FACT-CHECKING AUTOMATION: AN ETHNOGRAPHIC APPROACH TO NEWSROOMS

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ORIGINAL RESEARCH ARTICLE / DOI: 10.20901/ms.15.30.3 / SUBMITTED: 14.2.2024.

ABSTRACT *This article explores the adoption of artificial intelligence-driven automation tools in fact-checking newsrooms, focusing on their potential to enhance verification efficiency and reach. Using digital ethnography and semi-structured interviews with executives, journalists, and engineers from Duke Reporters' Lab (USA) and Full Fact (UK), the study examines the motivations for adopting these tools, their impact on fact-checking practices, perceived benefits, user attitudes, and measurable outcomes. Findings reveal significant variations in approaches and results across newsrooms, underscoring ongoing challenges in implementing automation tools within complex workflows. This work advances understanding of automation's role in fact-checking and offers insights for future research.*

KEYWORDS

AUTOMATED FACT-CHECKING, ARTIFICIAL INTELLIGENCE, ETHNOGRAPHY, NEWSROOMS, MEDIA

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ORIGINAL RESEARCH ARTICLE / DOI: 10.20901/ms.15.30.3 / SUBMITTED: 14.2.2024.

INTRODUCTION

Artificial intelligence is one of the most promising avenues for scaling fact-checking efforts. However, only a few media outlets have adopted tools to automate the fact-checking process of political discourse in newsrooms, and even fewer have been able to develop their own systems for the automatic detection of falsehoods.

Fact-checking platforms face several challenges in this digital transition, particularly in an ecosystem predominantly comprised of small newsrooms with limited resources (IFCN, 2022; Stencel & Ryan, 2022). Half of the organizations are non-profit, and one in three has fewer than five employees, making it difficult to integrate technical expertise. Furthermore, Meta's independent media verification program remains the primary source of income for nearly half of these organizations. As a result, there has been an imbalance in debunking misinformation, sidelining attention towards political discourse verification. This has also influenced the interest and level of adoption of new algorithms, with only a few media outlets actively investing in developing their own technology, as highlighted by Lucas Graves at the 2022 annual fact-checkers conference (Abels, 2022; Global Fact 9, 2022).

New technologies for fact-checking political discourse have focused on detecting factual and check-worthy statements, retrieving similar verifications, and numerically verifying data to achieve quicker responses and broader coverage (Adair, 2021; Danzon-Chambaud, 2020; Smalley, 2022). However, the analysis of the trajectory of fact-checking organizations in this direction, along with the impact they have achieved, the challenges they face, and the lessons learned, has yet to be explored in academic literature (Donohue, 2019). Previous research has primarily focused on the tools instead of their adoption, taking more of a technological rather than journalistic perspective, which has not effectively translated into newsroom practices. Existing research often remains disconnected from fact-checkers and "does not optimally comply with their actual needs and expectations" (Hrckova et al., 2022, p. 2; Nakov et al., 2021).

Therefore, this study explores how artificial intelligence tools are being adopted in fact-checking organizations to analyze their impact on professional newsrooms' routines. It also investigates the role these technologies play in journalists' work and their impact on the goals and objectives set by each organization.

Two main causes for limited automation adoption in fact-checking organizations can be identified. First, smaller organizations may be discouraged by the high opportunity cost of incorporating these tools, which not only presents economic constraints but also requires specialized personnel and a lengthy experimentation period before yielding results. Full Fact (2020) noted that a lack of technical staff hampers participation in discussions about future technology, while Mesquita and Fernandes (2021) highlighted how Latin American digital media outlets innovate to overcome resource limitations. Additionally, Beers et al. (2020) found that resource constraints restrict the use of tools against misinformation, with larger budgets allowing journalists more time to learn and

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collaborate with developers. Many fact-checkers also expressed that existing tools are not designed for their needs and often face language barriers.

Secondly, fact-checking organizations tend to develop their own tools because commercial solutions do not adequately meet their specific requirements and often perform poorly when tested in their environments.

Based on this, the research questions that will guide this study are:

RQ1: What is the process of adopting automation tools in fact-checking newsrooms, and how do these tools influence the work of fact-checkers?
RQ2: What are the main areas of tool development, including the benefits and challenges of using automation tools, and how are their results measured?

The research findings contribute to identifying the fact-checkers' real needs and objectives, which can help prioritize the most pressing tasks for automation. To achieve this, we have employed a methodology based on ethnographic research, which has been underexplored in this field. This has allowed us to conduct a detailed analysis of fact-checkers' practices and needs in terms of technologies, procedures, and resources utilized.

