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Meet the People Who Train the Robots (to Do Their Own Jobs)

Before the machines become smart enough to replace humans, as some people fear, they need to be taught.

By DAISUKE WAKABAYASHI   APRIL 28, 2017

SAN FRANCISCO — What if part of your job became teaching a computer everything you know about doing someone's job — perhaps your own?

Before the machines become smart enough to replace humans, as some people fear, the machines need teachers. Now, some companies are taking the first steps, deploying artificial intelligence in the workplace and asking their employees to train the A.I. to be more human.

We spoke with five people — a travel agent, a robotics expert, an engineer, a customer-service representative and a scriptwriter, of sorts — who have been put in this remarkable position. More than most, they understand the strengths (and weaknesses) of artificial intelligence and how the technology is changing the nature of work.

Here are their stories.

'It made me feel competitive'

Rachel Neasham, travel agent

Ms. Neasham, one of 20 (human) agents at the Boston-based travel booking app Lola, knew that the company's artificial intelligence computer system — its name is Harrison — would eventually take over parts of her job. Still, there was soul-

searching when it was decided that Harrison would actually start recommending and booking hotels.

At an employee meeting late last year, the agents debated what it meant to be human, and what a human travel agent could do that a machine couldn't. While Harrison could comb through dozens of hotel options in a blink, it couldn't match the expertise of, for example, a human agent with years of experience booking family vacations to Disney World. The human can be more nimble — knowing, for instance, to advise a family that hopes to score an unobstructed photo with the children in front of the Cinderella Castle that they should book a breakfast reservation inside the park, before the gates open.

Ms. Neasham, 30, saw it as a race: Can human agents find new ways to be valuable as quickly as the A.I. improves at handling parts of their job? "It made me feel competitive, that I need to keep up and stay ahead of the A.I.," Ms. Neasham said. On the other hand, she said, using Harrison to do some things "frees me up to do something creative."

Ms. Neasham is no ordinary travel agent. When she left the Army after serving as a captain in Iraq and Afghanistan, she wanted to work at a start-up. She joined Lola as one of its first travel agents. Knowing that part of her job was to be a role model, basically, for Harrison, she felt a responsibility for Harrison to become a useful tool.

Founded in 2015 by Paul English, who also started the travel-search site Kayak, Lola was conceived as part automated chat service and part recommendation engine. Underlying it all was a type of artificial intelligence technology called machine learning.

Lola was set up so that agents like Ms. Neasham didn't interact with the A.I. much, but it was watching and learning from every customer interaction. Over time, Lola discovered that Harrison wasn't quite ready to take over communication with customers, but it had a knack for making lightning-fast hotel recommendations.

At first, Harrison would recommend hotels based on obvious customer preferences, like brands associated with loyalty programs. But then it started to find

preferences that even the customers didn't realize they had. Some people, for example, preferred a hotel on the corner of a street versus midblock.

And in a coming software change, Lola will ask lifestyle questions like "Do you use Snapchat?" to glean clues about hotel preferences. Snapchat users tend to be younger and may prefer modern but inexpensive hotels over more established brands like the Ritz-Carlton.

While Harrison may make the reservations, the human agents support customers during the trip. Once the room is booked, the humans, for example, can call the hotel to try to get room upgrades or recommend how to get the most out of a vacation.

"That's something A.I. can't do," Ms. Neasham said.

'How do we elegantly recover?'

Diane Kim, interaction designer

Ms. Kim is adamant: Her assistant doesn't use slang or emoji.

Her assistant, Andrew Ingram, also avoids small talk and doesn't waste time on topics beside scheduling her meetings, she said.

Ms. Kim isn't being tyrannical. She just knows her assistant better than most bosses, because she programmed him.

CLICK BELOW

Ms. Kim, 22, works as an A.I. interaction designer at x.ai, a New York-based start-up offering an artificial intelligence assistant to help people schedule meetings. X.ai pitches clients on the idea that, through A.I., they get the benefits of a human assistant — saving the time and hassle of scheduling a meeting — at a fraction of the price.

