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DATA JOURNALISM, DIGITAL VERIFICATION AND AI

THE CASE FOR NEWSROOM CONVERGENCE

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Abstract: This article discusses the opportunities and challenges of implementing data journalism, digital verification and AI in the centre of the newsroom. Data journalism, digital verification and fact-checking continue to be seen like jobs for specialists. As has AI, they have all entered newsrooms in various forms over the past two decades. This article comes out of preparatory work for an online course on data literacy for journalism, communication and creative industries students called MediaNumeric. The course focuses on search and exploration of data, digital skills, and tracking and debunking misinformation. As part of this special issue, this article wants to offer a sense of what is at stake in data entering newsrooms, and editorial and media production offices.

Keywords: Data journalism, Digital verification, AI, Newsroom

1 Introduction

Digitisation has changed all aspects of the news media landscape, from the way content is created, to how it is distributed and interacted with.[1] Meanwhile the quality of news and news engagement is under threat. Among other sources, reports for the European Commission say as much. There is decreasing trust and what is called 'information disorder', digitisation is changing user behaviour, and the dominance of global technology owned by tech giants makes it unclear whether Artificial Intelligence (AI) can develop for the social good[2] In news production (as in media making in general), these present a direct challenge. 'Data journalism' is one of the terms used in the field to identify new forms of storytelling that vary from using data as a source, to using new technologies to visualise stories and news applications.[3] Such 'data journalism' does not, in principle, affect the principles of journalism as they have been established in the 20th century. Journalistic storytelling continues to answer who, what, where, when and why questions. Arguably, with the help of digital verification and use of AI tools, journalism can continue to deliver reliable, accurate and truthful information in the changing information landscape and perhaps come to offer even more incisive investigative reporting. The skills that are needed to deliver 'quality' information have, of course, evolved. It is important therefore, according to journalism researchers such as Steensen, that newsrooms incorporate new information literacy competencies.[4]

As part of the preparation for an open online course in data literacy for journalism, communication and creative industries students, a European team of academic researchers, teachers, archivists and journalists surveyed the state

of the art regarding the search and exploration of data, digital skills for journalists and professional media storytellers, and tracking and debunking misinformation. MediaNumeric, as the project is called, is partly a literature overview, partly based on 56 expert interviews. These experts confirmed that digital verification and fact-checking are still, to their regret, considered jobs for data specialists in the field.[5] These specialists tend to be externally hired to contribute to individual stories, or are part of a separate department within a media organisation. In their data journalism podcast Alberto Cairo and Simon Rogers address this as well. Their guests tell them that as data and visualisation experts, they felt like a 'service desk': there to provide data or a visual in support of a text story rather than a source of ideas and an investigative team in and of itself.[6]

Keeping data specialists and journalists apart will not help fill the significant knowledge and skill gap that appears to continue to exist between them. That does seem important though, given developments in the media ecosystem we signalled at the top of this article which include increasing numbers of media outlets by amateur and professional makers and greater accessibility of AI that uses data and algorithms beyond anyone's overview. We note that there are some initiatives that work towards closing the data skill gap. The City University in London Centre for Investigative Journalism, e.g., offers dedicated courses in statistics for journalists to help journalism students overcome their fear of math and spreadsheets, and their feeling that data and numbers are complicated.[7] There is also the MediaNumeric course. Important to say that neither of these two includes newsroom editors. As will become clear below, they could benefit from training in data-driven journalism which might be a crucial element to newsrooms embracing the digital era.

Bringing journalists and AI and data specialists together is a new form of 'newsroom convergence'. Formed around the principle of bringing formerly separated news organisation departments together, it would help make different forms of data journalism more visible, among them digital verification and fact-checking. Specialists would more easily find their place in the news production flow, which might ease the exchange of knowledge and make data journalism a more ordinary and everyday part of media work.

Using a literature review and a small number of qualitative interviews with expert media professionals, this article attempts to provide firm ground for why it is important that more people in the newsroom learn how to work with large datasets, whether that is to develop and tell stories or to check the authenticity of stories through digital verification. In addition, it will discuss who should learn these skills and what benefits this can bring to media organisations (and eventually to societies as a whole). A broader understanding of the role and application of data and technology in journalism will ultimately help secure the future of journalism, as transparent, well-founded use of data and sources is the basis of trust in the reliability of media content. The literature review was based on a targeted search for recent articles on data journalism, digital verification and fact-checking and newsroom convergence.