After identifying the media outlets that have incorporated automation tools in political discourse fact-checking tasks, the research includes designing a hybrid strategy that combines digital ethnography with detailed process observation in cases where it is feasible (Ardévol, E. & Gómez-Cruz, 2014), and in-depth semi-structured interviews with project leaders.

STATE OF THE ART

There is a dividing line in the academic literature focused on fact-checking automation between works that adopt a technological perspective on the tasks to be automated and those that center on the needs of fact-checkers from an editorial standpoint. The former is part of a broader investigation into the application of artificial intelligence in journalism, where fact-checking has enjoyed a privileged position due to its inherent characteristics that enable a greater structuring of content around specific categories, such as the factuality of claims, evidence-based content, and a rating determining the veracity of the claim, among others.

A considerable amount of the development of technology is evolving towards detecting narratives and sources of misinformation, identifying emerging viral posts, connecting the dots between known disinformers (Lead Stories, n.d.), and monitoring shared information (Rappler Research Team, 2018). Political discourse fact-checking, on the other hand, has its own specific features that make it more amenable to automation based on natural language processing (NLP) and has been the focus of several development competitions such as 'CheckThat! Labs' (Nakov et al., 2022).

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In this way, a significant portion of research has sought to break down the components of the verification process and attempt to automate them individually. This includes detecting factual claims worthy of verification (Cazalens et al., 2018; Konstantinovskiy et al., 2021), retrieving previously verified similar claims (Kazemi et al., 2021; Shaar et al., 2021), or fact-checking specific data (Guo et al., 2022; Saquete et al., 2019; Zeng et al., 2021).

From an editorial perspective, Babakar and Moy (2016) laid the foundation for the state of automated fact-checking (AFC) and identified the needs of fact-checking organizations. At that time, when artificial intelligence technologies were still far from their current development, they believed that the focus should be on using existing technology for verification purposes. The objective was to simplify tracking multiple sources, fact-checking more statements, and creating diverse products with the results. They also established research areas of interest for newsrooms at that time.

More recently, Beltrán et al. (2021) provided another perspective on implementing automated tools in fact-checking newsrooms. These authors describe experiments with ClaimHunter, a tool developed by the Spanish fact-checking organization *Newtral* to detect factual claims among a group of X (formerly Twitter) accounts.

However, beyond these firsthand experiences, academic literature that takes the perspective of journalists and fact-checking newsrooms is scarce, and only in a few cases have advancements in newsrooms been evaluated (Graves, 2018; Nakov et al., 2021). Micallef et al. (2022) found that relatively little research has focused on the work practices of professional fact-checkers. These authors also highlight the need for developers to better incorporate the values and objectives of journalists, as well as their actual use of the tools. Hrckova et al. (2022) also identified a gap between the needs and issues faced by fact-checking professionals and the current research on AI.

Recent studies, such as the one by Johnson (2023), reveal that there are reservations within the journalism profession regarding certain developments in AFC, which may have contributed to the slow adoption of these technologies in newsrooms and limited academic research on the phenomenon. Full Fact (2020, p. 106) also pointed out that different conceptions of automation exist within newsrooms, with some organizations showing skepticism. Specifically, for the final phase of the process, data validation or evidence retrieval is considered "a distant and unrealistic fantasy, as it requires significant human judgment and creative thinking to locate sources and evidence, collaborate with other fact-checkers, and identify context and framing, such as satire" (Full Fact, 2020, p. 106).

The AI Index Report (Stanford Institute for Human-Centered Artificial Intelligence, 2023) also points out that the number of citations for FEVER, LIAR, and Truth of Varying Shades, three datasets commonly used for AFC, has plateaued, reflecting a possible shift in the research landscape from static datasets for natural language processing tools. The study also shows that several proposed systems are based on assumptions and lack the real-world context to which human fact-checkers have easy access (Glockner et al., 2022).

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A significant portion of the academic corpus has relied on the work of fact-checkers to develop models or has focused on studying the models themselves. In both cases, the focus has been distinct from their integration into newsrooms (Alsmadi & O'Brien, 2020; Konstantinovskiy et al., 2021; Patwari et al., 2017; Sarr et al., 2018).

METHODOLOGY

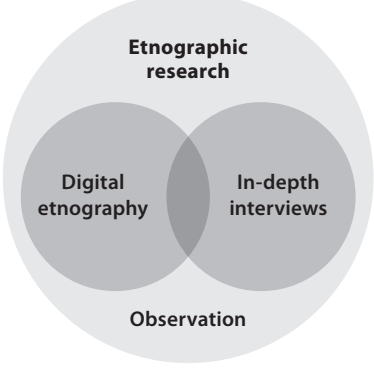
Digital Ethnography in Media

Digital ethnography enables the scaling of observation and the coverage of newsrooms from different parts of the world that work remotely and simultaneously (Masten & Plowman, 2003; Pink et al., 2016). In its cognitive aspect, this methodology assumes that we can describe the reasoning behind a process by simply listening and interviewing people or observing patterns of behavior in a specific process, in materialist theories (Fetterman, 2009; Zhou et al., 2022).

