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The New Threat to Journalists: Robots

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The New Threat to Journalists: Robots

I WAS WORKING on a story about which states had students with the most debt in the CNBC newsroom in Englewood Cliffs, New Jersey, when my editor pinged me on Slack. All interns were to report to a lunch session with Michael Senzon, the head of video news. We filed into a long conference room and dutifully put slices of greasy pizza on our plates.

Senzon looked like a happy dad. He spouted clichés, telling us to make the most of every minute at CNBC, to ask “everyone, every day: How are you feeling? Humans are *humans*...” Don’t count on it, I thought. When I passed someone in the hallway I mumbled, “How are you?” and then walked away before he or she could answer. Every morning the staff rode the shuttle from Manhattan to New Jersey in silence. Then back again.

Suddenly, Senzon’s voice deepened: “Humans are humans, until robots come in and take over our jobs!”

I put down my slice and looked around the room. A nerdy-looking man wrote out every word Senzon uttered. A woman with a lot of makeup on nodded compulsively. To not stand out, I returned my attention to Senzon. But, so preoccupied by the robot comment, I didn’t hear anything else he said. Could a machine write a story about how students in New Hampshire had more debt than students in Utah? When I sensed other people standing up and leaving, I followed.

Back in the newsroom, I tried to not worry about the future. There was not a robot in sight at the CNBC headquarters. The television screens on every wall had human faces at the center. I sat in a long line of human reporters cradling phones between their ears and shoulders, talking to other humans somewhere out there.

NEWSPAPERS, television studios and news websites across the world have swapped out human reporters for robots. The World Editor’s Forum, an international network of editors, lists “Automation” as one of the top trends in journalism. Chief Scientist Kris Hammond at Narrative Science, a story algorithm company, predicts a robot reporter will win a Pulitzer Prize.

In a time when media organizations are pressured to create more content to catch more clicks to lure more advertisers, robots hold a big advantage: they’re prolific. The Associated Press publishes tens of thousands of stories each year with robot bylines. It only needs one automation editor (a human, at time of publication) to correct the machines’ meticulous copy. When humans at the AP wrote the publication’s so-called earnings stories, articles that detail a company’s financial health, it published 300 such stories annually. Now that robots write them, it publishes 4,000 a year. “Twenty-First Century Fox shares have decreased slightly since the beginning of the year, while the Standard & Poor’s 500 index has climbed 16 percent,” a robot writes in one story.

Machines at ProPublica, an investigative journalism nonprofit, have written more than 35,000 stories about the problems in America’s public schools for a project called, “The Opportunity Gap.” Heliograph, an artificial intelligence system at the *Washington Post*, churned out 900 articles last year, on events like the Rio Olympics and the congressional races on Election Day. This year, Atlantic

media publication Quartz received \$240,000 from the Knight Foundation to build a robot studio. Inside, machines scour crime reports and SEC filings for story ideas.

Last summer, Google gave the Press Association, the United Kingdom-Ireland news organization, a \$805,000 grant to invest in robot reporters covering local news on crime, health and employment. Those robots are expected to write 1,000 stories a day. Peter Clifton, editor-in-chief of the Press Association, said the project “will provide the news ecosystem with a cost-effective way to provide incisive local stories, enabling audiences to hold democratic bodies to account.”

Wibbitz, a media start-up, creates algorithms that generate video news, and *Time*, *USA Today* and CBS employ its robots. Just this year it raised more than \$20 million, from investors like The Associated Press and The Weather Channel. Hilary Kay, vice president of marketing, said videos that would take a human three hours to create, the robots can finish in “about 15 seconds.” I spent one afternoon watching them. One video on boxer Muhammad Ali’s life was particularly moving.

Last year, BuzzFeed dispatched its robot reporter, Buzzbot, to the Republican National Convention in Cleveland to gather on-the-ground information. A robot at *The Los Angeles Times* is on the earthquake beat. “A shallow magnitude 3.8 earthquake was reported Thursday morning three miles from San Benito, Calif.,” Quakebot writes in one story. Although 1,000 people are murdered each year in Los Angeles County, *The Times’* reporters were able to write about only 100 of them. Since robots were introduced into the newsroom, every dead person gets a story.