The interview extracts come from a set of 56 interviews undertaken as part of a 2021-2023 Erasmus+ funded project on data literacy. Elsewhere in this issue, the interview material is discussed in more detail.[8] For the purpose of this article, out of this set, the interviews with experts also employed by media organisations were studied for their examples and arguments regarding data journalism. Based on their professional experience in media organisations, they add a practice-based perspective. As such, they are used here for inspiration and illustration and as validation of the literature review. Relevant professional experience of these eight interviewees will be mentioned with the quotes from the interview material. Their professional interest is in fact-checking, data journalism and the news archive. They are based in France, the USA, the UK and Poland. One, e.g., is the head of AFP's Medialab, another is an editor-in-chief.

2 Beyond Numbers: Data Journalism

Discussing data journalism requires that we know what we mean by data and by data journalism. In the dedicated journal *Data Journalism*, of which this overview article has made good use, Bradshaw remarks that many think that

data revolves around numbers and spreadsheets.[9] It generally refers to a description of something that allows recording, analysing, and reorganising. To datafy a phenomenon, according to Mayer-Schönberger & Cukier is 'to put it in a quantified format so that it can be tabulated and analysed'.[10] Data-driven journalism and storytelling comprises essentially any story that rests in some part on the analysis of a data set, as data and visual journalists Cairo and Rogers remark in their podcast series.[11] Visual elements, such as charts, maps, or graphics often elucidate the data although not all data-driven journalism includes data visualisation. Simon Rogers is a renowned data journalist, Alberto Cairo a specialist in data visualisation.

Journalists have always used some form of data collection and analysis in their reporting. In the 2000s access to online data became available and began to play a role in large-scale investigations. Examples are the UK parliamentary expenses scandal (2009), the WikiLeaks diplomatic cables (2010), the offshore leaks (2012-2013), Luxembourg Leaks (2014), Swiss Leaks (2015), Panama Papers (2016), Paradise Papers (2017), FinCEN Files (2020), OpenLux (2021) and the Pandora Papers (2021).

The ability to analyse data sets enables journalists to verify for themselves information that is provided to them by a source, an organisation or a government. These third parties might be promoting a specific agenda though. The piece of the data offered might be in support of specific goals rather than broader stories based on different facets embedded in the data. Instead of reporting the supplied figures and assuming them to be correct, data journalism examines the data and comes to its own conclusions. Additional stories might be found, argues Lorenz. Data research is thus able to provide news articles with more depth that illuminate aspects of stories that might otherwise stay hidden.[12]

The downside to data-driven journalism, a Reuter's team says, is its high cost. With news and information so widely available, and advertising income shared by so many online and offline news outlets, media companies are all struggling with revenue and distribution.[13] It can be difficult to monetise general news reports as these can be easily copied by competing news organisations.[14] The detail and complexity of data-based stories has the advantage that it makes them less easy to replicate. While competing news organisations are able to report on the findings in a published article, such stories are more copy-proof. In addition, they tend to be popular with readers and provide an opportunity to draw in subscribers or increase advertising revenue.[15] For some media organisations, data-based journalism is the basis of a new business model as Aron Pilhofer, who holds a chair in Journalism Innovation at Temple University explains in Cairo and Rogers' data journalism podcast:

> I can tell you definitively that as we are shifting away from scale and reach and more toward reader revenue, membership, that people pay for exclusive things. People pay for content that you can't get anywhere else. And in a world now where exclusives are exclusive for about a nanosecond before someone aggregates them and they're immediately all around the web, the thing that can remain exclusive, the thing that's impossible to aggregate and rewrite quickly is data journalism, a great visualisation, great content. This is why *the New York Times* is doubling, tripling, quadrupling down. This is a business decision. This isn't because they love making pretty pictures on the Internet. They're making a business decision that is key to their future.[16]

Pilhofer's assessment suggests that journalists would do well to upgrade their data competencies. Journalists today are faced with data sets or information derived from them, as are most citizens. Financial reports, government statistics, climate data, information about health and diseases, such as Covid statistics recently, touch all of us. While it is hard to argue that everybody should learn how to code or create data visualisations, it is vital that journalists generally are able to analyse data sets so that they can independently verify the information that is being provided to them.

