

AI in the Newsroom: Lessons from the Adoption of The Globe and Mail's Sophi

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Abstract

This case study examines the relationship between artificial intelligence (AI) and journalistic values through an analysis of Sophi, an algorithmic recommendation engine developed by *The Globe and Mail* in Canada. As AI becomes more prevalent in newsrooms, there are debates ranging from concerns about journalist displacement to hopes for improved quality and economic sustainability. The study explores how Sophi's development, adoption, and reception showcase the interaction between technological capabilities and journalistic values. By analyzing Sophi's implementation across various international news publishers, we investigate the conditions that foster the adoption of AI systems in journalism and the implications for future AI design and deployment within newsrooms. Our findings suggest that successful AI integration in journalism requires careful attention to organizational context, scope of automation and institutional origins. The story of Sophi highlights the need for a more granular investigation into how different news outlets balance economic imperatives with journalistic values when adopting AI technologies.

Keywords: Artificial Intelligence, AI, algorithmic recommendation systems, innovation journalistic norms, local news

The discourse on the role and impact of artificial intelligence (AI) on journalism tends to veer from fears about robots replacing journalists to hopes that machines could boost quality journalism and address economic woes. Broadly, AI has been deployed to support, extend and enhance existing journalistic practices in newsgathering, news production and news distribution (Beckett & Yaseen 2023). These uses range from deploying AI systems to discover trends on social media to generating headlines and summaries to recommending stories for readers.

Perspectives on AI in journalism are shaped by normative ideas of what journalism was, is and could be. At the core of the debate is how far the vision, priorities, and needs of journalists, editors and publishers shape the use of these technologies. This is taking place in a context of declining revenues, fragmented audiences, the lack of a strategic vision and diverging visions on the part of the technology industry which develops and supplies core AI infrastructure and technology to the news industry.

This research takes a case study approach to consider the relationship between certain AI systems and journalistic norms as they relate to gatekeeping. A case study approach provides a lens to consider how algorithmic systems, as “contested symbolic objects” (Christin, 2020, 153), are implemented in specific institutional contexts. Gatekeeping provides a lens to examine the impact of AI systems in journalism, given how news organizations are revising gatekeeping practices in the light of “the new algorithmic logic governing the media landscape at large” (Bucher 2018, 118).

This case study examines the rollout, adoption and reception of one such gatekeeping system – Sophi –, an algorithmic recommendation engine developed by Canada’s leading quality newspaper, *The Globe and Mail*. It is an instructional object of study as it was widely hailed as one of the first advanced AI systems developed by the news industry for the news industry (Digiday 2021), garnering numerous industry awards for innovation (Globe and Mail, 2021). Drawing on an analysis of data about Sophi’s use across publishers and an analysis of news coverage as well as secondary sources, we seek to address three key questions: (1) Where has Sophi been adopted and how has the system been framed by the industry? Building on this descriptive question we ask further (2) Under what conditions are specific AI systems such as Sophi deemed acceptable within journalism, and (3) what are the potential implications of our findings for the design and deployment of other AI technologies for journalists? The study of this form of AI in newsrooms offers potential insights into the reaction and reception of emergent technologies like generative AI.

Literature review

We first provide an overview of how AI has come to be used within journalism to better situate Sophi within this context. We then engage with the research on algorithmic news recommender systems, before considering gatekeeping theory as a frame to explain the adoption of AI within the news and as a lens through which AI’s intersection with journalistic norms can be understood.

Uses of AI in journalism

The news industry has consistently embraced technological advancements throughout its history, with the integration of artificial intelligence representing the latest chapter in this ongoing evolution of news work. AI is a broad and fuzzy term, defined for this study as “the act of computationally simulating human activities and skills in narrowly defined domains, typically the application of machine learning approaches through which machines learn from data and/or their own performance,” (Simon 2024, 11). Even before the rise of foundation models and large language models which captured the public imagination after the release of OpenAI’s ChatGPT in November 2022, an increasing number of publishers had started exploring AI applications in this vein. Publishers had begun using AI in news production, news distribution and for various business tasks, primarily aiming to enhance journalistic work, optimize different operational processes and improve financial performance (Beckett 2019; Diakopoulos 2019).

Many of these developments accelerated in 2023 as a result of a broader shift towards generative AI. These AI systems are characterized by their ability to adapt to a wider range of tasks than more specific machine-learning systems, built upon so-called “foundation models”. They typically use deep learning and are trained on large datasets (House of Lords Communications and Digital Committee 2024) to handle, for example, language-related tasks such as text generation or translation (so-called Large Language Models, LLMs) or other existing modalities (such as images, video, audio) in ways that are realistic and almost equal to human abilities. Well-known AI systems built on such models are OpenAI’s chatbot ChatGPT, Anthropic’s Claude and Meta’s LLaMa.

