

BUSINESS

AI 101: What Fashion Needs to Know

- How retailers and tech providers are applying the art of artificial intelligence.

BY ADRIANA LEE

Smart has had its day – now it's time for intelligence.

After years in the thrall of smartphones, smartwatches and other devices, the pursuit of artificial intelligence has taken center stage in fashion. Sophisticated hardware begets expectations of sophisticated experiences, and nowhere is that more evident than in shopping.

Consumers want convenience and personalization and they want it faster than ever. Meeting one customer's fashion emergency is straightforward enough. But meeting growing demand at scale is another story – and the conundrum has made AI all the rage for forward-thinking fashion and beauty companies.

It's time to take stock of where the tech applies in retail right now. It's time for AI 101.

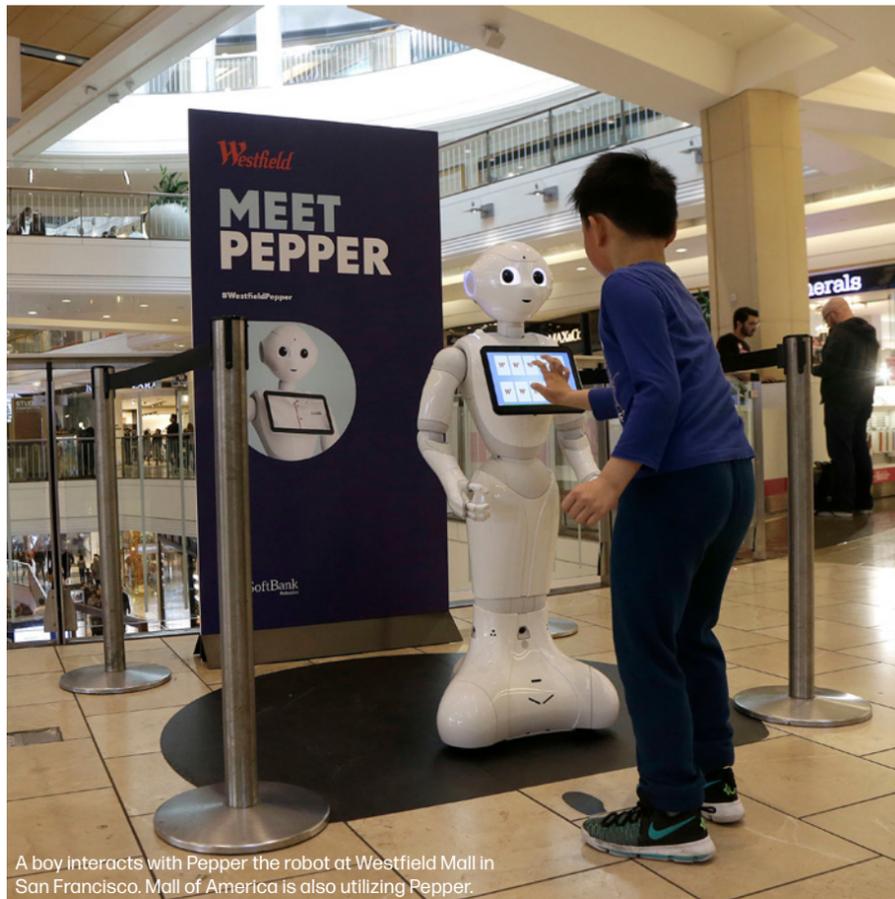
"Artificial intelligence" covers computing technology that can do things typically requiring human intelligence, from understanding language and recognizing visuals to making plans and solving problems. Engineers and academics split hairs over whether machine learning and deep learning – which can learn to perform functions without specific programming – are distinct. But in business, the definitions matter less than the investments and the tech's uses.

Retailers are expected to invest \$3.4 billion on cognitive and artificial intelligence systems this year alone, according to IDC, which wrote in a report last spring that "retail will overtake banking in 2018 to become the industry leader in terms of cognitive/AI spending."

The industry is increasingly turning to AI for everything from logistics and supply chain to front-of-house features, including customer service, sales and more.

"There are four major areas for AI in retail: robotics in the warehouses and shipments, personalization and recommendations, voice and augmented reality," said Nitin Mangtani, founder and chief executive officer of PredictSpring.

