



8 Leading Machine Learning Use Cases

How today's businesses are using machine learning to achieve fast, efficient, measurable results



Solve real-world problems with machine learning

Machine learning has moved beyond the hype to become a meaningful driver of value for many organizations. Over half of businesses that have deployed machine-learning-powered artificial intelligence (AI) initiatives say the technology has increased productivity.¹

While it's clear that machine learning is an essential part of business transformation, many organizations struggle to understand where to apply machine learning for the most impact. Selecting the right machine learning use case requires you to consider a number of factors.

First, you need to find a balance between optimal business value and speed. A proof of concept built by a siloed data scientist is not likely to generate much enthusiasm for machine learning in an organization. What is more apt to attract the needed commitment and funding is showing how machine learning can address the real-world issues your organization currently faces. Furthermore, you'll want to find something that can be accomplished in 6–10 months so that you don't lose momentum. This is especially true if this is your first foray into machine learning.

Second, you'll want to find a use case that is rich in data that you already have. A good business use case with no data leads to frustrated data scientists.

Lastly, you'll want to evaluate whether your business problem actually requires machine learning for success and whether or not machine learning will result in better outcomes than your traditional approach. These outcomes might be realized as cost reduction, increased employee productivity, or improved experiences for your end customers.

The best way to satisfy all of these criteria is to ensure that technical experts and domain experts are working hand in hand on your machine learning project. Technical experts can conduct feasibility assessments, and domain experts will ensure the solution is solving a real business problem and will have real impact.

¹<https://www.pwc.com/us/en/services/consulting/library/artificial-intelligence-predictions.html>



Starting with the right use case is key to organizational buy-in

In this eBook, we have outlined eight use cases where AWS customers have successfully applied machine learning. These use cases will strengthen your business case for wider adoption of machine learning, and you can apply them to kick-start your machine learning journey or add them to your current strategy.

What makes a good machine learning use case?

- Solves a real problem for your business—one that's important enough to get attention, support, and adoption
- Leverages sources of untapped data
- Increases performance, reduces costs, and/or improves your end-customer experiences
- Includes technical experts to conduct feasibility assessments and domain experts to ensure the solution will be used
- Can be completed in 6–10 months

8 leading use cases

- 1 **Improve employee productivity »**
- 2 **Optimize data science team productivity »**
- 3 **Analyze rich media assets »**
- 4 **Forecast demand metrics »**
- 5 **Add contact center intelligence »**
- 6 **Personalize customer recommendations »**
- 7 **Automate document data extraction and analysis »**
- 8 **Identify fraudulent online activities »**

Improve employee productivity by quickly and easily finding accurate information

Employees who have fast, easy access to accurate data are more productive. In a 2019 study by "The Economist," executives were asked to identify ways in which technology can enable stronger employee engagement. "Ease of access to information required to get work done" emerged as the #1 most-chosen enabler, with 47% of respondents citing it as an essential driver of productivity.²

Amazon Kendra is a highly accurate and easy-to-use enterprise search managed service that's powered by machine learning. Employees from all business sizes can use natural-language questions rather than inefficient keyword searches to get the information they need. The resulting boost in productivity helps accelerate research while enabling better, faster decision making—and strengthens your business case for wider machine learning adoption.

IDEAL FOR ALL INDUSTRIES

WOODSIDE ENERGY LTD.

"(With AWS Kendra,) we're now able to precisely search our most valuable project engineering documents. This step-change in cognitive capability will enable better, faster decision-making to improve our operations and the working lives of our people."

Shelley Kalms, Chief Digital Officer

SAGE

"Our purpose is to transform the way people think and work so their organizations can thrive. Using services like Amazon Kendra, we can support our customers to do just that."

Shivani Govil, EVP of Emerging Tech and Ecosystems

²https://theexperienceofwork.economist.com/pdf/Citrix_The_Experience_of_Work_BriefingPaper.pdf



Optimize data science team productivity, increase model accuracy, and lower machine learning costs

The machine learning development process is often complex and time-consuming, due in part to a lack of integrated tools for the entire machine learning workflow. When organizations are forced to cobble together different tools, the process can slow down, become error-prone, and put the brakes on the business case for larger machine learning investments.