In just a few weeks, I’ll be in a cap and gown at the City University of New York’s Graduate School of Journalism. I have dedicated the last 18 months of my life to learning how to report and write. Here is where people are transformed into the so-called East Coast elite members of the media. No small amount of money, energy and time went to this effort. Had I learned to do anything a robot couldn’t?

My quest to find out began in a major American newsroom, where the machines are hard at work. I made a visit to a laboratory in Durham, North Carolina, where a team of writers and coders program robot reporters. I spoke with news scientists and scholars about if machines could really get scoops and describe the times. Along the way, I stepped into the future.

FROM ITS BIRTH in 1846, The Associated Press oriented toward the future. Pigeons, pony expresses, railroads, steamships, telegraphs, short radio waves, telephones and screens have all delivered its news. Its constant evolution made it the first publication to let the world know Abraham Lincoln was dead and Pearl Harbor bombed. Lately, however, it has struggled. Fewer newspapers exist to house its wires, and digital proves less lucrative than print advertising. Over the last eight years, its annual revenue has dropped 25 percent, from \$748 million in 2008 to \$556 million in 2016.

Francesco Marconi, a leader of AP’s global automation, hopes to turn this around. His Twitter profile reads, “Media strategist implementing the future of journalism.”

I met him one crisp, fall morning at the AP’s headquarters in downtown Manhattan. The elevator ejected me and I walked down a silver hallway. A petite man with short, neat brown hair marched toward me. His blue eyes were paused in surprise, as if he’d dispensed with blinking. He led me into a

conference room with bare, white walls. He quickly spoke about his work to turn robots into reporters at a publication read by just about half the world's population each day.

In 2012, Marconi worked with a team of researchers at the Missouri School of Journalism. "We were doing a project on the future of atomized content," he said, balling his fists. "Essentially, breaking down the story to particles." I asked him what his biggest takeaway was. "The inverted pyramid model can be rethought for the digital age," Marconi said. "It's a really relevant form for automation because it relies on a story structure."

He grabbed my notebook, as if he figured I was just clinging to tradition. "The way that automation works is that we start with a structured data set, and we use natural language generation to turn this data into a human readable text. Think of it as a decision tree," he said, carving deep, dark lines in my yellow pad with his pen. "If A is bigger than \$50 billion, then you're going to put sentence B. But if A is lower than \$50 billion, then you're going to put sentence C. This is called branching, and you can do it across different things: Weather, politics – you name it."

He flipped open his laptop. He showed me a PowerPoint he had created, titled "Augmented Journalism." He pointed to a list of the artificial intelligence fields infiltrating journalism: machine learning, natural language, speech, vision, and robotics. "This," he said, "is just the tip of the iceberg."

I asked him what the reporters at Associated Press think of his work. "Someone in the newsroom actually had the idea – a journalist had the idea," Marconi said, "of relegating some of the work to a machine." Today all of the AP's earnings stories are automated. But, he said, no journalists have been fired. Instead, the business reporters work on deeper stories and sometimes add quotes or context to the robots' articles. The automation has freed up around a quarter of the reporters' days, he said. "I don't think it's about job loss," Marconi said. "It's about the jobs transforming into something else."

He gave me a tour of the newsroom. A grid of people stood at those trendy standing desks. The place was silent, save for the click, click, click of reporters typing. Beyond the glass walls, the sky was a headstrong blue and the Statue of Liberty popped out of the Hudson River.

I headed back to the subway to make it to class on time. When I found myself at the Q train, I couldn't remember how I got there.

ALL FIRST SEMESTER students at The City University of New York's Graduate School of Journalism take a course on the basics of news-writing. In the class, we practiced how to write in the inverted pyramid style, in which you order information from most important to least important. We sorted through lists of details, refining our instinct for news. Car accident kills successful race car driver *and* well-known model. Which person should go first? I chose the race-car driver, attracted to the irony. But the professor said the model was more newsworthy. More people would know her name.

One of the first events I covered was a Bernie Sanders' campaign rally in the South Bronx. I was writing for the local newspaper, *The Mott Haven Herald*. The bigger publications, like *The New York Times*, usually didn't cover the events I did. That time, however, I sat among dozens of other reporters in the stanchioned-off press pit behind the packed attendees. Although excited, I also felt like

an impostor in my sweatshirt and ripped jeans. The other reporters were all in suits. But, like all of them, I had a press badge dangling from my neck. And, along with all of them, I transcribed Sanders' speech on my Mac laptop.