While some authors have questioned digital observation as a research tool (Redman & Trapani, 2012), others argue that it can provide relevant insights into digital practices, as it allows for reaching a larger number of study subjects with greater flexibility (Hine, 2000). Furthermore, it can help identify barriers and challenges in implementing new technologies.

Research Methodology Design

An ethnographic approach was employed for one year through immersive observation of their publications and interviews within fact-checking organizations. This involved direct engagement with newsroom environments and workflows through a visiting stay in one of them, allowing researchers to closely observe interactions with automated tools and gather insights from the journalists, executives, and engineers who use them.



▲ *Figure 1.*
Research Design
Source: Authors' elaboration.

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Ethnography was chosen for three main reasons. First, it helps uncover undocumented needs and gaps in the literature, identifying potential areas for improvement. Second, it enables researchers to adopt the newsroom journalists' perspective, a crucial but often overlooked angle. Finally, ethnography allows for a detailed exploration of the motivations, processes, and changes associated with adopting (or not adopting) automated tools, making it ideal for diagnosing organizational challenges and work methodologies.

Data collection

The ethnography was conducted through the observation of methodologies and related publications concerning their automation work, with the purpose of providing a useful account of the processes involved (Button, 2000). Both observation and data collection were carried out to gain further insights into the context of automation in the fact-checking process, offering details about the problems, challenges, and unmet needs that technology has yet to address. Detailed summaries of processes, conversations, debates, and other events were created for qualitative analysis (Crabtree et al., 2012).

In-depth interviews

Five in-depth semi-structured interviews were conducted with project leaders from each organization and their counterparts in the technology field. The process involved gathering and reviewing existing data from each automation project, identifying essential information for the research, selecting the appropriate interview type, designing the questions, identifying key informants, and determining the method for documentation. The semi-structured interviews followed a question guide aligned with the research objectives, supplemented by case-specific questions to capture stakeholder perspectives (Klandermans & Staggenborg, 2004). This method is well-suited to digital ethnographies, as it allows for follow-up questions and probing (Adams, 2015; Barriball & While, 1984; Saltzis & Dickinson, 2008), enhancing precision through targeted inquiries (Rabionet, 2011).

The selection of interviewees was based on their subject-matter expertise and ability to provide detailed insights from their experience (Whiting, 2013), ensuring a diverse representation of both journalistic and engineering roles for a comprehensive perspective. The questionnaire guide is detailed in Annex 1, and profiles of the selected individuals are included in Annex 2. Interviews were conducted in person for Duke Reporters' Lab between October and December 2022 and via video calls for Full Fact between March and April 2023. All interviews were transcribed using Otter.ai. As this research follows an iterative process, findings were verified with the interviewees to ensure accuracy.

Case studies

Based on this work, two case studies are conducted on two prominent examples: Digest by Full Fact and Squash by the Duke Reporters' Lab. Case study research (Johansson, 2007) is an effective methodology for ethnographic investigation as it allows for a detailed and in-depth understanding of a phenomenon or group and has the potential to validate findings through multiple sources of information.

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The article is structured as follows: a mapping of fact-checkers working with their own AI tools, an analysis of advancements and challenges, a case analysis of Squash (Duke Reporters' Lab - Politifact), and a case analysis of Digest (Full Fact).

RESULTS

The media focused on AFC argues that fact-checking is a part of journalism with significant potential for automation. Firstly, it is based on certain repetitive tasks that are more susceptible to automation, such as detecting factual claims. Secondly, it benefits from the news archive more than other types of journalism, as many of the detected falsehoods are repeated. Additionally, fact-checks contain several structural elements, such as the claim to be verified, the rating or assessment result, the politician who made the verified statement, and the date on which it was made. This structure allows for easy archiving and retrieval through systems like ClaimReview, which enables structured categorization (Adair & Luther, 2021), or MediaReview, for images and videos.

However, only a few fact-checking organizations use automation tools for continuous verification of political speech, all of which rely on their own developments. These organizations include Full Fact, Chequeado, Africa Check, Duke Reporters' Lab, and Newtral. The first three share technology as a result of funding obtained through Google's Digital News program, which supported their development (Team Full Fact, 2019). While Duke Reporters' Lab is not a verification medium per se, it collaborates with Politifact, the Washington Post's Fact Checker, and FactCheck.org, with whom it has organized pilot tests of its Squash tool.