Amazon SageMaker solves this dilemma by providing all the components needed for machine learning in a single toolset. This fully managed service allows every developer and data scientist to build, train, and deploy machine learning models quickly. With Amazon SageMaker Studio, the first fully integrated development environment for machine learning, you can reduce the TCO of machine learning by at least 54% and improve developer productivity up to 10 times, so models get to production much faster with less effort. Amazon SageMaker Studio includes notebooks that start working in seconds, experiment management, automatic model creation, debugging, and model drift detection. With Amazon SageMaker, you can quickly move from idea to deployment and support your machine learning business case—in a wide variety of ways.

IDEAL FOR ALL INDUSTRIES

INTUIT

"With Amazon SageMaker, we can...create novel, large-scale machine learning and AI algorithms and deploy them...to solve complex problems that can power prosperity for our customers."

Ashok Srivastava, Chief Data Officer

ZALANDO

"Using Amazon SageMaker, Zalando can steer campaigns better, generate personalized outfits, and deliver better experiences for our customers...our engineers' and data scientists' productivity has increased by 20%."

Rodrigue Schäfer, Director Digital Foundation



Analyze rich media assets to increase value and create new insights

Rich media assets offer a wealth of invaluable content—if you can access them quickly and efficiently. Unfortunately, many companies are left swimming upstream against rising requests for increasingly specific content to be delivered in shorter time frames and across a greater number of formats. Compounding the issue is that the “supply chain” for these media assets is often highly dependent on human resources. This makes content retrieval costly, complex, and prone to error.

Applying machine learning to this problem can lead to benefits across two key areas. First, machine learning can reduce the time, cost, and effort required for content preparation. Second, by improving the overall quality of media asset management, you enable faster access to accurate content that can open up new revenue opportunities.

AWS Media Insights Engine dramatically accelerates your ability to index rich content—so you can quickly make it available for content searches, ad targeting, subtitling and localization, content moderation, compliance marketing, and highlight clipping. Amazon Rekognition enables faster, easier image and video analysis with custom labeling to further enhance content indexing and retrieval. The Media Insights Engine dramatically accelerates your ability to index rich content—enabling your developers to use the framework to quickly build out video use cases such as content search, ad targeting, subtitling and localization, content moderation, and compliance marking.

IDEAL FOR ENTERTAINMENT AND MEDIA, SOFTWARE AND TECHNOLOGY, TRAVEL AND HOSPITALITY

CBS OPERATIONS AND ENGINEERING

“We are looking to Amazon Rekognition to automate the moderation of our video content while leveraging the Custom Labels feature to further refine moderation models. This will enable us to automate the tagging of sensitive content...and speed up processing from hours to minutes.”

Jamie Duemo, Senior Vice President, MultiPlatform Distribution

NFL MEDIA

“Amazon Rekognition...significantly improves the speed in which we can search for content and enables us to automatically tag elements that required manual efforts before.”

Brad Boim, Senior Director, Post Production and Asset Management

Forecast key demand metrics faster and more accurately to meet customer demand and reduce waste

Forecasting what customers want, how much of it they want, and when they will want it is vital to any organization's success—and an opportunity to strengthen your business case for wider adoption of machine learning. Sales, finance, supply chain, and other business units are dependent upon accurate demand metrics to satisfy customers, better manage inventory, and optimize cash flow. You can use machine learning to discover how time-series data and other variables like product features and location affect each other to generate forecasts such as product demand and resource needs performance.

In the past, machine-learning-powered forecasting tools have been too expensive for many businesses to adopt in a meaningful way. Amazon Forecast changes the equation, making it easy to generate fast and accurate business forecasts from time-series data. Automated processes help you create a custom-machine-learning model in hours—with no machine learning experience required.