Once we all dispersed, I saw tears streaming down faces, people hugging and singing. I heard one group of attendees talk about how Sanders was the first presidential candidate to visit the South Bronx since Ronald Reagan in 1980. From the press pit, I'd only been able to see the backs of people's heads. Now the excitement and happiness of the crowd overwhelmed me. I felt like I might cry. But, being an objective and professional reporter, I refrained. Instead, I asked people why they came and if they really thought Sanders' could win. After all, a Sienna Research Institute poll of New York City voters conducted earlier in the month found Hilary Clinton leading by 25 percent. Under the dark blue sky, I moved with the massive crowd back to the subway. As the train pulled us all away, I tried to tune out the loud conversations and plan how to write this story, due in two hours.

I decided that it was the size of the rally (between 15,000 and 18,000 people – a lot more had been expected) that should lead the article. In the morning, I compared my article to the professional journalists' renditions. My lede: "St. Mary's Park was more crowded than anyone has seen it in decades on Thursday, as lines stretched for ten blocks to hear Bernie Sanders." *The Daily News'* lede: "Bernie Sanders rocked the Bronx on Thursday night as an estimated 15,000 people thronged St. Mary's Park in Mott Haven." *New York Magazine's* lede: "On Thursday night, the democratic socialist drew 18,500 raucous supporters to St. Mary's Park in the South Bronx." DNA Info's lede: "Thousands of supporters of Vermont Sen. Bernie Sanders packed into St. Mary's Park in the South Bronx on Thursday to welcome the Democratic presidential candidate."

I was ecstatic. We all had practically the same lede. I told myself I had a rare instinct for news, which surely required a cocktail of empathy, intelligence and knowledge. But now I wondered: Was I just being a good robot?

NATURAL LANGUAGE GENERATION, the software that The Associated Press and other news outlets employ to automate stories, was first used in a journalistic context in 1970. The Weather Bureau's National Meteorological Center created a computer program that reported the temperature, wind speed, cloudiness and possibility of precipitation. It then turned that data into text stories. The most important element, determined by whichever finding was lower or higher than the average, went at the top of the story. On March 6, 1970, one story read: "Good morning. Strong northerly winds this morning 20 MPH. Colder today, maximum temperature 48 degrees. Mostly cloudy this morning with decreasing cloudiness this afternoon. Only 2 percent probability of precipitation today." The software had 80 different phrases and sentences through which to express its data. Headlines were alternated for variety. "The popular concept of the man-machine mix in weather forecasting can take on new aspects," Harry R. Glahn, a scientist at the National Weather Service wrote in an article about the project. Because, he wrote, "the more routine duties can be handled by computer." But the technology advanced beyond the routine. In 1995, Robert Dale, now the CEO of a story-automation company called Arria in London, gave a presentation at the Microsoft Institute of Advanced Software Technology. He asked the audience a basic question. "Why bother to generate language at all?" His answer? "As machines become more intelligent, they need more sophisticated means of expression."

Now the avenues are wide open. There are about a dozen technology companies across the globe that build and sell natural language generation software for news publications: AX Semantics, Text-On, Narrative Science, 2XT NLG, Retresco, Textomatic, Syllabs, Labsense, Tencent, Yandex, and Automated Insights – the company that sends its robots to the Associated Press.

I bought a plane ticket to Automated Insight's office in Durham, North Carolina.

The red-brick office building sits on the American Tobacco Campus, a vestige of the city's once dominating industry. Tobacco manufacturing propelled Durham from a town of 100 people in the nineteenth century to a thriving city, in which 260,000 people now reside. In the 1850s, James Buchanan Duke, a local entrepreneur, was frustrated by his inability to compete with the city's most successful factory: The Bull Durham Tobacco Factory. As a result, Duke poured himself into a more niche business: ready-rolled cigarettes. Under Duke, a team of people, using their hands, rolled tobacco into paper and twisted the ends into seals. But Duke was frustrated by how time consuming and messy the process was. He partnered with a mechanic, James Bonsack, to create a machine that automated the cigarette production process. The machine churned out 200 cigarettes a minute. Never was smoking so easy and accessible. Soon half the world was smoking Duke's cigarettes. Today scientists estimate that in the following century, 100 million people died from them.

