Top 7 machine learning use cases for startups

How leading startups achieve fast, efficient, and measurable results with machine learning

Meet startup challenges with machine learning

Machine learning (ML) has moved beyond the hype to become a meaningful driver of value for many startups. Over two-thirds of businesses that have fully embraced artificial intelligence (AI) say the technology creates better customer experiences, and more than half say it improves decision-making and increases productivity. And with cost optimization a priority for every startup, ML successfully allows for innovation while achieving cost savings.[1]

Startups across nearly every industry are leveraging ML to reduce costs, boost productivity, create better products, and get to market faster than their competitors. With the ability to predict outcomes and produce better results over time, ML gives startups the key advantages to win.

Recognized as a Leader in the 2022 Gartner Magic Quadrant for Cloud AI Developer Services[2], Amazon Web Services (AWS) provides AI and ML services for every use case—enabling startups of any size to launch new products immediately and enhance existing products, services, and processes. Startups choose AWS over alternative AI and ML approaches because of faster training times, lower costs, lower inference latency, and the deepest set of security features.

[1] "Artificial Intelligence (AI) and Analytics," PwC, 2021
[2] "2022 Gartner Report Magic Quadrant for Cloud AI Developer Services"

Starting with the right use case is key

In this eBook, we have outlined seven use cases where AWS startup customers have successfully applied ML to meet their goals.

What benefits can you expect from implementing ML?

- Solves a real problem for your business—one that's important enough to get attention, support, and adoption
- Increases performance, reduces costs, and improves your customer experience
- Can be completed quickly—often in a few hours or a few weeks, depending on the complexity

When you're ready, 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**—an end-to-end solution that provides you with all the tools you'll need to build your own ML models in a single service.

Seven leading use cases

1. **Automate document data extraction and analysis ›**
2. **Personalize customer recommendations ›**
3. **Get more out of images and videos ›**
4. **Optimized sales and support ›**
5. **Forecast key business metrics ›**
6. **Validate user identity ›**
7. **Improve the customer self-service experience ›**

Your startup can scale and get to market faster with AWS low-code ML tools for automatically building and training models and no-code tools with pre-built ML solutions. Practice MLOps and put in place a collaborative and streamlined approach to the ML development lifecycle.

1. Make faster decisions by automatically extracting and analyzing data from documents

Your startup contains a treasure trove of insights within your documents waiting to be leveraged. However, accessing and searching the ever-growing volumes of information requires manually processing—a costly and cumbersome task for startups. ML can do the job for you by accessing the information you need within your documents and providing new insights to inform your business decisions.

Depending on your startup needs, AWS offers three services that can be deployed individually or combined as building blocks to develop an end-to-end document processing solution. **Amazon Textract** automatically extracts handwriting, printed text, and data from scanned documents. **Amazon Comprehend** is a natural language processing (NLP) service that uses ML to find insights and relationships in text. And **Amazon Augmented AI** (Amazon A2I) provides built-in human review workflows to ensure the accuracy of the data.

Quickly and efficiently develop your own ML models for text extraction and analysis with **Amazon SageMaker**, a fully managed service that helps business analysts, data scientists, data engineers, and MLOps engineers prepare data and build, train, and deploy ML models quickly. This service provides several built-in ML algorithms—such as BlazingText and Linear Learner—that are optimized for text classification, NLP, and optical character recognition (OCR).

HELLOSIGN
a Dropbox Company

HelloSign transforms PDFs into mobile-friendly forms.

Solution used:

Amazon Textract

Results:

Decreased form creation time from at least one hour to an average of 40 seconds

Increased month-over-month growth of form creation by 26%

Tripled the ratio between the number of new customers and new forms created

"[Using AWS], we can expand what our product can do without hiring an expert in that field. This helps us keep our team small and agile."

