Journalism Studies

ISSN: 1461-670X (Print) 1469-9699 (Online) Journal homepage: www.tandfonline.com/journals/rjos20

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To cite this article: Tomás Dodds, Astrid Vandendaele, Felix M. Simon, Natali Helberger, Valeria Resendez & Wang Ngai Yeung (2025) Knowledge Silos as a Barrier to Responsible AI Practices in Journalism? Exploratory Evidence from Four Dutch News Organisations, Journalism Studies, 26:6, 740-758, DOI: 10.1080/1461670X.2025.2463589

To link to this article: https://doi.org/10.1080/1461670X.2025.2463589

JOURNALISM STUDIES
2025, VOL. 26, NO. 6, 740–758
https://doi.org/10.1080/1461670X.2025.2463589

Routledge
Taylor & Francis Group

Knowledge Silos as a Barrier to Responsible AI Practices in Journalism? Exploratory Evidence from Four Dutch News Organisations

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ABSTRACT

The effective adoption of responsible AI practices in journalism requires a concerted effort to bridge different perspectives, including technological, editorial, and managerial. Among the many challenges that could impact information sharing around responsible AI inside news organisations are knowledge silos, where information is isolated within one part of the organisation and not easily shared with others. This study aims to study how knowledge silos might affect the adoption of responsible AI practices in journalism through a cross-case study of four Dutch media outlets. We examine individual and organisational barriers to AI knowledge sharing and the extent to which knowledge silos could impede the operationalisation of responsible AI initiatives inside these newsrooms. To address this question, we conducted 14 semi-structured interviews with a strategic sample of editors, managers, and journalists at *de Telegraaf*, *de Volkskrant*, NOS, and RTL Nederland. The interviews aimed to uncover insights into the existence of knowledge silos, their effects on responsible AI practice adoption, and the organisational practices influencing these dynamics. Our results emphasise the importance of creating better structures for sharing information on AI across all layers of news organisations and highlight the need for research on knowledge silos as an impediment to responsible AI production.

ARTICLE HISTORY
Received 26 April 2024
Accepted 2 February 2025

KEYWORDS
Knowledge silos; responsible AI; journalism; artificial intelligence; information sharing; automated journalism

Introduction

As the social impact of artificial intelligence (AI) is growing, so do concerns around safety, fairness, responsibility, and the ethics related to using these technologies (Helberger et al. 2022; Moran and Shaikh 2022). As Lu et al. argue, "compared to traditional software

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Supplemental data for this article can be accessed online at https://doi.org/10.1080/1461670X.2025.2463589.

systems, AI systems involve a higher degree of uncertainty and more ethical risk due to their dynamic, autonomous and opaque decision-making and historical-data-dependent behaviours" (2023, 1). As AI systems become more integrated into the workflows of newsrooms, the mechanics of editorial decision-making and content curation also risk becoming less transparent (Carabantes 2023). To address these challenges, government, academia, industry, and civil society stakeholders are developing best practices and governance frameworks to ensure AI's responsible development and deployment (Becker, Simon, and Crum 2023; Helberger and Diakopoulos 2022).

While these conversations are taking place, recent studies have shown that news workers are struggling with both technical and cultural challenges around the integration of AI in newsrooms (Gutierrez Lopez et al. 2023). On the one hand, as Simon (2022) argues, financial limitations and technical difficulties make it challenging for news organisations to develop AI-based technologies without relying on US-based platform companies and other external vendors who control much of the current AI infrastructure. On the other hand, Beckett and Yaseen (2023) show how media managers are not only struggling with technical issues that stem from a lack of resources. Instead, as they put it, "mitigating AI integration challenges […] requires bridging knowledge gaps that exist among various teams in the newsrooms, a challenge that is more consistent across the board" (33). This lack of information sharing, knowledge gaps, and different internal priorities can not only make it difficult to integrate AI in the first place—but it could also become an obstacle to the responsible implementation of AI systems.

It is in this context that the expanding field of responsible AI in journalism emphasises the necessity of ethical and accountable AI systems development, deployment, and usage inside newsrooms (Trattner et al. 2022). Rather than exclusively focusing on the faults and foibles of how media workers use these systems, the concept of responsible AI demands that AI-based systems and the companies that develop and deploy them (see Kak, Myers West, and Whittaker 2023) adhere to societal values and human rights and prevent detrimental outcomes (Dignum 2019). Particularly for journalists and news organisations, for whom AI brings forth both unique challenges and opportunities (Fridman, Krøvel, and Palumbo 2023), there is a pressing demand for further exploration into the creation of ethical media technology guardrails. As the Council of Europe argues in the publication of a recent set of guidelines for newsrooms, "news organisations should have procedures in place to recognise, and where feasible, assess and mitigate risks that result from the way journalistic AI systems are implemented" (2023, 13). This approach aims to optimise the advantages of AI for news organisations and the public at large (e.g., automation of repetitive, routinised tasks, assistance for in-depth reporting) while preventing adverse impacts (e.g., bias in reporting and undermining public trust in journalism) (Aissani et al. 2023; Helberger and Diakopoulos 2022). As Shin et al. (2022, 900) further put it, "regulating for responsible AI also means regulating for the responsible use, implementation, oversight, control, and contestation of AI systems."

