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Introduction: Innovations, Transitions and Transformations in Digital Journalism: Algorithmic, Symbolic, and New Forms of Journalism

Binakuromo Ogbemor^a and Cynthia Carter^b

^a Department of Journalism Studies, The University of Sheffield, Sheffield, England, UK
b.ogbebor@sheffield.ac.uk

^b School of Journalism, Media and Culture, Cardiff University, Cardiff, Wales, UK
cartercl@cardiff.ac.uk

Abstract

This special issue of *Digital Journalism* includes a selection of articles from the seventh biennial Future of Journalism (FOJ) conference hosted by Cardiff University's School of Journalism, Media and Culture (JOMEC) in September 2019. With the theme, "Innovations, Transitions and Transformations", the conference featured a wide range of presentations variously exploring how journalism practice is changing in response to technological change, as well as others highlighting the urgent need for development of new conceptual frameworks and methodological approaches to better understand such transformations. The papers in this issue build upon the conference theme, offering a broad array of compelling and important insights into contemporary issues and debates across the field of digital journalism studies.

Keywords: future of journalism; artificial intelligence; digital technologies; fake news; participative gatekeeping; audiences; digital innovation history; local news business models

This special issue of *Digital Journalism* includes a selection of article from the seventh biennial Future of Journalism (FOJ) conference hosted by Cardiff University's School of Journalism, Media and Culture (JOMEC) in September 2019. With the theme, "Innovations, Transitions and Transformations", the conference featured a wide range of presentations on how journalism studies should respond to technological and innovative shifts in digital journalism, both conceptually and methodologically. A broad range of topics¹ based on this theme were explored across over 150 papers in 46 sessions.

In recent years, digital journalism studies scholars have devoted a great deal of time and effort toward understanding disruptions to journalism brought about, for example, by the internet, social media platforms, as well as the use of algorithms and big data. They have demonstrated many of the complex ways in which these technologies have, for better or for worse, impacted on news production processes, distribution, labour, issues around media ownership and control, the role and definition of journalism and journalists, as well as the changing relationships between journalists and their audiences. The articles in this special issue offer a wide range of compelling insights into several of these developments.

The issue starts with Dawn Wheatley and Raul Ferrer-Conill's article "The temporal nature of mobile push notification alerts: A study of European news outlets' dissemination patterns" where they examine, by news publisher type and national context, transformations to journalism brought about by mobile phone push notification technology, an area of study currently under-researched. Based on findings from a content analysis of 7092 push notifications from 34 news outlets in nine north-western European countries, the authors highlight the growing significance of this technology as an everyday journalistic tool used to capture and maintain reader attention in a time of information overload, disinformation and

competition. Specifically, the study provides insights into how some news organisations are using push notification technology and how its use may relate to changes in audience behaviour and activity. Additionally, it documents the times news organisations send push notifications to their mobile audiences and their temporal personalisation options (this relates to customisation settings within apps to enhance user experience). For instance, more push notifications were sent to media audiences during weekdays than on weekends; that, largely speaking, there is very little use of them overnight; 7.00am is when most start coming in while 12noon -1.00pm is the most popular period for sending them out. The study identified three considerations that shape temporal personalisation options. They are quiet modes, breaking news, and digests. Regarding quiet modes, the authors discovered while the apps used by some media outlets automatically provided this opportunity for users, mostly overnight, others allowed users to manage the time they wanted their sound and vibrations to be turned off. The study also shows how many apps still draw on the immediacy element of breaking news as the basis for notifications. The digest pattern relates to the way “notifications are regularised with the aim of being incorporated into users’ daily rhythms of news consumption”. The authors argue that news outlets try to integrate with as well as disrupt the audience’s activity through push notifications. As Wheatley and Ferrer-Conill point out, news personalisation using the push notification in newsmaking is important because it “bypasses social media and news aggregators, reaching readers directly; it alters the agency and control of temporal news personalisation; and reinforces mobile as the locus of contact between news organisations and audiences”.

