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# From the "Desk Set" to "Doraemon": A comparative analysis on the sociotechnical imaginaries of artificial intelligence in news work

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## Abstract

Artificial intelligence has become increasingly pervasive throughout the entire news cycle. In response to this trend, this paper explores journalists' sociotechnical imaginaries concerning the integration of AI in news production, focusing on their perceptions of AI's opportunities and ethical challenges. The study also examines the influence of diverse media and discourse cultures on these perceptions by conducting problem-centered interviews with journalists from China, Japan, Switzerland, and the UK. Through an inductive thematic analysis of the interviews, the results reveal that journalists across these four countries acknowledge the potential advantages of AI in journalism, such as enhanced efficiency and improved data analysis. However, their expectations regarding human-machine collaboration in news work vary according to cultural contexts.

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Furthermore, the findings highlight that the interviewed journalists advocate for the design and implementation of AI systems to adhere to ethical standards.

**Keywords**
Artificial intelligence, sociotechnical imaginaries, comparative research, ethics, human-machine communication, journalistic cultures, design

## Introduction

In 1957, just one year after the term artificial intelligence (AI)[1] was coined at the Dartmouth summer Research Project on AI, in New Hampshire, the movie "The Desk Set" was released, starring Katharine Hepburn and Spencer Tracy. The movie tells the story of a television network research department headed by Hepburn, which is threatened by the arrival of an engineer and efficiency expert (Tracy), who plans to automate the department. The movie anticipated the organizational and professional impacts of electronic computers in newsrooms, encapsulating anxieties about the replacement of human agency by machines. This aligns with the concept of technological drama, developed by Pfaffenberger (1992) and later adapted to the field of automated journalism by Carlson (2015), illustrating the dichotomy between employee's visions about the future of the field and technocratic entities' transformative expectations. In the film, upon learning that a computer is being introduced, the news workers immediately assume they will be laid off, which indeed happens, with the computer itself starting to fire everyone from journalists to top managers. In real newsrooms, however, research has shown that concerns about being replaced have decreased since the early 2010s (Schapals & Porlezza, 2020), when journalism studies began investigating the issue (Carlson, 2015; Van Dalen, 2012). Nonetheless, the advent of generative AI, such as ChatGPT, has reignited worries about job losses in newsrooms (Borchart et al., 2024), reflecting the imaginative constructions surrounding the technology. In this regard, societal contexts and culture play a crucial role given that no technical innovation is independent of the symbolic forms and representations produced by the social groups in which a specific innovation emerges (Bory & Bory, 2015).

To what extent are different cultural dimensions influencing how news workers perceive the implementation of AI in journalism? To explore this, we looked at four distinct countries: China and Japan in Asia, and Switzerland and the UK in the Western hemisphere. These countries were selected because they exhibit not only diverse journalistic cultures (Hallin & Mancini, 2004; Hanitzsch et al., 2019) but also varied cultural traditions related to AI (Irrgang, 2014). China has emerged as a global leader in AI development and application (Lee, 2018). The country's rapid advancements in AI technology reflect its strategic prioritization and substantial investments in this field. Japan, on the other hand, has a longstanding history with AI, marked by extensive public support programs for AI research and development that began in the 1980s (Garvey, 2019). Moreover, AI holds a significant place in Japanese (popular) culture, for instance within anime and manga. In Switzerland, AI has been identified as a central theme in the Digital Switzerland Strategy since 2018, as declared by the Swiss government (Swiss Federal Council, 2018). This strategic emphasis highlights Switzerland's commitment to integrating AI into its digital infrastructure. Similarly, the UK launched a National AI Strategy in 2021, aiming to position Britain as a "global AI superpower" within the next decade (Gov.UK, 2022), underscoring the UK's ambition to lead in AI innovation and application. By examining these diverse contexts, this study aims to uncover how

cultural and media factors shape journalists' perceptions of AI's role, opportunities, and ethical challenges in the field of journalism.

Drawing on sociotechnical imaginaries, the article strives to answer the following three research questions:

1. What imaginaries do news workers draw upon regarding the impact of AI on journalism?
2. How are AI-related sociotechnical imaginaries influenced by the specific media cultures in different countries?
3. In what ways do news workers' professional background shape their perceptions of the challenges posed by AI in journalism?

This paper intentionally moves away from examining the "material impact" of AI within journalistic enterprises (Natale, 2019). Instead, it elucidates the imaginaries journalists hold about the functional and role-specific applications of AI in the journalistic field. By doing so, it interrogates the broader socio-cultural implications and analyzes the perceptions of AI's impacts, potentialities, and inherent challenges.

The structure of the article is as follows: First, a comprehensive literature review is presented, including an elucidation of the theoretical framework centered on imaginaries. This is followed by the methods section, detailing the empirical approach undertaken. Next, the findings from the empirical analysis are presented. Finally, the concluding section discusses the implications of these findings, articulates the study's conclusions, provides an outlook for future research, and acknowledges the limitations encountered during the investigation.