However, the effective contestation and oversight of AI systems in journalism demand a nuanced understanding of both the operational dynamics within news organisations and the areas where journalists may lack the required knowledge to challenge or mitigate the influence of "unruly AI." Yet, it is essential to acknowledge that most newsrooms are likely to adopt off-the-shelf AI products from dominant US-based platform companies, and they will have limited capacity to modify or influence these technologies directly (Dodds et al. 2023), highlighting a power imbalance between newsrooms and platform

companies (Simon 2022). This reality underscores the necessity of not just governing journalists' interactions with AI but also reforming the broader institutional practices within news organisations with respect to AI. Without such reforms, efforts to foster responsible AI risk are being reduced to mere window dressing, failing to address the more profound systemic challenges AI systems bring forth in journalism.

In response to these challenges, various news organisations have initiated steps to address the ethical implications of AI (Becker, Simon, and Crum 2023). *Wired*, for instance, was one of the first to establish ground rules for using generative AI, emphasising ethical usage and transparency. The magazine decided against publishing stories with text generated or edited by AI, except when AI's involvement is central to the story (Tobitt 2023). As Cools and Diakopoulos (2023) put it, some of these guidelines may "help map, measure, and manage risks, offering ways to efficiently develop policies for mitigating risks that are identified." This proactive approach reflects a broader awareness among media organisations about the ethical ramifications of AI in journalism.

Against this backdrop of technological awareness, financial limitations, and a lack of information-sharing among different teams inside newsrooms, our research aims to explore the following question: *How do knowledge silos affect the adoption of responsible AI practices in journalism?* We argue that this question is crucial because understanding current applications and journalistic information-sharing practices about AI systems is essential to developing effective strategies and policies that ensure the beneficial use of AI in journalism without compromising ethical standards and journalistic integrity. Drawing from 14 interviews with a strategic sample of journalists in the Netherlands, this paper examines current AI applications and debates inside four major Dutch newsrooms. We specifically chose these given the Netherlands' reputation as an early adopter of AI systems and having an overall progressive stance on digital innovations (Vergeer 2020). While our findings from the Dutch context are not universally generalisable and exploratory, this case study offers valuable insights, especially in terms of ethical AI usage and the potential for scaling responsible practices within the global journalistic community, and provides fertile ground for further research.

Adopting Responsible AI Practices in Journalism

Defining AI and AI Use in News Organisations

Artificial intelligence is difficult to define, but in practice, it typically takes the form of "narrow" computer systems that focus on specific tasks and problems usually associated with human abilities (Broussard 2019; Mitchell 2019). AI systems employ a variety of techniques—often from the machine learning branch in computer science and statistics—varying in complexity, autonomy, and abstraction. Within the news industry, AI "serves as an umbrella term to encompass a range of technologies and is commonly understood by many as the computational simulation of human activities and skills in specific domains" (Simon and Isaza-Ibarra 2023). As such, artificial intelligence is increasingly shaping journalistic work. A growing number of journalists and news workers nowadays use AI to automate "routine" tasks (such as translation or transcription of content) or aid in other news tasks, for example, investigative work (Fridman, Krøvel, and Palumbo 2023). News organisations also employ AI on the distribution side, for example, to optimise paywalls and recommend content to users (Hansen et al. 2023; Simon 2023).

However, the increasing adoption of AI in the news industry is not a smooth process and has been going hand in hand with a range of concerns. Many journalists have expressed worries about AI potentially taking over their jobs, also referred to by some as the "robocalypse". Additionally, adopting AI has brought existing tensions and power dynamics in news organisations to the fore (Simon 2024). As the societal and journalistic impact of AI is growing, so do concerns around the safety, fairness, responsibility, power, and ethics of artificial intelligence systems and applications. Dörr and Hollnbuchner (2017), for example, observe a significant shift in the locus of responsibility within news production, extending beyond the individual journalist to various stakeholders, including algorithms, service providers, and data collectors. Others have noted tensions between the use of AI and journalistic ideals, including public service, autonomy, and objectivity (Milosavljević and Vobič 2021), concerns regarding the growing dependency on technology companies and the effects on (editorial) autonomy due to AI (Dodds et al. 2023; Simon 2022), and tensions between economic interests and commitments to journalistic integrity and quality. Wiley (2023), for example, has examined this from a legal perspective, noting that algorithmic journalism often has to navigate "fuzzy" situations, with legal concerns arising in all parts of news production and distribution, especially around the use of data, defamation liability, and individual privacy.

Responsible AI

Efforts to address and mitigate these challenges regarding the use of AI are often grouped under the label "Responsible AI." While it lacks a clear definition, the term is often used to describe specific organisational choices and practices around AI and refer to the emerging area of AI governance, which focuses on the ethical and accountable development, deployment, and use of artificial intelligence systems. It emphasises the need for AI technologies to align with societal and professional values, respect human rights, and avoid harmful consequences, and is pursued in parallel by governments, academia, industry, civil society, and, increasingly, news organisations. Many of these are working on establishing best practices and regulatory frameworks to promote or enforce the responsible development and deployment of AI technologies, as well as considering the broader implications and potential risks associated with AI applications and taking the steps necessary to mitigate them. The unifying trend among many of these initiatives is a focus on accountability, responsibility, and transparency (ART) as essential facets of ethical AI systems (Krausova and Moravec 2022), with further emphasis on the ability to explain outcomes, human responsibility in design and deployment, and transparency in technical solutions, data, and involved stakeholders.