The increasing interest in AI and broader adoption of AI in the news is driven by various factors, including broader technological advancements (Westlund et al. 2021), as well as a mixture of institutional and sociocultural factors which drive media innovation. As Creech and Nadler (2018) have argued, increasing automation has been a defining feature of the news industry over the past two decades, set against the backdrop of a broader quantification and of the growing influence of algorithmic, data-centric approaches to various domains of life, including the news (Mau 2019). The continuing decline in traditional journalism business models globally (Newman 2023) has also spurred news organisations to view ongoing technological innovation as a central strategy to address current and future challenges. Competitive industry dynamics also play a role (Kueng, 2017) with news organizations closely monitoring their own and other industries for potential strategies and innovations that could provide them with an edge. Finally, general concerns about acting “too late” when it comes to new technologies, and sustained hype around the potential of new technology has partially driven the adoption of AI across the news industry.

Looking at how news organizations have leveraged AI systems, uses abound (Simon, 2024). International news organisations have successfully used the technology to scan vast amounts of data, identifying trending topics and breaking stories, while also increasingly using AI

systems to help produce content. AI also aids in fact-checking and misinformation detection, for example at UK-based fact-checker FullFact. AI also facilitates video and audio processing, making content more searchable and accessible both within archives (for journalists) and on publisher's online properties (for audiences). News production workflows have additionally benefited from AI-assisted editing, translation and transcription services. Finally, some news organizations have used machine-learning approaches to analyze user preferences to deliver tailored content, improving engagement and reader experiences.

Despite these uses, scholarly and industry studies have pointed to ambivalence in the newsroom towards AI in journalism. At a senior level, only 21% of news leaders globally believed that generative AI would fundamentally transform every role in the newsroom in a survey conducted in 2023 (Cherubini and Sharma 2023). At the level of the newsroom, one study found that journalists thought such technologies could both support or undermine journalistic values (Komatsu et al. 2020). While AI may help the efficiency and productivity of journalists, such as in investigating large datasets or in various other tasks (Borchardt et al. 2024), it also surfaces questions about accuracy, ethical concerns around privacy and autonomy (Simon 2022, Becker et al. 2025), and, perhaps most importantly, whether and to what extent such AI systems will replace humans in the newsroom (Marconi 2020; Milosavljević and Vobič, 2021; Munoriyarwa et al. 2023; Noain-Sánchez 2022; Thurman et al. 2017). Discourse on AI has also veered towards debates over how far AI may aid, augment and/or assume tasks that were once the domain of journalists (Boyles and Meisinger 2020; Wu et al. 2019).

While the promise of efficiency and cost-savings of AI technologies such as recommender systems is attractive to media owners – with recent surveys of news media executives show that AI interest and deployment are driven by these factors, with the primary focus on promises of profit and new or improved business models (Newman 2021 and 2023) – they also fuel anxieties about job losses among journalists (Kim and Kim 2018; Moran and Shaikh 2022; Simon 2024). In addition, there are also concerns that a focus on commercial imperatives and clicks may conflict with the core ideals of journalism (Møller 2022b, 2023; Petre 2021).

Algorithmic recommendation systems

Algorithmic recommendation systems – such as Sophi – are at this point deeply embedded at various points of digital ecosystems, from Facebook to YouTube (Schrage, 2020), automating search, selection and organizing tasks (Louridas 2020) and generally curating information for users. The choices made by these systems are usually based on individual and aggregate user behavior to decide the visibility and prominence of content, often reflecting commercial priorities (Beer 2017). Such systems have also become increasingly used in media organizations to curate the news (Bucher 2018; Møller 2022a, 2022b).

Recommender systems in journalism take on what used to be a core gatekeeping function of professional editors in deciding the hierarchy of news. Consequently, they have become a

growing focus in journalism studies given that, as Diakopoulos predicted in 2019, “algorithm design will become the new way of exercising journalism so that the ethical responsibilities of the profession are met in the implementation and expression of journalistic values *via* code,” (Diakopoulos 2019, 28). Algorithmic recommendation systems in news are often encoded with established news values, such as timeliness and relevance, thus at least partially reflecting the normative priorities of news organizations (Møller 2023). As well as selecting news content that is personalized to individual users, such recommender systems have become important in attracting, growing and retaining visitors (Bodó 2019), increasing subscriber and other forms of revenue.