## Literature review

### *Sociotechnical imaginaries of AI*

Over the past decade, the discipline of Science and Technology Studies (STS) has increasingly focused on the relationship between discourse and technology, particularly concerning "expectations and stories about the future" (van Lente, 2016) and narratives surrounding "contested futures" (Brown et al., 2017). Research in this field has examined the role of myths, ideologies, metaphors, and narratives in shaping perceptions of the future, especially in the context of the Web and digitalization (Bory, 2020; Mansell, 2012). This focus extends to artificial intelligence (AI): Natale and Ballatore (2020, p. 7) highlight that "predictions and visions of the future are one of the main ways in which mythical ideas about technologies substantiate into particular cultural and social imaginaries." In essence, future imaginaries enable actors to "anticipate future possibilities based on present empirical observations, informing current decision-making" (Ruotsalainen et al., 2023, p. 1046). These potential imaginations of the future are powerful forces that can redefine the journalistic field and influence how news organizations adapt to or implement AI (Deuze & Witschge, 2020).

In this context, journalists' expectations about AI and the future of journalism are conceptualized on the basis of social imaginaries through which individual actors—or communities—interpret their social existence (Taylor, 2004). The imagined thus becomes integral to how people conceptualize institutions, such as the nation-state (Anderson, 1983). Social imaginaries facilitate communal understandings among individuals who have never met, establishing what is perceived as normal, though these imaginaries can evolve over time. The early conceptualizations of social imaginaries have inspired further exploration of "sociotechnical imaginaries" (Jasanoff & Kim, 2009, 2015),

which examine the role of technology in societal structuring. Sociotechnical imaginaries are defined as "collectively imagined forms of social life and social order reflected in the design and fulfillment of nation-specific scientific and/or technological projects" (Jasanoff & Kim, 2009, p. 120).

While sociotechnical imaginaries offer a higher-level conceptual framework, they can be empirically analyzed through the narratives present within specific cultural contexts. They illustrate how individuals perceive their social existence in relation to technological developments, shaped by dominant values, beliefs, ideas, myths, and norms within particular social, cultural, and historical settings. However, material conditions and power relations are also crucial, as imaginaries about the future often reflect the desires of specific social groups (Cantó-Milà & Seebach, 2015). Consequently, sociotechnical imaginaries can be contested, with different groups holding divergent visions of desirable futures.

Given that societal implications and conceptions of desirable futures influence the progression, implementation, and use of technology, it is crucial to understand the social and cultural context in which technological advancements occur (Jasanoff, 2015, p. 4). This becomes even more important as sociotechnical imaginaries allow a meaningful sense-making of the surrounding world, in particular when the "here and now" is affected by an ongoing technological transformation. Imaginaries can thus go well beyond a description of what is "actually" going on, by "describing and envisaging something that already exists as a latent embryo that can actualize and bloom in the future" (Ruotsalainen et al., 2023, p. 1047). Technological innovations are often connected to normative ideas and the imagining of a better future world by a small group of pioneers before becoming shared and institutionalized by larger social groups (Beckert, 2013). As journalism innovation is increasingly conceived in datafied terms (Meier et al., 2022; Porlezza, 2023), current imaginaries in the news industry revolve around techno-utopian visions (Creech & Nadler, 2018), with promises of increased efficiency and productivity.

Journalists and technologists in news organizations are pivotal in shaping sociotechnical imaginaries about the future of journalism, particularly concerning AI. These imaginaries, defined as "imaginaries of new possibilities," influence both current and future journalistic practices (Hepp & Loosen, 2021, p. 5). Sociotechnical imaginaries help frame how journalists perceive AI's impact, informed by their interactions and experiences with the technology (Bucher, 2017). This concept bridges the often separately studied domains of public discourse, political action, and technological development (Richter et al., 2023, p. 4), distinguishing it from the "frames" concept in communication sciences. Nardi and Kow (2010) describe imaginaries as social constructs consisting of cultural notions, predicaments, and anxieties circulated by digital media. The framing of AI technology in news coverage can thus serve as an initial proxy for how journalists understand AI (Lin & Lewis, 2022).

However, the term AI is "polysemous and problematic," often invoked broadly and inconsistently in media discourse (Broussard et al., 2019, p. 673). The lack of a universally accepted definition for AI, due to its conceptual ambiguity, leads to its use as an umbrella term encompassing algorithms, machine learning, and automation, further complicated by imaginative AI narratives in popular culture and, specifically, in science fiction (Cave et al., 2018). This stereotypical, broad, and often inaccurate media portrayal of AI contributes to the myth-making surrounding technological innovations (Davis, 1998). Consequently, analyzing frames in public discourse alone is insufficient to fully understand how news workers make sense of AI in their social reality. Thus, it is crucial to consider the deeper sociotechnical imaginaries that inform their perceptions and practices.

## Different media and discourse cultures

Sociotechnical imaginaries serve as a lens through which actors from different cultural contexts perceive and integrate technologies into their daily practices. These deeply ingrained, often unquestioned beliefs shape responses to technological innovations. Imaginaries can help to explain differences across cultural contexts regarding technological transformations. However, to better comprehend how journalists from different countries envision AI through their imaginaries, distinct media and discourse cultures need to be taken into account (Hepp et al., 2012). Such cultural contexts have been previously analyzed, for instance by Hallin and Mancini's media system models (2004), the Worlds of Journalism project, or the Reuters Digital News Report.