While the concept of "Responsible AI" is fairly novel in journalism studies, there is a thematic alignment with the concept in parts of the literature, with scholars discussing, among other things, issues such as algorithmic bias, data privacy, transparency, impact on employment, and the potential for AI-generated content to be indistinguishable from human-written content, in the context of algorithmic journalism and AI. Three distinct categories that repeatedly feature in the wider literature on digitalisation and automation in the news focus on (1) upholding professional values inherent to journalistic practices, such as objectivity and accuracy, (2) adhering to legal frameworks governing technological applications (and AI) in journalism and (3) considering democratic obligations associated with journalism and the societal impact of AI in news.

Previously mainly a niche endeavour, Responsible AI has grown in importance following the proliferation of generative AI and the resulting wide-scale bottom-up adoption of AI. With user-friendly interfaces like those of OpenAI's ChatGPT or Google's Gemini, powerful AI technology has become accessible to every journalist. Although emerging ethical guidelines have started to outline the principles of responsible AI use, they often remain (too) abstract and lack specific implementation strategies. This also highlights the importance of understanding how journalists in the field perceive and practice responsible AI.

Information Sharing and Knowledge Silos

Journalism's primary purpose is to impart accurate and relevant information and "to provide people with the information they need to be free and self-governing" (Shapiro 2010). In this context, journalists have long come together as Communities of Practice (CoPs) to learn from and collaborate with one another (Dodds et al. 2024; Wenger 1998) both intra- and extra-organisationally. CoPs are based on mutual engagement and unite actors of different abilities, sharing "a repertoire of communal resources (routines, sensibilities, artefacts, vocabulary, styles, etc.) that members have developed over time" (Wenger 1998, 98). Sharing knowledge within journalistic CoPs ideally ensures that reporters stay well-informed and up-to-date and can produce comprehensive and diverse news stories, thus contributing to maintaining high journalistic standards and a well-informed society.

Specialisations naturally develop in organisations as a response to increasing complexity, enabling different actors to focus on specific tasks and areas of expertise. For instance, network scientists and journalists have distinct roles that require different skill sets and knowledge bases. However, the problem arises when there is no infrastructure to facilitate the exchange of critical information between these specialised units. This lack of communication and coordination leads to knowledge silos, where specialised teams operate in isolation, unaware of or unable to integrate the knowledge and insights from other units.

Journalists rarely operate independently. Instead, they are embedded in formal and informal structures (Clement and Puranam 2017), with the social context of a news organisation (Singer 2004) shaping their work. Research into knowledge management has demonstrated that, among other things, such organisational settings can both enable and constrain knowledge sharing—not just between journalists but also between the newsrooms and other parts of the organisation. Such "knowledge silos"—"individuals or higher-level collectives that serve as heterogeneously distributed repositories of knowledge" (Phelps, Heidl, and Wadhwa 2012, 1117) arise in many organisations, in some cases on purpose. Especially in large organisations, operating in silos and compartmentalisation (for example, departments) can lead to greater efficiency or make functioning possible in the first place (de Waal et al. 2019)

Yet, despite the lack of empirical studies on organisational and knowledge silos (Bento, Tagliabue, and Lorenzo 2020), the general view, including in journalism studies, is that knowledge silos are often an obstacle to innovation. For example, a "silo mentality"—the presence of barriers to communication and exchange (Bento, Tagliabue, and Lorenzo 2020)—in legacy structures or organisational designs can discourage

collaboration (de Waal et al. 2019). Effectively, knowledge silos can manifest themselves in four different forms within organisations: As (1) individual silos, where certain individuals possess valuable knowledge or expertise but do not share it, (2) as departmental silos, where different departments or teams within an organisation hoard information and fail to communicate effectively with each other, (3) as technological silos where information is stored in different software systems, databases, or file formats that are not easily accessible or integrated across the organisation, making it more difficult for employees to access or share relevant information across different systems and limiting the interoperability of the newsroom, and (4) cultural silos where organisational culture (in addition to organisational structure) discourages collaboration, information sharing and learning.

Furthermore, knowledge silos may also manifest in various structural dimensions within (news) organisations, including vertical, horizontal, internal, and external forms. Vertical silos refer to communication barriers that emerge along the organisational hierarchy, impeding the flow of information and interaction between upper management and lower-tier employees. Conversely, horizontal silos describe the knowledge disconnects that occur among peers who, despite operating at the same hierarchical level, possess divergent specialities, thus hampering interdisciplinary understanding and cooperation (see Finnegan and Willcocks 2006). At the same time, internal silos are recognised within the confines of a singular organisation, where they inhibit collaboration and the sharing of information across different divisions or teams. External silos, in contrast, arise between organisations and their overarching parent entity, restricting the transfer of knowledge and strategic congruence between the two (see Hullova, Laczko, and Frishammar 2019).