It's Ms. Kim's job to craft responses for the company's assistants, who are named Andrew and Amy Ingram, or A.I. for short, that feel natural enough that swapping emails with these computer systems feels no different than emailing with a human assistant.

Ms. Kim's job — part playwright, part programmer and part linguist — didn't exist before Alexa, Siri and other A.I. assistants. The job is like a translator of sorts. It is to help humans access the A.I.'s superhuman capabilities like 24/7 availability and infallible memory without getting tripped up by robotic or awkward language.

Even in the narrow parameters of scheduling meetings, it takes a lot of machine learning to break down emails for a computer. For example, setting a meeting for "Wednesday" is different than setting a meeting for "a Wednesday," as in any Wednesday. X.ai breaks down emails to their component parts to understand intent.

The automated response is where Ms. Kim takes over. Her job is to imagine how a human assistant would arrange a meeting for the boss. For a specific task, she devises different situations — for example, what if the meeting had five attendees versus two — and then she creates a flow chart of how the email exchange would go.

The goal is to schedule a meeting in as few emails as possible. With that in mind, x.ai settled on a set of personality traits for its assistants: polite, professional, friendly and clear.

Sometimes, it's hard to predict what will rub people the wrong way. Early on, the A.I. assistant sent emails to potential attendees saying that the assistant would be happy to put something on the boss's "calendar," but some people found that wording to be cold, and not always appropriately deferential to the other attendees.

X.ai changed the wording so that the A.I. assistant says it would be happy to "find a time" that works for all attendees.

Some people try to test the A.I. assistants with unusual requests. For example, people are curious what else the assistants can do and ask for help in booking hotels, flights or conference rooms (things they can't do). Others ask Amy's age, or Andrew's birthday. "How do we elegantly recover when Amy or Andrew don't know what to do?" Ms. Kim said.

X.ai doesn't pretend the assistants are human. But Ms. Kim still gets satisfaction when people don't realize that the assistants are robots. People ask them out on

dates. They receive thank-you emails from happy customers even though, as robots, they don't need gratitude.

"They're shocked and surprised that they were talking to an A.I.," she said.

'A cesspool of legal language'

Dan Rubins, chief executive

Mr. Rubins has a lot of grievances with lawyers.

At his former job, he recalled the time when six corporate lawyers, each billing at hundreds of dollars an hour, were inspecting a contract looking for capitalization errors. It's what prompted him to create Legal Robot, a start-up that uses artificial intelligence to translate legalese into plain English. CLICK ABOVE

Having reviewed nearly a million legal documents, Legal Robot also flags anomalies (strange wording or clauses) in contracts. "Lawyers have had 400 years to innovate and change the profession, and they haven't done it," said Mr. Rubins, who is not a lawyer. "It's time for some outside help."

He said legal documents are well suited to machine learning because they are highly structured and repetitive. Legal Robot tapped a vast trove of contracts prepared by human lawyers in filings with the Securities and Exchange Commission — "a cesspool of legal language," Mr. Rubins said — as well as past documents from law firms who wanted to help train Legal Robot's systems.

After going through a large set of documents, the company's machine learning systems start to recognize patterns indicating the words that tend to go together and those that do not. However, Mr. Rubins becomes worried when the A.I. is too confident about its results. That's often a byproduct of training the computer on too narrow a set of contracts.

For example, Legal Robot trained its A.I. on thousands of employment contracts from a state that allows noncompete clauses, which restrict employees from switching to a rival company. That meant when the A.I. saw contracts from states

where noncompetes aren't enforceable, it nevertheless piped up to say the clause was missing. In other words, the A.I. was missing important context.

Mr. Rubins, 33, said the A.I. is good at identifying potentially vague word choices. He recently received a two-page nondisclosure agreement — it was reviewed by human lawyers — from another company containing the word "shall" 30 times. The A.I. pointed out that "shall" can be vague and advised that "will" or "may" are more clear, depending on the context.