Despite – or in fact because of – their widespread use, concerns have been raised about the breadth and diversity of news selection (Möller et al. 2018), as well as editorial accountability and transparency in regards to audiences (Pasquale 2016). These issues are related to the potential democratic deficit of news recommendation in journalism (Helberger 2019; Möller et al. 2018), especially when such systems are optimized to maximize reach and clicks (Lu, Dumitrache and Graus 2020), or if personalisation means that users potentially miss out on relevant information. Such concerns have led scholars such as Møller to ask, how the industry can “operationalise normative considerations about the social and societal function of journalism in programming language and practices surrounding data processes and human-computer interaction?” (2023, 2).

Gatekeeping in the AI era

To better make sense of AI’s use within the news – and specifically of an AI-driven recommendation system such as Sophi – gatekeeping theory (Shoemaker and Vos 2009) is a useful lens. At its core, gatekeeping theory focuses on the processes by which news items are selected, shaped, and ultimately delivered to audiences. While traditional gatekeeping research emphasises the role of journalists and editors as the primary agents who decide which events, issues, or perspectives merit coverage, the rise of digital technologies has given rise to new actors and processes that “keep the gates” at various stages of the gatekeeping process.

Novel approaches include secondary gatekeeping (Singer 2014), gatwatching (Bruns 2005), algorithmic gatekeeping (Wallace 2018), and post-publication gatekeeping (Hermida 2020). Such work has broadened the scope of the processes, practices and players engaged in gatekeeping at all stages of the news cycle, including after publication. The development of algorithmic platforms, datafication and generative AI have added to the complexity of gatekeeping processes.

The increasing use of algorithmic systems for story placement, prominence and propagation in journalism has also led to questions about the traditional gatekeeping responsibilities of editors in shaping news products. Audience metrics often highlight the tension between what is of public interest and what is in the public interest (Zamith 2018). Other studies point to misgivings that algorithmic recommender systems may lean toward what audiences find

interesting, rather than what journalists consider newsworthy (Møller 2022b). These concerns extend to the impact of platforms on the prevalence and prominence of news in people's media diets. The gatekeeping power of platforms such as Facebook to unilaterally decide how people access news, or not in the case of the news ban in Canada, has increasingly been a focus for scholars, activists and policymakers (for an overview, see Meese & Bannerman 2022).

Within journalism studies, there has been a significant focus on the influence of audience metrics, as well as the use of algorithmic recommender systems that tailor news content for users based on their preferences, behaviours, and other data points in the context of modern gatekeeping (Blanchett Neheli 2018; Bodó 2019; Fürst 2020; Hanusch 2017; Petre 2021; Van den Bogaert, Greetz & Harambam 2024). Scholars widely agree that recommender systems serve as gatekeeping mechanisms by (co-)deciding the delivery, prominence and circulation of news items, based on an algorithmic analysis of user actions and other data.

Users may have no knowledge that such a system is using their data to make gatekeeping decisions or have any idea how it is deciding their choice of news (Bastian et al. 2020). From the perspective of the newsroom, there are tensions between commercial imperatives and editorial priorities (Bodó et al. 2019). As Møller concludes, the rise of algorithmic logics in journalism raises “questions about how the gatekeeping role is conceptualised and negotiated when deciding to adopt these new technologies,” (2022b, 804).

A Case Study: Sophi's choice

We adopt a case study approach to focus on one product, Sophi, developed in-house by a major media organization, *The Globe and Mail*. Case studies are particularly useful in studies of a more exploratory nature, often to generate hypotheses and theories, or to identify causal mechanisms which can later be subjected to further investigation (Gerring, 2009). Sophi was launched by *The Globe and Mail* in 2015. It uses machine learning to automate and optimize most publishing decisions on the outlet's homepage and key landing pages to drive up subscriptions through a dynamic paywall.

Sophi constitutes an example of publishing software developed internally by a news organization, which has been sold commercially to other media outlets. It has also been licensed to *The Washington Post* and integrated into that organization's Arc Publishing software-as-a-service (SaaS) platform. In 2022, Sophi was spun off as a separate company from *The Globe and Mail* and sold in August 2023 to the analytics company Mather Economics, a subsidiary of the European media conglomerate Mediahuis.