Switzerland's media system aligns with the "Democratic Corporatist Model" (Hallin & Mancini, 2004), featuring high professionalism and a strong tradition of rational-legal authority. It is characterized by a linguistically fragmented, small market, and significant influence from foreign media (Porlezza, 2024). Swiss journalists report a high degree of professional autonomy, though this is decreasing due to technological changes that have worsened working conditions, reduced research time, and necessitated new technical skills (Dingerkus et al., 2016). Social media algorithms heavily impact journalism, prompting many publishers to expand their presence on multiple platforms. Public service media remains strong but faces growing political pressure (Vogler et al., 2023). Economic challenges have driven a focus on efficiency, with publishers increasingly cooperating and using AI tools to streamline news production. AI is viewed as a major innovation, though it is critically perceived by audiences, reducing their willingness to pay for news (Vogler et al., 2023).

The United Kingdom's media system falls under the "Liberal Model" (Hallin & Mancini, 2004), being largely market-driven and focused on profitability. Despite this, the BBC maintains a central role, dominating both online and offline media (Newman et al., 2024). British journalists enjoy considerable autonomy and freedom in their reporting. Transformation in the media is heavily influenced by digital platforms, necessitating new technical skills (Thurman et al., 2016).

Economic pressures have led to job cuts, resulting in financial and professional uncertainty. Both private and public media are increasingly using AI in news production and distribution (Newman et al., 2024). While journalists often cover AI positively (Brennen et al., 2018; Kleis Nielsen, 2024), the public perceives AI-generated news as less valuable (Fletcher & Kleis Nielsen, 2024). This trend of rapid AI adoption for efficiency and engagement contrasts with media managers' concerns about AI potentially rendering the industry obsolete (Caswell, 2024).

China's media system is heavily influenced by the state's control and regulation (Loo, 2019). Chinese journalists often navigate a complex landscape of censorship, with the state exerting considerable influence over media content, with an increasingly dominant position of digital platforms. Unlike Switzerland and the UK, Chinese journalists declare to have limited degree of professional autonomy in their reporting as the freedom to freely decide what elements to emphasize in a news story is constrained. Chinese journalists stress that the profession is going through significant changes that require further technical skills. This is mainly due to the dominant positions of social media platforms, whose importance and influence have grown. China could thus be characterized as an authoritarian model, where media serves as an instrument of state power or is heavily influenced, for instance through censorship or limited information access. This results in a journalistic culture focused on social stability and rather than investigative journalism.

Japan's journalism culture, while sharing similarities with Western cultures in prioritizing a monitorial role and holding those in power to account, is distinctive in several ways. Japanese journalism emphasizes a strong commitment to objectivity, operating within a framework

influenced by significant political and economic pressures. This duality is reflected in Japan's media environment, where professional norms coexist with state intervention, fostering a journalistic culture that values both independence and public service. Public broadcasters like NHK enjoy high trust, symbolizing the balance between professional integrity and regulatory oversight. Additionally, the Japanese media landscape is shaped by unique socio-cultural factors. The practice of press clubs plays a significant role in how news is gathered and reported, fostering close relationships between journalists and official sources. Additionally, technological advancements and social media have begun to influence Japanese journalism, challenging traditional practices and introducing new dynamics in news consumption and dissemination, resulting in a complex interplay of tradition, modernity, and the constant negotiation between autonomy and external pressures.

Both the defining patterns of media systems and specific journalistic cultures are interdependent and embedded in distinct discourse cultures, which shape the formation of public spheres (Hepp et al., 2012). Variables such as the political system, legal framework, cultural norms, languages, media structure, and access to technology define these discourse cultures (Jiang et al., 2021). These cultures influence how news organizations develop professional journalistic practices, including editorial policies and news framing (Carter, 2013). Conversely, news media shape discourse cultures by enabling public dialogues (Nguyen, 2017). Technological shifts, like the rise of AI, are interpreted within these cultural frameworks, reflecting local impacts and cultural norms. While similar technologies affect societies broadly, their exact impacts and experiences vary across and within cultural contexts (Nguyen & Hekman, 2022). However, Nguyen and Hekman argue that cultural reflections on technology perceptions are often missing, highlighting the need for comparative analyses of cultural differences in AI perceptions within newsrooms.

## Methodology

The study adopted a two-step methodology: initially, we conducted problem-centered interviews (Witzel, 2000) with journalists and technologists working in newsrooms. We opted for problem-centered interviews in order to focus on the issue of AI being increasingly deployed in newsrooms, a trend that often entails significant changes to journalistic role perceptions (Schapals & Porlezza, 2020). We also adopted snowball sampling (Becker, 1963), albeit its downsides in terms of interviewee selection. Yet, it can be helpful when it comes to a topic such as journalism and AI since many actors in the field are closely connected, for instance through academic initiatives such as the JournalismAI initiative at the London School of Economics. These networks foster the exchange of expertise and experience across different news organizations and journalism cultures.

In a second step, we applied an inductive thematic analysis (Braun & Clarke, 2013) on the answers provided by the journalists. We initially coded those topics in the interviews relevant to our research, such as particular cultural references and other recurring elements. Second, the codes were aggregated to main themes that reflect major emerging topics such as views about the human-machine divide. The thematic analysis served to understand the perspectives of news workers about AI technology, ranging from the roles, the expectations to the extent to which the design of AI-driven tools embodies journalism values.