Mr. Rubins doesn't think A.I. will put lawyers out of business, but it may change how they work and make money. The less time they need to spend reviewing contracts, the more time they can spend on, say, advisory work or litigation.

"I really don't think we're going to get rid of lawyers," he said. "Unfortunately, we still need them."

'That was a 'wow' moment for me'

Sarah Seiwert, customer representative

It took two weeks for Ms. Seiwert to notice that her company's A.I. computer system was starting to pick up on her work patterns.

Ms. Seiwert, 37, a customer representative at the online test-prep company Magoosh, answers student emails. When a question comes in, she searches a database of preapproved responses and finds the appropriate answer.

There are thousands of different responses. Finding the right answer isn't as easy as it sounds.

When Magoosh implemented an A.I. system in February to help its customer service team work more efficiently, Ms. Seiwert noticed that it was reading the questions and suggesting responses.

If the suggestions were good, she would add a few niceties and send back a quick reply. But within two weeks, she noticed that even when she wasn't responding

directly to an email, but following up to one that she had sent earlier, the software was suggesting the proper response.

"That was a 'wow' moment for me," said Ms. Seiwert, who works from a home office in Mankato, Minn. "It's been studying and learning my patterns."

As more customer service moves from phone calls to text-based conversations through chat or email, companies are looking to machine learning to help the human agents work faster. Magoosh is using software created by DigitalGenius, a London-based start-up.

When an email comes into Magoosh, the system reads the email, categorizes it and routes it to the appropriate employee. After a few months, some DigitalGenius customers start to automate responses for some common questions. Basically, this happens when the A.I. has seen enough examples of how human agents handled the request that it gains confidence that its answer will be correct.

Magoosh isn't there yet. But Ms. Seiwert said the software has reduced Magoosh's queue of customer requests by half, and it has made her team's goal of responding to every customer within 24 hours more manageable.

Even though the A.I. is learning from the human agents, Ms. Seiwert said she doesn't foresee a future where she's out of a job. Too many questions still require a level of human intuition to know the appropriate answer. There are also times when rules need to be broken, like when customers ask for an extension on their account because of some circumstance beyond their control.

"I am not convinced that artificial intelligence is going to replace us," she said. "You can't program intuition, a gut instinct. So the A.I. might get very intelligent, but I hope as a human I continue to get intelligent and not stand at a standstill."

The 'cases we haven't seen before'

Aleksandra Faust, software engineer

As a senior software engineer at the self-driving car company Waymo and a robotics expert, Ms. Faust grapples with an unpredictable world.

Formerly known as Google's self-driving car project, Waymo wants to build autonomous vehicles that can react properly under all kinds of unusual circumstances. Not only when drivers run red lights, but also when a child crosses an intersection riding a hoverboard while walking a dog (which happened recently).

Waymo's cars have driven two million miles in the real world and billions more in computer simulations. But it's impossible to program for every event.

"There's always going to be some cases that we haven't seen before," Ms. Faust said. "Based on the situations it's seen, the A.I. helps the car react in situations it hasn't seen."

Safety is a concern, said Ms. Faust, 43, but so is comfort. Take the process of braking at a red light. When human drivers see a red light, they tend to slow down gradually before coming to a full stop. Waymo's driverless car was hitting the brake too abruptly in a way that human drivers would do if they weren't paying attention.

However, a sudden stop is dangerous because other drivers may not be paying attention. And it is jarring for the passengers.

Using real-world examples of how human drivers slow to a stop from different speeds, Ms. Faust's team creates different models for the most natural way a car should brake depending on how fast it is going. "One thing we've learned about human driving is that it's very, very complex," said Ms. Faust, who joined Waymo two years ago when it was still part of Google's research lab, X.

Follow Daisuke Wakabayashi on Twitter @daiwaka.

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