IDEAL FOR ENERGY AND UTILITIES, INDUSTRIAL, MANUFACTURING, RETAIL, SOFTWARE AND INTERNET, STARTUPS, TELECOMMUNICATIONS, TRAVEL AND HOSPITALITY

PUGET SOUND ENERGY

"Amazon Forecast performed very well at forecasting 30 days out with virtually no manual effort. With these enhanced analytical capabilities, PSE will be able to identify custom energy saving programs and services, ultimately reducing customer bills."

Paul Johnson, Senior Cloud Architect

HEROLEADS

"By integrating Amazon Forecast, we will free up the team to focus on more value-added work, expand the reach of our models to be used by other teams, and improve our forecast model accuracy to 99%. (Amazon Forecast provides) faster insights, improved predictability, performance alerting systems, dynamic budget planning, and more accurate investment models."

Amit Das, Lead Data Engineer

Add intelligence to your contact center to improve service and reduce cost

Improving the customer service experience is one of the best ways to differentiate your brand—and to demonstrate the value of machine learning. Successful organizations treat customer contact centers as an asset that is crucial to success rather than viewing it exclusively as a cost center. Customer service is highly personable, so making service agents more productive should be central to any contact center strategy.

Machine learning can enhance customer-service-agent productivity by getting them the right information they need when they need it, optimize staffing with better resource forecasting, and reduce wait and resolution times with greater automation. This all leads to improvements in overall satisfaction—while substantially reducing costs.

AWS offers a number of machine-learning-powered solutions that add intelligence to your contact centers at a pace that fits your transformation strategy. Amazon Connect allows you to optimize and personalize every customer interaction, identifying areas for improvement and helping you maximize the productivity of each agent. Amazon Forecast can improve resource staffing by more accurately predicting call volumes, helping to ensure contact centers are properly staffed. Additional AWS solutions perform real-time speech recognition, enabling you to create grammatically correct transcriptions of each call, translate conversations into an agent's preferred language, analyze interactions to detect the sentiment of the caller, and identify key words and phrases.

IDEAL FOR ALL INDUSTRIES

VONAGE

"With Amazon Lex, we can empower Vonage customers to choose how and where they will engage with us—building intelligent interaction paths into existing voice and messaging channels."

Alan Masarek, Chief Executive Officer

GE APPLIANCES

"Using Amazon Connect, Amazon Lex, and Amazon Polly, we can automate simple (call center) tasks, such as looking up product information, taking down customer details, and answering common questions before an agent answers (the phone)."

Byron Guernsey, Chief Strategist



Make personalized recommendations to increase customer engagement

Machine learning makes it possible to create personalized experiences for your customers. By recommending related items and tailoring search results—including websites, apps, ads, marketing emails, and push notifications—to individual customers, you can engage with them on a deeper level, transforming prospects into customers at a higher rate, driving repeat sales, and solidifying your business case for wider adoption of machine learning.

Amazon Personalize uses machine learning technology perfected from years of use on Amazon.com to enable you to personalize customer engagement by building a custom recommendation engine using your data. With fully automated machine learning processes, the solution makes it possible to complete this project in just hours and without the need for a data scientist. Your data on each user's clicks, purchases, views, and other activity will drive user-level product and similar-item recommendations, content customization, and personalized notifications—increasing sales, improving retention, and fostering greater customer loyalty.

IDEAL FOR RETAIL, MEDIA AND ENTERTAINMENT, TRAVEL AND HOSPITALITY, EDUCATION, FINANCIAL SERVICES, GOVERNMENT, HEALTHCARE, SOFTWARE AND INTERNET

KEEN INC.

"With the implementation of Amazon Personalize, email CTR is up 67%...Rev/M Sends is up 49%, and because the content is even more relevant, our Opt Out Rate has dropped 36%...test emails have shown a 12.5% increase in revenue."

Kristina Smith, Director Global Digital Marketing

LOTTE MART

"(With Amazon Personalize,) we have seen a 5x increase in response to recommended products...(increasing) the number of products that the customer has never purchased before up to 40%."