The development of Sophi is linked to the institutional context of *The Globe and Mail* as a commercial, subscription-based media entity, operating a metered paywall online. The aim behind the software was to help it grow its subscriber base following the introduction of a metered paywall in 2012. In a 2021 interview, its publisher and CEO Phillip Crawley reflected that the organization only started “to feel happy about the rate of the progress about

six, seven years ago when we brought in some people who really had a superior understanding of what artificial intelligence could do for the subscription business,” (quoted in Turvill 2021, para. 28).

Sophi was pitched as “an artificial intelligence system that helps publishers make vital strategic and tactical decisions to transform their business,” (Sophi n.d.). The newspaper marketed the software as a means to drive subscription and advertising revenue, crediting Sophi with bringing about “a dramatic improvement in the business metrics that matter,” (Mather n.d.). For *The Globe and Mail* Editor-in-Chief, David Walmsley, the technology had the potential to both generate revenue and free up staff for other tasks (Owens 2021).

A key factor in the development of Sophi was the involvement of journalists in its development and training (Digiday 2021). This fostered what Crawley said was “the connection between that technology and the newsroom,” (quoted in Turvill 2021, para. 36), recalling that “what happened over the years was a good relationship was formed between our chief technology officer and our editor-in-chief – both relatively new in their roles,” (quoted in Turvill 2021, para. 38).

By 2020, Sophi was deployed across 99% of *The Globe and Mail*’s digital properties as an AI and machine learning platform for automation, optimization and prediction (Parratt-Fernández & Hermida 2024). It was credited by its Director of Business Development, Sonali Verma, for a 222% increase in registrations and a 51% increase in subscription conversions (IAB Canada 2022). According to Verma, the use of Sophi “has resulted in 10x more subscription revenue than the advertising revenue given up by hard paywalling *The Globe*’s articles and has brought in several million dollars incrementally — without changing how its journalists do their jobs,” (quoted in IAB Canada 2022, para. 13).

Sophi presents an interesting example of an AI tool that has been celebrated by *The Globe and Mail*, industry publications, and professional journalism organizations. Coverage of Sophi and its implementation was overwhelmingly positive, rather than critical about the risks for journalists and news outlets. It has been widely reported in academic and industry publications (such as Scire 2021; Willens 2020) as a particularly innovative and wide-reaching use of automation. Industry publication NiemanLab praised *The Globe and Mail* for “creating both new products and a culture of ‘bottom-up’ innovation,” (Bilton 2018). In the UK, the leading trade publication, the *Press Gazette*, wrote glowingly about “how a robot called Sophi helped Canada’s *Globe and Mail* hit 170,000 digital subscribers,” (Turvill 2021). Sophi has also been recognized by some of the top professional bodies in journalism. Between 2020 and 2021, the system was lauded with six major journalism awards by leading professional associations, including an Online Journalism Award, two INMA Global Media Awards and two WAN-IFRA North American Digital Media Awards. Crucially, Sophi also pre-dates the era of generative AI and is in use at several organisations, thus making it an object that can – to a degree – be studied, in comparison to more nascent experimentation with generative AI tools at many places at the time of writing.

Methodology

For this study, data on the take-up of Sophi in the news industry was collected using BuiltWith, an online profiler tool which analyzes the use of specific software across the internet. Founded in 2007, BuiltWith captures the use of technologies such as Shopify, Hubspot, Zendesk and Salesforce, and lists Google, Meta, Adobe and Amazon among its customers. It analyzes more than 673 million active websites (BuiltWith n.d.) to provide details about the deployment of software used to build web applications. It has been used in a range of academic studies across disciplines to identify the underlying technology used on websites (Dushnitsky and Stroube 2021; Hoffman, Nagle and Zhou 2024; Koning, Hasan and Chatterji 2022; He and Huang 2023; McKelvey 2019).

There are some limitations to using BuiltWith, primarily that “the database was not created with an academic audience in mind. Rather, it is geared towards business practitioners and offers information about technology adoption and usage analytics for internet-based companies,” (Stroube and Dushnitskyv 2023, 1). The free version of BuiltWith allows users to submit a web address and obtain details on the software used by that website. Detailed data requires a paid subscription, which was acquired for this research.

This study only investigated instances where Sophi was identified as a standalone software package used on a news website using BuiltWith’s paid subscription services. As such, BuiltWith may not capture instances where the analytics or automation components of Sophi have been integrated into other software offerings such as Arc Publishing from *The Washington Post* (WashPostPR 2020). In addition, BuiltWith only has access to a website’s public-facing technology, so would not capture software used, for example, in human resources, and the data is organized around websites, rather than companies (Stroube and Dushnitsky 2023). Despite these issues, Stroube and Dushnitsky conclude that “the vast coverage of a tool like BuiltWith is fundamentally a strength,” (2023, 14).