The sample included four countries with different journalistic cultures: Switzerland, the United Kingdom, China, and Japan. The countries were chosen on the grounds of a most different systems design given that they (a) are of different media (market) sizes, (b) present different media structures and discourse cultures, (c) are at different stages regarding the use of AI in their newsrooms due to limited resources and market fragmentation. In other words: Japan and China are strongholds regarding the development and implementation of AI systems, while the UK matters because of its

still influential role in shaping journalistic practices and innovation globally. Switzerland is part of the sample not only due to the fact that part of the authors are based there, but also because as a small, landlocked, multilingual nation with limited resources, surrounded by large media markets, presents completely different characteristics to the other countries.

Overall, we carried out 12 semi-structured interviews. Each of the authors conducted the interviews in the original language of the country. All interviews were subsequently translated into English. The interviews were carried out between the summer and fall of 2022. In every country we had an initial contact we knew was involved in the implementation process of AI-driven tools. From there, we asked every interviewee to provide us with other potential interviewees active in the area of journalism and AI.

It should be noted that newsrooms are restrictive workplaces and the pool of experts that deal with AI is limited. In some cases, it resulted complexity to get in touch with the specific actors suggested in the interviews. Either because it was impossible to get in touch with them, or because they did not want to talk to us because they were working on sensitive projects. In other cases, specifically in a small media market like Switzerland, one individual was consistently mentioned by all interviewees, thereby reducing the diversity of potential interview subjects.

An additional complexity was that some interviewees requested not to be recorded because some of the information shared in the interview was confidential due to ongoing projects.

The roles of the interviewees varied between journalists, editors, senior management, developers, and data scientists. Roles will not be cross-referenced with news organizations in order to guarantee full anonymity to the interviewees. The experts work in newsrooms of different sizes in the countries considered: national and provincial news organizations in China (anonymized as requested by the interviewees); NHK, Nikkei, and Smartnews in Japan; Ringier, Tamedia, and the public service media SRG SSR in Switzerland; and the BBC in the UK. The fact that in the UK all interviewees are members of the BBC is due to the relevant position of the BBC in the British media market and its resources in terms of journalism innovation. The interviews, each lasting between 30 and 45 minutes, were conducted using platforms such as Microsoft Teams and similar applications. Ethics committee approval was not required for the execution of this study. Nevertheless, each interviewee was formally queried regarding their consent to participate prior to the commencement

**Table 1.** The sample of interviewees.

| Country | Broadcaster/Newsroom | Type | Code |
|---|---|---|---|
| UK | BBC | Journalist | J-UK1 |
| UK | BBC | Journalist | J-UK2 |
| UK | BBC | Technologist | T-UK3 |
| CH | Ringier | Technologist | T-CH1 |
| CH | Tamedia | Technologist | T-CH2 |
| CH | SRG SSR | Journalist | T-CH3 |
| CHINA | National News Agency* | Management | J-CN1 |
| CHINA | National TV Station* | Journalist | J-CN2 |
| CHINA | Provincial TV Station* | Journalist | J-CN3 |
| JAPAN | NHK | Management | J-J1 |
| JAPAN | Nikkei | Technologist | J-J2 |
| JAPAN | SmartNews | Journalist | J-J3 |

of the interview before the interview took place. In addition, anonymity was granted to all participants, and, where requested (Table 1).

Overall, our interview guide focused on three main themes: First, we asked about the news workers' perceptions of the role of AI in journalism practice; here the interviewees were also questioned about their interaction with AI on a typical workday. A second set of questions focused on the importance of journalistic values and to what extent they are embedded in the technology. Here the interviews also concentrated on the question of whether the news workers ever took part in the process of designing the aforementioned tools. In the end, interviewees were also asked about ethical concerns regarding the use of AI technology.

## Findings

### *The human-machine divide*

Generally, there is a positive sentiment regarding the opportunities AI offers. Most news workers are upbeat about the «convenience» (J-CN2) of AI and its ability to free them from «straightforward tasks» (J-J3). The interviewees believe « machines should help» (J-UK2) and address specific issues that range from data analysis to disinformation and polarization, many of them specify that automation thanks to AI systems is still in its infancy where human oversight is needed and crucial. This sometimes even results in an increase rather than a decrease work. Nevertheless, journalists advocate for the preservation of their core creative roles, insisting on retaining responsibility for the processes of data interpretation and publication.

> «AI cannot explain the output. […] What journalists do is not just sharing the output of their analysis but also verifying and explaining the causality, and telling a compelling story to inform the audience» (J-J1)

Some view AI as a potential machinic collaborator that enhances journalistic work by identifying patterns elusive to the human eye and by completing repetitive tasks. A journalist in Japan pointed out that neither machines nor humans are perfect and immune to errors. This is why any human-machine divides should be reduced in order to establish a hybrid work environment, in which humans and machines work together like "good colleagues" (J-J2). Journalists in general draw on sociotechnical imaginaries that envision technology as a complementary rather than substitutive force. These imaginaries emphasize an integration of human and machine capabilities, where AI assists with data processing, fact-checking, and routine tasks, thereby freeing journalists to focus on creative and investigative endeavors. The imagined future is one where AI amplifies human strengths, reflecting an optimism about technological progress (as it could often be seen in the literature about journalism and AI; see for instance Beckett, 2019) coupled with a strong belief in the irreplaceable value of human intellect and editorial insight in the journalistic process.

