

The Competition for Automation in News Media

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On my honor as a University student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

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News organizations have applied machine learning (ML) algorithms to introduce automated journalism: written articles that emulate journalism by human reporters. How are journalists responding to efforts to automate aspects of journalism? To many journalists, such “robot journalism” threatens “journalism’s value,” but many also agree that automated data collection, language processing, and analysis, properly applied, can augment the industry’s speed, scale, and accuracy (Kim, 2018; Graefe, 2016). Media companies, news organizations, journalists, tech companies, and readers promote, resist or otherwise influence applications of ML in news media. According to Matt Carlson, the professor at the University of Minnesota’s Hubbard School of Journalism and Mass Communication, automation could help or displace journalists: “The question is what do news rooms do with the excess labor. Do they fire people? Or do they give them more important stories that are better for humans” (Willis, 2019)? Some question the legality and ethics in response to efforts to automate aspects of journalism. This competition will determine how ML’s technical possibilities in news media will develop. To many professional journalists, it is a useful supplement with problematic implications that must be prevented from displacing humans from important news stories; to the management of large news organizations, however, it is a valuable cost cutter of growing necessity in a highly competitive business.

Review of Research

With machine learning (ML), engineers can apply artificial intelligence to communications media, introducing new advantages and new hazards. ML algorithms can automate validation of online news, and it can even automate journalism itself, through algorithms that “automatically

generate news.” Within the news industry, machine learning enables automated journalism: “the use of algorithms to automatically generate news” (Graefe, 2016).

Researches have investigated the role of automation in the news industry. Wu et al. (2019b) applied Pierre Bourdieu’s sociological field theory of link structure and agency and found that many news groups perceive automated journalism as a means to produce more content.

According to them, automation can provide news groups economic and cultural independence, enabling them to rely less on “revenue streams” from corporations and government agencies.

Tuñez-Lopez (2021) contends that automated journalism will continue to “promote changes in the business model through new ways of relating with the audience and distribution of the product” in media systems. His extensive interviews with researchers and company managers in the AI and journalism industry show that automated journalism has already affected the Spanish news industry. According to Dörr (2015), natural language generation (NLG), one form of automated journalism, can “perform tasks of professional journalism at a technical level” and revolutionize journalism. News corporations can use automated journalism as a means to grow cultural and economic capital.

Other studies find that some journalists resist automated journalism. According to Wu et al. (2019a), automated journalism has created “divergence in journalist’s attitude” in several Singaporean news groups. Automated journalism “has fueled journalists’ fears that automated content production will eventually eliminate newsroom jobs” (Graefe, 2016). Some readers distrust automated journalism. Some question the algorithms’ reliability to stay “fair and accurate,” and “free from subjectivity, error, or attempted influence” (Gillespie, 2014).

Studies have investigated the effects of automated journalism on readers. While readers cannot reliably distinguish articles written by humans from articles written by software

(Clerwall, 2014) and Graefe (2016) finds that readers “do not particularly enjoy reading automated content,” he contends readers “rate automated news as more credible than human-written news.” Robot journalists’ limitations as writers will constrain their growth in journalism; it may also be symptomatic of their limits as interpreters of the news.

By presenting and analyzing interviews, inventions, business relationships, and agendas of relevant participants such as tech company representatives, journalists, researchers, and other specialists, this study aims to extend the conversation on automated journalism. Specifically, the study aims to discuss how the recent development of automated journalism has influenced these participants’ economical, sociological, and legal perspectives.

Developing Automated Journalism

Newspapers, Tech Giants, and Start-ups

As tech giants and start-ups that market journalism programs extol their products’ advantages, newspapers continue to invest in efforts of news automation. Major newspapers have engineered machine learning systems to automate the newsroom. The *Los Angeles Times* has used its Quakebot application to analyze data from the U.S. Geological Survey and report local earthquakes since 2017 (Miller, 2019). The *Washington Post*’s Heliograf is an “automated storytelling technology” that uses data and natural language processing for hyperlocal news (WashPostPR, 2017). Heliograph “created more than 500 articles about house, state, and gubernatorial races in every single state” during the 2016 election (Kramer, 2017). Major newspapers have invested more into internal technology roles to further automate the newsroom, more efficiently output content, and rely less on other corporations or external parties.