The academic literature on the use of these technologies emphasizes the primary objective of increasing the speed, scale, and impact of fact-checking (Donohoue, 2019; Fernández, 2017; Full Fact, n.d.; Ortega, 2019; Ortega, 2022). However, in practice, this objective has materialized in two distinct research approaches.

The first approach focuses on achieving internal efficiency to optimize the verification process, aiming to save time and effort for fact-checkers while expanding the scope of their work. The second approach, on the other hand, aims to improve external effectiveness to enhance the dissemination capacity of fact-checks and achieve a greater impact on the public. This objective translates into the pursuit of greater immediacy and the utilization of previously published fact-checks in the news archive when a false claim is repeated.

In any case, newsrooms that have been able to develop automation tools share certain characteristics. The first characteristic is their prioritization of balanced fact-checking of political discourse, in addition to debunking misinformation, even though the latter accounts for a significant portion of their revenue. Along with this, they share the need to use these tools to enhance their work. In both cases, they have developed the tools internally rather than using available market tools or third-party developments. This has

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required a significant allocation of resources to finance these developments, such as support from a university or assistance from technology platforms.

Lastly, and in line with the previous conclusion, both examples demonstrate the integration between the editorial department and the artificial intelligence area, working in parallel and mutually benefiting from each other. They have established working dynamics between journalists and engineers to share concerns and common needs. Their results are also interconnected. While the Duke Reporters' Lab points out that, beyond technical challenges, one of the obstacles they still need to overcome is the lack of sufficient fact-checks (Adair, 2021), Full Fact has relied on external collaborators among its users to annotate data (Dudfield, 2022).

The Case of Squash

The approach adopted by the Duke Reporters' Lab for automating fact-checking focuses on improving response speed for real-time verifications, particularly during electoral debates, allowing for immediate responses based on previously published fact-checks on the same or similar topics. To date, teams have performed these functions manually by listening to debates and re-verifying claims that politicians repeat and have already been fact-checked (Politifact, 2020). The team's goal is to automate this process to enhance agility and enable almost immediate responses to audiences.

The program, known as Squash, is designed to detect factual claims in live debates that are identical or similar to previously fact-checked claims, displaying them on the screen seconds after politicians have made them (Adair, 2021; IFCN, 2021b; Rauch, 2019). This process involves sending audio clips of a debate or speech to Google Cloud, where they are converted into text. The text is then processed by ClaimBuster, a tool developed by the University of Texas that identifies verifiable statements. These statements are compared to a database of previously published fact-checks to find matches. When a match is found, a summary of the fact-check is displayed on the screen, and a journalist filters it before publication. This system operates on the premise that politicians often repeat a significant portion of their arguments or factual claims, allowing for the reuse of previous fact-checks.

Unlike other fact-checking organizations, the goal of automation at the Duke Reporters' Lab is external dissemination rather than supporting internal processes. The team is convinced that automation is the only viable method for conducting real-time fact-checking, as noted by Mark Stencel, co-director of the Duke Reporters' Lab.

> *When you're covering a major live event that millions of people will be watching at the same time, such as the State of the Union address or presidential debates, which for many are the only direct interaction with politics, if we can intercept the falsehoods stated in those speeches or debates, we can prevent people from internalizing lies or unreliable information. That was the goal and the necessity.*

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In the context of automating live fact-checking, Chris Guess, Chief Technology Officer of the Duke Reporters' Lab, argues that the adoption of this practice is supported by studies showing that early verification of misinformation increases the chances of debunking it and preventing its spread. This objective aligns with other goals, such as reaching individuals who may resist or be averse to fact-checks and directing web search traffic to the fact-checks published by fact-checkers.

Despite the availability of numerous verification models and applications in the market and academic literature, the decision was made to develop proprietary fact-checking tools. Guess explains that this approach arises from recognizing a disconnect between the development of these tools and the actual needs of journalists, as well as a lack of adaptation to their specific workflows. This discrepancy, as highlighted by Guess, is not always adequately addressed by external tools.

> *It often happens that the people building models have no idea how journalists actually work. They don't talk to them because they think the problem is evident, but it's not the case (...) we need to communicate with journalists and fact-checkers about what works best and constantly be in a kind of design and feedback loop.*

Bill Adair emphasizes that, in the case of the Duke Reporters' Lab, a direct connection is established between the fields of fact-checking and journalism, fostering a mutual exchange of problems and needs between the two.