Benny Kao, Product Manager, HelloSign

Read the full story ›

2. Make personalized recommendations to increase customer engagement

Today's consumers expect personalized experiences across digital channels as they consider, purchase, and use products and services. According to a recent study, 80 percent of consumers are more likely to do business with a company that offers personalized experiences.[3]

ML allows you to create highly personalized experiences that can improve customer engagement, revenue, and margin. Personalization engines powered by ML are especially helpful for new companies because they can generate recommendations, even for customers where there is little or no data or for customers with changing preferences.

ML helps you leverage personalization in ways that are cost-effective and easily scalable. AWS manages the entire ML pipeline to enable you to scale as needed through a pay-for-what-you-use service. Leveraging personalization allows you to provide 1:1 service to all your customers through a personalization engine powered by ML. Keep customers engaged throughout the funnel with messages and offers tailored to their specific needs.

To get started quickly with personalization today, **Amazon Personalize** offers a fully managed service that leverages more than 20 years of personalization experience at Amazon.com. 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 ML expertise required. Additionally, you'll pay only for what you use, helping you better optimize your costs.

Or, if developing your own ML models appeals to you, **Amazon SageMaker** provides built-in algorithms, such as factorization machines, KNN, or XGBoost, all of which are optimized for personalization. You can also bring your own algorithms or models or select from the hundreds of algorithms and pretrained models available from **Amazon SageMaker JumpStart**.

nerdwallet

NerdWallet uses AWS ML services to power personalized finance recommendations for customers.

Solutions used:

Amazon SageMaker

Amazon Elastic Compute Cloud (Amazon EC2)

Amazon Elastic Container Service (Amazon ECS)

Results:

Reduced ML model training time from months to days

Reduced training costs by 75%

Improved flexibility and performance

"Working with AWS, we effectively get to stand on the shoulders of giants."

Ryan Kirkman, Senior Engineering Manager, NerdWallet

Read the full story ›

[3] "More Than Just a [First Name]," Epsilon, 2018

Pomelo.

Pomelo, a global fashion e-tailor, increased revenue with personalized shopping experiences powered by AWS AI services.

Solution used:

Amazon Personalize

Results:

15% increase in gross revenue from category pages

18% boost in click-throughs from category to product pages

16% increase in add-to-cart clicks from category page

400% increase in ROI within one month

60% of product views come from Amazon Personalize–fueled recommendations

8% increase in incremental gross revenue

User preferences updated on product pages in minutes

"When you think of e-commerce, you think of AWS."

Shane Leese, Business Intelligence Director, Pomelo Fashion

Read the full story ›

3. Get more out of images and videos

Images and videos can enhance the user experience. Unfortunately, visual data is bulky and often expensive to incorporate into ML models.

The rise of user-generated content (UGC) further complicates the challenge. Use cases like ad placement, content moderation, or even upselling require real-time results. Startups have limited resources and can get overwhelmed in building ML models for image analysis. It takes time to manually moderate, review, tag, and archive UGC images and videos across social media and other channels and derive insights.

Fortunately, **Amazon Rekognition** can help businesses of every size get more out of images and videos. It can immediately tag important information such as objects, people, text, scenes, and activities, as well as inappropriate content. Additionally, with **Amazon Rekognition Custom Labels**, you can identify objects and scenes that are specific to your business needs.

Several use cases, such as home security, traffic control, and industrial inspection, require real-time video analysis near the camera location. For such instances, the **AWS Panorama Appliance** and SDK deliver computer vision (CV) intelligence to IP cameras. Because the ML happens locally on the AWS Panorama Appliance, customers save on bandwidth costs and can use it in low-bandwidth locations.

Amazon SageMaker is also commonly used to build models that use images and videos, thanks to capabilities like **Amazon SageMaker Ground Truth**, which labels images and generates fully labeled synthetic images. SageMaker also provides built-in algorithms and models designed for visual data, making it much easier to incorporate images and videos into your ML projects.

SYNCHRONIZED

Synchronized transforms customer content into smart videos.