This level of competency is not a big ask. The MediaNumeric informants would gouge it at maths taught to 12-year-olds and enough of an understanding of statistics to get started in the field of storytelling with data. The problem here might be news organisations rather than journalists themselves. News editors and media managers would benefit from a better understanding of data-driven journalism. On joining *Libération* newspaper in 2015, Léchenet, one of our

interviewees, said: 'There was a lot of ambition and a lack of resources, and then there was, I think, a lack of understanding on the part of the editors of what we could do on the question of data and new formats' (MediaNumeric, Léchenet, 2021).

3 The importance of Digital Verification and Fact-Checking in Journalistic Work

It is assumed that trust in the media will increase when users are able to apply and check primary sources of statements in journalistic articles themselves. This is the goal in any case that lies at the heart of digital verification and fact-checking that relevant data and insight in the data are both made available. The overlap between fact-checking and (digital) verification can cause confusion. Verification (checking and verifying statements and sources) is a basic journalistic routine. Digital verification simply makes use of online sources and tools such as open-source intelligence (OSINT) to do so. Fact-checking, in turn, is a specific application within the verification process. Fact-check articles seek to verify the truth of facts as stated: going beyond whether something was said, it seeks to establish whether what is said is true. *The Washington Post,* e.g., has a fact checker tab on its homepage. The American newspaper considered its fact checks newsworthy during a recent presidential debate and around major elections as well as in other cases.[17] About the 2024 Biden-Trump debate, it wrote: 'The former president dusts off familiar falsehoods about tax cuts, inflation, energy independence, EVs, gas prices, crime, undocumented migrants and more.' These and similar headlines come with exact references in the body of the text.[18] Fact-checkers thus debunk misinformation and place claims in their proper context without which these claims mislead.[19]

Fact-checking is focused on more than the basic quality of the journalistic product, it seeks to make good on journalism's civic responsibility as it finds ways to limit the supply and impact of bad information. Fact-checking may reach audiences in different ways. *The Washington Post* and other newspapers have their own fact-checking teams. Facebook has partnership programmes with independent fact-checkers who attach labels on false or misleading content to warn users and reduce its distribution in the news feed.[20] Fact-checking aligns with the promotion of media literacy: it promotes media literacy and empowers people to spot misinformation for themselves. It works with institutions to advocate for better access to public data and policy outcomes in an effort to prevent or remedy the broader problems of misinformation.[21]

Fact-checking needs more than basic journalism skills, it also needs digital verification competencies that are not always present in newsrooms. In the BENEDMO report *The Gatekeepers of Truth* (BENEDMO is the Flemish-Dutch hub of the European Digital Media Observatory), journalist Luc van Bakel (VRT) states:

> I believe that the average journalist currently lacks sufficient knowledge of social media and OSINT techniques. I am confident that these techniques will become essential skills for journalists in the coming years. This doesn't require in-depth expertise, but rather a fundamental understanding of how to initiate internet research, for instance. These skills are becoming progressively more critical.[22]

Although fact-checking is an intensive and time-consuming task, the research literature, says Ognyanova, recognizes it as having the potential to have a significant social impact. It can increase knowledge about facts, help recognize disinformation and stimulate trust in the media.[23]

Fact-checking is widely discussed in the MediaNumeric interviews as a key activity that can be unlocked with greater data literacy. Without journalistic skills though, fact-checking decreases in value. Baybars Orsek, director of the International Fact-Checking Network, among others insisted in the MediaNumeric interviews that fact-checkers need the skills of a journalist (MediaNumeric, Orsek, 2021). Other informants also mention that the

number one rule of fact-checking is the journalistic routine to always seek out the source for basic verification. Whether it is a political claim in a speech or a viral photograph surfacing on social media, finding the source is the first most important thing a fact-checker needs to do. This requires search skills and knowing where to look for relevant information. (MediaNumeric interviews: Kiely, 2021; Cunliffe-Jones, 2021; Teyssou 2021; Holan, 2021).

Instead of arguing in favour of more in-depth expertise of specialist workers or teams, the MediaNumeric informants and the research literature agree that it would be best if all journalists in the newsroom learn the fundamentals of various verification techniques. They need to understand online platforms and databases to the extent that they can assess sources in an efficient manner which will enable them to produce reliable stories. Given how fact-checking is a time-consuming process, for the time being fact-checkers are of course an asset for the newsroom. Journalists will not always have the time to do extensive fact-checking themselves.