> *I acted as a translator. I believe it is important for someone to be the translator between journalists and engineers (...) When ClaimBuster, the first algorithm that detected factual claims, was created, they asked me what fact-checkers needed, and I went through the workflow of what fact-checkers do. That's how there was a mutual benefit, going through the workflow and saying 'this is what fact-checkers do'.*

The incorporation of tools for AFC is not intended to replace fact-checkers but to assist them in performing their work more efficiently and quickly. However, Squash faces four key obstacles: (i) errors in voice-to-text transcription; (ii) limited accuracy in the matches generated by the system; (iii) insufficient verifications to find similarities in new verifiable claims (Mantas, 2021); and (iv) the passage of time and subtle nuances that can alter the conclusions of previous fact-checks (Funke, 2018).

While the first problem lies outside the scope of AFC tools, some progress has been made in addressing the second obstacle, with new avenues being explored to improve the accuracy of the system's matches. The team identified that the issue with detecting similarities arises from Squash valuing certain words or numbers as sufficiently relevant to guide the search for corresponding verifications, even if those words are not the focus of the claim. This challenge stems from the fact that the search system is based on Elasticsearch, which poses difficulties in detecting paraphrases or phrases that use different language to refer to the same reality.

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To tackle these challenges, the team has begun experimenting with a new approach based on thematic tags, allowing the algorithm to weigh the relevance of words more systematically. However, this requires an additional effort to tag verifications in the database before they can be utilized. Another proposed solution involves creating an intermediate tool in the role of a "Gardener," where the system presents the reporter with three possible matches, leaving it up to them to choose the most suitable one, although this may limit immediacy. The retrieved phrases are not always identical and may contain nuances that differentiate them, prompting the decision to label them as "related verifications" rather than identical claims. This approach addresses one of the main concerns identified by Mark Stencel and his team during the development of the Squash program.

> *They may be using very similar words to say something slightly different. So, we had to find a way to recognize that it's a fact-check from the past that is relevant to what is being said now, but it's not a true or false statement as such... A big part of it depends on how the public understands what we're showing them and what that means. But we're trying to find a way to explain that something is not true or false because the previous statement was true or false, but it can still be relevant. It's a big mental leap for viewers... because the algorithm is doing its best to find matches quickly, but people are in a better position to say whether it's a good or bad match.*

The additional challenges identified are related to the tool's on-screen presentation and overall user experience. A few seconds of delay in displaying the results can confuse viewers regarding which statement is being referenced and who made it. Developers have also noted two other challenges related to the result presentation. First, the display time of the summary of the previous fact-checks overlaps with the politicians' new factual claims, making it difficult for the audience to fully read the summary. Additionally, user interaction is not permitted to access the complete information of the fact-check. It is important to note that these experiments were conducted in a secure environment using the FactStream platform developed by the Duke Reporters' Lab.

Another limitation of the system is its ability to verify all statements made, as it does not detect every claim, and not all detected statements have a corresponding previous fact-check that appears as a match. This can create confusion among the audience. Stencel highlights that, at present, the system operates only at a national level due to a lack of sufficient fact-checks in other contexts. This limitation can result in a distorted perception by only displaying corrections for some false claims while leaving others unverified, potentially leading the audience to believe that unverified claims are correct.

The Case of Full Fact

In the case of Full Fact, which leads research within the consortium alongside Chequeado and Africa Check, the aim has been to develop an automated data-checking system that encompasses the entire fact-checking process, from the detection of relevant claims to their verification, employing an end-to-end approach (Babakar & Moy, 2016). To

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achieve this, the system consists of three distinct algorithms: the first algorithm detects verifiable phrases that contain elements suitable for fact-checking with data (claim detection and checkworthiness); the second searches for similar results from previous fact-checks (claim matching); and the third validates the claim by linking it to statistical data from various reliable sources (claim validation) (Full Fact, n.d.).

This approach aims to enable automated and accurate verification of claims while ensuring that a journalist remains central to the fact-checking process (Corney, 2021). Unlike the Duke Reporters' Lab, which focuses on external dissemination, Full Fact's tools are designed to support and complement the work of fact-checkers. David Corney, a data scientist at Full Fact, emphasizes that while the software can indicate whether a claim is true or false, most claims require nuanced human explanation.

The Full Fact AI team comprises six individuals, including the director, the product director, three data scientists, a front-end developer, and a software engineer. Their ultimate goal is to transform these tools into a commercially viable product for the global fact-checking community. The drive behind the adoption of automation for fact-checking at Full Fact stems from the exponential increase in misinformation circulating online, with the objective of systematically addressing this issue, as explained by Kate Wilkinson, the product director.