In fact, although journalists were initially afraid of being replaced by AI, with the quick adoption of AI in news organizations, most of the concerns have become less drastic, making room for a newfound confidence in the role of human beings in both the oversight of and the collaboration with algorithms.

> «We've talked (with other colleagues) about whether AI would lead to journalists losing their jobs. I think for journalists, this would never happen. AI is not here to replace humans. They are here to serve humans, to help you increase efficiency. We must be clear about that. Machines will never be able to replace humans in thinking and creating. But if there are certain tasks that are of low technical

requirement and if they are more fixed and repetitive and follow certain patterns, AI may replace that for you» (J-CN2)

Others adopt a more critical stance, less towards the technology itself, but more towards the lack of strategies for effective utilization. It would be important to look at the way in which humans determine the use of algorithms in newsrooms.

«Some people would talk far more about the interactivity between the machine and the human, but I think it's actually a thing we can manipulate for a positive human dimension. I think that gets forgotten a lot. People focus on what we can do, how we can develop it, but they jump ahead of the question what do we want to achieve, how do we get consensus about what we want to achieve?» (J-UK1)

Both in the UK and Switzerland, interviewees predominantly emphasized the potential of AI to increase efficiency and scale through automation. By automating repetitive and uninteresting tasks, such as data entry and research, journalists can focus on higher-level tasks that require critical thinking and analysis. This allows them to produce more content in a shorter amount of time and improves the quality of the reporting.

«I think the longer-term goal is to be more efficient without losing any quality» (J-UK1)

«We try to automate all the repetitive and uninteresting tasks» (J-CH3)

Overall, when it comes to RQ1, the findings show that most journalists view AI as a machinic collaborator enhancing their work rather than a replacement, even if they initially thought so.

## *Cultural influences on AI perceptions*

Particularly in the interviews with Japanese journalists, experience with robot culture in people's everyday life shape the perceptions about AI technology.

«[…] people have unrealistic expectations about AI, expecting AI to be able to do things like Doraemon,[…] AI is a buzzword for marketing purposes to make everything sound like something innovative» (J-J2).

Only Japanese journalists referred to a pop-cultural artifact. This reflects the fact that both robots and AI are present in everyday life more often than, for example, in Western countries. Referring to Doraemon to explain senior management's exaggerated expectations shows how industry-related issues and cultural references are intertwined. In addition, interviewees also referred to visual aspects of the technology, such as AI's ability to accurately recognize and classify objects in images or features within an image. Japan has a longstanding tradition of producing visually striking and engaging content across a variety of mediums, including manga, anime, and video games. As such, Japanese journalists may be particularly attuned to the potential for AI to enhance the visual aspects of news reporting, the generation of images, data visualization and visual AI, in general, have the strongest impact.

In the case of China, interviewees expect AI to help them facilitate their work. There is a sense of optimism about AI's potential to improve productivity, efficiency and simplify work processes. However, the interviewees also expressed doubts as to whether AI would be able to replace human

beings' ability to instill emotions and creativity into the work they do, particularly in fields that require imagination.

> «I truly hope AI will get better and better and it will make our jobs easier, but I have no concern that it would have any substantial impact on my job. Our work requires abundant creativity and imagination. There are human emotions embedded in it. As far as I am concerned, I don't think AI would be able to achieve this in the near future» (J-CN1)

On top of that, the impact of AI implementation in Chinese newsrooms can be challenging due to the issue of censorship that needs special monitoring. Having content risk management systems implemented at the local level can be expensive and not all news organizations can afford it—which can result in specific risks:

> «A notice from the National Radio and Television Administration was received for using prohibited materials – an image of a disgraced celebrity that's banned from appearing on TV. The footage itself only has 16 frames and escaped the human reviewers' eyes at the provincial TV station. It's proof of the central supervision unit using automated image capture technology for reviewing (censoring) content, combining computer vision and facial recognition, etc.» (J-CN2)

British interviewees pointed out that AI and the resulting automation could threaten the normative basis of journalistic authority. The introduction of this new technology not only challenges current communication processes in newsrooms, as conversation among different actors becomes paramount, but it also entails the need to re-think organizational settings in relation to news work and work routines. Hence, according to the interviewees, a certain degree of resistance can be observed in the newsroom, in particular when it comes to the reluctance to study, learn and use AI-driven tools:

> «There is a large number of journalists who are reluctant to take on or to begin to understand the power of data and what the tools can do for them» (J-UK1).

In some cases, initiating a conversation about the usefulness of a tool might help, in others, journalists might well remain very reluctant to adopt a tool that interferes with what they see as their responsibility:

> «When we tried to have a conversation about manual created curation, a lot of the pushback we get is from journalists who feel that using machines in news production is an aberration of their responsibility, so they feel very passionately that they are the ones that make decisions about how news hits the audience… So, we have to convince news journalists that there is a role for machines in this, but I think that the conversation is still quite difficult» (T-UK3)

However, in order to spark these conversations in newsrooms, there is often a need to foster knowledge about AI. Some journalists are better equipped than others due to their specific education in the area of data science, in particular when it comes to technologists working together with newsrooms.