The effects can be problematic. Knowledge silos are often blamed for hindering innovation, decision-making, and overall organisational performance. They are also seen as impeding the flow of information, limiting the cross-pollination of ideas within the organisation, and preventing the organisation from capitalising on the collective intelligence of its staff. Within a journalism context, this has been shown to matter, for example, in the context of how editorial decision-making is automated. In this context, differing levels of knowledge and power can be unequally distributed within organisations (van Drunen and Fechner 2022) and are often limited to particular teams in newsrooms (Milosavljević and Vobič 2021). In newsrooms, such team compartmentalisation may lead to a lack of cross-team collaboration, reduced efficiency in information sharing, and slower response times to emerging stories. For instance, if the editorial team responsible for producing news articles is unaware of insights gathered by the investigative team working on the same topic, this can result in incomplete or fragmented reporting, potentially affecting the depth and accuracy of the coverage. Additionally, in digital media organisations, if the social media team is not aligned with the content creators, there might be missed opportunities for timely and effective dissemination of news, thereby reducing the organisation's overall impact and reach.

To overcome knowledge silos, it is generally suggested that organisations should foster a culture of collaboration, implement effective knowledge management systems, encourage information sharing, and promote cross-functional communication and learning, with some studies indicating that there is a positive relationship between the application of such a "silo-busting" approach and the extent of learning and knowledge

exchange, the quality and outcomes of collaboration and the overall strength of the organisation (de Waal et al. 2019).

Methods

We theorise that knowledge silos and the lack of information sharing also affect the adoption and implementation of responsible AI practices. Consequently, this study aims to explore if, and if so, how different dimensions of knowledge silos (i.e., individual, departmental, technological, and cultural) might affect the adoption of responsible AI practices in journalism. We focus on four major media outlets in the Netherlands to generate the first answers to this question, which can, in turn, provide the foundation for more general and representative research.

The Netherlands is an excellent case study for examining the adoption of AI in newsrooms due to its proactive stance and substantial investment in AI across various sectors, including media and journalism. The country's government and private sector have collaborated actively through initiatives like the Netherlands AI Coalition, highlighting a national commitment to responsible and innovative AI development (Vergeer 2020). The Dutch approach to AI, which focuses on ethical, legal, and societal aspects (ELSA), underpins a framework conducive to studying AI's impact on journalism and newsmaking. Furthermore, the Dutch media landscape's participation in global AI initiatives and adherence to stringent AI regulations provides a unique context for us to explore AI's role in journalism. While other countries with similar AI advancements could also be interesting to study, we selected the Netherlands because its specific regulatory and ethical framework offers valuable insights into the dynamics of responsible AI adoption in journalism.

The four news organisations chosen for this study are *de Telegraaf*, *de Volkskrant*, the Nederlandse Omroep Stichting (NOS), and RTL Nederland. These organisations were strategically selected due to their significant presence in the Dutch media landscape and their existing engagement with AI technologies in journalism. They also represent a broad spectrum of the Dutch media landscape, encompassing print, digital, and broadcast media, and are pivotal in understanding the role of knowledge silos in AI adoption in newsrooms. For instance, commercial broadcaster RTL Nederland, alongside NPO, the Dutch public broadcaster, has publicly pledged to adhere to ethical guidelines when using AI systems for news production (Priestley 2021). Mediahuis, the Belgian media company that owns *de Telegraaf,* has also started experimenting with AI tools like ChatGPT for tasks such as writing marketing messages and job descriptions, illustrating a pragmatic approach to AI utilisation inside news media (Majid 2023).

We conducted 14 semi-structured interviews with a strategic sample of editors, managers, and journalists across the above-mentioned newsrooms. The respondents were approached via LinkedIn, and their selection was based on the criterion that they use AI in their daily practice, as identified through desk research. Relying on snowball sampling (Parker, Scott, and Geddes 2019), agreeable participants were then asked to recommend others who fit the research criteria and who potentially might be willing to participate, and so on.

We ended up conducting an equal number of interviews inside *de Telegraaf* (n = 4), *de Volkskrant* (n = 4), and NOS (n = 4). Due to availability, we conducted fewer interviews at

RTL (n = 2). The interviews had an average duration of one hour. They were conducted using a semi-structured interview instrument, which we developed based on the research question and the existing literature (cf. Appendix 1). We chose this approach for its flexibility and depth, allowing for a comprehensive exploration of the participants' experiences and attitudes toward AI in journalism. The semi-structured format enabled the interviewees to express their views freely while ensuring that all relevant topics were covered (Gubrium and Holstein 2002; Magaldi and Berler 2020).

As strict privacy was a condition for access to each newsroom, we decided to anonymise all our participants. In the results, we refer to "editors" without making a distinction between, e.g., "Editor-in-Chief" or "Online Editor." We provide more information about the participants in the text when the quotes cannot be used to identify a particular individual. Research ethics approval was granted by [ANONYMISED].

The interviews were conducted in Dutch and translated into English for coding. Drawing on the principles outlined by Skjott Linneberg and Korsgaard (2019), this study involved a three-tiered coding process, starting with open coding to identify emerging concepts and themes from the data. This was followed by focused coding, which aimed at detecting patterns and trends within these initial findings. Finally, axial coding was employed to establish consistency and associations between the identified categories. This approach facilitated a comprehensive understanding of the studied phenomena, ensuring a thorough and nuanced qualitative data analysis.

Coding was carried out by one team member, after which a second team member checked the initial coding. Where necessary, labels were refined and adjusted. Regular communication, code reviews, and adherence to a shared coding style guide were standard practice during the study. This collaborative coding effort contributed towards the consistency and agreement among team members in interpreting and implementing coding standards, ensuring high inter-coder reliability.

