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FEATURE

What's Minding the Store

Artificial intelligence offers fuel and convenience retailers insightful, actionable data.

BY JERRY SOVERINSKY

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Like its U.S. rival Amazon, Chinese e-commerce giant Alibaba has been expanding into a number of channels beyond e-commerce, in each instance leveraging technology that promises widespread disruption. In its waitstaff-less Robot.He diner in Shanghai, for instance, customer orders are shuttled efficiently along a web of monorail-like tracks, with individual dishes gliding silently around turns and tables before stopping precisely before each corresponding customer as a robotic voice says, "Enjoy your meal."

With waitstaff earning on average $1,500 per month, the artificial intelligence (AI)-based replacements save "hundreds of thousands [of dollars] in costs every year," said Can Haitao, the Alibaba product manager who developed the concept, to Malaysian website The Star Online. "But we don't need two shifts for robots and they are on duty every day."

Not to be outdone, Alibaba's main Chinese rival, JD.com (https://corporate.jd.com/home), announced plans earlier this summer to develop a chain of more than 1,000 restaurants by 2020 that are run completely by robots, eliminating not just waitstaff but all kitchen personnel, replacing them with AI-based systems. The concept was alluring enough to attract Google, which has invested $550 million in the Chinese e-commerce company and its foodservice venture.

Think those are one-off experiments that are sure to power down? Wait, there's more...

Pizza Hut has begun testing robot waiters, called Dilly Plate, in South Korea. A California restaurant is testing its AI-driven robot, called Flippy, to flip hamburgers and place them on buns. KFC launched an AI-powered store in Beijing that uses facial recognition software to profile new customers while

recognizing returning patrons as it recommends food offerings. And earlier this year—you might have heard—Amazon launched a cashier-less store, Amazon Go, which delivers a revolutionary, frictionless shopping experience, one that featured prominently in this year's NACS State of the Industry Summit presentations as promising significant retailing disruptions.

Yes, the AI future is here. And if not yet on your street corner, it's fast approaching. While this might not mean a front office team of R2D2s replacing clerks and stock personnel, there are a number of less customer-centric, back-office applications that AI can play in enhancing the efficiency and performance of your business operations. Let's take a closer look.

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YOU READ IT HERE FIRST (MAYBE)

Five years ago, we reported on the exponential growth of data that is collected at POS systems while detailing the decryption challenge for retailers.

"Data is no longer reported just at the total store or category level. Instead, since the cost of data storage has dropped dramatically in recent years (with rapid improvements in POS and storage technologies), it is much more feasible for convenience retailers to collect transaction-level and customer data," said Marek Polonski, head of convenience and grocery for Applied Predictive Technologies, a Washington, D.C.-based strategic consulting and enterprise software company.

The challenge, we noted, was deciphering staggering amounts of information. Enter artificial intelligence, which can not only gather that data, but process it in a way that delivers valuable insights for retailers, including past and present behaviors as well as future intent.

"You're able to get predictive," said Gray Taylor, executive director of Conexxus, the nonprofit organization focused on standards and technology for the convenience and fuel retailing market. "So if [the data shows] that Customer A drives by your store every day, how can you get him to stop in your store? It presents clear business opportunities." To understand how, it's instructive to run through a cumbersome, non-AI retailing scenario.

PROBLEM, SOLUTIONS

TLM Technologies

"Traditionally, c-store executive teams identify Key Performance Indicators to enable measurement of performance across stores—inventory turns, inventory accuracy, stock outs, service levels, etc.," said Michael Johnson, vice president, North America, of TLM Technologies, a U.K.-based provider of technology and support to convenience and fuel retailers. "Management then periodically analyzes these measurements through trend analysis,

benchmarking and critical path analysis. These numbers are posted at work centers, strategic operations areas and other areas where they can be readily viewed."

While highly precise, these metrics are not necessarily the most relevant—or instructive. "Might there be better indicators or trends that the organization can identify? Are there deeper "reasons" and trends behind them?" Johnson asked rhetorically. For that, one needs a smarter platform, one made possible with artificial intelligence.

An AI solution not only enables retailers to process large quantities of data, but to do so without bias. "We see an opportunity to give professionals an objective, data-driven perspective without ignoring the humanity, critical to answering questions being asked of data collected across an organization and its stores," Johnson said.