Mangtani, an ex-Google who, in fact,



A boy interacts with Pepper the robot at Westfield Mall in San Francisco. Mall of America is also utilizing Pepper.

was the driving force for Google Shopping, now employs engineers from Google and Motorola for his mobile commerce platform. PredictSpring, which works with Cole Haan, M.Gemi, Maje, Calvin Klein, Sketchers, PacSun and others, invests deeply in artificial intelligence for retail.

"You need to have a broad vision and a narrow focus," he said. "There is so much AI can do. But what I think about is, what is practical AI? What is something retailers will actually benefit from and actually deploy?"

Here, a primer on some of the ways merchants are trying to lean into the future and how much more development AI still has ahead of it.

Speaking Naturally

People have been able to talk to gadgets for years, but the experience was clunky.

End users had to learn specific verbal commands and cues to make it work and train the tech to learn the idiosyncrasies of their voices. The pursuit of voice tech today is a race to lower those barriers and make the experience feel more natural.

AI's Natural Language Processing drives Samsung's Bixby, Google Assistant, Apple's Siri, Microsoft's Cortana and other voice assistants. But the headliner is Alexa, Amazon's voice platform, which made the act of talking to gadgets mainstream. Echo and Fire TV users can command their smart homes or order home goods by speaking to one of the microphone-equipped devices. And the number of voice-enabled devices is only growing: Over Amazon's record-breaking Prime Day sale last week, the top items on its bestseller charts worldwide were Alexa-enabled gadgets Fire TV

Stick and Echo Dot.

Tech purveyors are using natural language processing to hone what the machines can understand, so people can turn their lights off or order basics with ease. But the use cases are evolving in some surprising ways.

In May, Google showed off Google Duplex, a new AI voice feature that can hold convincingly human-sounding phone calls. "The amazing thing is that Assistant can actually understand the nuances of conversation," said chief executive officer Sundar Pichai. "We've been working on this technology for many years." He showed off Google Duplex ringing up a hair salon and booking an appointment – sans robotic tones and complete with "uhs" and "ums" – fooling the receptionist.

The demo immediately drew shock and admiration, but also concern. Pundits questioned the ethics of deceiving service workers and invoked the much larger issue of transparency in technology. (Soon after, it came to light that Google and Facebook have in certain instances used human beings to accomplish tasks that they billed as AI, muddying the waters for anyone trying to understand the emerging technology).

In its current state, the tech may not be a panacea that sci-fi fantasy would make it out to be. But there's little doubt that it's evolving and that companies are willing to invest in it in different ways.

Chatbots are a low-hanging fruit for the AI-curious. They're appealing, because they can take some of the customer service burden off workers. Basic bots are a shoo-in to aid with mundane tasks, such as helping shoppers track purchases and get ship dates, store hours and more. More sophisticated versions offer product recommendations and enable actual purchases.

When it comes to chatbots, brands have choices: They can go it alone, hiring technical talent to build chatbot systems using a growing spate of development tools, or leave it to the experts by enlisting a partner. And they can launch on web sites, in Facebook Messenger or Apple iMessage chats, and even through physical versions in brick-and-mortar locations.

Malls, for instance, have been dabbling

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WWD LIST

10 AI Companies Raising Millions

The funding frenzy is real with these 10 companies, which raised more than \$1 billion total to make machines smart. BY ADRIANA LEE

Two little letters have caught the imagination of the venture capital crowd. Investors are pouring money into operations that fly the AI banner, from tech providers to e-commerce platforms. Here, a look at 10 standout firms that have been sparking VC funding fever, according to PitchBook.

1. Trax Image Recognition

Total raised: \$285.5 million

Trax is a provider of an image recognition platform designed to deliver accurate and reliable performance analysis for consumer goods companies. The firm's platform

turns retail shelf images into real-time actionable insights, enabling manufacturers and retailers globally to control performance gaps, identify category opportunities and immediately increase revenue at all points of sale.

2. Signifyd

Total raised: \$206.2 million

Signifyd is a provider of a stand-alone risk and guaranteed fraud-prevention platform designed to make commerce safer for online retailers. The company leverages big data, machine learning and expert

manual reviews to provide a 100 percent financial guarantee against fraud on approved orders that turn out to be fraudulent, enabling retailers to provide friction-free buying experiences for their customers.