> *The sheer volume of information published online every day, the speed at which it is shared, the ways in which it can be amplified through targeted spending, and the different actions taken by various platforms, which make false information easily spread or unaccompanied by correct information, implies that we need to elevate our efforts to address the magnitude of the problem. This is where* Full Fact *sees automation playing an important role. Automation allows fact-checkers to continue doing their work, for which they are highly skilled and experienced, while the tools take care of manual tasks that are often low-skilled and time-consuming, such as monitoring media for claims or matching claims. This way, we are able to tackle this problem at the scale needed to make a difference.*

The reasoning behind this approach is that while verifying specific misinformation is essential, the ultimate goal of fact-checkers extends beyond mere verification. It involves understanding the origins of false information, identifying misleading narratives, analyzing their spread, and uncovering the interests behind them. In this context, artificial intelligence tools play a crucial role by enabling fact-checkers to streamline specific verifications and focus on addressing these broader issues from a more comprehensive perspective. These AI tools can conduct extensive searches across multiple reliable data sources, analyze dissemination networks on social media, identify patterns of disinformation, and perform content analysis, thereby facilitating a deeper understanding of the problem.

As a result, the development of automation for fact-checking (AFC) has evolved from a narrow focus on verification to a more holistic approach, aligning with the advancements

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in artificial intelligence, which now aims for artificial general intelligence capable of processing a wide range of information. Both Wilkinson and Corney emphasize that Full Fact's understanding of the actions, goals, and objectives associated with AFC has shifted due to technological progress in the field. The current aim is to optimize the deployment model of fact-checking tools to such an extent that it achieves economic sustainability, reducing reliance on grants received thus far.

This shift is motivated by two key reasons. First, to minimize dependence on donor funding, which can be unpredictable and significantly impact operations and strategic plans. Thus, the current objective is to obtain commercial licenses for these tools, making them accessible to fact-checkers with limited internal expertise in data science, software engineering, and technology. Simultaneously, demonstrating the value of these tools is crucial to encourage organizations to invest in them. According to Wilkinson, this would serve as a primary indicator of the success of their efforts.

A notable strength highlighted by the Full Fact team is that the tools were developed collaboratively by engineers and fact-checkers from three continents, integrating diverse professional and contextual perspectives. This collaboration has also ensured that the data annotation used to train the models was conducted by journalists, thereby enhancing the quality assurance of the tools.

> *Fact-checkers have been deeply involved in the construction and development of these tools from the very beginning. This integration is also facilitated by the close working relationship between the technical team and the editorial team.* (Kate Wilkinson)

Corney emphasizes that the algorithms reflect the insights gained from journalists, aiming to replicate their processes and behaviors through effective algorithm design. Rather than solely focusing on what is verifiable based on current content, the algorithms prioritize the types of factual claims that are significant for verification now and in the future, enabling them to accurately interpret which phrases should be selected for scrutiny.

In terms of tool development strategies, Full Fact has opted to concentrate on specific topics, especially within the health sector, due to the heightened relevance of health-related claims during the pandemic. David Corney explains that this focus allows them to address pressing issues effectively while leveraging the algorithms' capabilities to tackle claims that are particularly impactful during this critical time.

> *The misinformation about health is widespread, it is quite universalized, and it is very important, so we thought we could demonstrate how technology identifies health claims and verifies them. If it works, we can use it and apply it to other areas of politics, such as surveys, or anything else (...) We did it this way because choosing a topic makes the problem smaller, making it easier to address.*

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The team explains that they opted to develop internal tools instead of utilizing external developer tools, despite the higher costs, for several reasons. Firstly, they found that the performance of existing models did not align with the promised accuracy when tested. Additionally, many of these tools were trained in secure environments, which did not reflect the daily realities of political discourse. Finally, David Corney emphasizes that the objectives of these external tools often do not match their specific needs, leading to a misalignment in goals and functionalities.

Often, there is a mismatch between what academics are trying to achieve and what the on-the-ground metrics are showing. So, when we talk about a 90% accuracy, the metric doesn't actually align with the same objectives. Sometimes, it's also very limited, for example, to political discourse during an election campaign, but you can't use the same algorithm on random Facebook pages. Therefore, even though the accuracy might look good in a conference and is interesting for research papers, these are not tools that we can simply download and use because the results are not as useful for the problems we are trying to solve.

The challenge ahead is to improve the technology and user experience to adapt to the needs of other newsrooms and ensure that the tools can work in different contexts and languages with the same accuracy. Similar to the Duke Reporters' Lab case, they mention the need to improve the transcription tool, as well as the other tools. Corney points out that there are so many complications in language, such as spatial and temporal references or different ways of addressing someone, that the algorithms don't always work well enough to be reliable. Finally, they also mention the challenge of removing barriers to accessing the tools and promoting the use of AI technologies among the fact-checking community. Wilkinson and Corney express these points in their interviews.