The data for this study was collected over two time periods — in March 2022 and in April 2024 — for one day in each year to provide details about the adoption and abandonment of Sophi. The data was gathered by asking BuiltWith for details of all websites that it detected as using the tool. This was downloaded as an Excel spreadsheet that included a range of variables including domain names, country and parent company. The data sheet also included variables not relevant to this study such as page rank, telephone numbers and social media links. The spreadsheet was cleaned to remove these extraneous details.

The data was then coded by two graduate research assistants based on a codesheet to determine: how many were news sites; whether the sites were local, regional, national or international; the sites’ host country; and the parent company of a website. A sample of 10 results was coded and reviewed by the authors before the full data was coded. The coding was then reviewed by the authors for consistency, drawing on their knowledge of the news industry. Statistical methods for inter-coder reliability were not considered necessary for this study, given the low complexity of variables and the relatively small size of the sample.

We also conducted a search for news coverage in January 2025 using Lexis+ in their category “News,” retrieving all results for the search term “Sophi AND Globe & Mail” from 9062 international news sources in the database. The search returned 406 results, with the earliest entry dated September 21, 2017, and the most recent dated July 1, 2024. After translating non-English articles into English using the neural machine translation service DeepL and removing duplicate entries, 55 unique articles remained. These articles were then deductively coded for two predefined themes: “Acceptance of Sophi in News Organisations” and “Reasons for Using Sophi” in line with the research questions. We then analysed and synthesised key themes that emerged from the coding.

Findings

BuiltWith Data of News Websites Using Sophi

The analysis of the BuiltWith data showed 49 news websites in the 2022 dataset and 55 news websites in the 2024 dataset were using Sophi. In the 2022 dataset, 34 were local news websites, such as the *Kalgoorlie Miner* in Australia, and 12 were regional, such as the *Boston Globe* in the US. Two were national, both of them URLs linking to *The Globe and Mail*, and one was international, OpenlyNews from the Thomson Reuters Foundation.

In comparison, the 2024 dataset showed that 26 were local news websites such as SILive.com (*Staten Island Advance*) in the US and 21 were regional, such as Pennlive in the US. Of the rest, eight were national, such as Global News in Canada, and none were international. For both datasets, the predominant use of Sophi was at the local and regional level, accounting for 46 of 50 sites in 2022 and for 47 of 55 in 2024.

The number of sites captured by BuiltWith using Sophi only tell part of the story as in some cases, several URL links pointed to the same website. For example, *The Globe and Mail* appears twice using two URLs, theglobeandmail.com and globeandmail.com. There were also some URLs like timeperson.shop which linked back to the Michigan news website to Mlive.com. The analysis by parent media group and country helped to mitigate some of the issues of duplicate websites.

A breakdown of the websites using Sophi showed that it was mainly deployed by large media conglomerates running a network of local and regional sites. In 2022, Sophi was detected on the news websites of 12 media groups in seven countries (Table 1). The breakdown indicates that two media groups, Advance in the US and Seven West Media in Australia accounted for 59% (29) of the instances of Sophi. In both cases, the websites were local and regional sites, such as Lehighvalleylive.com from Advance and the *Busselton Dunsborough Times* from Seven West Media.

Media group	Country	Websites
Advance Local Media LLC	US	12
Chicago Tribune Media Group	US	1
Cox Enterprises	US	2
Globe Newspaper Company	US	2
Hearst Media Group	US	5
Naspers	South Africa	4
Organizações Globo Participações	Brazil	1
Thomson Reuters Foundation	UK	1
RCS Media Group (Cairorcs Media)	Italy	1
Seven West Media	Australia	17
Sunbeam Television Corporation	US	1
The Woodbridge Company	Canada	2

Table 1: Media groups using Sophi (2022)

The other two main media groups using Sophi, Hearst in the US and Naspers in South Africa, had also deployed the recommender system to run local and regional sites. The one instance from Italy was for the *Corriere Fiorentino*, a spin-off for Florence from the country's most read newspaper, *Il Corriere della Sera*. The instance from Brazil does not link directly to a news website and appears to have been a testing site for the deployment of Sophi on the homepage of Globo.