Results

Our results suggest that knowledge silos regarding the responsible use of AI in newsrooms manifested themselves in several forms in the organisations we looked at. We identified four different types of knowledge silos (vertical, horizontal, external, and internal) playing a role across three different areas of the newsrooms related to the way news workers use and understand AI: professional limitations, infrastructural limitations, and ethical guardrails. We show how these different types of silos seem to manifest in various areas of these newsrooms and appear to condition the way journalists approach Responsible AI practices in journalism, but also how they impact collaborative relationships with colleagues across their news organisations.

Knowledge Silos and Professional Limitations

Knowledge silos present multidimensional challenges in professional environments, as revealed in our interviews with newsroom personnel. Editors frequently noted knowledge gaps between themselves and colleagues with technical expertise. We categorise these gaps as "horizontal silos," representing disparities across disciplines at the same

organisational level, and "vertical silos," referring to differences in understanding between hierarchical levels. These silos hinder the effective integration of technology and impede collaboration across expertise areas within news organisations.

An editor from *de Telegraaf* illustrated the concept of horizontal silos when discussing the use of machine learning and natural language processing tools in their work: "Oh, I find it very difficult to explain. [My colleague, an IT technician] probably knows more about that. He knows about numbers." Interestingly, this statement highlights not only a knowledge gap between editorial and technical staff but also a lack of confidence in engaging with machine learning - despite its active use within the newsroom. The association of technical expertise with "numbers" underscores a stereotype that may further entrench these silos. A similar dynamic was observed during interviews with an RTL editor and a NOS social media editor. The editor at RTL claimed, "I am sitting here, in my management office, thinking about what the editors should do about AI, while my journalists, of course, already have a much better understanding of these tools from using them."

Meanwhile, the social media editor from NOS acknowledged a gap in AI knowledge, saying, "No, for example, I wouldn't know exactly how the technology behind it works. But we have tech editors for that, who can explain that nicely." These findings point to a possible need to pay attention to how horizontal silos could be impacting production processes inside newsrooms in a way that makes the development of new technologies opaque to certain sections of the newsroom.

This example could also suggest the need to bridge the gap between technical and non-technical staff to foster a more collaborative and informed workplace environment. This is important because we also find that terminology could become a barrier for internal vertical silos. For example, when we asked an editor from RTL to name some of the AI technologies that they are currently using, he responded:

> "I don't know if what I have in my head right now falls under either of those [AI technologies]. I'm just not good at the terminology yet … I will name one [AI technology], and then you have to tell me whether it fits."

As this quote shows, editors might be aware of new technologies being adopted in newsrooms. Yet, they typically leave determining whether these technologies qualify as AI to colleagues they perceive to have greater technical expertise.

Knowledge gaps also emerge between departments within the same organisation. For instance, a respondent from *de Volkskrant* described a distinct separation between teams managing private data and the editorial staff, revealing limited transparency and understanding of data privacy practices and AI tool implementation across departments:

> "When it comes to handling that private data, yes, I never use users' private data. That's good, right? There is a separation between the advertising and sales department and the editors. I don't think we actually do [collect users' private data] as editors ourselves. So, if and when that happens, it happens in another department."

Externally, organisations are collectively responsible for complying with legal frameworks like the General Data Protection Regulation (GDPR), which governs data use. However, our interviews revealed an internal culture of deflecting responsibility, with individuals often assuming that compliance is the concern of other departments. This "not our concern"

mindset highlights fragmented accountability within newsrooms, impeding not only the flow of knowledge but also the coherent application of regulatory compliance.

The professional backgrounds required to deal with AI innovations in the newsrooms are sometimes so different that they often require professionals from different departments to unite. For example, *de Volkskrant*'s attempt to develop LOOKER, an in-house web data tracker, showcases how different teams, like News Analytics and Directional Analytics, need to come together to collaborate. As one of the journalists involved in the project put it:

> "LOOKER. There's a whole team behind it. That is really a huge number of people. There is a News Analytics Team, which really focuses on the newsroom and news analysis. There's a Directional Analytics Team that focuses on strategic numbers and things like that. They made that themselves, but it is based on existing data systems, such as Google Analytics in the end."

Furthermore, we also found knowledge silos between levels of positions and, thus, a vertical one. Editors often have a broader awareness of AI adoption trends but limited knowledge of specific tools used in the newsroom, whereas journalists tend to be more familiar with hands-on applications. For example, a tech-savvy journalist highlighted this disparity in knowledge, sharing that he navigates the dark web to access unconventional datasets for his reporting. He noted: "Well, to be honest, I think most of the editors have no idea what AI is, what it can do, and what we should be thinking about it." This observation underscores a vertical silo, with knowledge gaps between editorial decision-makers and operational staff. On some occasions, editors even acknowledge their limitations on knowledge.

Finally, the disconnect between parent and subsidiary companies, referred to as an external vertical silo in our study, further complicates the situation. An example from *de Volkskrant* illustrates this gap, where the parent company DPG is actively engaged in AI adoption. Yet, such initiatives are not as prevalent within the editorial office of the subsidiary. When a journalist from *de Volkskrant* was asked about plans for AI adoption in the newsroom, she mentioned:

> "Well, not in the editorial office; I think at DPG, undoubtedly it is. They are very busy working on that. But here at the editors' offices—no. People think AI impacts much of what we do, but no."