The main difference lies in the speed of work. Fact-checking aims to publish verifications on a daily basis, and when a claim is false, there is a desire to address it as quickly as possible. On the other hand, as a software developer, my perspective operates on a timescale of months. This can be frustrating for both sides, as they want things to work immediately. (David Corney)

I believe that for many years, it has been marketed as an advanced tool that can revolutionize fact-checking and make it faster and more efficient. However, sometimes it can be challenging for organizations to envision how it fits into their workflow. There may be friction in adopting new tools due to a learning curve during the onboarding process. Even if it ultimately leads to increased speed and efficiency, organizations may have reservations about investing the time required to acquire knowledge of a new tool and see the results. (Kate Wilkinson)

Indeed, these entry barriers are also reflected in the internal dynamics of newsrooms. In the case of Full Fact, most fact-checkers who have worked with the tools have recognized their potential and the benefits they can bring in terms of time savings and increased impact. However, concerns are reflected in the initial challenges of adopting

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these tools, stemming from the inherent characteristics of journalistic work, as explained by Kate Wilkinson:

> *In a fast-paced 24-hour news cycle, even if you can see the efficiency of using the tools and meet your deadlines, it's challenging to persuade people to try a new approach that may initially slow them down while they learn how to use the tool. Therefore, it's crucial to communicate how these tools can help, what the learning curve looks like, and what support can be provided.*

Measuring the impact of fact-checking is also a challenge when quantifying the weight placed on automation. On the one hand, Full Fact analyzes the increase in the number of claims an organization can review daily. For example, before 2019, Full Fact detected around 100 claims per day that could be fact-checked. However, with the tools they have developed, they are now able to review an average of around 100,000 claims per day due to the enormous amount of content that the tools can process.

CONCLUSIONS

The study demonstrates that the development and adoption of artificial intelligence tools for fact-checking automation is a slow and costly process, yet it offers multiple benefits. The work of fact-checkers in this field has evolved from the initial goal of addressing specific tasks, such as identifying factual statements, towards more complex tasks that integrate different processes and scale multiple tasks within a unified system, aligning with the progression of artificial intelligence towards general intelligence.

Organizations share motivating reasons for employing AFC, such as the rise of misinformation and the need for tools that can enhance the reach of fact-checking while reducing the required time. However, they have pursued different goals, resulting in two main lines of research. On the one hand, the creation of a system capable of detecting repeated falsehoods and retrieving previous fact-checks to issue them in real-time, aims to improve the reach of fact-checking for the public, increasing its dissemination and the speed at which it can be accessed. On the other hand, the development of an internal system capable of performing three processes: detecting factual claims, finding matches with previously published content, and validating information, to assist fact-checkers in filtering the volume of information they encounter.

Nonetheless, the newsrooms that have been able to develop such tools share certain characteristics:

>They prioritize fact-checking of political discourse as an important part of their work, beyond debunking misinformation.

>They share the need to streamline or enhance their fact-checking work through such tools, although not always with the same ultimate goal.

>They have chosen to develop the tools internally, instead of using off-the-shelf or third-party-developed tools.

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>They have successfully established working dynamics between journalists and engineers to share common concerns and needs.
>Significant resource allocation is required for these developments, necessitating external financial support.
>They encounter challenges both in technological development and in the integration of these tools.

The aforementioned factors have resulted in multiple barriers to the adoption of technology in other fact-checking newsrooms, not so much due to lack of interest but due to implementation difficulties. These barriers include high costs, the need for a strong and automation-focused technical team, as well as communication about the tools themselves, to explain the learning curve they require and the time it takes to adopt them in a newsroom.

The study also highlights several important insights gained:
>Collaboration between journalists and engineers has been crucial in developing tools that meet the needs of fact-checkers and are effective in real-world environments. This collaboration has been one of the main motivations for developing proprietary tools instead of using those available in the market.
>The involved fact-checkers have shown a positive response to these developments, although they also exhibit some resistance due to the implementation curve these tools require.
>The tools need to be more accurate to expand their scope to other languages and be used by other fact-checkers.

On the other hand, it has been evident that the developed tools have had an impact on the work of fact-checkers, enabling them to increase their reach and reduce the time spent on certain tasks. However, it is important to note that there are still few quantitative indicators that accurately measure the impact of these systems on the daily work of fact-checkers. This has resulted in organizations lacking a concrete measurement of the outcomes of AFC, as these systems are still in the development or experimental phases, which could influence their feasibility.