Solution used:

Amazon Rekognition

Results:

Automates thumbnail creation for 500+ hours of programs

Guarantees the quality of thumbnails based on specific editorial criteria

Significantly increases the amount of data generated from videos

"The beauty of it all is that a startup can embark on highly ambitious projects while building on and collaborating with companies like AWS…that was impossible 15 years ago."

Guillaume Doret, CEO, Synchronized

Read the full story ›

PromoMii

PromoMii creates video ads with speed and intelligence.

Solution used:

Amazon Rekognition

Results:

Produces trailers 10 times cheaper and 20 times faster

Quickly identifies scenes with certain celebrities, emotional characteristics, and shot types

Provides labels and template queries out of the box for faster results

"Suddenly it feels like working in one team, rather than thinking about AWS as a cloud provider. For a fastmoving startup…AWS' support is much more than just infrastructure. It's a lot of expertise, constant feedback, and that much needed reassurance."

Tigran Mnatsakanyan, CTO and Co-Founder, PromoMii

Read the full story ›

4. Power your customer support with AI to improve service and reduce costs

By analyzing customer interactions using ML-powered solutions, startups can gain insights to increase sales, improve customer support, reduce churn, and increase up- and cross-selling. Two solutions from AWS are particularly useful for speech and video analysis.

Amazon Connect is an ideal solution for startups that want to add the benefits of ML to their customer support services—but can't yet afford to invest in a large team. The solution delivers AI-powered speech analytics and customer insights in real time that help salespeople and your customer service reps and their supervisors better understand and respond to customer needs. In moments when your staff gets flooded with requests, Amazon Connect helps each person quickly detect the sentiment of a caller to better understand the context and determine the proper response. It also includes pretrained AWS AI services that allow you to transcribe, translate, and analyze each customer interaction.

For startups that already have a contact center in place, **AWS Contact Center Intelligence** (CCI) solutions help improve customer experience, boost agent productivity, and gain insights into customer interactions—with the freedom to add AI services as you choose. AWS CCI solutions use a combination of AWS ML services to power Self-Service Virtual Agents, Real-time Call Analytics and Agent Assist, and Post-Call Analytics.

ChartSpan is the largest startup managed services provider of chronic care management programs in the United States, providing turnkey managed care coordination and compliance programs.

Solution used:

Amazon Connect

Results:

80.5% decrease in costs with consumption-based pricing

67% reduction in management and engineering spend

12% increase in clinical contact center staff utilization

6 weeks to move entire contact center to Amazon Connect

"Moving to Amazon Connect has dramatically impacted our business. We've eliminated costs, improved productivity, and improved our margins."

Patrick Carter, Chief Medical Officer, ChartSpan

Read the full story ›

5. Forecast key business metrics

Forecasting customer demand helps you understand where your next hire should be or how much inventory you really need. Being right about your forecast is critical to your startup growth. Unfortunately, ML-powered forecasting tools have historically been too expensive and complex for most startups 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 like inventory or sales demand. You can generate insights faster and make smarter financial decisions driven by timely, relevant data. Automated processes help you create a custom ML model in hours—with no ML experience required.

Or, if you want to develop your own ML models for forecasting, **Amazon SageMaker** makes it easy by removing the heavy lifting from every step of the process. The service includes Amazon SageMaker DeepAR, which is optimized for forecasting.

App8

App8 helps restaurants predict demand.

Solution used:

Amazon Forecast

Results:

Reduced development overhead

Automated demand forecasting

Improved forecast accuracy

"You can actually predict how many people are going to come to your restaurant at a specific time and how many menu items are going to be in demand…you won't waste food, and you'll get a better return on your investment."

Hani Jabbour, CTO, App8

Read the full story ›

6. Validate user identity to protect user and prevent fraud

Today, organizations have to invest billions of dollars to reduce and prevent fraud in our increasingly digital world. In fact, the fraud detection and prevention market is expected to grow to $75 billion USD by 2028 at 16 percent CAGR.[4] One way organizations can prevent fraud is by leveraging identity verification, but the process of correctly identifying user identity in real time can be complex and can add friction to the customer experience. Verifying identity to combat fraudulent activities makes for a good AI and ML use case. Startups can benefit in three main areas.