Another digital innovation that has the potential to produce significant transformations in journalism practice is predictive smart features embedded within digital technologies employing artificial intelligence. Smart features can predict or suggest responses

to emails and other text messages, making technologies faster and easier to use. But how might we assess the possibility of using predictive texts in the future for news headlines and news stories? To address this and other related questions, in their article “Probabilistic storytelling and temporal exigencies in predictive data journalism”, Christian Pentzold and Denise Fechner critically analyse the expectation that “by using available data, journalists will be able to compose predictions and write tomorrow’s headlines and stories accordingly” (Maycotte, 2015). Drawing on responses from interviews with professionals working in data journalism projects in Europe, the U.S. and Israel, the authors provide in-depth analyses of the shape and possible consequences of the use of predictive analytics for news making. The article introduces two key concepts, the idea of temporal exigencies and the notion of probabilistic storytelling. The concept of temporal exigencies comprises 1) the temporal limits of forecasting news reports based on past data and, 2) time-consuming efforts of forecasting several potential realities, some of which may never come true. Probabilistic storytelling uses visuals and narratives to outline a range of possible forecasts and measures the degree of uncertainty. The authors provide insight into how predictive analytics are used to make evidentiary claims; the epistemological implications of these future-oriented news productions; and how practitioners dealt with the intrinsic fallibility of such forecasts. Though the computation of data is associated with increasingly precise evaluations, journalists often find it difficult to turn the prognoses from the algorithms into strong news stories. There are fears that such stories could lead to misinformation and further erode public trust in the media because they only offer potential futures. This fear is not unfounded considering the recent wave of dis/misinformation in the media owing largely to the possibilities offered by digital technology.

Concerns around dis/misinformation are also highlighted in the next article in this special issue which assesses the phenomenon of “fake news” popularised by the administration of the former U.S. President, Donald Trump, who frequently referred to views from mainstream media he found to be disagreeable using this term, and those who publish it as “fake news media” (Polletta and Callahan, 2019; Ross and Rivers, 2018). There is a now considerable scholarly literature critiquing the former President Trump for his “fake news” attacks on the news media. However, his impact could be more complex than earlier imagined. In their article, “Trump and Trumpism: The symbolic dimensions and implications of Donald Trump for journalism”, Matt Carlson, Sue Robinson and Seth Lewis map the former President’s influence on the U.S. press, analysing journalistic discourses surrounding two phenomena: Donald Trump as an “individual” and Donald Trump as a “symbol”. Donald Trump “as an individual” invites scrutiny because of his elected role and his open disdain for journalists” but as a symbol, Trump collapses together interlinking forces, including a network of conservative media outlets, a turn to populist politics, vocal attacks on journalists, and the decline of mainstream journalism. Trump-as-symbol encompasses ongoing concern around journalism in the present era of increasing uncertainty about the continued viability of journalism in the age of digital transformations, the unchecked proliferation of public voices made possible by social media such as Twitter, and fears over the circulation of false information. The authors argue that while “Trump the individual” signals an isolatable and idiosyncratic threat, “Trump the symbol” pertains to a more complex environment, one that challenges journalistic authority and threatens the gatekeeping power of the press in the age of politicians’ free access to Social Networking Sites (SNS) such as Twitter.

It is often claimed that the ability of SNS and other forms of digital technology to connect political actors with the public has had a considerable impact on journalism. Such

technologies, some suggest, have actually improved accessibility and interaction between journalists and their audiences (see Appelgren 2018 for a discussion of this assertion). In their article, “Engaging citizens for climate change—challenges for journalism”, Anna Maria Jönsson and Ester Appelgren challenge this perception by taking a closer look at data journalism’s level of engagement with the public on climate change issues. Using the methods of content analysis and interviews, they examine how Swedish public service media use data journalism to engage with their audiences on this topic. Using Schulmeister’s (2003) taxonomy of interactivity, the study demonstrates that the level of such interactivity is only moderate. Though producers place priority on educating and raising awareness on climate change, the level of interaction with audiences does not include, for example, use of interactive features, metrics, and qualitative audience data. Jönsson and Appelgren argue that data journalism would benefit from employing a greater variety digital methods and audience research techniques to enhance their efforts to engage audiences in climate change issues and debates.