Tech giants are using automation to strengthen their role in the news industry. Since 2014, Google News Initiative has partnered with major newspapers such as *Vox*, *Washington*

Post, *New York Times*, and *Guardian* (Google, 2014). In 2018, Google distributed €300,000 of its €150 million Digital News Innovation (DNI) Fund to Trint, a UK start-up that markets an “automated transcription service [that combines] a text editor and an audio/video player into one easy-to-use tool” (GooglePR, 2018; TrintPR, 2018b). Alexander Fanta (2019), a reporter who focuses on digital civil rights, says that Google has created a metaphoric “operating system for journalism.” He says many of Google’s initiatives – Google News, Google Search, Google Analytics, YouTube, Google Cloud, and The Google News Initiative – play a key role in the news industry, shifting Google “from being a mere search engine to becoming a central node for the production and distribution of news.” Google, with its connections, investments, and key services, is becoming an indispensable part of the news industry and, by extension, democracy. Tech giants like Google have gained more influence in the news industry by marketing automation.

Major newspapers have invested heavily in automation start-ups. The Associated Press, in 2016, took an equity stake in Samdesk. Their main product SAM, “a global disruption monitoring tool,” uses AI to generate algorithms that search social media for keywords to ensure swift alerts and situational awareness. The Associated Press reports that SAM has significantly improved alert awareness, and Jimmy Kennedy, the Associated Press’s Senior Vice President of Strategy and Enterprise Development, joined the SAM board of directors, commenting, “SAM’s ability, as a startup, to build a world-class product and power several of the world’s largest newsrooms is a sign of even greater things to come.” Other large-scale newspaper companies, including *Reuters*, *Wall Street Journal*, *Financial Times*, *Toronto Star*, *Guardian*, and *First Look’s Reportedly*, have also invested in Samdesk (Neufeld, 2016). Lewis (2019) says, “It is no longer unthinkable that news organizations would publish content untouched by human

employees.” The CEO of Syllabs, a company that “produced 150,000 web pages ... during France’s 2015 election,” told reporters: “Robots can’t do what journalists do,” but they “can do amazing things and it’s a revolution for the media” (Radcliffe, 2016). Automated journalism can significantly improve the efficiency of the newsmaking process. Both tech and news companies will continue to develop and capitalize on automated journalism.

Automation’s Impact on the Human Worker

Should Human Journalists Fear the Robot Journalist?

Some people worry that automation will supplant human workers, diminish the job market, and ultimately destabilize their economic welfare. Some tech executives and public polls contend that artificial intelligence technologies will eventually supersede human workers. According to Kai-Fu Lee, a leader in the tech industry in China and founder of venture capital firm Sinovation Ventures, AI “will probably replace 50 percent of human jobs” (Yan, 2017). Elon Musk, CEO of Tesla Motors, at a major tech summit, predicts robots will eventually surpass and replace human workers: “There certainly will be job disruption. Because what’s going to happen is robots will be able to do everything better than us...All of us” (Musk, 2017). The *Washington Post* took a poll that reported that “in several countries around the world, large majorities of people believe it is most likely that robots will be doing much of the work done by humans within 50 years” (Taylor, 2018). Journalists have expressed concern about the possibility of increased lay-offs due to the automation of news processing. As Graefe (2016) notes, automation’s advantages are compelling: algorithms can already “create thousands of news stories for a particular topic,” and “do it more quickly, cheaply, and potentially with fewer errors than any human journalist.” A National Public Radio (NPR) reporter raced an AI to write a news story; the AI won (Smith, 2015). But to reporters, such advantages are also threats; automation

“has fueled journalists’ fears that automated content production will eventually eliminate newsroom jobs.” *Microsoft News (MSN)* let go 27 journalists in favor of completely automating their news room: “The journalists were told [that] Microsoft had decided to end the contract in favour of using full automation to update and manage its websites around the world.” A former journalist for *MSN* commented that their “job’s been replaced by a robot. It doesn’t feel good” (Tobitt, 2020). According to Galily (2018), automated journalism will continue to develop despite the “worry that automation will either cause or be used as an excuse for job cuts and dismissal of journalists.”

