to colorizing black-and-white photos in just a few clicks in Adobe Photoshop, to painting with digital brushes that look, feel, and act like the real thing in Adobe Fresco, and more, Adobe's AI and machine learning features empower creators to focus their energy on what they love—ideating, experimenting, and creating.




## Helping in Times of Crisis

In times of humanitarian crises, fast response is essential. Researchers are developing ways to use AI to help first responders in the critical hours and days after a natural disaster, and to track pathogens that could lead to outbreaks of disease and mitigate the spread.

### Navigating the COVID-19 Pandemic

AI and cloud computing have been crucial tools for COVID-19 research. When the pandemic began, the White House Office of Science and Technology Policy (OSTP) [established](#) a public-private collaboration between government and companies—including IBM, Intel, and Microsoft—to create the COVID-19 High Performance Computing Consortium. The Consortium has leveraged AI for numerous projects, including efforts to model the structure of the virus and accelerate the discovery of treatment options.



“The United States and European Union believe that artificial intelligence (AI) technologies have the potential to bring substantial benefit to our citizens, societies and economies. AI can help tackle significant challenges societies face, transform industries, and improve the quality of our lives.”

—Inaugural Joint Statement of the US-EU Trade and Technology Council

Salesforce AI products have also been used by medical providers across the country to [create](#) patient screening tools. By analyzing patient data through risk assessments, such as a tool used by Fruit Street Health to generate a health risk score based on patients’ exposure and pre-existing medical conditions, which help doctors give personalized health recommendations.

Siemens’ [Dynamic VAV Optimization](#) is a software solution for building management systems that uses machine learning and AI to configure HVAC controls according to a building’s priorities, whether that’s minimizing virus transmission or minimizing energy consumption. In direct response to the challenges of the pandemic, DVO was launched with a new operating Defense Mode in late 2020 to reduce the risk of viral spread in indoor spaces. DVO adjusts ventilation, temperature, and humidity conditions to minimize risk of viral spread indoors while also maximizing energy efficiency.

## Responding to Natural Disasters

AI systems can be used to [predict and assess](#) damage when natural disasters strike. For example, algorithms can be used to analyze geospatial and weather data along with historic patterns to track hurricanes and predict where they might cause the most damage and displace people. After a major weather event, AI can also be used to analyze satellite photos of the area and identify damage to infrastructure or where flooding has taken place. Rescuers and aid groups can then use this information to distribute aid more efficiently after an event has occurred.



## Enriching Our Lives

### Leveling Up Gaming and Entertainment

AI can be used to create sophisticated 3-D environments and train autonomous characters in our favorite games and movies. Unity’s AI products are used to [develop](#) video games, animations, and other detailed virtual environments. By training computer-based characters in Unity’s software, game designers can create more realistic environments that capture a player’s imagination and enhance the gaming experience.

### Suggesting Skills for Job Candidates

Employers are using Workday’s Suggested Skills tool, which uses machine learning to help job candidates identify and translate their knowledge and experience into job-related skills. Using this tool, job candidates are made aware of the skills that recruiters have identified in the context of a job application and are provided with recommendations of job-related skills inferred from their resume. The candidate is in control of whether to accept or reject these Suggested Skills as part of their application.

### Restoring Ancient Artwork

Researchers from the University of Cambridge use image processing and machine learning tools from MathWorks to categorize, analyze, and restore ancient artwork. They [created](#) the Mathematics for Applications in Cultural Heritage (MACH) initiative, which combines the expertise of mathematicians with that of art historians, conservators, classicists, and medievalists to advance artwork restoration and archaeology. AI tools used in the program can generate suggestions of what a damaged fresco once looked like, or classify ancient pottery based on the shape of shards found at an archaeological site.