Audiences are also central in Nicole Blanchett’s article, “Participative gatekeeping: The intersection of news, audience data, newswriters, and economics”. In this article, Nicole Blanchett explores data journalism’s use of audience metrics and analytics, highlighting inconsistencies in how both are defined and understood by journalism researchers. The lack of consistent terminology, Blanchett argues, may limit scholarly understanding around the everyday use of audience data in the newsroom. Drawing from knowledge gathered from her ethnographic research in six newsrooms across three countries (Norway, Canada, and England), Blanchett proposes a new participative gatekeeping model relating to the use of audience data. This model consists of three channels – promotional (short-term gatekeeping done on news site homepages e.g.,

prioritising trending news stories); developmental (longer-term use of analytics to determine how media audiences consume information) and experimental (a more porous channel of experimentation where such hypotheses are tested). The article presents detailed analysis of the participative gatekeeping analytical model.

“When computers were new: Shifts in the journalistic sensorium (1960s–1990s)”, by Juliette De Maeyer and John Delva, goes back in time to examine a key moment in the history of digital innovations and transformations in journalism. The article closely examines, in the first instance, the introduction of computers in newsrooms in the 1960s and 1970s, including the transition from analogue to the digital systems. The authors do so in order to explore how these developments appear to have affected many aspects of journalism and to evaluate their long-lasting consequences for journalism practice. Their research brings to light the wide-ranging changes taking place in journalism during this period in terms of labour, working conditions, techniques, and tools of the profession, amongst others. It provides a deep, historical understanding of the variety of innovations, transformations, and transitions that underpin contemporary forms of journalism. The findings reported on in the article are based on an archival analysis of metajournalistic discourses in the Canadian magazine published by the Fédération Professionnelle des Journalistes du Québec, the trade association for journalists in the province of Québec, Canada, and interviews with people who were journalists during the transitional decades of the 1960s - 1980s.

Technological transitions, innovations and transformations in journalism are also having a wide range of impacts on the provision of local news content. As Ragnhild Olsen outlines in her article “The value of local news in the digital realm: Introducing the integrated value creation model”, historically local newspapers in Western liberal

democracies have relied on a two-sided market model for double value creation – with news sold to audiences in one market and audiences sold to advertisers in another. In the process, newspapers have also created value for society, in that they have contributed to informing citizens on important issues, widely regarded as central to the health of democratic societies. Many local newspapers are now facing difficulties attracting sufficient advertising revenue as they transition to digital provision. Commercial models of news are thus falling apart. To save local newspapers in Western democracies from these challenges, Olsen introduces the “integrated value creation model”, which she describes as situated within a triple market setting where local newspapers receive financial support from the state in return for serving public interest functions while at the same time, conducting business as commercial newspapers.

Turning our attention to Artificial Intelligence (AI), it seems fair to suggest its development is fundamentally transforming human interactions in almost every facet of life including family, religion, health, education, and industries (Clayton and Kleinman, 2020). The field of journalism has been profoundly altered by AI, with its impact felt across all news formats (print, broadcast, online) and processes (including news production, transmission, and interaction with audiences). Journalism’s use of AI has elicited plethora of responses within and outside journalism. While some stakeholders are critical of the field’s increasing dependence on algorithms, others present them as a solution to many problems including promoting objectivity, building trust, and improving standards in journalism (Ali and Hassoun 2019; Shin 2020; Shneiderman 2020). Concurring with this latter view, in their article “Safeguarding the journalistic DNA: Attitudes towards the role of professional values in algorithmic news recommender designs”, Mariella Bastian, Natali Helberger and Mykola