In summary, the study emphasizes the importance of collaborative work between journalists and engineers in the process of developing AFC tools, while also acknowledging the need to improve their accuracy and have quantitative indicators to measure their impact on daily work.

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Annex 1
Guideline for Semi-Structured Interview Questionnaire

1. General introductory questions
>What kind of automated fact-checking do you use in your newsroom?
>What phases of the fact-checking does it handle?
>How much automation is there for the whole process?
>Can you describe the whole fact-checking process specifying which parts are assisted with automated tools?
2. Questions regarding the origin of automated fact-checking processes in the newsroom
>Who, when, and why did you start with the automation of fact-checking?
>What was the goal of developing/adopting this technology?
>What were you trying to achieve?
>Was it an internal development or an external one? Why?
>How did you finance it?
>Who did you develop it?
>Did the development involve the editorial team or just the technological one?
>How do both sides adapt to each other?
>What kind of discussions did you have?
3. Questions regarding the technology itself
>Who did the training of the model? Did you use a preexisting model or dataset to start?
>And the testing?
>Does it tackle the whole spectrum of fact-checking you publish?
>What else would you need for claim validation?
>Does a claim validation tool only focused on checking numeric data would work for you? How?
>What problems did you find when developing it? And now, using it?
>Is it multiplatform? And multilingual?
4. Questions regarding the results and impacts
>How has it impacted the fact-checker's work?
>Has it reduced the time for finding claims or producing a fact check?
>Have you measured if it has helped you to publish more articles?
>How has it changed the roles inside the team (if fewer people need to be focused on listening to political statements to find a claim)?
>What was the original scope of the project and the one you have achieved at the moment?
>And what were the expectations compared with the final results?
5. Questions regarding the future projects and goals
>What are your plans for the future: are you willing to design new tools, keep using the ones you have, or stop using them...?
>What kind of technologies or support would you need to reinforce or potentiate the automation of the fact-checking process?
>What technologies do you think other newsrooms would need?
>Have you shared your technology with other fact-checkers? Why? Is it for free or paid?
>Have you shared your advances in academic papers or other similar ones?

Annex 2
Profiles of the Participants in the In-Depth Interviews

1. From Duke Reporters' Lab and Politifact:
>Bill Adair is the Knight Professor of the Practice of Journalism and Public Policy at Duke University and the director of the Duke Reporters' Lab.

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>Mark Stencel teaches journalism at Duke, where he also is co-director of the university's Reporters' Lab.
>Christopher Guess is the lead technologist for the Reporters' Lab.
2. From *Full Fact*
>David Corney is a Senior Data Scientist at Full Fact. He joined the team in 2019 as a data scientist specializing in natural language processing. He helps bring AI into *Full Fact*'s tools to better support fact-checkers and other colleagues. David has previously worked in academia and for tech startups, where he developed tools to analyze news articles and other texts.
>Kate Wilkinson, Senior Product Manager at Full Fact. Kate joined *Full Fact*'s automated fact-checking team in 2022 as a senior product manager. She's working to scale the technology output and ensure it develops in line with the needs of users around the world.

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AUTOMATIZACIJA PROVJERE INFORMACIJA: ETNOGRAFSKI PRISTUP REDAKCIJAMA

Irene Larraz :: Ramón Salaverría :: Javier Serrano-Puche

SAŽETAK *Ovaj članak istražuje usvajanje alata za automatizaciju koji su zasnovani na umjetnoj inteligenciji u redakcijama za provjeru točnosti informacija, pri čemu se fokus stavlja na njihov potencijal za poboljšanje učinkovitosti i dosega verifikacije. Korištenjem digitalne etnografije i polustrukturiranih intervjua s rukovoditeljima, novinarima i inženjerima iz Duke Reporters' Laba (SAD) i Full Facta (UK), istraživanje ispituje motive za usvajanje navedenih alata, njihov utjecaj na praksu provjere informacija, percipirane prednosti, stavove korisnika i mjerljive rezultate. Nalazi otkrivaju značajne varijacije u pristupima i rezultatima među redakcijama, pri čemu se naglašavaju izazovi u implementaciji alata za automatizaciju unutar složenih tijekova rada. Ovo istraživanje unaprjeđuje razumijevanje uloge automatizacije u provjeri informacija i nudi uvide za buduća istraživanja.*

KLJUČNE RIJEČI

AUTOMATIZIRANA PROVJERA INFORMACIJA, UMJETNA INTELIGENCIJA, ETNOGRAFIJA, REDAKCIJE, MEDIJI

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