3. Stitch Fix

Total raised: \$167.6 million

A provider of online styling services that offers one-to-one personalization for shoppers, Stitch Fix – which had a much-hyped initial public offering in December – uses a combination of data science and human judgment to send clients personalized selections of apparel, shoes and accessories that fit their style. Subscribers can schedule automatic shipments or order a "fix" on demand, after filling out a style profile on the website or mobile app.

4. Poshmark

Total raised: \$159.7 million

The online social commerce marketplace allows users to buy, sell and share their personal styles. The platform allows

people to easily sell clothes and accessories by posting photos and details. Listing an item for sale takes less than 60 seconds. Users can follow people whose styles they admire or connect with particular stores, giving them access to new and "gently used" items at up to 70 percent off retail.

5. Riskified

Total raised: \$63.65 million

Riskified is the developer of an e-commerce fraud-prevention technology designed to turn fraud management into a growth engine for online retailers. The company's e-commerce fraud-prevention technology offers machine-learning algorithms and proprietary behavioral analytics that protect the bottom line and customer experience. Riskified uses an adaptive approach to stay ahead of the constantly changing fraud landscape, enabling merchants to protect themselves from fraud and offer better customer experience, lowering overhead and maximizing their revenue.

6. Abeja

Total raised: \$45.61 million

The retail analytics platform uses deep learning to collect, analyze and visualize data from brick-and-mortar stores and shed light on customer buying habits and interests.

7. Rubikloud Technologies

Total raised: \$45 million

The company is a developer of retail intelligence platforms that uses machine learning and big data systems. The technology gathers online and off-line consumer behaviors to give retailers insight into preferences, ranging from product affinity and price sensitivity to response prediction and demand forecasts.

8. Malong Technologies

Total raised: \$44.1 million

Malong is the provider of machine vision technologies intended for visual product recognition. Its ProductAI platform uses artificial intelligence for product recognition, general image recognition and image-based content-searching

services. The goal is to give its machines a humanlike visual perception of products, including non-rigid objects like fabric.

9. Twiggie

Total raised: \$34.7 million

The developer of an online search technology designed to make online shopping easier, Twiggie's online search technology is built on both humanlike understanding of linguistic structure and retail awareness. This enables e-commerce search engines to understand customers the way in-store employees do and to help connect people to the products they are looking to buy.

10. Feedvisor

Total raised: \$33.45 million

Feedvisor is a provider of an algorithm-based commerce platform that offers repricing services. The company uses machine-learning algorithms to provide cloud-based algorithmic repricing and revenue intelligence services to help retailers maximize profitability and drive business growth.

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with physical ways to connect with AI. Both Westfield Malls and Mall of America have welcomed Pepper, a cheery robot from Soft-Bank Robotics that was designed to delight passersby and field basic store inquiries.

Consumer Connection

Intelligent systems can also act behind the scenes in the store environment, giving sales staff real-time information on merchandise levels, customer preference history and more.

At business intelligence firm Sisense, some retailers have taken to natural language processing to improve the in-store experience. “Our client, Premium Retail Services, has also integrated smart speakers into their business, and can use it to interrogate their data on the fly, checking to see if a particular item is in stock anywhere across a network of stores,” said Sisense vice president of strategic growth Guy Levy-Yurista, an AI expert whose diverse background includes stints at MicroStrategy, TrustDigital and AOL, as well as work in Israel’s military intelligence.

The hospitality and luxury market holds particular interest for Levy-Yurista, who also once worked as a top-tier sommelier. “An increasing number of service businesses are leveraging AI to increase margins, but luxury has been something of a holdout,” he said. “Affluent customers have demanded concierge-like service which could only be delivered by humans.”

But this is changing, he said. Levy-Yurista looks to systems that can anticipate questions before they’re asked and fulfill needs that buyers weren’t even aware of, calling them “the essence of excellent, high-touch service.”

“We’re starting to see this with our luxury travel clients already, and are starting to see this transcend with retailers on the brick-and-mortar side as well,” he said.

Computer Vision

For the visually driven apparel and cosmetics industries, computer vision is a natural area of AI interest. Bixby Shopping uses Samsung’s Android smartphone camera, not just to capture fashions on the go, but to read and understand what’s in front of the lens. The AI assistant can tell users where those garments or accessories are available and help them make a purchase. For beauty, Bixby also lets consumers digitally try on makeup before buying, through its partnership with Modiface, the beauty augmented reality company. The firm, which was recently acquired by L’Oréal, uses AI to make its digital makeovers more realistic.