4 Opportunities and Challenges around Artificial Intelligence

Perhaps surprisingly given its negative press, Artificial Intelligence (AI) can also serve as a tool to process data and make it more accessible for journalists to work with. AI can, for example, analyse and select multiple sources of information, including on social media. With transparent algorithms, this broadens access to reliable sources, according to Opdahl and co-authors in *Data & Knowledge Engineering*.[24] But AI can do more than that, say Deuze and Beckett. Journalists can, e.g., strengthen their "story ideation, newsgathering, content creation and the dissemination, consumption and monetization of journalism".[25] According to Zhang & Perez Tornero in *Journal of Applied Journalism & Media Studies*, the use of AI has the potential to change traditional dynamics in journalism and media institutions in general.[26] While offering opportunities, such use of AI also causes concern. Will computers take over making stories? Will journalists become superfluous?

While AI tools are more and more used in newsrooms around the world, the editors who were interviewed for MediaNumeric took pains to underline that this does not change the fundamentals of journalism by which they mean that journalism still requires strong storytelling and research skills. Today, however, it is also the case that the possibility to disseminate 'news' is at everyone's fingertips. That makes speed for news organisations essential and AI tools might well be a game-changer in processing news and events at a fast pace. Some news organisations are indeed now using AI to generate whole articles. Michael Miller of News Corp Australia told the WAN-IFRA World News Media Congress in Taipei in 2023 that News Corp was supplementing local journalism in Australia with 3,000 articles a week created by generative AI, covering topics such as local weather, fuel prices, and traffic conditions.[27] The United Kingdom's second biggest regional news publisher, Newsquest, likewise is using "AI-assisted reporters" to generate copy across its local titles.[28] This will also mean that low-level jobs in journalism will be lost because AI is used. It is a much heard concern.

It is also unfortunate that AI is still a 'black box'. With the development of AI going at breakneck speed, research on what exactly AI does in relation to news is still limited. Challenges in using AI include ownership of the data and the computational processes used to sort and analyse these. Leiser, in addition, notes that many AI initiatives that began with a public interest mandate have been taken over by major companies such as Microsoft and Google. As the technology passes into the hands of private companies, it becomes difficult to know how the Large Language Models (LLMs) were put together, with what content and what kind of algorithms as algorithmic bias will change the type of results the AI provides.[29]

As AI is expected to gain a central role across the newsroom in the near future, training journalists on responsible AI is needed. Or, as Zhang & Perez Tornero state:

> The confluence between AI and journalism brings transformations in the evolution of news media. To identify and clarify the quandaries, it demands the active adaptation of mindset, shaping new concepts and recasting the journalistic environment.[30]

This is exactly why the experts interviewed for MediaNumeric argued that responsible AI needs to be integrated in newsroom work rather than be left to AI-specialists. AI will likely impact all aspects of making the news. As we rethink the making of news, it is imperative that understanding and to some extent working with data and AI becomes part of the tool set of all newsworkers.

The MediaNumeric experts also note that most organisations are not there yet. It is more usual than not that data teams are considered a niche area, separate from the core of the newsroom (Medianumeric interviews: Léchenet, 2021; Vaudano, 2021). They are concerned that data-driven storytelling, digital verification and fact-checking have not yet gained the necessary attention, although their importance and potential for wide-reaching impact are undisputed. They also note, for the sake of transparency, that integrating AI has its costs. Working on data sets, for example, is time-intensive. Investigative data journalism can take months or even years. The International Consortium of Investigative Journalists, for example, worked on the Pandora Papers for two years before they began publishing stories. With budgets under constant pressure, editors need to become aware of the impact that data can offer to be able to justify the time investment of their staff. They need therefore to understand more of the tools and the work process in order for them to commit budget and human resources to support data journalism, argues Green-Barber in *Data Journalism*.[31]

In the same journal, Beelman and LaFleur note that media groups who brought data into the heart of their news operations and skilled up their journalists to return to their departments with new tools, saw reporting take on an extra dimension.[32] This contrasts sharply with how other data and visualisation experts say they are still regarded as a 'service desk' (in the Data Journalism podcast mentioned above), there to provide data or a visual in support of a text story rather than a source of ideas and an investigative team in and of itself.[33] All journalists, the MediaNumeric interviewees believed, should be encouraged to feel comfortable and confident in challenging figures and statistics that are presented to them by outside sources on a daily basis. It does not need all members of a newsroom to be able to develop data collection tools, coding or visualisation techniques. More broadly shared insight in data-related journalistic possibilities, will improve the quality of reporting. Mazotte goes so far as to claim that this will foster transparency inside and outside of the newsroom which will help to rebuild public trust in the media.[34] Training for AI competency would therefore need to become far more widespread. To date, news organisations have not made it easy for their workers to acquire new skills in this regard. Newsrooms are overworked and budgets are limited. The 2022 Data Journalism survey found that more than one in three of the 1,800 respondents were entirely self-taught in this area.[35]

