7 Leading Machine Learning Use Cases

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

Solve your most common business challenges 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 practical 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 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 a 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 seven 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

When you are ready to deploy your use case, you have the choice of using one or more fully-managed AWS AI Services to quickly get started and easily integrate intelligence into your applications. Or, if you want to develop your own models, you can use Amazon SageMaker—a solution that provides you with all the machine learning tools you'll need in a single service.

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7 leading use cases

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 identified "ease of access to information required to get work done" as the #1 way in which technology can drive productivity.[2]

Your employees can search for the information they need by asking natural-language questions through Amazon Kendra—a highly accurate intelligent search service powered by machine learning. This is much faster and more efficient than traditional keyword search, and the service is easy to deploy for businesses of all sizes. The resulting boost in productivity helps accelerate research while improving decision making—and strengthens your business case for wider machine learning adoption.

[2] https://wtheexperienceofwork.economist.com/pdf/Citrix_The_Experience_of_Work_BriefingPaper.pdf

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WOODSIDE ENERGY LTD.

"(With Amazon 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

BAKER TILLY DIGITAL | LABS

"By using (Amazon) Kendra, our clients are able to surface relevant information 10 times faster when compared to SharePoint full text search, quickly surfacing an answer previously not possible with keyword search and connecting them to relevant content across an enterprise-wide repository, or providing marketing managers quick access to crucial research on customer behavior."

Ollie East, Director of Advanced Analytics and Data Engineering, and Tom Puch, Sr. Manager

Make faster decisions by automatically extracting and analyzing data from documents

The millions of documents created by your organization contain a treasure 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. 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.

For organizations looking to easily activate intelligent document processing today, AWS offers three services that can be deployed individually or in any combination. Amazon Textract automatically extracts handwriting, printed text, and data from scanned documents. Amazon Comprehend is a natural language processing (NLP) service that uses machine learning to find insights and relationships in text. And Amazon Augmented AI (Amazon A2I) provides built-in human review workflows to ensure accuracy of the data.

You can also quickly and efficiently develop your own machine learning models for text extraction and analysis with Amazon SageMaker, a fully managed service that helps data scientists and developers build, train, and deploy machine learning models. This service provides several built-in machine learning algorithms—such as BlazingText and Linear Learner—that are optimized for text classification, NLP, and optical character recognition (OCR).

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ASSENT COMPLIANCE

"Amazon Textract's OCR technology enabled us to process… documents while Amazon Comprehend was able to extract custom entities. (Using) Amazon Augmented AI, we were able to have our teams review documents in a given accuracy range and help train our next model iteration. Combining these services…(saved) our customers hundreds of hours in manually reviewing documents."

Corey Peters, AI/ML Team Lead

THOMSON REUTERS

"Our solution required several iterations of deep learning configurations at scale. Amazon SageMaker enabled us to design a natural language processing capability in the context of a question answering application…successfully allowing (our customers) to simplify and derive more value from their work."

Khalid Al-Kofahi, AI and Cognitive Computing - Thomson Reuters Center

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 their customer contact center as an asset that is crucial to success rather than viewing it solely as a cost center.

Machine learning can help to transform a contact center into a profit center by reducing call wait times, improving agent productivity and satisfaction, lowering costs, and helping to identify business improvement opportunities.

AWS offers several flexible options to easily add intelligence to your contact center. Amazon Connect is an easy-to-use omnichannel cloud contact center that helps companies provide superior customer service at a lower cost. Contact Lens for Amazon Connect is a set of machine learning capabilities integrated into Amazon Connect that allows contact center supervisors to better understand the sentiment, trends, and compliance risks of customer conversations to effectively train agents, replicate successful interactions, and identify crucial company and product feedback.

If your organization already has a contact center solution in place, AWS Contact Center Intelligence (CCI) solutions offer a variety of ways to quickly and cost-effectively add AI to your contact center. These solutions, available through participating AWS Partner Network (APN) partners, allow customers to benefit from AWS machine learning-powered solutions to enhance self-service, analyze calls in real time to assist agents, and learn from all contact center interactions with post-call analytics.

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VONAGE

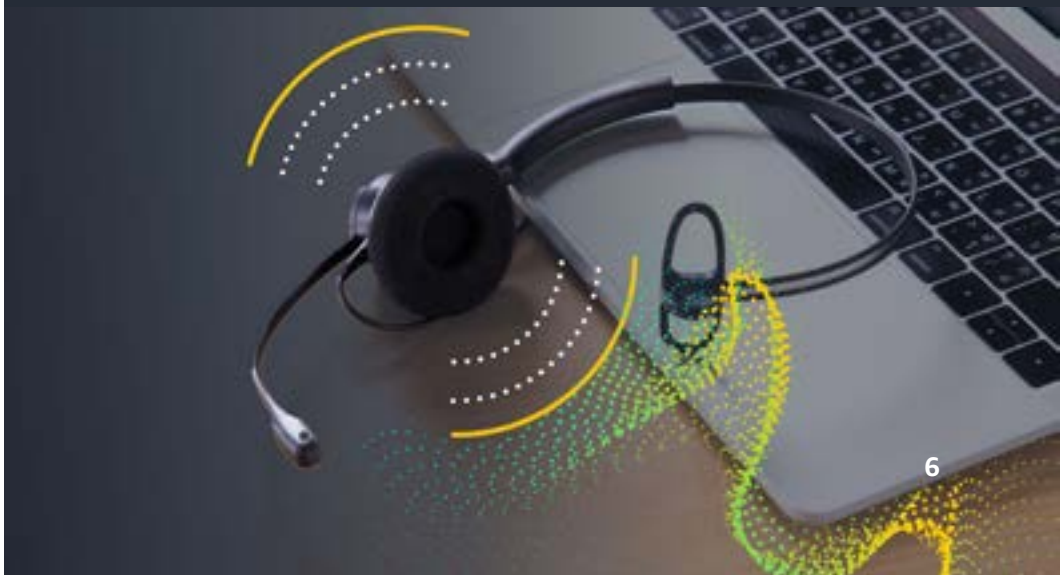
"With Amazon Lex, we can empower Vonage customers to choose how and where they will engage with us—building intelligent interaction paths into existing voice and messaging channels."