Other news reporters, scholars, tech executives, however, believe news automation may even help job opportunities to become more abundant and fulfilling. One reporter writes that automated journalism enhances human journalists by giving them “more time to explore other news angles and stories instead of doing repetitive work.” He also says, “News organizations are also able to publish more content and are reaching a wider audience” with automation (Techslang, 2020). Associated Press, after several years of “automating their stories” in a partnership with Automated Insights’ Wordsmith, a language automation software, found that “over 50,000 articles have been automated.” The automation “hasn’t displaced any reporters, but instead has freed up about 20 percent of the time that was spent producing earnings reports each quarter, or the equivalent of freeing up three full-time employees across the organization.” Ross Miller, a journalist for *The Verge*, notes, “computers are not taking journalists’ jobs – not yet, at any rate. Instead, they are freeing up writers to think more critically about the bigger picture.” The Associated Press “used NLG to automate NCAA Division I men’s basketball previews during the 2018 season allowing their journalists to focus on writing critical, qualitative articles” (Automated Insights, n.d.)

Some journalists disagree that robot journalists will replace human journalists. According to John Keefe, a developer for Quartz at Work, a company that programs to alert reporters of unusual happenings, automation will never replace “great writing. Rich storytelling. Journalistic ethics. Sorting fact from fiction. Knowing truth from misinformation.” He believes his teams are developing the bots to “enhance” not replace human reporters’ news content. Sarah Kessler, the deputy editor of Quartz at Work, does not believe current artificial intelligence technology can completely replace journalists: “There are some computer programs that write newspaper articles, but typically they work on articles that wouldn’t be written by human reporters” (Kramer, 2017). According to Cait O’ Riordan, a former *British Broadcasting Corporation* (BBC) journalist and current chief product and information officer, robot reporters will not replace human reporters: “human audiences want to read opinion and analysis, not just structured data processed by an algorithm” (Chace, 2020). Bessen (2018) surveyed several AI companies and found 98% of respondents believed that AI will augment human capabilities rather than reducing them. One *Washington Post* reporter says automation has increased job growth: “Our human team covering politics is bigger than it’s ever been. Our newsroom has grown every year since I joined the Post in 2014.” He contends that automated journalism technology has only increased the quality of work output without causing editor lay-offs (Willis, 2019).

Many executives in news organizations welcome automated journalism. Lou Ferrara, vice president of Associated Press, sees automated journalism as the future of news production: “We see this [automation] as a part of [Associated Press’s] history.” Lisa Gibbs, the director of news partnerships for the Associated Press, argues that automated journalism liberates journalists: “The work of journalism is creative, it’s about curiosity, it’s about storytelling, it’s about digging and holding governments accountable, it’s critical thinking, it’s judgment —and that is where we

want our journalists spending their energy.” Francesco Marconi, *The Wall Street Journal*’s head of research and development, predicts that “a lot of the tools in journalism will soon be powered by artificial intelligence” (Peiser, 2019). Kenn Cukier, a senior editor for *The Economist*, notes, “We didn’t cling to the quill in the age of the typewriter, so we shouldn’t resist [automation] either. It’s a scale play serving niche markets that wouldn’t be cost-effective to reach otherwise” (Chace, 2020). Many journalists believe automation can enhance news production, and large newspapers will continue to promote news automation despite anxieties that automation may displace journalists.

Ethical and Legal Concerns

The Dangers of Algorithmic Error

Recent incidents of algorithmic errors have prompted ethical questions concerning automated journalism and policy. Amazon’s pricing algorithms inappropriately priced a book at over 23 million dollars (Sutter, 2011). A computer-trading system damaged the integrity of its trading company by incorrectly listing Facebook on a Nasdaq stock market (Patterson, 2012).

Newspapers and news outlets can also be vulnerable to algorithmic error. According to Marconi (2019), “as algorithms are used in more areas of society, the need for newsrooms keeping those systems in check will continue to grow.” The Japanese Meteorological Agency accidentally alerted a non-existent magnitude 9.1 earthquake to cell phone users in Tokyo and halted train services (Guardian, 2016). *Los Angeles Times*’ Quakebot, similarly, sent out a false alert of a heavy earthquake in Santa Barbara because of a software issue (Schmidt, 2016). Shortly after Microsoft announced plans to “replace” the “human editors who run MSN.com [with] Microsoft’s artificial intelligence code,” the AI mismatched a headline and photo, incorrectly posting “a story about the singer Jade Thirlwall’s personal reflections on racism being illustrated