Up to this point, our findings seem to indicate that knowledge silos hinder the responsible implementation of AI in newsrooms by limiting AI literacy and learning opportunities. However, some interviewees highlighted the potential of cross-departmental knowledge-sharing practices to dismantle these barriers, and break knowledge silos. When asked about their knowledge of AI, a journalist at NOS admitted that although they "wouldn't know exactly how the technology behind AI tools work," the more technical editors could "explain it very well." However, we observe how a culture of sharing tools, techniques, and skills is emerging within the tech journalism community, promoting a more innovative and collaborative approach to journalism.

These results leave the door open to argue that addressing these various types of knowledge silos require concerted efforts to foster open communication, ongoing training and continuous education, and the formation of cross-functional teams. By doing so, news organisations can transform technology from a divisive factor into a unifying force, enhancing both journalistic processes and outputs.

Breaking Silos

The integration and effective utilisation of AI in the newsroom is an evolving challenge that requires a robust organisational infrastructure. Through our interviews with industry professionals, we identified three critical elements that significantly impact the adoption and perception of responsible AI in journalism: in-house training, tool testing, and team collaboration. These elements are not just operational considerations; they form the foundation for fostering an environment in which AI can be used ethically and effectively to enhance journalistic practices (Council of Europe 2023).

In-House Training

Firstly, in-house training emerges as a key driver in equipping newsrooms for the challenges and opportunities presented by AI. Our interviews revealed that such training programmes are instrumental in building a more informed and capable workforce. For instance, a journalist from *de Volkskrant* shared that their parent company, DPG, offers courses on AI applications in journalism:

> "Within DPG, there is a kind of teaching program for journalists. And that's where people who know more about navigating the web, for example, come and teach us. Recently, there was also something from the VVOJ [Vereniging van Onderzoeksjournalisten, Association of Investigative Journalism] and something specifically about AI and how you can use it in music research. We recently made a production in which we trained an algorithm ourselves."

This education initiative empowers journalists, providing them with a greater sense of agency and competence in leveraging AI for innovative projects. By reducing reliance on external expertise, these programmes help to break down knowledge silos, fostering a more cohesive and technologically proficient newsroom.

Tool Testing

Secondly, tool testing appears to be another important aspect that newsrooms must consider. It involves ensuring AI-based applications meet journalistic standards of responsibility and integrity. An editor from *de Telegraaf* emphasised that the adoption of automated tools is not merely a technical decision but a journalistic one, reflecting on the ethical implications of using AI to condense articles:

> "The question of automated journalism is not a question of fairness; it is a question of journalistic responsibility. For example, if we have a web article that is 700 words long, but we only have space for 500 words for the paper … If there is a tool that automatically makes it shorter, we might experiment with it if there is a good tool for this. However, that test should focus on whether it is acceptable and responsible from a journalistic point of view. And if that tool is so good that it is journalistically acceptable and justifiable, then we can use it. And is that unfair to journalists? No, that's not unfair. It helps them. Then, the reporter, who has been somewhere all morning to make a story, does not have to cut back that story at eight o'clock. So, it also makes the journalist's life a bit more pleasant."

This approach ensures that tools are rigorously evaluated for their ethical implications and journalistic value before implementation. Furthermore, such evaluations require substantial AI literacy, which, in turn, fosters collaboration between editorial and technical teams. This collaboration plays a crucial role in dismantling knowledge silos and encouraging a multidisciplinary approach to AI adoption.

Team Collaboration and Experimentation

Thirdly, we found that the composition of teams and the allocation of resources for experimentation within news organisations can play a crucial role in the swift and effective adoption of emerging technologies such as AI. An editor from RTL Nieuws noted the rapid pace of development of tools like ChatGPT, stressing the need for dedicated time and resources to explore these advancements thoroughly: "[ChatGPT] is a development that is going so fast that we need to give ourselves time to dig into this, so we don't get caught off guard with how the market is already handling it." Similarly, *de Telegraaf*'s approach to forming specialised teams for evaluating AI tools exemplifies how structured collaboration between editorial and product departments can lead to more strategic technology adoption. According to one of the editors at *de Telegraaf*:

> "These conversations take place between the editorial team and our product department, which possesses the most insightful understanding of the tools available to us. Through these discussions, we organise demonstrations with various providers to assess which tools best suit our needs and decide how to implement them effectively. This process ensures that we have thoroughly deliberated on what actions to take and what to avoid, thereby making informed decisions."

Such collaborative structures ensure that AI tools are not only suited to the newsroom's needs but also integrated in a thoughtful, informed manner. Clearly, the successful integration of AI in journalism is not solely dependent on the technology itself but also on the infrastructural support provided by the organisation. In-house training, tool testing, and team composition are not just administrative or operational tasks; they are essential strategies to mitigate knowledge silos and facilitate responsible AI implementation.

Guidelines and Legal Frameworks

The implementation of responsible AI in newsrooms requires the development of clear journalistic guidelines and legal frameworks to ensure its responsible use. Despite this need, our findings suggest that responsibility for AI remains fragmented within organisations, perpetuating knowledge silos. Regulatory frameworks aimed at privacy and transparency, such as the GDPR, are infrequently mentioned during the interviews, highlighting a gap in integrating these critical measures into daily journalistic practice.