- **First**, as speed to market is paramount to startups, ready-to-use AI solutions, services, and ML models enable developers to quickly implement identity verification processes
- **Second**, fully managed APIs can help train and implement custom models with less effort and data
- **Third**, customers can leverage existing development resources with solutions and services that require no previous expertise, making AI and ML readily available across startups at a lower cost

Your startup can quickly integrate pretrained facial recognition and analysis capabilities to authenticate your users' identities using **Amazon Rekognition Identity Verification**. Through a streamlined verification process and the ability to detect fraudulent and duplicate accounts in seconds, onboarding legitimate customers becomes easy without affecting your customer experience. By leveraging automation and AI with ready-to-use services, your startup can effectively reduce implementation and operational costs.

GAMES 24 SEVEN

Games24x7 keeps gaming fair and fun.

Solution used:

Amazon SageMaker

Results:

Prevents fraud and collusion during online games

Detectes and mitigates security threats faster

Identifies and thwarts intrusions with real-time visibility into attack vectors

"It was an awesome experience... bringing observability into our tech stack has helped enormously with real-time reactions to any system event."

Sandeep Agarwal, CTO, Games24x7

Read the full story ›

[4] Bloomberg: Fraud detection and prevention.

7. Improve customer self-service experience with conversational AI

The demand for self-service conversational interfaces continues to grow as more and more users prefer to interact with businesses on digital channels. For startups, achieving cost-efficiency where possible is key—developing voice and text conversational interfaces can reduce operational costs, as well as increase user satisfaction and streamline business processes. Add human-like conversation capabilities to your startup's business applications using conversational AI (CAI) interfaces. CAI is created by combining different natural language technologies like NLP, natural language understanding (NLU), and natural language generation (NLG).

CAI interfaces are used broadly across a wide variety of industry segments and use cases, including customer service, financial services, healthcare, insurance, travel, retail, automotive, and more. The common use cases for CAI include building virtual agents and voice assistants, automating informational responses and data capture, boosting agent productivity in contact centers, automating customer service, and performing transactional operations.

AWS conversational AI solutions primarily leverage **Amazon Lex**, which is complemented by additional AI and ML services including **Amazon Kendra**, **Amazon Comprehend**, **Amazon Translate**, **Amazon Polly**, and **Amazon SageMaker**. **Amazon Transcribe** combined with Amazon Lex provides the advanced deep learning functionalities of automatic speech recognition (ASR), and NLU to enable customers to build applications with highly engaging user experiences and lifelike conversational interactions using voice and text. With Amazon Lex, the same deep learning technologies that power Amazon Alexa are now available to any customer, enabling them to build sophisticated natural language conversational bots quickly and easily.

ACTIVE.Ai

Active.AI automates customer conversations with banks using AI through voice, bots, or messaging platforms.

Solutions used:

AWS AI services to construct automated conversations

Amazon EC2 Spot Instances

Results:

Reduced training costs by 50%

Automated conversations with banking customers

Helps banks make as many as one million interactions per month

Enables secure, seamless, and scalable customer experiences

Improves customer engagement

Enables safe, secure transactions on unstructured data

"At Active.ai our mission is to provide seamless conversational experiences to our customers on digital platforms. AWS has allowed us to focus on providing wonderful experiences, that are secure, seamless, and scalable."

Parikshit Paspulati, Co-Founder & CTO, Active AI

Watch the full story ›

Empower your startup with machine learning

With the use cases in this eBook, your startup can leverage the many advantages of ML—boost productivity, make smarter use of 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 startups like yours are achieving success with them today—and because they fulfill all the requirements you should look for when identifying a suitable application for ML. Your team can complete these use cases in a matter of months, solve real business problems, increase performance, reduce costs, and improve customer experiences. They lend themselves to the inclusion of technical and domain experts, and—when properly executed—generate results that can accelerate the innovation and business growth of your startup.

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

Learn more about AWS ML for startups ›