The findings for 2024 are similar. Sophi was detected on the news websites of seven media groups in four countries (Table 2). The results show that three media groups, Advance in the US, Seven West Media in Australia and Shaw in Canada accounted for 78% (43) of the instances of Sophi. Similar to the findings for 2022, these were local and regional news sites, such as Syracuse.com from Advance in the US, the *Bunbury Herald* from Seven West Media in Australia and Global Toronto from Shaw in Canada.

Media group	Country	Websites
Advance Local Media LLC	US	12
Alden Global Capital	US	3
Axel Springer	Germany	4
Cox	US	3
Seven West Media	Australia	19
Shaw	Canada	12
The Woodbridge Company	Canada	2

Table 2: Media groups using Sophi (2024)

The four web properties associated with Axel Springer all relate to *Business Insider*, with Sophi detected on four different URLs used to point to the main website. Similarly, the three instances for Cox all point to the *Atlanta Journal Constitution*. And the three instances from Alden are for *The Chicago Tribune* and *The Denver Post*, with the third pointing to what appears to be a staging site.

The findings for 2022 and 2024 indicate a small increase over time in the number of news websites where Sophi was detected by BuiltWith. The main development over the two years is a consolidation of the use of Sophi by big media groups with a significant number of local and regional news sites. The results also point to the use of the tool coalescing around English-language regional and local news sites, owned and operated by Anglo-American media organizations.

News Coverage of Sophi

Our analysis of international press coverage regarding the adoption and acceptance of Sophi within news organisations revealed several points. Sophi was predominantly reported as gaining traction in news organisations due to its perceived ability to help automate content curation, optimise paywalls, and provide better data-driven insights that could assist editors in making more informed decisions. Essentially, it was portrayed as helping to improve the operational efficiency of publishers and increase revenue.

The press coverage also highlighted that Sophi had established notable partnerships with platforms such as WordPress VIP, CUE, and Arc Publishing. These co-operations were positively noted as allowing the system to be seamlessly incorporated into existing workflows at publishers. The system's adaptability was highlighted as an additional key strength, and Sophi's perceived ability to cater to the specific needs of individual news organisations was seen as a particularly appealing attribute.

Importantly, a recurring emphasis in the reporting was that Sophi was a support tool in editorial workflows rather than a replacement for news workers. It was frequently described as a "decision-support analytics tool" that allows editors to retain the ability to curate content, but also giving them the freedom to "override autonomous decisions", and thus maintain overall editorial control. This distinction was frequently praised as enabling journalists to focus on producing high-quality journalism while benefiting from technological support in decision-making processes.

Finally, another aspect of Sophi's that was frequently mentioned in the press coverage we analysed is its origin within the newsroom of *The Globe and Mail* and thus within an established and respected news organisation. The analysed sources pointed out that the system was "built in close collaboration with journalists and editors", which was seen as ensuring that it would meet the practical and strategic needs of media professionals in other

organisations, too. This collaborative development process was frequently highlighted as a factor that enhances Sophi's credibility and relevance to the industry.

However, it needs to be pointed out that much of the reporting on Sophi appears to draw heavily from a limited set of primary sources, such as press releases from *The Globe and Mail* and awards announcements from organisations like WAN-IFRA's Digital Media Awards. This reliance on promotional material suggests that the portrayal of Sophi in the media is strongly skewed towards emphasising its marketed benefits rather than reflecting the actual experiences of news organisations that have implemented the tool. As a result, the coverage may be read as boosterism, and thus provide an incomplete and potentially overly positive picture of Sophi's impact and performance in practice.

Discussion

Our case study of Sophi provides insights into the adoption pattern of one artificial intelligence system. Our analysis demonstrates that Sophi's widespread adoption occurred primarily among local and regional news outlets owned by large media conglomerates, notably Advance in the US, Seven West Media in Australia and Shaw in Canada. This and the additional analysis of news coverage also provides some insight into why AI systems gain acceptance within journalism. The findings suggest that AI systems find acceptance when they address specific operational challenges while preserving a degree of human editorial oversight. The system's development within *The Globe and Mail*, a respected news organization, and the direct involvement of journalists in the training of the system, seems to have helped establish its legitimacy within the industry, reflected in the overwhelming positive media coverage of Sophi.

Looking first at the adoption pattern of Sophi, local and regional news websites dominated both BuiltWith datasets for 2022 (92%) and 2024 (85%). One explanation is that international and larger outlets are also more likely to be able to develop their custom systems, owing to larger budgets and R&D departments, thus making them less in need of external software products. The only national news outlet using Sophi in both 2022 and 2024 was the system's developer, *The Globe and Mail*. There was one additional national outlet in the 2024 dataset — Global News, one of Canada's main TV news networks, which runs a network of regional sites. The only global site that appeared in the 2022 part of the data was Openly News from the Thomson Reuters foundation site, which covered LGBTQ+ news and information from around the world. The site has since been archived.