We did, however, encounter positive exceptions during our interviews; some interviewees demonstrated a commitment to transparency and compliance. Consider the experience of an editor at *de Volkskrant* who expressed unease regarding the collection and use of personal data and the transparency of the AI tools used in her newsroom, particularly for advertising:

> "Transparency is key; we never utilise private data, and that's a positive aspect, wouldn't you agree? We also maintain a clear distinction between our advertising and sales departments and the editorial team. Ads can indeed be intrusive, and they reflect what users have interacted with. Unfortunately, advertising is integral to our business model—it's essential for generating the necessary revenue. We're always looking for opportunities to include ads,

> but we must balance this with user experience. If ad intensity becomes overwhelming and drives our users away, it defeats the purpose."

Then, the interviewee continued:

> "At DPG Media, we are committed to full compliance with all relevant legislation. I've encountered concerns from readers in the past who were reluctant to accept cookies, voicing their complaints to us. My consistent response has been that any data we store is handled strictly in accordance with the law. DPG Media upholds these standards meticulously. Should you have any further technical or legal inquiries, I recommend contacting our legal department for detailed assistance. As a journalist, I'm acutely aware of how bothersome these issues can be, and I empathise with your frustration."

When faced with contestable data collection methods, legal compliance is often the default resolution to disputes, as one interviewee suspected the AI tools were "not so transparent" but trusted in an unnamed "European legislation" to ensure legitimacy. The problem is compounded by the absence of a solid conversation around internal guidelines for AI tool usage, at least in the newsrooms where our research occurred. A tech journalist at *de Volkskrant* admitted to a lack of discussion around guidelines, "there's not a very solid conversation or any kind of guidelines," underscoring a significant issue: The difficulty journalists face in grasping the emerging challenges posed by AI.

These findings suggest an urgent need for news organisations to develop strategies that address knowledge silos and promote responsible, transparent AI adoption.

Discussion and Conclusion

Adopting AI responsibly inside news organisations is not easy, as it requires a concerted effort to bridge different perspectives, interests, and the voices of technicians, editors, journalists, and managers (Helberger et al. 2022). This collaboration between the various actors involved in news production is fundamental to harnessing the benefits of artificial intelligence while preventing the potential risks associated with these systems (Beckett and Yaseen 2023). However, among the many challenges that could impact information sharing around the responsible use of AI inside news organisations are knowledge silos, where information is isolated within one part of the organisation and not easily shared with others (de Waal et al. 2019; van Drunen and Fechner 2022).

Our analysis identified "knowledge silos" as one of many barriers to the effective integration of AI within the Dutch news organisations we studied. The term "silos" refers to the segmentation and isolation of information, expertise, and communication within different departments or groups, leading to inefficiencies and obstacles in collaborative efforts. This concept, rooted in organisational behaviour and knowledge management theories (Finnegan and Willcocks 2006; Phelps, Heidl, and Wadhwa 2012), highlights the challenges posed by fragmented structures that inhibit the flow of information and shared learning.

Our study aims to offer a preliminary exploration of whether, and if so, how, knowledge silos affected the adoption of responsible AI practices in journalism through a cross-case study of four major Dutch media outlets. Our findings suggest the existence

of such silos across the Dutch media outlets we examined, coupled with a lack of organisational and more structural conditions to enable knowledge sharing, which could present a potential barrier to the effective operationalisation of responsible AI initiatives.

Our results propose that knowledge silos regarding the responsible use of AI in newsrooms may take several forms. In this article, we identified four different types of knowledge silos (vertical, horizontal, external, and internal) playing a role across three distinct areas of the newsrooms related to the way news workers use and understand AI: professional limitations, infrastructural limitations, and ethical guardrails.

In our study, we observed that these silos might hinder cross-departmental collaboration and the holistic adoption of AI technologies, which require a unified approach to ethics, technology, and journalism practices. The presence of silos appears to contribute to compartmentalised knowledge, limiting the organisation's ability to leverage AI effectively and responsibly. By emphasising this dynamic, our research sheds light on the need for integrative strategies that bridge these divides, fostering a more collaborative environment that could be more conducive to responsible AI innovation.

Differentiating silo types allowed us to pinpoint specific challenges. For example, and drawing from our interviews, we observed how vertical silos separate hierarchical levels, with editors lacking technical expertise often relegated to colleagues in the IT department or journalists covering technology. We also identified horizontal silos existing between departments, such as gaps between journalists working from different thematic sections inside the same newsrooms.

Furthermore, we distinguished between internal silos that exist within a news organisation and external silos that impede knowledge sharing with external stakeholders, such as parent companies or regulatory bodies. This distinction was useful to recognise the challenges that news organisations might face in the future because while internal silos might be addressed through knowledge-sharing programmes, addressing external silos could require industry-wide projects to bring different stakeholders together.

By analysing how these different types of silos manifest in various areas of the newsroom—professional limitations, infrastructural limitations, and ethical guardrails—we gain a tentative understanding of how journalists might approach Responsible AI practices in journalism more generally. For instance, a horizontal silo between journalists and data scientists might lead to journalists feeling apprehensive about using AI tools due to a lack of understanding. This is a particularly important conclusion because it highlights a paradox within the news organisations we looked at. Despite initiatives such as in-house training, tool testing, and cross-departmental collaboration, there remains a persistent cultural undercurrent where individuals who lack technical expertise perceive AI as inaccessible or simply "too complex to learn." This belief not only reinforces the knowledge silos but also risks perpetuating a cycle where these individuals remain excluded from meaningful participation in AI-driven innovation. Moreover, a vertical silo between editors and IT staff could result in editors feeling they lack the authority to enforce responsible AI practices. Additionally, knowledge silos can also impact collaborative relationships with colleagues across news organisations

(Wenger 1998). For example, an internal silo separating the legal department from the editorial team could lead to confusion and delays when implementing ethical frameworks for AI use. Unknown legal and social risks are thus the inevitable downside of AI innovations in the context of silos.