> "We want to have conversations: people need to become more data literate in order to understand the technology and not feeling that the tools are being imposed on them." (T-CH2)

Overall, regarding RQ2, the perception of AI is shaped by the media cultures of different countries, reflecting their unique socio-political and economic contexts. In China, the discourse around AI is intertwined with issues of state control and censorship, highlighting concerns about how AI might enhance governmental surveillance and information regulation. In Japan, interviewees refer to popular anime characters when discussing AI, drawing on cultural familiarity to frame AI in an accessible and relatable way, blending technology with cultural narratives. In the UK and Switzerland, economic considerations dominate the perception of AI, with a focus on how AI can improve efficiency and profitability in the news industry amid financial pressures.

Research Question 3. In what ways do news workers' cultural and professional backgrounds influence their perceptions of the ethical challenges presented by AI in journalism?

## *AI design, professional ethics, and collaborative dynamics*

Typically, each newsroom deals with AI in its own unique way. However, according to the interviewees, two factors are crucial in determining how collaborations between various actors such as journalists and technologists can be effectively implemented: the willingness of journalists to work with technologists and the IT department (provided that they see usefulness in AI), and the existence of established processes that allow for collaboration over time.

The Chinese interviewees stated that the majority of tools are not developed in-house but by technology companies. In some cases, the tools adopted in the newsroom are not even developed for specific journalistic purposes and therefore need to be adapted to editorial workflows:

> «The ultimate goal is integration (of the technology to day-to-day newswork). But it's a process. For example, you could not place the AI anchor full scale when it first launched, it needs time and process to be integrated into the daily news production. Technology itself is being improved every day. The integration between technology and the newswork needs work» (J-CN3)

The Japanese interviewees explained that collaboration is difficult due to strict hierarchical responsibilities that do not easily allow for interdepartmental exchanges or partnerships between different roles. Technologists typically do not have a background in journalism, which means that they may not possess the same level of expertise on the editorial side such as researching and verifying information, writing compelling stories, and adhering to ethical and journalistic standards. Also, technologists do not have the same hierarchical standing in news organizations compared to news workers:

> «They work separately in Nikkei. Engineers don't have a journalism background. There's a tradition that editorial is placed in a higher hierarchy. Journalists usually order engineers' specific work. It is rare for engineers to make recommendations as traditionally journalists are positioned higher in the hierarchy» (J-J2)

At the BBC, few journalists collaborate with technologists through the BBC's Newslab, which is the public service media's innovation laboratory. Co-design processes between journalists and technologists are rare.

> «Developers often test prototypes or ideas with journalists. It's not that they're completely out of the loop. But broadly and historically journalists do not collaborate as much as they should, a lot of decisions are being made by developers, designers, and UX teams» (J-UK2)

Sometimes, the lab comes up with an idea that was inspired by journalists. However, according to the interviewees, it is quite easy to develop something in isolation and adapt it to the newsroom's requirements. Once the tool has been tested and the evaluations are positive, the actual transfer of the technology to the newsroom happens. This is a complex process, and one of the possible solutions to the problem is the creation of a specific role such as a "development editor," whose responsibility is to deal with new technology, test it and feed the information back to the developers. However, this limits the collaboration to a specific user with the right skills to interact with the developers:

> «The development editor's role was to basically take that technology, pull it into the business, work out how it fitted into the workflows, and feed the right journalistic arguments back to the technologists. The technologists don't know these arguments. Without that very crucial role you're almost doomed to failure unless something is incredibly simple and intuitive to use» (J-UK1)

On the other hand, the creation of a specific role might help news organizations in dealing with journalists' resilience. Having a knowledgeable person in the newsroom can be useful if you do not have the possibility to get a group of beta testers: according to one of the Swiss interviewees, selected journalists are given access to new tools. This group of journalists typically has a good level of understanding of algorithms and may even have coding skills. Journalists' feedback on issues related to user experience design is particularly valuable because the ease of use and intuitive design of a tool greatly influence whether journalists will adopt it or not. If a tool passes user testing, it is released to the newsrooms, if it fails, it is sent back to the developers with feedback from the testers. This triggers an iteration process that resembles a co-design process.

> «We usually test the tools with a small group of journalists. If the tools work, they are implemented and adopted. Only in the case of issues a feedback and iteration process from the journalists back to the technologists is triggered» (T-CH1)

In other cases, ad hoc project teams can also fall victim to internal reorganizations: while working on a specific tool, perhaps even together with journalists, senior management decides that the project is no longer of strategic importance and reallocates the technologist to another task, which means that the original project reached a dead end:

> «Usually we proceed with baby-steps, especially if the tool deals with news personalization or news recommendation. We limit the tests to a very small bunch of users and keep it, so to say, below the surface. But then again, some collaborators may be reallocated to other tasks and the collaborative project finishes there. Sometimes, however, it can also be an issue of time: journalists have a lot to do and such projects are usually seen as "luxury-projects" not everyone wants to get involved with» (T-CH3)

The main values at risk in the design process are accountability, transparency, and accuracy. While these values seem to be the top priorities when it comes to the risks of AI-driven tools used in journalism practice, the internal discussions about how to embed them into the code remain at a rather superficial level:

> «The explicit discussion of values is less common than those values being embedded in conversations, so it's all very contextual and it comes out in practical examples more than anything else» (J-UK2)

But even if journalists have a basic knowledge of how algorithms work, they might not want to be part of conversations because the tools touch upon the journalistic craft, that is the creative part of journalism. The more reluctant journalists become, the more complicated it gets when the IT department needs to explain how algorithms work or what the organizations want to achieve with the technology.