However, these findings also support the notion that AI adoption in the gatekeeping process within journalism is shaped by a complex interplay between economic pressures and professional values, as found for other computational technologies. While concerns about algorithmic systems potentially undermining editorial autonomy persist, our research suggests that some organizations, particularly at the local and regional level, potentially view the operational benefits of systems like Sophi as outweighing potential drawbacks. Local and

regional news websites using Sophi may be less concerned about handing over gatekeeping control of front pages and websites – contrary to what other research has found. Møller (2023), for example, found limited use of algorithmic recommender systems among Nordic national newspapers due to concerns about their effect on editorial control and their compatibility with journalistic values.

While we cannot go as far as to suggest that these concerns do not apply on the regional or local level – something that is indeed unlikely – the *economic calculus* in face of a more difficult business environment might simply be different. The key issue here that might explain the stronger uptake of Sophi on a regional and local level may not just be the resource constraints faced by such news organizations but also the greater difficulty in running a sustainable business, in comparison to national publications in general or outlets in better market conditions such as in the Nordics. Arguably, systems like Sophi provide a cost-effective, dependable way to perform certain gatekeeping tasks, operating digital properties at scale and helping to maximise user engagement. An algorithmic system that can reliably perform certain gatekeeping tasks – such as optimising story placement and managing paywalls – could indicate that in these contexts Sophi’s economic and organisational benefits are seen as outweighing potential downsides in the form of lower costs to editorial control and journalistic autonomy. This is also mirrored in other uses of AI on the local level, with for example automated content generation considered particularly valuable for local newsrooms with limited resources (Thäsler-Kordonouri and Barling 2023; Wilczek, Haim & Thurman 2024).

At the same time, it might not just be cost-pressures at play. Concerns about the risks of ceding editorial control (Møller 2022b) may also play out differently in the specific institutional contexts of Sophi’s adoption. Local and regional news organisations do not only face different economic challenges; they also have different profiles in terms of exposure to reputational risks. The reputational risk in using such an AI gatekeeping system in local news publications is likely lower – at least in terms of the scale of any possible risk – than letting such a system manage an elite national or international title. From an institutional perspective, their agenda-setting power (or overall gatekeeping power vis-a-vis the public) is also more constrained than that of a national or international publication, providing a greater incentive to automate greater parts of their web properties as setting the agenda through the deliberate placement of story items is of comparably lesser importance (albeit not fully irrelevant). Future research could explore the stratification in approaches to AI across different levels of news organizations to provide insights into how different types of news organizations approach AI adoption and integration.

Our analysis points to the entrenchment of a more nuanced model of gatekeeping in contemporary journalism. Software systems like Sophi can be seen as becoming an influential part of the gatekeeping mechanism that co-shapes audience exposure to specific stories while augmenting the role of existing gatekeepers within news organisations. Sophi’s wide adoption underscores how AI-driven tools within news organisations – not just on the platforms on which content is distributed – are by now part and parcel of modern gatekeeping

processes within the news, reflecting an increasingly complex gatekeeping model (see also Bro and Wallberg, 2014; Hermida 2020; Wallace 2018) involving news organisations, audiences, platforms as well as software systems and increasingly AI.

Sophi's appeal may be its ability to optimize technical aspects of content distribution and monetization, without challenging decisions by human editors on all the news that is fit to publish, to paraphrase Petrie (2021). It augments, rather than replaces, traditional editorial judgment. As an AI system, Sophi therefore promises to maintain the often called for "essential role of humans in journalism, with AI serving as a tool to enhance efficiency and support various tasks but not as a replacement for the unique qualities, judgment, and creativity that human journalists bring to the field," (de-Lima-Santos, Yeung and Dodds 2024, 23). This suggests that future AI systems in journalism may find greater acceptance when they are designed to complement rather than replace existing journalistic practices.

Our research further demonstrates the importance of institutional origins and development processes in the adoption of AI. Sophi has been marketed both by the newspaper and its new owners, Mathers Economics, as a system that "was born in the newsroom of *The Globe and Mail*" and then "developed, tested and trusted by the #1 news brand in Canada," (Mather Economics n.d.). Journalists were directly involved in training it, rather than the AI system learning by scraping and analyzing news content. One of the senior executives behind Sophi, Ariel Burkett, noted that "the content is placed following the rules previously established by the newsroom," (quoted in Parratt-Fernández and Hermida 2024, 178).

