



Release innovation from within your organization with Machine Learning on AWS

EBOOK

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Intelligent computers break out of sci-fi typecasting

For decades, dreams about computers coming to life with artificial intelligence (AI) have ignited our imaginations. From utopic to catastrophic, we've built galaxies and industries around tall tales of AI. The closer we get to it, though, the easier it is to see that we've misjudged the role AI will play in our lives.

Instead of shackling us to computers, AI empowers us to achieve digital transformation. Businesses today plan to use AI to make better decisions, unlock data in text and speech, identify anomalies, recommend products, predict maintenance, and more.

AI lands a leading industry role with its machine learning prowess

Machine learning is the engine behind AI, and it isn't scary the way sci-fi movies would have you believe. As a general-purpose technology, you can apply machine learning to many different scenarios to fuel innovation and create new capabilities.

Machine learning works by using massive volumes of historical data and the probability of likely outcomes to refine mathematical models to better describe complex scenarios. Answer bias is not programmed into the system, meaning the data itself directs the modifications made to the model until the model reflects the data as accurately as it can. Once your model is ready (or trained) you can apply it to new data to better understand trends and likely outcomes.

AI is simply the program logic to interpret machine learning results.

Machine learning makes a grand entrance on the cloud

Machine learning is making a profound impact on a broad canvas of business and technology areas today. From boosting application intelligence, to analyzing data on a deeper level, and forecasting future outcomes, machine learning offers organizations valuable inroads to improving their agility and efficiency. Companies across industries are using machine learning to create competitive opportunities for themselves.

To work, machine learning needs data—LOTS of data—as well as specialized compute power like GPUs to train and run models on all that data. The cloud provides secure, virtually unlimited access to data and power at scale. Its on-demand availability means companies no longer need to purchase expensive, specialized technology that sits unused most of the time.

Cloud computing brings digital transformation to the center stage for business by enabling machine learning—the science that uses self-improving algorithms—to help us find better answers, faster.

Get your machine learning models into production faster with Amazon SageMaker

SageMaker is a fully managed service on Amazon Web Services (AWS) that brings machine learning to every developer and data scientist by assisting with the entire workflow.

- ✓ Label and prepare data
- ✓ Choose an algorithm
- ✓ Train the model
- ✓ Optimize and deploy the model
- ✓ Automate decisions
- ✓ Take action

Machine learning starts on AWS more than anywhere else

Amazon Web Services (AWS) offers the broadest and deepest set of machine learning services, with more than 10,000 customers choosing AWS for machine learning.

Getting started is easy with pre-trained services, programs like Amazon SageMaker, and support for open-source frameworks. Once you have a strong foundation in place, the AWS Partner Network (APN) makes it easy to find partners with expertise in machine learning who can help you guide and maximize your investments.

With APN partners and the fully equipped AWS Cloud, you can feel confident that your machine learning projects will deliver results.



Broadest set of ML services

Access the broadest and deepest set of ML services to accelerate innovation



Lower cost in production

Lower the cost of predictions in production—aka inference—by better balancing your compute needs



Support for a fast start

Execute ML projects faster with support from skilled partners and easy access to frameworks