There are differences in the way that news organizations tackle ethical issues in relation to AI. The BBC as well as the Swiss public service media SRG-SSR have developed AI-related guidelines or Machine Learning Engine Principles. The Japanese public service media NHK has also been working on a normative framework that guides their "research for solving the various problems involved with the social implementation of media technologies from the perspective of ethical, legal, and social issues, ELSI" (Nhk, 2022).

Overall, regarding RQ3, the professional background of journalists tends to shape their perceptions of ethical challenges posed by AI in journalism. Journalists' willingness to collaborate with technologists is not only crucial for effective AI integration, but it would also be relevant for the discussion on how to implement editorial values. However, ethical considerations, such as accountability and transparency, are embedded in practical discussions but are often superficial. In any case, the findings show that varied professional backgrounds and organizational structures highlight the complex interplay between journalistic practices and the ethical implementation of AI in newsrooms.

## Discussion

This study aimed to understand journalists' imaginaries in relation to AI and how they conceptualize its impact, considering the potential cultural differences across various journalistic discourse cultures. The findings reveal both differences and similarities in how journalists perceive AI technology, with these perceptions being significantly mediated by cultural contexts.

### *Imaginaries on AI's impact in journalism*

Responding to RQ1, the results confirm previous studies, such as (Porlezza et al., 2022), which show that journalists are generally optimistic about AI-driven tools. Most journalists see AI as a potential collaborator that augments their abilities, for instance, by identifying elements that are not easy to spot for humans. Overall, they express optimism towards journalism's future, where AI supports and alleviates journalists from repetitive and time-consuming tasks. This positive stance is also grounded in a slightly fatalistic perspective, given that neither humans nor machines are perfect and immune to errors. However, journalists defend their craft against the use of AI in areas such as writing and verification. Additionally, interviewees demonstrate a certain reluctance to be more strongly involved in the internal discourses and co-design processes regarding AI. Even in cases where AI systems are built in-house (e.g., the BBC), companies are mostly unable to include journalists in interdisciplinary discourses to foster collaboration or knowledge transfer between developers and newsrooms. While it strongly depends on the use-case of a specific tool, embedding them in journalistic workflows can therefore be a difficult task.

### *Cultural and media influences on AI perceptions*

Addressing RQ2, the way journalists perceive the collaboration between humans and machines is influenced by their cultural contexts. In Japan, for instance, the enculturation of robots and AI in pop

culture and everyday life shapes perceptions of AI's potential to enhance the visual aspects of news reporting. A journalist remarked, "People have unrealistic expectations about AI, expecting AI to be able to do things like Doraemon" (J-J2). This cultural influence, combined with the misuse of the term AI for marketing purposes, can lead to unrealistic expectations about the potential of the technology on the management level, while rank-and-file journalists show a much more pragmatic perception. This gap between expectations and reality can sometimes lead to disappointments. This is also due to unclear organizational strategies regarding the role of AI in present and future news work. Hence, there is a need for a better understanding of the implications of AI for journalistic roles, for instance, in relation to collaborations between journalists and technologists—a complex process that requires not only organizational adaptations, as mentioned particularly by the Japanese interviewees, but also a willingness to partner from both sides. In Japan, the strong links with popular culture, evidenced by the fact that both Atom (Astro Boy, in 2003) and Doraemon (in 2013) were granted special residency permits, demonstrate the close ties between industry ideas and the public imaginary of AI. This also reflects a clear political agenda, as expressed by then Prime Minister Shinzō Abe's 2007 Innovation 25 program, which focuses on the combination of nostalgic recreations and advanced technology like robotics (Kovacic, 2018).

In China, interviewees are optimistic about AI's potential to improve efficiency, but they express doubts about its ability to replace human emotions and creativity. A Chinese journalist noted, "Our work requires abundant creativity and imagination. There are human emotions embedded in it" (J-CN2). The flipside of the coin is that many newsrooms need to take into account that their content is scrutinized with AI-based governmental censorship systems. Technology comes, therefore, as a double-edged sword, particularly to those newsrooms of local news outlets that cannot afford the technology and still need to manually "filter" the content. In this context, the relevant role of different media and discourse cultures regarding AI becomes apparent: censorship, tighter governmental controls, and access to technology result in a specific discourse culture that significantly impacts the way news organizations develop professional journalistic cultures and apply new technology. The results support previous findings of both resilience and adaptability to AI among Chinese journalists (Yu & Huang, 2021).

In the UK and Switzerland, interviewees predominantly emphasize the potential of AI to increase efficiency and scale by automating certain processes, allowing journalists to focus on higher-level tasks that require critical thinking and complex analysis. Machines are seen as social entities that coexist with humans in different social settings, thereby taking on different perceptions. Overall, regarding RQ2, the findings confirm both resilience and adaptability.