> **If I promote an item at a certain price, the platform will predict sales, forecasting according to week. This solves a multi-billion-dollar replenishment problem for stores, minimizing out-of-stocks.**

TLM will be adding AI-based applications designed for convenience and fuel retailers to its offerings in 2019, allowing them to drive every element of their business. "Our goal is to build and extend c-stores' current human intelligence to help build a better customer experience and measurable profit gains," Johnson said. In doing so, TLM will be joining a robust field of competitors that leverage AI-based machine learning, with several focusing on convenience retailing, including the following two companies.

SwiftIQ

For the past few years, Chicago-based SwiftIQ has been refining a software platform that brings machine learning to retailers and brands. By collecting data from POS transactions—as many as five million per day for large retailers—the company is able to process the information into actionable insights that guide assortment, price and even promotion decisions.

"The process addresses companies at the store level," said Jason Lobel, CEO and co-founder of Chicago-based SwiftIQ, a retail analytics solution provider, "as each is unique. Some are morning stores, some are evening stores and some may sell more food or beer. Having a system that can cut through [those unique attributes] and provide recommendations goes very far in terms of helping the retailer make decisions."

SwiftIQ's overarching goal is to leverage its smart platform to provide retailers with instant insights to take meaningful business action to grow sales and boost profitability, with an automated process that incorporates basket-level data.

For the supply chain, this means forecasting the number of beverages you need to order each week (which will vary by time of year), transmitting those orders to a store manager. And for promotions, this could involve price and demand forecasting. "For instance, if I promote an item at a certain price, the platform will predict sales, forecasting according to week," Lobel said. "This solves a multi-billion-dollar replenishment problem for stores, minimizing out-of-stocks."

Other applications for SwiftIQ address assortment—"Is the retailer carrying the best items based on what's in the market?"—and the personalization of promotions. "If there are 5,000 items available to sell in a store, it will recommend things to Person A vs. Person B," Lobel said.

Revionics

For Austin, Texas-based Revionics, a developer of price optimization software, AI is used to address an unexpected shift and disparity in knowledge. "Consumers have an unexpected level of visibility into what's available [at stores], how much it costs and how quickly they can get it," said David Thompson, chief technology officer of Revionics. "That's what drives a purchasing decision. Without using similar [smart] tools, the consumer has more information than the retailer. And that's a tough thing."

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While the consumer tool—a smartphone—has been ubiquitous the past several years, practical solutions geared toward the enterprise have been slower to emerge. "Historically, this has been difficult for retailers to get, you would have hired a team of people to do it and it would have been a big science project ... We've created a systematic method for getting predictable output in a measurable way."

Leveraging artificial intelligence, Revionics delivers price, promotions and markdown optimization recommendations that help retailers increase trip frequency and purchase volume, key issues for convenience stores today. "You can now drill into the net effect of the actions that you take, using AI to disentangle the factors and predict what happens," Thompson said.

For instance, if a retailer promotes a BOGO offer, Revionics can produce analyses that extend far beyond product lift. "AI allows you to drill into a much richer picture," Thompson said. "You can find that you sold 20% more of a water, but 37% less of another water, for instance ... without AI systems, you can't dig into the trailing or complimentary effects of your actions."

AI IS NO JOKE

As AI seeps into our commercial consciousness, understand that the transition will not always be seamless—or practical. "While numerous opportunities exist for AI, practical and theoretical barriers still stand between it becoming a nuanced thinking algorithm to replace the most powerful analysis-synthesis machine ever made: the human mind," Thompson said.

Which means AI-fueled solutions do not always produce smarter outcomes. Blogging on the AI Weirdness website, Janelle Shane recounts the challenge of training an artificial intelligence-based neural network to write one-liner jokes. Incorporating a dataset of more than 43,000 "What do you call a …" or "How do you …" jokes into a machine learning algorithm, the jokes that the network generated were … well … anything but smart:

"What do you call a cat does it take to screw in a light bulb? They could worry the banana."

"What did the new ants say after a dog? IT was a pirate."

"What do you call a pastor cross the road? He takes the chicken."

According to Thompson, when it comes to AI, there's still a bit of work to go. "Perhaps one day AI will be able to recognize and reason about the kindness extended by store personnel to a customer, or the hard work put into a specific location around keeping the forecourt clean and stocked.

"But, in the meantime, human intelligence is still key."

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ABOUT JERRY SOVERINSKY
Jerry Soverinsky is a Chicago-based freelance writer. He's also a *NACS*

Magazine contributing writer.

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