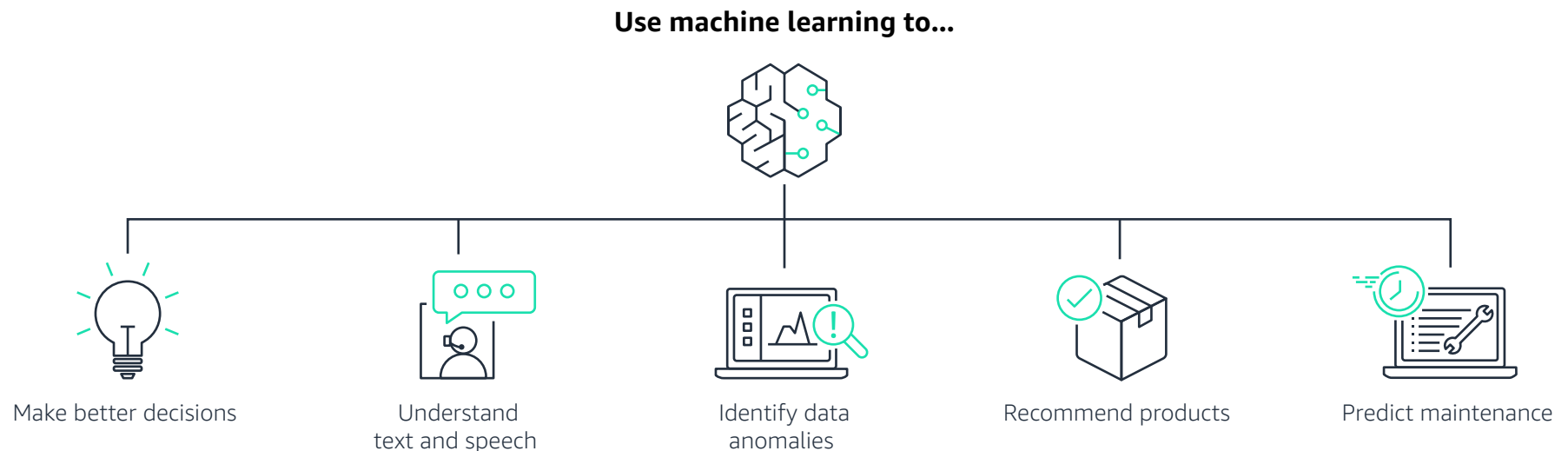
“Alexa, deploy ML to create a great customer experience...”

Applying machine learning across internal departments at Amazon.com has led to breakthrough innovation and improved customer experiences at a global scale. Trust the platform developed by ML leaders.

The AWS approach to machine learning makes innovation contagious

AWS offers a unique company-wide, company-directed approach to machine learning that empowers innovation from all areas of the business. It starts at the C-level with adoption of a centralized machine learning platform that provides easy access to users across the organization. A shared platform approach empowers groups to cross pollinate best practices and build on one another's ideas.

How you choose to write machine learning into your company's story is up to you.



Make better decisions to inform your course of action

Businesses use forecasting to help them plan how best to move forward. You can improve the accuracy of your forecast by using machine learning to train models with historical and third-party data and then apply that to new information as it becomes available.

Different departments within the same organization can use machine learning for:

- Revenue forecasting (Finance)
- Benefit planning (HR)
- Promotion planning (Marketing)

Across industries, machine learning helps with forecasting and planning activities, like:

- Inventory planning (Retail, manufacturing, industrial)
- Shipping logistics (Transportation)
- Price planning (Airlines and hotel)

Unlock information from documents and verbal language

A lot of valuable information still exists in paper documents and auditory recordings today. By making this data available electronically through machine learning, you can include it in your queries, which opens up new avenues for unlocking insights and solving problems.

Different departments within the same organization can use machine learning for:

- Contract management (Legal)
- Resume digitization (HR)
- Chatbot intelligence (Customer service)

Across industries, machine learning makes non-digital data available for analysis, like:

- Patient history (Healthcare)
- Bill of Sale documents (Shipping)
- Attendant monitoring (Call center)

Paper doesn't have to be a dead end!



Document indexing extracts text and data from virtually any document without the need for any manual effort or custom code, while natural language processing translates voice recordings into searchable data.

Identify anomalies in your data

Unusual behavior or circumstances will often trigger deviations in data. Machine learning establishes a baseline that you can use to detect anomalies in new data in real time in order to isolate issues before they get out of hand.

Different departments within the same organization can use anomaly detection to identify:

- Security threats (IT)
- Identity theft (HR)
- Fraudulent purchases (Sales)

Across industries, machine learning detects data anomalies that may indicate issues with:

- Unauthorized account access (Banking)
- EKG irregularities (Healthcare)
- Temperature control (Industrial)

IoT sensors extend data anomaly insights



Data from IoT sensors can improve your ability to serve your customers and secure your business by providing you with valuable insights into connected assets outside your physical boundaries.

Recommend unique activities for customers

User-specific data generated from online activities through search engine and website cookies track customer behavior. You can use machine learning to create models that allow you to offer valuable recommendations and experiences for your customers in the moment.