with a picture of her fellow band member Leigh-Anne Pinnock” (Waterson, 2020). According to Green, a writer for Journalism.co.uk, “Entrusting artificial intelligence to produce articles has proved to be a huge time-saver. But it is prone to error;” he’s witnessed automation produce “disastrous” headlines by showing incorrect football photos or listing a 7-year-old as a 70-year-old. According to the European Broadcasting Union, “Humans are more vital than ever – particularly for judgment skills. But virtually all journalism roles will need to change.” Charlie Becket, the director of the Media Policy Project, predicts, “There would be new tasks for people in existing roles and new workflows – but few AI-specific new roles” (Dysart, 2019).

Many journalists and legal are concerned about the legal ambiguities raised by artificial intelligence technologies. Rinehart (2019), a former director of technology and innovation policy at the American Action Forum, notes that “policymakers should proceed with caution” when considering automated journalism. According to Lewis (2019), “Scholars of journalism and media law, as well as professionals managing such processes in newsrooms, will need to think through the legal as well as social and ethical consequences of such technologies.” Critics warn that “algorithmic authorship” complicates responsibility, and invites “discrepancies between the perceptions of authorship and crediting policy” (Montal, 2016). Ryan Calo (2014), a former *Forbes* contributor, points out the ambiguities of decided who is to blame when artificial intelligence is involved: “The law--which so often relies on a perpetrator who intends an injury (or a tortfeasor who foresees one) --will just have to adapt.” According to Lewis (2019), “automated journalism may raise questions regarding who should be considered the author of algorithm-produced content for copyright purposes.” Lyrissa Lidsky, the dean of the University of Missouri’s School of Law says, “It’s hard to talk about the knowledge that algorithm has or whether an algorithm acted recklessly” (Georgiev, 2019). Amy Sanders, an associate professor at

the University of Texas, Austin, argues that news organizations must maintain caution when hiring in tech development areas: “We’ve seen major news organizations like the *New York Times* slim and trim their copy desks, and get rid of that layer of copy editing... That is a news organization’s first line of defense against a lawsuit” (Georgiev, 2019). According to Lewis (2019), automated journalism opens the industry to new criticism and liabilities; unlike large tech companies like Google, news organizations cannot “shield themselves from libel suits” with the claim that “its algorithm serves as a mere conduit to search results containing libelous information, rather than being the actual publisher of such libelous statements.” Without proper policies in place, automated journalism may expose large newspapers and journalists to libel and lawsuits.

Others voice concerns that using automation could negatively affect readers’ perceptions of news groups. Willis, a professor at the University of Oregon, says, “People may well judge it differently if they knew it was written by a computer” (Carlson, 2018). According to Pew Research Center, Americans feel skeptical towards the fairness and effectiveness of computer programs that influence their life decisions; a majority (58%) of poll responses feel that algorithms are likely to reflect some level of human bias (Smith, 2018). *Gazette* polled readers on whether “they think AI robots are a threat to journalism or an opportunity.” The results show that the majority (69%) of over 1,200 readers perceive AI as a threat to journalism (Mayhew, 2020). James Gordon, the senior editor at Reynolds Journalism Institute (RJI) emphasizes the importance of “radical transparency” as a “necessary step for media outlets” and their growth (Georgiev, 2019). Kim (2021) contends that marketing transparency can promote positive readership: “to encourage positive user behavior, “companies...must explain their technology

and its effects as much as possible to their audiences.” Newspapers can market transparency to help readers accept automated journalism.

Conclusion

News groups are using automated journalism technology to stay competitive in journalism, and discussions on automated journalism’s possible legal, ethical, and social consequences are becoming more prevalent. Newspapers, start-ups, and tech giants are continuing to invest and develop technology that automates journalism. Some journalists, readers, tech executives, and scholars exhibit anxiety that robot reporters will displace many human reporters. More journalists and executives are finding that automated journalism optimizes the news-making process and gives news workers more time to enhance higher-level news content. Journalists can use automated journalism as a tool to significantly increase their cultural and economic capital. Newspapers, tech companies, and policymakers should, however, pay close attention to the possible legal and ethical consequences of the misuse of algorithmic technology in automation as it is unclear to what extent the misuse of automated journalism can exhibit algorithmic bias and indirectly contribute to echo chambers and news polarization.

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