For consumers, computer vision has been making the leap beyond phones. Consider the Echo Look. Amazon’s fashion selfie cam can recognize what the owner is wearing, sort the looks and recommend other items that go with them based on the individual’s tastes and the styles’ characteristics.

Not that Amazon had this specific game plan in mind when it introduced the Echo Look last year.

“We had no idea really how that was going to unfold,” said Linda Ranz, Amazon’s product management director. “The idea of going invitation-only [opening the technology up to only a limited pool of users], it was just kind of an efficient way to get this product in customers’ hands as soon as possible. But we recognize that it’s such a new concept; we weren’t sure how the customers would respond to it....I mean, it was a little bit like, this is a crazy idea. But there was also this response of ‘Whoa, fashion machine learning, AI technology, all coming together!’ That was very accepted from our side, but we weren’t sure when we started.”

Pairing AI With People

Despite all the buzz about making use of

AI: By the Numbers

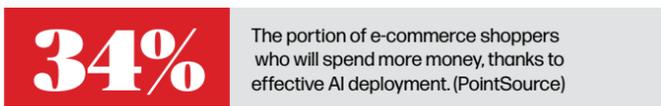
A snapshot of where we are with artificial intelligence, told in 11 numbers.

BY ADRIANA LEE

Artificial Intelligence might go back more than 60 years, but it’s never been more buzzworthy. Here, a glimpse of AI’s recent and future traction.

1

The number of AI bots that have been granted citizenship. Saudi Arabia made headlines in 2017 for naturalizing Sophia, a robot infamously quoted as saying “I will destroy all humans.”



1 trillion

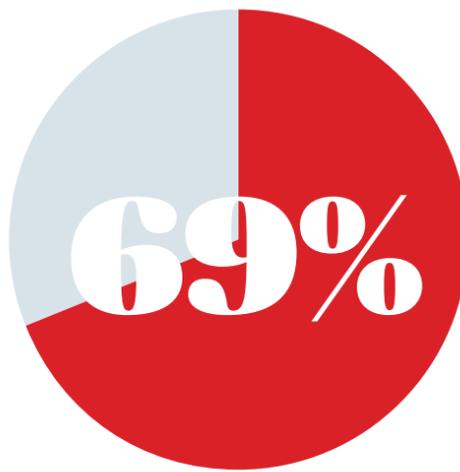
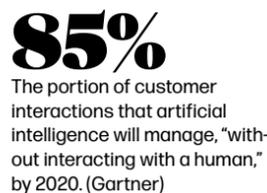
The number of retail data points that flow through Adobe Analytics and get crunched by its Sensei AI and machine-learning technology. Its analysis can cover a trillion visits to more than 4,500 retail sites and 55 million sku’s. (Adobe)

2

The number of tech giants busted for “pseudo-AI”: It’s recently come to light that Google and Facebook have used cheap human labor to mimic machines in the past. Development time and complexity made people-powered processes more practical, though it kicked up a privacy controversy about humans reading users’ messages. (Wall Street Journal)

10,000

The number of participants in Digital Transformation Institute’s report, which discovered that 63 percent of AI-aware consumers like the technology because of its round-the-clock availability. (Cappgemini)



The portion of consumers “creeped out” by AI, with 61 percent unnerved by facial-recognition tech identifying store shoppers. Notably, younger customers were less concerned than older ones, with 66 percent finding AI-based personalization valuable. (RichRelevance)

\$7.3 billion

Global spend on artificial intelligence expected by 2022, up more than threefold from the \$2 billion projected in 2018. (Juniper Research)

\$15.2 billion

The amount of equity funding in machine-learning start-ups in 2017, a 141 percent leap from 2016. (CB Insights)

2 million

The number of AI conversations Satisfi Labs facilitated in 2017. (Satisfi Labs)

machine smarts, when it comes to picking looks for shoppers, there’s more talk about how to use AI and human stylists – a key component of Stitch Fix’s model (and one Amazon has mimicked with its Echo Look).

Stitch Fix uses technology to chew through every known detail of the inventory and matches items against customer profiles to create a “fix,” with people stepping in to make sense of the choices and fine-tune the selection.