Different departments within the same organization can use personalization for:

- Product recommendation (Sales)
- Offer personalization (Marketing)
- Advertisement placement (Marketing)

Across industries, machine learning helps businesses make personalized recommendations, like:

- Cart additions (Retail)
- Route suggestions (Transportation)
- Service providers (Legal)

Predict maintenance requirements ahead of schedule

Many companies still rely on routine diagnostic inspections and scheduled maintenance to monitor their equipment. You can train machine learning models to analyze data retrieved from device sensors and anticipate problems before they start.

Different departments within the same organization can use predictive maintenance for:

- Equipment upkeep (Maintenance)
- Asset budgeting (Finance)
- Location assignment (Scheduling)

Across industries, machine learning predicts maintenance needs to avoid malfunctions in assets, like:

- Airplanes (Transportation)
- Truck engines (Shipping)
- Heavy machinery (Construction)

IoT sensors play a key role in predictive maintenance



Run data from your IoT sensors through machine learning models to assess the state of your assets, anticipate further disrepair, and prescribe maintenance instructions.

About Pulsion Technology



Founded in 1995, Pulsion Technology has established themselves as a leading digital partner to an extensive list of clients across public, private and third sector organisations. Our partnership with Amazon Web Services ensures we are able to offer the best technology solution for your requirements.

The Pulsion team has extensive experience in cloud migration, custom software development, mobile app development, artificial intelligence solutions and website development, which ensures we are perfectly placed to understand your project and offer the most appropriate solution for digital transformation.

Book your free consultation with Pulsion

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Pulsion case study: Velappity

80% Time Saving in Building Electronic Forms

Client

Velappity - a company who design and build forms within an electronic risk assessment app

Issue

- Design and build of electronic forms required for clients was a time-consuming manual process and were looking for ways to save time in this area
- Manual steps involved extracting information from a document and building in an electronic format

Solution

- Use Artificial Intelligence to read the document and build the electronic form with the information in the right place
- "By using AI we were able to train the system to recognise what was a question and determine that a response would be required next to it"
- The AI solution that was built could recognise the format the answer should be in. For example, if a photo was required, the response would be that the answer should contain an image. If the question requested a name then the response would require a text box. If it was a direct question such as a yes or no answer, then the response would require a checkbox

Benefit

Since implementation, the client has seen a reduction in time of between 70%-80% for building small forms and over 80% for larger forms

Pulsion case study: OneSearch

75% Reduction in Manual Effort

Client

OneSearch - a property search company

Issue

A key activity for the client is to go through council meeting minutes and extract the relevant information related to traffic management schemes that should be associated with specific properties for searches. The information required is things like traffic calming measures or the implementation and length of double yellow lines on streets. Further information that maybe required was information on planning permission. This detail would be across a number of documents ranging in size from 10-70 pages long and was a completely manual piece of work, reading through the text of the meeting minutes and finding the relevant information. Further, the work had to be undertaken by someone with an understanding on how traffic management schemes work. There was a vast amount of documents to analyse, coming from all council across the UK.

Solution

The proposed solution from Pulsion was to build a machine learning algorithm that could scrape the web, find the council meeting minutes, scan the text from those minutes, extract the relevant data relating to traffic schemes and understand the data. For example, recognising specific streets and applying that to the database of properties.

Benefit

This project has resulted in a 75% reduction in manual effort since implementation.

Pulsion case study: The Wise Group

80% Reduction in Time Spent on Administrative Tasks

Client

The Wise Group - Charity / Social Enterprise organisation working in the community and in prisons

Issue

Staff working in the community or in a prison required to fill in paper based forms making their system overly cumbersome. The paper forms remained with the staff member until they were back in the office where they would manually transpose the information into a CRM system. It was a very manual , time consuming process.

Solution

Introduce an OCR (Optical Character Recognition) tool to allow the staff member to photograph the completed form and upload to the CRM system. The text translation means that the manual re-entry of data task is removed from the process. Forms are still completed on paper as devices are not allowed in the prison but the OCR tool scans the document and uploads to the CRM, putting the information in the right place in the system. When scanned, a preview is available to correct anything not picked up or misread by the tool before final submission.

Benefit

- The removal of the manual re-entry of data task has freed staff up to spend more time out in the field with clients and not back in the office. Information can be uploaded in real time as soon as a meeting is complete rather than waiting for the staff member to be back in the office.
- The result has been an 80% reduction in time spent on the administrative duties involved in the process.



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