The fourth floor of the building was crowded with other tech-start ups. No one looked older than 30. I immediately spotted Automated Insights, thanks to the plastic robot in the reception area. Two skull-heads stuck to its eyes: Halloween decorations, I reported in my notebook.

I sat down with Adam Long, vice president of product management at Automated Insights, in a conference room. Long, 28, seemed to carry the burden of every overstatement about technology ever uttered. "It's just math," he said, about natural language generation. "If we had a computer program that added two numbers together, at the end of that you're always just going to get a number, you're never going to get some unexpected thing where it's like, the secret mystery of the universe!"

He was tired of journalists writing "the fear story," about his software. "It's easy to write the fear story, to be edgy," Long said.

But, in reality, robot reporters will only automate "intern" work, he said. "We're doing things where you and I would write the same article," Long said. "And we could hire the next 10 journalism interns, and they would also write the same article."

He said that Automated Insight's biggest competitor, Narrative Science, was irresponsible for claiming that a machine could win a Pulitzer Prize. "You get these surface level, stupid pronouncements from people," Long said. "They know better. They're making these systems. Has math ever been creative?"

Journalists often asked him, "When are you taking the jobs? They think what they've intuited is a pattern: technology is getting better! But it's surface level, they don't understand the underlying thing." Robots were still pretty dumb, he said.

He described what would happen, for example, if a robot covered the recent Virginia race for state legislature. "The robot will never get the transgender woman that beat the shit out of the guy who

called himself ‘Chief homophobe,’” Long said. “A computer can never understand that.” He tried to sound like a robot: “OK what the fuck is chief homophobe? I’ve never seen that configuration before.”

On my way out, I passed a purple poster that read: “Automate Everything.”

Most other story-algorithm companies are more confident than Long in their robots potential. Sam Alkan, the CEO of AX Semantics, a natural language generation software company in Germany, says that their technology is able to automate about half of a daily newspaper’s stories. Alexander Siebert, a computer linguist and founder of Berlin-based natural language generation company Retresco, says that robot stories will be indistinguishable from human stories. Recent studies reveal people find machine-written stories more descriptive, informative, trustworthy and objective than human-written stories.

Noam Later, dean of the Sammy Ofer School of Communications in Israel, worries that media companies, losing revenue, will be eager to replace journalists with reporters – regardless of the machines’ weaknesses. “Media companies search all the time for efficiency,” Later said. He’s working on a book titled, *What Human Journalists Can Do to Compete with Robot Journalists*. “The robots are really terrific! They never ask for vacation. They will cost much less than the human journalist.” Later’s fears extend beyond unemployment for reporters. “Automation works according to preset objectives, and those objectives could be decided by the government. If human journalists cease to exist, it means the end of the social system.”

Graduation was approaching, and the future still seemed uncertain. I decided to meet with a professor at the CUNY Graduate School of Journalism, Jeff Jarvis, who calls himself a “techno boy to the fault.” He’s also the author of the book, *Geeks Bearing Gifts: Imagining New Futures for News*.

He laughed at my robot woes. While there was nothing wrong with dreading the change, he said, “you have to deal with reality.” He said he didn’t allow the demise of print newspapers to ruin his life. “The Internet gave me a second childhood, and I grabbed onto it, and to a fault, embraced the change,” Jarvis said. “I look at some of my friends now from my early days in newspapers, and they’re pretty miserable. It’s lonely.”

When the printing press was invented in 1440, writers assumed the machine would render them obsolete. In an expression of this fear, early models were decorated with skeletons. The oldest surviving image of the printing press is called, “dance macabe,” or dance of death. What people didn’t know, Jarvis said, was that the invention would “disrupt the Catholic church, fuel the reformation, spark the scientific revolution, change education and thus our notion of childhood itself.”

He went on: “If movable type created automated writing, what does artificial intelligence automate? What does it change? What does it open up?” he asked. “You madam are at that cusp.”

Perfect ending! I wrote in the margins of my notebook. At the start, I thought robots would be the end of journalists. But in the end, robots would present a beginning. It would provide my story the necessary reversal. A robot, no doubt, would have already exited. When I reached that point, however, something still felt unanswered. When I reached that point, however, something still felt unanswered. I was left wondering: would robots step aside when their time was over?