In this sense, Sophi is imbued with "one of the most fundamental truths in journalism, namely: the professional journalist is the one who determines what publics see, hear and read about the world" (Deuze 2005, 451). The involvement of journalists in training Sophi aligns with the call by Komatsu et al. that AI systems in journalism "are designed in synergy with user values, based on a deep appreciation of them", (2020, 11). Sophi's creation within an elite national news organization, with direct input from journalists, appears to have enhanced its credibility and adoption potential compared to systems developed by external technology companies, arguably mitigating concerns about ceding editorial control and the potential erosion of trust.

Limitations

This case study only considered the development and adoption of one algorithmic recommendation system, so findings are limited to this particular piece of technology in specific contexts. While we attempted to build on the data through qualitative interviews with editors, journalists and technologists involved in the development of Sophi at *The Globe and Mail*, efforts made over several years were rebuffed and we were unable to gain access to key individuals. Future research, nevertheless, should try to draw on interview data to enhance and expand upon these findings, focusing specifically on the organisations identified here to assess Sophi's adoption and effects in greater detail.

While not a form of generative AI system per se, Sophi's story still provides an interesting lesson as it points to how newer forms of generative AI may be accepted by news workers so long as they are bound with established journalistic norms and expectations. This, incidentally, also seems to be reflected not just in how journalists see the technology, but in how audiences think about it, too. Early comparative research on audience attitudes to AI in news shows a relatively high level of comfort with back-end tasks being done by AI with some human oversight. A tool such as Sophi and its future brethren arguably belongs here. However there is discomfort with AI being used for tasks such as writing articles or creating photographs for news purposes (Fletcher and Nielsen, 2024).

Conclusion

This case study suggests that successful AI integration requires careful attention to three key factors. These are; *organisational context*, with different approaches emerging at local/regional versus national/international levels; *scope of automation*, with AI systems finding greater acceptance when augmenting rather than replacing core journalistic functions; and *institutional origin*, with systems developed within journalism potentially gaining greater acceptance.

Integrating AI technologies like Sophi into journalism reflects a normative vision that seeks to reconcile two imperatives that often do not sit easily with each other. On the one hand, there is the economic survival of news organisations, on the other the preservation of journalistic integrity and autonomy. First, AI systems are framed as a response to the economic precarity of journalism, which has intensified amid shrinking resources and shifting revenue models. By automating labour-intensive tasks, Sophi exemplifies a Weberian rationalization process (Simon, 2024), prioritising efficiency and quantifiable outcomes to sustain journalism as a viable enterprise. As such, such systems align with what sociologist Steffen Mau has called the “wholesale quantification of the social sphere” (Mau, 2019, 2), which also applies in the news as news organisations increasingly adopt computational tools to optimise workflows, including around audience engagement. This metric-driven logic (Petre, 2021) has already and continues to reconfigure journalistic labour.

Second, such AI systems are also proposed as ways to mitigate fears of eroding journalistic autonomy and the weakening of journalistic norms by positioning and promoting these forms of AI as tools developed within the normative framework of journalism itself. Sophi's design—led by *The Globe and Mail*'s in-house data scientists in collaboration with journalists—emphasizes alignment with editorial values, framing automation not as an external threat but as an extension of human expertise. This development, or so seems to be the argument, preserved journalistic norms such as accuracy, objectiveness, and newsworthiness. Such efforts mirror newer calls for a “responsible” AI paradigm, where journalistic standards guide development and deployment to avoid biased or unreliable outputs or results.

Critical questions remain. While news organisations like *The Globe and Mail* report operational efficiencies and audience satisfaction, the empowerment of journalists using these

systems is less clear. Research on algorithmic decision-making warns that automation can diminish workers' agency, eroding their sense of self-efficacy and ethical responsibility as tasks are delegated to opaque systems (see, e.g. Koeszegi, 2024). Similarly, audiences' perceptions of AI's role in news production remain underexplored.

The story of Sophi highlights the need for a more granular investigation into how different types of news organizations approach AI adoption with particular attention to how news outlets balance economic imperatives with journalistic values when adopting AI technologies. Future research should examine whether the conditions for AI acceptance we identified with Sophi – namely its development within a respected news organization, direct involvement of journalists in training, and positioning as a decision-support rather than replacement tool – hold for other AI systems, especially as more sophisticated generative AI technologies emerge.

Disclosure statement

The authors report there are no competing interests to declare.

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