Jaehyun Shin, Big Data Team Leader



Make faster decisions by automatically extracting and analyzing data from documents

The millions of documents created by your organization contain a trove of insights waiting to be leveraged. Unfortunately, manually processing the ever-growing volumes of information to make them easy to access and search is a cumbersome, costly task. Many optical character recognition (OCR) solutions do not have the flexibility to scan certain types of information, such as tables or forms, and require manual customization or configuration for each document type. Human intervention is often required to manually input data, making the process time-consuming and susceptible to errors. Using machine learning, your organization can gain timely access to the information contained in your documents, leading to new insights that inform your business decisions.

Amazon Textract uses machine learning to go beyond simple OCR to help you automatically and accurately extract text and data—without the need for any manual effort or custom code. With Amazon Textract, you can create smart indexes, build automated approval workflows, and better maintain compliance with document archival rules by flagging data that may require redaction. Using natural-language processing, the solution classifies documents and extracts both structured data and text to provide you with a comprehensive view of your organization.

IDEAL FOR FINANCIAL SERVICES, HEALTHCARE AND LIFE SCIENCES, ACCOUNTING, EDUCATION, GOVERNMENT, LEGAL, OIL AND GAS

PITCHBOOK

“Before Textract, (analyzing survey data) took hundreds of hours going through PDFs and manually entering information as it came in. With Amazon Textract, we have seen gains as high as 60% in our process.”

Tyler Martinez, Director of Data Science and Software Engineering

CHANGE HEALTHCARE

“(With) Amazon Textract...we’ll be able to liberate the information from millions of documents and create even more value for patients, payers, and providers.”

Nick Giannasi, EVP and Chief AI Officer

Make it easy to identify fraudulent online activities

Around the globe, billions of dollars are lost each year to online fraud.⁴ Many applications that are designed to protect against system access from fake accounts, credit card theft, and other actions from bad actors rely on business rules that are not keeping pace with the rapidly changing tactics of today's cybercriminals.

Fraud detection is a good application for machine learning for three primary reasons. First, it addresses a problem that's rich in data and can benefit from pattern identification within data sets. Second, it can achieve results that are nearly impossible to accomplish through human input alone. Finally, these results are easily quantifiable in financial terms, which can help foster executive buy-in for machine learning across the organization.

Amazon Fraud Detector leverages machine learning and more than 20 years of fraud detection expertise from Amazon to catch more fraud and catch it faster. Amazon Fraud Detector puts your data at the center of your solution and makes it simpler to create your own fraud-detection models—with no prior machine learning experience necessary.

IDEAL FOR E-COMMERCE, FINANCE, RETAIL

COINBASE

"Machine learning helps us balance our risks with flexibility for our customers to give them the best experience possible."

Soups Ranjan, Director of Data Science

VACASA

"We're excited about the introduction of Amazon Fraud Detector because it means we can more easily use advanced machine learning techniques to accurately detect fraudulent (vacation) reservations. Protecting our 'front door' from potential harm enables us to focus on making the vacation rental experience seamless and worry-free."

Eric Breon, Founder and CEO

⁴<https://www.javelinstrategy.com/coverage-area/2019-identity-fraud-report-fraudsters-look-for-new-targets-and-victims-bear-brunt>

Start or expand your machine learning journey now

With the use cases in this eBook, you can leverage machine learning to boost productivity, make smarter use of your data, meet customer demands more effectively and efficiently, enhance customer experiences and satisfaction, make better decisions faster, and reduce the frequency and impact of fraud.

We chose to highlight these eight use cases because our customers are achieving success with them today—and because they fulfill all the requirements you should look for when identifying a suitable application for machine learning. These use cases can be completed in a matter of months, solve real business problems, leverage sources of untapped data, and increase performance, reduce costs, and/or improve end-customer experiences. They lend themselves to the inclusion of technical and domain experts, and—when properly executed—generate results that gain attention and foster executive support for wider adoption of machine learning.

The business potential of machine learning goes far beyond these eight use cases. With the broadest and deepest set of machine learning services available today, AWS can help you apply machine learning in a wide variety of ways that transform your business—allowing you to push innovation to new heights and reimagine the possibilities of what your organization can achieve.

[Learn more about AWS machine learning »](#)