“We have patented algorithms, and a bunch pending,” said Eric Colson, Stitch Fix’s chief algorithms officer. “We have an algorithm that can match you to a stylist, and then you start working together....[At first] they’re going to match every bit of everything we have in inventory to you, even the stuff that’s egregiously wrong.” The company whittles down the options using numerous sets of algorithms, preference data and fitting data. The system can even distinguish between a customer’s actual and “stated” sizes.

User preferences act as a foundation or jumping-off point. “She said she hated

blue, so get rid of blue,” Colson said. “All that kind of stuff – algorithms are sifting and taking things out. And it’s not just one algorithm; it’s many, based on what’s most likely to fit you, to surprise you.” The results come back in milliseconds before going on to human curation.

If Stitch Fix simply gave subscribers what they wanted, it would have a solid business. But it’s pushing past that, hoping to pleasantly surprise them. One of the company’s main goals is to feature products that customers may not have considered, but wind up loving. To hone its tech, Stitch Fix employs data scientists and engineers from outside the fashion business, from places such as Netflix and music streaming services like Pandora – basically, a group of specialists with expertise in predictive modeling and recommendations.

Personalization

Personalization and product recommendations have become the holy grail for tech-savvy fashion retailers. The approaches range from AI-enabled fitting

tech purveyors, who track measurements, purchases and browsing habits to match shoppers and trends, to vendors that chart hot products across social media or analyze thousands of user surveys and questionnaires. In many cases, it’s a combination of approaches to capture the data necessary to feed into the algorithms.

From the consumer point of view, what they encounter directly and recognize as AI through these apps and devices is growing. But for retailers and brands, the back-end integrations may offer even greater potential.

In China, where economies of scale put technology front and center, Alibaba’s bullish take on AI informs everything from magic mirrors that show customers what clothes look like on a personalized avatar to pricing strategies and inventory forecasts based on predicted demand, and more, a spokeswoman said.

Bravely Into the Future

AI’s potential for brands and retailers does not have a targeted focus, but a wide spectrum that touches multiple areas up and down their operations. The evolution doesn’t end with operational nuts and bolts, either. Everyone from techies at Amazon and Stitch Fix to academic researchers at universities are exploring the merits of machine-made fashion design.

Tech has its foot on the accelerator of shopping’s reinvention journey, which is a considerable change from business as usual. The retail market has historically dragged its fabulous heels in the face of technological innovation.

Some call it honoring old-world tradition or maintaining a charming analogue sensibility in an increasingly digital world. Complicating matters is the fact that new tech is often flawed. So it naturally follows that some companies would hesitate to stake their brand reputations on the latest, greatest development or gamble with intricate supply chains.

But, invoking the words of Facebook’s Mark Zuckerberg, the tech sector’s “move fast and break things” spirit didn’t line up with retail’s wait-and-see approach. Stores didn’t embrace e-commerce at first. Nor did they jump on the mobile web or phone apps. And retail’s reluctance wound up having a cost: It left the door open for companies like Amazon to take hold and grow into giants, while allowing tech-friendly fashion start-ups to scale quickly.

That’s not to say that AI is some magical ingredient. Companies can’t just sprinkle a few algorithms into their operations and wait for their bottom lines to rise. There’s more to it than that – especially since, despite its long ramp-up and recent attention, the technology still isn’t quite done baking.

AI has been ramping up for more than 60 years, going all the way back to mathematician Alan Turing’s historic paper “Computing Machinery and Intelligence” in 1950. And yet, it’s “still not fully automated,” said Sisense’s Levy-Yurista. “There’s a lot of trial and error and, at its current state, it’s not truly user-friendly, yet. The gap between perception of where the technology is based on science-fiction movies, and how much work it takes to make it actually work that way is large.”

In other words, today’s AI landscape, as innovative and transformative as it is already, may pale in comparison to tomorrow’s. Those who ignore it do so at their peril. “I can tell you that, at long last, it really is now happening,” Levy-Yurista said. “But there are still many people in ‘old-school’ industries, like retail, that respond with skepticism about the need to invest.”

The consumer experiences of the future are being written right now. For fashion’s establishment, that can mean only one thing: It must no longer rage against the machines, but embrace them.