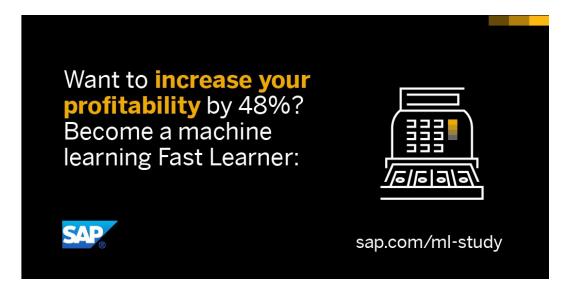# Machine Learning In The Real World

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O ver the past few decades, machine learning has emerged as the real-world face of what is often mistakenly called "artificial intelligence." It is establishing itself as a

mainstream technology tool for companies, enabling them to improve productivity, planning, and ultimately, profits.

Michael Jordan, professor of Computer Science and Statistics at the University of California, Berkeley, noted in a recent Medium post: "Most of what is being called 'AI' today, particularly in the public sphere, is what has been called 'machine learning' for the past several decades."

Jordan argues that unlike much that is mislabeled "artificial intelligence," ML is the real thing. He maintains that it was already clear in the early 1990s that ML would grow to have massive industrial relevance. He notes that by the turn of the century, forward-looking companies such as Amazon were already using ML throughout their business, solving mission-critical back-end problems in fraud detection and logistics-chain prediction and building innovative consumer-facing services such as recommendation systems.

"Although not visible to the general public, research and systems-building in areas such as document retrieval, text classification, fraud detection, recommendation systems, personalized search, social network analysis, planning, diagnostics, and A/B testing have been a major success — these are the advances that have powered companies such as Google, Netflix, Facebook, and Amazon," Jordan says.

Amazon, which has been investing deeply in artificial intelligence for over 20 years, acknowledges, "ML algorithms drive many of our internal systems. It's also core to the capabilities our customers' experience – from the path optimization in our fulfillment centers and Amazon's recommendations engine o Echo powered by Alexa, our drone initiative Prime Air, and our new retail experience, Amazon Go. "

The fact that tech industry leaders like Google, Netflix, Facebook, and Amazon have used ML to help fuel their growth is not news. For example, it has been widely reported that sites with recommendation

engines, including Netflix, use ML algorithms to generate user-specific suggestions. Most dynamic map/routing apps, including Google Maps, also use ML to suggest route changes in real time based upon traffic speed and other data gleaned from multiple users' smartphones.

In a [recent article detailing real-world examples of ML in action](#), Kelly McNulty, a senior content writer at Salt Lake City-based Prowess Consulting, notes: "ML isn't just something that will happen in the future. It's happening now, and it will only get more advanced and pervasive in the future."

However, the broader uptake of ML by enterprises – big and small – is less much less known. A recently published study prepared for SAP by the Economist Intelligence Unit and based on a survey of 360 organizations revealed that 68 percent of respondents are already using ML, at least to some extent, to enhance their business processes.

The report adds: "Some are aiming even higher: to use ML to change their business models and offer entirely new value propositions to customers...... ML is not just a technology." The report's authors continue, "It is core to the business strategies that have led to the surging value of organizations that incorporate it into their operating models – think Amazon, Uber, and Airbnb."

McNulty notes that there are both internal and external uses for ML. Among the internal uses, she cites Thomson Reuters, the news and data services group, which, after its merger in 2008, used ML to prepare large quantities of data with Tamr, an enterprise data-unification company. She says the two partners used ML to unify more than three million data points with an accuracy of 95 percent, reducing the time needed to manually unify the data by several months and cutting the manual labor required by an estimated 40 percent.

In another example of enterprise use of ML, she notes that GlaxoSmithKline, the pharmaceuticals group, used the technology to develop information aimed at allaying concerns about vaccines. The ML algorithms were used to sift through parents' comments about vaccines in forums and messaging boards, enabling GSK to develop content specifically designed to address these concerns.