Makhortykh contend that the use of Algorithmic News Recommenders (ANRs) can lead to progressive reassessments and (re)definitions of media organizations' values, missions and standards. This view is borne out in findings from semi-structured interviews with employees from two quality newspapers in the Netherlands and Switzerland demonstrating that journalists appear to broadly back the use of AI (including the use of ANRs) in the establishment of journalistic trust and transparency and to meet the interests of their audiences. While AI helps to shape news values and enhance newsroom efficiency, human editors' work is still widely regarded as essential to news production and dissemination. At the same time, in many newsrooms around the world, journalists are questioning whether objectivity should or should not continue to be one of journalism's core values.

Though reasons for optimism around AI certainly vary within news organisations and in society more generally, recent events have certainly called into question reliance on AI to ensure objectivity wherever it is used. For instance, Joy Buolamwini, a researcher in the MIT Media Lab's Civic Media group, and Timnet Gebru, former co-lead for Google's ethical AI Team, argue that facial recognition technology using artificial intelligence is less accurate or objective when identifying people of colour and women, a situation that has sometimes resulted in discrimination at the intersections of race and gender (Buolamwini and Gebru 2018; see also Hao 2020; Hardesty 2018; Walker 2020). Worryingly, this software is already being used, the authors note, to "help determine who is hired, fired, granted a loan, or how long an individual spends in prison, decisions that have been traditionally performed by humans are rapidly made by algorithms".

Another example of problematic use of AI is related to an incident that took place in 2020 where Ofqual (the UK's Office of Qualifications and Examinations Regulations) used an

algorithm to determine GCSE and A Level exam results for secondary students. The decision, which followed the cancellation of their exams because of teaching challenges brought on by coronavirus lockdown restrictions, sparked outrage among students when it became known that the algorithms were not as objective as previously presumed. Analysts argued that the algorithmised results were prejudiced in favour of private schools, typically attended by wealthy pupils, while exceptionally good students from state schools were at risk of being downgraded because of the lower class status and location of their schools (BBC News 2020).

As dependence on AI increases in journalism, politics, and other aspects of life, it is important for stakeholders within and outside journalism to bear in mind that AI has a human element - the point at which humans input data into the machine.

Conclusion

Articles in this issue demonstrate some of the ways in which journalism has become progressively shaped by an ever-widening array of digital technologies. In different ways, each points to the increasing role they play in determining new forms of journalism practice and values, and the possible challenging, if not negative, consequences for journalism practice.

Of course, it is important to note digital technologies can be used in politically progressive ways - to promote efficiency and economic viability in journalism practice, increase story relevance for audiences and help sustain and enhance more dynamic forms of civic engagement. Nevertheless, as the articles in this special issue on The Future of Journalism make clear, the increasing use of AI and digital technologies worldwide necessitates greater critical scrutiny of its current and planned uses and possible impacts on the provision of pertinent, authoritative, and trustworthy news.² How, we might ask, do we

envisage a future in which these technologies are used for good, to support journalism's core values and enhance public trust in its provision?

Notes

1. Issues addressed in the Future of Journalism conference hosted by Cardiff University's School of Journalism, Media and Culture (JOMEC) in September 2019:
 - How are definitions of journalism changing in an evolving news ecosystem?
 - What is the future for today's journalist in an environment increasingly shaped by artificial intelligence, big data, algorithmic processing and "liminal" journalism practices?
 - How are standards of quality, balance and fairness changing, including with regard to the perceived decline of 'mainstream media' and the rise of hyper-partisan outlets?
 - To what extent are social media democratising citizens' engagement with news across mobile platforms?
 - How best to encourage new cultures of experimentation and innovation for rethinking journalistic form and practice?
2. *Digital Journalism* has commissioned special issues into this area, one of which has already been published. See: [Digital Journalism: Vol 7, No 8 \(tandfonline.com\)](https://www.tandfonline.com)

Disclosure Statement

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