## *Ethical challenges and professional contexts*

Addressing RQ3, the ethical challenges presented by AI in journalism are influenced by journalists' cultural and professional backgrounds. Ethical concerns, such as bias and misinformation, are central to the discourse on AI in journalism. However, ethical considerations are not always a top priority in many newsrooms. All interviewees, as previously shown in (Porlezza et al., 2022) or (Porlezza, 2019), stated that ethical concerns are not a top priority. Governance issues are approached pragmatically, with problems tackled on a case-by-case basis rather than through institutionalized processes. At the time of the study, only some organizations in our sample, such as the BBC and NHK, had developed guiding principles (BBC, 2021) and frameworks to ensure the responsible and trustworthy development of AI. Public perception plays a crucial role in shaping AI's future in journalism, as emphasized by Sartori and Bocca (2023). This highlights the need for a balanced approach that considers both technological potential and ethical implications.

Governance issues are "pragmatically" approached, which means that problems are tackled on a case-by-case basis, without any institutionalized processes or strict guidelines. In the meantime, ethical issues around the responsible use of AI in news work have become one of the main issues institutions, press councils, and news organizations are looking into. The Council of Europe's Committee of Experts on Increasing Resilience of Media has recently released guidelines on the use of digital tools, including artificial intelligence for journalism. In addition, news organizations around the world have started to develop codes of ethics and guidelines regarding the responsible use of AI in journalism (Becker et al., 2023) — also because the audience perceives AI technology and its use in the news media skeptically (Vogler et al., 2023). It seems that at least at a strategic level, news outlets have acknowledged the need to define more clearly what a responsible use of AI consists of.

Overall, this study sought to investigate how journalists in different journalistic cultures perceive AI in news work and, in particular, the human-machine relation in their newsrooms. The findings show that different social contexts and cultures influence the way journalists perceive AI technology, depending both on the status and the cultural embeddedness of the technology. There are significant differences between newsworkers, mostly between Japan and Switzerland. Japan is characterized by an enculturation of AI technology that is not only reflected in the entanglement of industry and politics, and the exaggerated expectations of senior management, but also in the strict separation between journalists and technologists. AI is often the responsibility of the IT department. In Switzerland, interviewees' imaginaries demonstrate a positive focus on efficiency with no pop-cultural references involved. Additionally, journalists sometimes actively test tools or contribute to their functionality. Where discourses are still lacking is with regard to ethical issues, although the BBC and NHK are early adopters of guidelines for machine learning.

## Conclusion

In light of recent developments, it is crucial to consider how these findings connect to current trends regarding the possibilities and risks of generative AI, such as ChatGPT. Generative AI holds the promise of transformingsyom journalism by automating routine tasks and augmenting journalistic capabilities. However, this integration must be approached with caution. Understanding the cultural and ethical dimensions is essential to ensure that AI enhances journalistic practices while preserving core values of truth, creativity, and integrity. Addressing these aspects will harness AI's potential to advance journalism, ensuring it remains a pillar of informed and democratic societies. Ethical issues surrounding the responsible use of AI in news work have become a primary focus for institutions, press councils, and news organizations. The Council of Europe's Committee of Experts on Increasing Resilience of Media has recently released guidelines on the use of digital tools, including AI, for journalism. Furthermore, news organizations worldwide are developing codes of ethics and guidelines for the responsible use of AI in journalism. In conclusion, this study underscores the significance of considering cultural and ethical dimensions in the integration of AI into journalism. By doing so, we can fully explore the transformative potential of AI to enhance journalistic practices while safeguarding the fundamental values that define the profession.

Like any scholarly endeavor, this study is not without its constraints. The initial employment of a snowball sampling approach, though practical for identifying key participants within a closely knit community, is not devoid of its limitations. This method, while effective in engaging individuals central to the discourse on AI and journalism, inevitably introduces certain biases and limits the generalizability of the findings. Nevertheless, it served as a crucial starting point for this investigation.

The unique operational frameworks of each news organization present another layer of complexity. Assessing the extent to which journalists can contribute to the co-design process of AI tools is challenging, given the diverse and often proprietary nature of these frameworks. Each organization's distinct approach complicates efforts to derive universally applicable insights.

A further constraint arises from market considerations, which may have led some interviewees to withhold detailed information about the AI tools they utilize. This reticence, driven by competitive pressures, limits the depth of discussion regarding the integration of ethical values into these technologies.

Future research should aim to delve deeper into how news organizations perceive and implement transparency and accountability within their ethical codes, particularly concerning the development and deployment of AI and machine learning technologies. It is crucial to explore not only the theoretical underpinnings of these ethical principles but also their practical applications. Furthermore, a comparative analysis of how different cultural contexts influence the definition and implementation of concepts such as transparency and diversity in algorithmic journalism would yield valuable insights. Understanding these cultural nuances can illuminate the varied global landscape of AI integration in journalism, highlighting both convergences and divergences.

By addressing these areas, future research can build upon the foundation laid by this study, advancing a more robust and comprehensive understanding of the ethical, cultural, and practical dimensions of AI in journalism. This study will contribute to a richer academic dialogue, fostering a more nuanced appreciation of the interplay between technology and journalistic practice.

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## Note

1. We understand AI as "a collection of ideas, technologies that involve a computer system to perform tasks that would normally require human intelligence" (Brennen et al., 2018, p. 1). This particular definition is useful because it reflects the idea that AI cannot be reduced to technological aspects only, but it also represents a collection of ideas revolving around the technology. However, there is no universally accepted definition of AI.

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