In the financial sector, ML has been widely used for some time to help detect fraudulent transactions and assess risk. PayPal uses the technology to "distinguish the good customers from the bad customers," according to Vadim Kutsyy, a data scientist at the online payments company.

PayPal's deep learning system is also able to filter out deceptive merchants and crack down on sales of illegal products. Additionally, the models are optimizing operations. Kutsyy explained the machines can identify "why transactions fail, monitoring businesses more efficiently," avoiding the need to buy more hardware for problem-solving.

ML algorithms also underpin many of the corporate chatbots and virtual assistants being deployed by enterprise customers and others. For Example, Allstate partnered with technology consultancy Earley Information Science to develop a virtual assistant called ABIe (the Allstate Business Insurance Expert). ABIe was designed to assist Allstate's 12,000 agents to understand and sell the company's commercial insurance products, reportedly handling 25,000 inquires a month.

Other big U.S. insurance companies, including Progressive, are applying ML algorithms to interpret driver data and identify new business opportunities.

Meanwhile, four years ago, Royal Dutch Shell became the first company in the lubricants sector to use ML to help develop the Shell Virtual Assistant. The virtual assistant enables customers and distributors to ask common lubricant-related questions.

As the company noted at the time, "customers and distributors type in their question via an online message window, and avatars Emma and Ethan reply back with an appropriate answer within seconds." The tool was initially launched in the U.S. and UK but has since expanded to other countries and reportedly can now understand and respond to queries in multiple languages, including Chinese and Russian.

In the retail sector, Walmart, which already uses ML to optimize home delivery routes, also uses it to help reduce theft and improve customer service. The retail giant has reportedly developed facial recognition software that automatically detects frustration in the faces of shoppers at checkout, prompting customer service representatives to intervene.

Among SAP's own customers, a growing number are implementing ML tools, including those built into SAP's own platforms and applications. As SAP notes, "Many different industries and lines of business are ripe for machine learning—particularly the ones that amass large volumes of data."

The manufacturing, finance, and healthcare sectors are leading the way. For example, a large European chemicals company has improved the efficiency and effectiveness of its customer service process by using ML algorithms to automatically categorize and send responses to customer inquiries.

In the mining sector, Vale, the Brazilian mining group, is using ML to optimize maintenance processes and reduce the number of purchase requisitions that were being rejected causing maintenance and operational delays in its mines. Before implementation, between 25 percent and 40 percent of purchase requisitions were being rejected by procurement because of errors. Since implementation, 86 percent of these rejections have been eliminated.

Elsewhere a large consumer goods company, the Austrian-based consumer good company, is using ML and computer vision to identify images of broken products submitted by customers from the over

40,000 products in the company's catalog. The application enables the company to speed up repairs and replacements, thereby improving customer service and the customer experience.

Similarly, a global automotive manufacturer is using image recognition to help consumers learn more about vehicles and direct them to local dealer showrooms, and a major French telecommunications firm reduced the length of customer service conversations by 50 percent using chatbots that now manage 20 percent of all calls.

But not every enterprise ML deployment has worked out so well. In a highly publicized case, Target hired a ML expert to analyze shopper data and create a model that could predict which female customers were most likely to be pregnant and when they were expected to give birth. (If a woman started buying a lot of supplements, for example, she was probably in her first 20 weeks of pregnancy, whereas buying a lot of unscented lotion indicated the start of the second trimester.)

Target used this information to provide pregnancy- and parenting-related coupons to women who matched the profile. But Target was forced to modify its strategy after some customers said they felt uncomfortable with this level of personalization. A New York Times story reported that a Minneapolis parent learned of their 16-year-old daughter's unplanned pregnancy when the Target coupons arrived in the mail.

Target's experience notwithstanding, most enterprise ML projects generate significant benefits for customers, employees, and investors while putting the huge volumes of data generated in our digital era to real use.

For more insight on the implications of machine learning technology, download the [study Making the Most of Machine Learning: 5 Lessons from Fast Learners](#).

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