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

Consumers today expect real-time, personalized experiences across digital channels as they consider, purchase, and use products and services.

Machine learning can help you deliver these highly personalized experiences, resulting in improvements in customer engagement, conversion, revenue, and margin. AWS offers machine learning solutions that deliver higher-quality personalized experiences across digital channels—all tailored to your business needs.

If you want to quickly get started with personalization today, you can use Amazon Personalize—a fully managed service that leverages over 20 years of personalization experience at Amazon. Amazon Personalize makes it easy to develop applications for a wide array of personalization use cases, including product or content recommendations, individualized search results, and customized marketing communications—with no machine learning expertise required.

Or, if you want to develop your own machine learning models for recommendation engines, you can use Amazon SageMaker—a fully managed service that helps data scientists and developers build, train, and deploy machine learning models quickly. You can use built-in algorithms such as factorization machines or XGBoost, both of which are optimized for personalization, to readily train and deploy models. You can also bring your own algorithms or models or select from the hundreds of algorithms and pre-trained models available at the AWS Marketplace.

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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

ZAPPOS

"We are…using analytics and machine learning solutions to personalize sizing and search results for individual users. AWS services (including Amazon SageMaker) allow (our) engineers to focus on improving performance and results rather than DevOps overhead."

Ameen Kazerouni, Head of Machine Learning Research and Platforms

Analyze media assets to increase value and create new insights

Media assets, such as audio and video, are invaluable in offering an enhanced customer experience across entertainment, professional sports, education, and other industries. The value of these assets can be greatly increased through targeting, personalization, and improved monetization. Unfortunately, many companies struggle to optimize their media to fully take advantage of this content.

Applying machine learning to this problem can provide benefits across four key areas—easily enable better content search and discovery, increase accessibility through captioning and localization, improve content monetization, and improve media compliance and moderation. AWS offers several machine learning solutions that can help you intelligently manage your media assets.

AWS Media Insights Engine leverages Amazon Rekognition, Amazon Transcribe, and Amazon Translate to dramatically accelerate your ability to index rich content—so you can quickly make it available for content searches, ad optimization, subtitling and localization, content moderation, compliance adherence, and highlight generation. Amazon Rekognition enables faster, easier image and video analysis with custom labeling to further enhance content indexing and retrieval. Amazon Transcribe enables efficient conversion of audio speech into text to create rich metadata indexes for search and discovery. Combining Amazon Transcribe with Amazon Translate provides content publishers a workstream to easily caption and translate videos to remove barriers and increase reach and accessibility. Media2Cloud helps you set up a serverless, end-to-end content ingest and analysis workflow, streamlining the process of moving media assets to the cloud. It uses machine learning to extract and analyze the metadata needed to build the viewing experiences your customers want.

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NASCAR

"We selected Amazon Transcribe to power the captioning of NASCAR's VOD content…spanning 195 countries and 29 languages. Since implementing Amazon Transcribe, we automatically add captions to 99% of our VOD content and spend 97% less than what we had originally estimated."

Patrick Carroll, Senior Director, Development

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. Supply chain, sales, finance, 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 and complex for many businesses to adopt in a meaningful way. Amazon Forecast changes the equation, making it easy to generate fast and accurate forecasts by combining time-series data with additional variables that are relevant to each customer's unique needs. Automated processes help you create a custom machine learning model in hours—with no machine learning experience required.

Organizations that want to develop their own machine learning models for forecasting can use Amazon SageMaker, a fully managed service that helps data scientists and developers build, train, and deploy machine learning models quickly. The service includes several built-in machine learning algorithms, such as DeepAR, that are optimized for forecasting. Amazon SageMaker removes the heavy lifting from each step of machine learning to make it easier to develop high-quality models for forecasting.

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DOMINO'S PIZZA ENTERPRISES LIMITED

"We knew that by using AWS Services (including Amazon SageMaker) we could…give our stores a glimpse into the future by predicting what pizzas would be ordered next. Customers are getting their pizza faster, hotter, and fresher because of the improvements we've put into place."

Michael Gillespie, Chief Digital and Technology Officer

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

Make it easy to identify potential fraudulent online activities

Around the globe, billions of dollars are lost each year to online fraud.[3] Many applications that are designed to protect against potential online fraud rely on business rules that are not keeping pace with the ever-changing tactics of bad actors.

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 datasets. 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 potential online fraud faster and easier. It puts your data at the center of your solution and makes it simpler to identify and prevent fraud—with no prior machine learning experience necessary.

For fraud detection, Amazon SageMaker offers built-in algorithms, such as Random Cut Forest and XGBoost, and hundreds of algorithms and pre-trained models available through the AWS Marketplace, allowing you to develop fraud detection solutions in days.

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EULER HERMES

"With administrative and financial data of more than 30 million companies, it can be challenging to detect cyber fraud before it impacts business operations. (Using Amazon SageMaker,) we were able to launch a new internal service in seven months and can now identify URL squatting fraud within 24 hours."

Luis Leon, IT Innovation Advisor

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

[3] https://www.javelinstrategy.com/coverage-area/2019-identity-fraud-report-fraudsters-seek-new-targets-and-victims-bear-brunt

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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 seven 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 seven 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 »