According to our interviews, it is important to notice that the implications of knowledge silos extend beyond questions of mere inefficiency. As our results suggest, these silos could, for example, create a breeding ground for accountability evasion. Aligned with prior studies (Dörr and Hollnbuchner 2017), our interviews revealed that journalists in these organisations sometimes deferred responsibility for the ethical and responsible implementation of AI in the newsroom to the tech or the legal team. This case hinders the need to move from the traditional independent role of journalists to a more collaborative role that includes communication and knowledge transfer among different stakeholders to ensure the responsible use of AI. Furthermore, a lack of shared understanding across departments could exacerbate existing biases within AI algorithms, as those with limited technical knowledge may be unable to challenge potential biases within the systems effectively. Our results reinforce the notion that responsible AI requires a "many hands" approach (Helberger, Karppinen, and D'Acunto 2018) to dismantle silos and encourage cooperation and knowledge exchange. This study, however, also points to the need for media organisations to think more structurally about how to organise and facilitate knowledge sharing. This should also include creating room and incentives for knowledge sharing.

Our research aligns with existing literature highlighting the importance of "bridging the gap between ideals and practices" (Schiff et al. 2020) regarding responsible AI inside newsrooms. Journalistic principles are only as effective as their practical application (Dodds 2022), and knowledge silos can significantly impede this translation. For instance, based on our interviews, robust ethical frameworks for AI use in newsrooms become meaningless if siloed departments lack the knowledge or capacity to implement them.

By fostering collaboration and knowledge exchange across departments, news organisations can create a more fertile ground for developing responsible AI practices. This requires not only training programmes but also a fundamental shift in organisational culture, creating incentives and dedicated spaces for knowledge sharing.

Despite providing insights into the knowledge silos and challenges within newsrooms, our study has important limitations that should be addressed. First, we only focused on four Dutch news outlets, which are neither representative of the media landscape in the Netherlands nor the news industry writ large. While our strategic sampling allowed us to gain a good insight into the situation at these organisations, the small sample size means that our findings should be treated as exploratory rather than conclusive and do not present a strong enough basis to draw wider generalisations. Future research should expand to include a broader spectrum of media organisations and integrate quantitative methods. Larger samples of interviewees or more representative survey work across different geographical regions will be necessary to determine whether the siloed structures and challenges identified are universal or specific to the organisations in question at the time of writing. Second, while this study focused on knowledge silos, other organisational structures and factors may also hinder the adoption and implementation responsible AI practices. Investigating

these factors alongside silo effects would provide a more comprehensive picture of the challenges faced by newsrooms.

In conclusion, our study highlights the important role that knowledge silos play in hindering the responsible adoption and integration of AI within news organisations. These silos, whether vertical, horizontal, internal, or external, create barriers to communication and collaboration, challenging the flow of information needed for addressing the ethical implementation of AI. For this reason, our study highlights the need for a more holistic approach to AI integration that involves technical training and addresses cultural and organisational barriers to knowledge sharing. Without overcoming these silos, news organisations potentially risk failing to harness the full potential of AI while also exposing themselves to ethical and legal pitfalls. Moreover, while fostering cross-departmental collaboration is crucial, engaging external stakeholders such as regulators, academic institutions, and other media organisations is equally important. These broader collaborations can provide valuable insights and help create a long-term framework for responsible AI practices across the industry.

Disclosure Statement

No potential conflict of interest was reported by the author(s).

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Appendix 1: Questionnaire

Explainability	1. Could you explain to me what type of AI tools you use in this newsroom? *If any*, could you explain how these tools work? And how exactly you use them in your daily practice? 2. Do you, for example, use any technology based on machine learning or natural language processing? Are you familiar with these concepts and what they mean? 3. Do you remember when and how these technologies were originally implemented in your newsroom? Was there a conversation with editors and managers beforehand? Did they talk about how they would work? Were ethical considerations discussed? 4. In general, how do you feel about using AI tools for your work? Do you think they are making your job easier? 5. Do you think you have a good understanding of how they work? 6. Do you use platforms like Chartbeat or Google Analytics to find ideas for future stories? *If yes*, how much do you know about the algorithms behind these technologies? 7. Has there been a conversation in your newsroom about implementing new and/or more AI for reporting? *If yes*, can you tell us how those conversations went?
Privacy	1. What do you think privacy means when it comes to (using) AI? 2. In your opinion, how transparent are the AI tools you use are on how they handle private data from your audiences? 3. In your opinion, how transparent do you think your organisation is when they collect users' personal data?
Fairness	1. Do you use a search engine or social media to research your articles? *If yes*, are you aware of any biases in the data that you collect? 2. Do you think that using search engines or social media to collect information is more biased than traditional sources (like cultivating your own sources)? *If yes*, can you explain? 3. How much do you trust these recommendation systems? Do you think your articles reach everyone you intend to reach? 4. When is the use of automated content production unfair vis-a-vis a) the audience, and b) other journalists?