

Part 1

ARTIFICIAL INTELLIGENCE TRAILBLAZERS

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Using Artificial Intelligence To Power The Retail And Business-To-Business Services Of The Future

Alibaba Group is a Chinese multinational conglomerate that operates the world's largest e-commerce network through its web portals, which include Alibaba.com, Taobao, Tmall and Ali Express. With global sales that dwarf those of Amazon and eBay combined,¹ the business took what it learned from building a global online retail platform and has applied it to enterprises in just about every area of business and technology. Alibaba's success in delivering e-commerce and retail services, electronic payment, as well as business-to-business cloud services, has earned it a market cap in excess of US\$500 billion.

Its customers use artificial intelligence (AI) tools to help them find what they want when they shop at its online portals, and as one of the world's largest cloud computing providers it also licenses platforms, tools and cloud services to other businesses to help them leverage AI.

Beyond that, Alibaba is rolling out AI across the wider society, with projects involving turning entire cities into "smart cities". They are also planning on revolutionizing China's (and perhaps the world's) agricultural industries to ease the burden of feeding a growing population.

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How Does Alibaba Use Artificial Intelligence?

The Chinese government has strongly supported efforts by businesses to adopt AI, clearly believing that it has enormous potential for driving economic growth. Its goal is to foster a \$1 trillion industry and be the world leader in AI by 2030.²

This, combined with the fact that the country's enormous population gives companies access to huge amounts of data on customers' lives, makes the country a fertile ground for AI development.

Alibaba's e-commerce portals use sophisticated AI to choose which items to display to customers when they visit and search for products they want to buy. It does this by building a custom page view for every visitor, aimed at showing them items they will be interested in, at prices that seem right.

By monitoring customer actions – whether they make a purchase, browse to a different item or leave the site – it learns in real time to make adjustments to these page views to increase the probability of the visit ending in a purchase.

To train its e-commerce portals to show visitors pages that are likely to result in a sale, Alibaba has deployed a form of semi-supervised learning known as reinforcement learning on its Taobao portal.³

Because collecting enough user data to train unsupervised learning algorithms from real-time customer actions would take a long time, and involve real business risks, a virtual Taobao was built, with customer behavior simulated from hundreds of thousands of hours' worth of historical customer data.

This mass of data meant that it was possible for the algorithms to be exposed to a far wider range of customer behaviors, in a far shorter time span.

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Alibaba also has its own AI-powered chatbot – Dian Xiaomi – that answers more than 350 million customer enquiries a day, successfully understanding more than 90% of them. These tools are necessary to help it deal with the huge spikes generated by special occasions such as the Alibaba-created “Singles’ Day” shopping event.⁴

Automated Sales Copy

With millions of different items on sale across its sites, Alibaba has invested in automated content generation to ease the burden of writing descriptions for everything it sells. The tools are also available to third-party sellers on its platforms.

Its AI copywriter uses natural language processing algorithms running on deep learning neural networks to produce 20,000 lines of copy in a second.⁵

Traditionally, sales copywriters have had to spend hours researching keywords and click-through rates to understand what is likely to make a customer click their link in a page of product search results. The AI copywriter allows Alibaba and others selling through its platforms to do it at the click of a button.

This is done by creating multiple versions of adverts and running them through algorithms trained on customer behavior data. The system works out which combination of words is most likely to result in customer clicks, and uses them to create its copy.

Cloud Services

Just like Amazon and Google, Alibaba offers artificially intelligent services through the cloud to its business customers. Its cloud service business is the largest of all the Chinese tech giants.⁶

Alibaba’s AI offering is called Machine Learning Platform for AI, which offers solutions for businesses wanting to take advantage of

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cognitive computing functions such as natural language processing and computer vision, without the upfront costs of directly investing in infrastructure.

Alibaba's natural language processing technology was the first in the world to beat a Stanford University test designed to assess whether a machine can beat a human at reading comprehension.

In 2018, its deep neural network language processing technology passed the 100,000 question test with a score of 82.44 – narrowly beating the human score of 82.3.⁷

Smart Cities

Alibaba has developed a suite of cloud-based AI tools designed to carry out essential jobs like managing traffic flow, lighting and waste collection in cities where infrastructure is connected through smart online technology.

Alibaba City Brain already tracks and manages traffic flow on every street of Hangzhou, a city with a population of 9.5 million. The system is reported to have reduced traffic jams by 15%⁸ and is soon expected to be deployed in Kuala Lumpur, Malaysia.

City Brain monitors the flow of traffic and builds up models that it can use to predict when congestion is likely to occur. When it recognizes signs that there is a high probability of this happening, it can alter traffic light patterns to speed up or control the flow of traffic, so jams are less likely to form.

Alibaba's AI also powers the smart ticket kiosks at Shanghai's subway stations. The kiosks give customers route information when asked, and check customer identification using facial recognition technology.⁹

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Smart Farming

Alibaba has developed an AI system for monitoring farm herds, crops and orchards.

As the world's biggest supplier and consumer of pork, Chinese pig farmers have access to technology that records activity and health levels of herds, automating decision making over when to increase feed or provide animals with more exercise.¹⁰

Facing the challenge of feeding an ever-growing population, the system allows farmers to optimize breeding rates by raising a healthier herd and reducing newborn death rates. The system also has applications in crop growing and land management.

Academy For Discovery, Adventure, Momentum And Outlook

Alibaba's AI strategy is based around distributing its cutting-edge machine learning and deep learning solutions to businesses and customers through its cloud services.

Its business AI platform is delivered through its Alibaba Cloud subsidiary, which operates 18 global data centers. These host the hardware that powers the AI algorithms and data processing technology, which is provided as a service.

In 2017 it announced it would invest \$15 billion over the next three years, expanding its global network of AI research and development facilities.

It calls this program the Academy for Discovery, Adventure, Momentum and Outlook – DAMO – and will involve recruiting 100 researchers for its labs in Beijing and Hangzhou, China, and San

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Mateo and Bellevue in the United States, as well as others in Moscow, Tel Aviv and Singapore.¹¹

Research at the labs will focus on machine learning, natural language processing, Internet of Things, human/machine interaction and quantum computing.

Key Challenges, Learning Points And Takeaways

- Alibaba is China's biggest investor in research and development, which has given it a strong start in the race to become the world leader in AI.
- Its model for rolling out AI to millions of customers and businesses is to deploy its services through the cloud. This cuts customer risk and infrastructure cost, while giving Alibaba access to valuable data about how its customers behave.
- By applying technology designed to drive sales at its retail portals to other problems in business and society, it identifies new use cases for AI, within and outside its established business operations.

Notes

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