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# The Humans Working Behind the AI Curtain

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Just how artificial is Artificial Intelligence? Facebook created a PR firestorm last summer when reporters discovered a human "editorial team" – rather than just unbiased algorithms – selecting stories for its trending topics section. The revelation highlighted an elephant in the room of our tech world: companies selling the magical speed, omnipotence, and neutrality of artificial intelligence (AI) often can't make good on their promises without keeping people in the loop, often working invisibly in the background.

So who are the people behind the AI curtain?

Cut to Bangalore, India, and meet Kala, a middle-aged mother of two sitting in front of her computer in the makeshift home office that she shares with her husband. Our team at Microsoft Research met Kala three months into studying the lives of people picking up temporary "on-demand" contract jobs via the web, the equivalent of piecework online. Her teenage sons do their homework in the adjoining room. She describes calling them into the room, pointing at her screen and asking: "Is this a bad word in English?" This is what the back end of AI looks like in 2016. Kala spends hours every week reviewing and labeling examples of questionable content. Sometimes she's helping tech companies like Google, Facebook, Twitter, and Microsoft train the algorithms that will curate online content. Other times, she makes tough, quick decisions about what user-generated materials to take down or leave in place when companies receive customer complaints and flags about something they read or see online.

Whether it is Facebook's trending topics; Amazon's delivery of Prime orders via Alexa; or the many instant responses of bots we now receive in response to consumer activity or complaint, tasks advertised as AI-driven involve humans, working at computer screens, paid to respond to queries and requests sent to them through application programming interfaces (APIs) of crowdwork systems. The truth is, AI is as "fully-automated" as the Great and Powerful Oz was in that famous scene from the classic film, where Dorothy and friends realize that the great wizard is simply a man manically pulling levers from behind a curtain. This blend of AI and humans, who follow through when the AI falls short, isn't going away anytime soon. Indeed, the creation of human tasks in the wake of technological advancement has been a part of automation's history since the invention of the machine lathe.

We call this ever-moving frontier of AI's development, the *paradox of automation's last mile*: as AI makes progress, it also results in the rapid creation and destruction of temporary labor markets for new types of humans-in-the-loop tasks. By 2033, economists predict that tech innovation could convert 30% of today's full-time occupations into augmented services completed "on demand" through a mix of automation and human labor. In short, AI will eliminate some work as it opens up opportunities for redefining what work humans do best. These AI-assisted augmented services, delivered by people quietly working in concert with bots, are poised to enhance our daily productivity but they also introduce new social challenges.

Much of the crowdwork done on contract today covers for AI when it can't do something on its own. The dirty little secret of many services — from FacebookM to the "automatic" removal of heinous videos on YouTube, as well as many others — is that real live human beings clean up much of the web, behind the scenes. Those magical bots responding to your tweets complaining about your delayed pizza delivery or the service on your flight back to Boston? They are the new world of contract labor hidden underneath a layer of AI. A hybrid of humans and AI is remaking retail, marketing, and customer service. It turns out that AI, just like humans, struggles to make tough decisions about what content should and should not be included in our daily diets of social media, depending on what criteria or values we want to impose.

The real story isn't whether Facebook biased its trending topics by involving human editors; it is that the AI of today can't function without humans in the loop, whether it's delivering the news or a complicated pizza order. Content moderation and curation — from newsfeeds, and search results to adjudicating disputes over appropriate content — involve people hired by technology and media companies to make judgments about what to leave up or take down. Remember that classic moment in the 2012 presidential campaign when Mitt Romney uttered the phrase "binders full of women"? Twitter needed contracted, on-demand workers to figure out, in real-time, why such an obtuse phrase so quickly became such a popular hashtag and whether it was an appropriate thing to post to its trending topics.

Who are these workers behind the AI curtain? Many are like Kala: everyday people, typically paid a low, flat rate, working independently or through temp agencies, many operating outside the United States. It is not common knowledge that the bulk of content moderation is outsourced to contract workers around the globe with little transparency about their training, work environments, or protocols for making editorial decisions. In fact, it is striking, especially after the Facebook "editorial team" incident, that more consumers haven't asked: what are the content moderation practices of social media? Who has a hand in creating the content that lands on our virtual doorsteps? The incident left only room for speculation about the team's credentials and support for complicated editorial work.

Our team learned from two years of researching the world of paid crowdwork, where content moderation is a steady stream of gig work, that the inside practices of both the largest and the smallest companies in the tech world involve literally thousands of decisions about what content to keep or delete. Contract workers are needed to train algorithms to make some of the most important decisions about content. And, more than we realize, they are charged with stepping in to make snap decisions about what stays on a site, and what's deleted. This is a new form of employment that we should all value, as these people keep the internet from becoming a swampy pool of spam. Companies rely heavily on part-time contract workers hired through crowdsourcing platforms like Crowdflower and Amazon Mechanical Turk, or vendor management systems like Clickworker.

We need to think seriously about the human labor in the loop driving AI. This workforce deserves training, support and compensation for being at-the-ready and willing to do an important job that many might find tedious or too demanding. A host of future jobs, going far beyond editorial treatments of trending topics, will require the creative efforts of humans to channel the speed, reach, and efficiencies of AI. The first step is to require more transparency from tech companies that have been selling AI as devoid of human labor. We should demand truth in advertising with regard to where humans have been brought in to benefit us — whether it's to curate our news to inform our body politic, or to field complaints about what some troll just posted to our favorite social media site. We should know there's human labor in the loop because we want to have both the capacity to recognize the value of their work, and also to have a chance to understand the training and support that informed their decision-making, especially if their work touches on the public interest.

As consumers, we have a right to know what ingredients and processes are in the AI that compiles our news and media content, in the same way that we should know what's in the food we feed our families. As citizens, we have a need to know where our information comes from. And, as human beings, we should always know when humans are at work, producing what we consume, whether physical or digital. The labor of these hardworking people around the world should not be rendered invisible or opaque by the shibboleth of AI. Just as we need companies to be accountable for the labor practices that produce our food, clothes, and computers, so, too, do we need accountability to both consumers and workers producing and shaping digital content.

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