5 Concerns

Beyond training incoming journalists and upskilling newsrooms, there are other aspects to data-based news production that are concerning. One of these is archiving. Countless projects have been lost because the tools that were used to create the work no longer function. All data journalists and storytellers who were interviewed for the MediaNumeric project, said that some of their work no longer is accessible because the technology on which it was built has been retired. Other, similar snags are that the media organisation folded, the URL link no longer works, the rights over website domain names expired or the website changed, underwent an upgrade or the project was not considered a priority in allocating server space.

The availability of open-source data is another concern. Although the benefit of open-source data for democracy is widely recognized, the monetary value of their information has become an asset to organisations. X, the platform

previously known as Twitter, e.g., now charges a fee to access data. In addition, storage is also running up against General Data Production Regulations (GDPR) developed to protect the privacy of individuals.

Transparency is yet another concern as the controversial '*Sports Illustrated* case' shows. The American magazine published articles by AI-generated authors without making this entirely clear.[36] Failing to be transparent about the origin of content and worse, actively creating a scenario which presents a fictitious person as a real journalist, feeds a narrative that mainstream media are untrustworthy.[37] This particular case also shows how mistrust is fostered among journalists who fear that AI will be used to replace them, dumb down content and shrink newsrooms.

Segueing from lack of transparency to mistrust, we see how diametrically opposing viewpoints within newsrooms and among storytellers will also be the result of the use of the new data-related tools that are available today. While some journalists take this evolution in their stride, others will not.[38] This too is a real concern as building confidence in technology seems imperative given the speed of technological and digital developments, regardless whether these are used for responsible news or to spread disinformation.[39]

6 Moving Data Journalism and Fact-Checking to the Centre of the Newsroom through Newsroom Convergence

Collaboration is vital in the world of data-driven storytelling and could offer a solution to the challenges and concerns raised above. It is (still) rare for journalists to be an expert in all fields (and will likely continue to be rare) when it comes to data collection, data cleaning, statistical analysis, data visualisation, and so on. Each area needs the expertise of the other. For example, a data analyst working on a climate story will need the expertise of a specialist reporter to identify whether the data is 'clean' (accurate or plausible) or whether there are figures that need to be investigated further and potentially corrected. Reporters need the help of data visualisation specialists in order to transform information into striking visualisations to draw the reader in and give meaning to the data.

Traditionally, the concept of newsroom convergence refers to bringing together formerly separated departments within a news organisation, such as print, online, radio and television. While this is thought to increase cross-media reporting, traditional journalistic practices might well stay in place, say Larrondo Ureta and co-authors, arguing against many of the more optimistic authors in *Data Journalism*.[40] As processes of digitisation seem irreversible, newsroom convergence could be taken further to benefit the use of data.[41] Moving journalists and data specialists out of their separate departments and having them work at the same table, will allow for easier collaboration though and enable an easier exchange of knowledge and expertise. As data and visualisation experts become more integrally part of producing media stories, journalists are given an easy route to acquire data-related skills and apply these to their reporting, says Kalender in *Journalism and Media*.[42] Factchecking can be incorporated in the same way.

Promoting such newsroom convergence needs to take into account that they are deeply hierarchical work spaces. Dodds found that even when different sections of a newsroom are brought together, new hierarchies may still form, or old ones will continue to exist, leaving journalists with a feeling of professional dissonance.[43] In an earlier study, Tameling & Broersma showed that cultural resistance of reporters hindered the convergence process, eventually leading to the de-convergence of the newsroom.[44] In addition, newsroom convergence may run into strong objections from journalists as convergence has been used to downsize news organisations. An example is News Corp tearing down Murdoch's 'silo' model in favour of newsroom convergence (in addition to using AI for simple journalistic tasks which came with a significant loss of jobs.[45]

Cooperation between media sections might lessen time pressure for journalists though. Converged 'media-teams,' in addition, can come to function as a 'bridging' group between production teams, serving 'new' and 'old' media

platforms. It can foster the expansion of news production while enhancing the quality needed for well-rounded news coverage'.[46] All of which, of course, is little comfort to individuals who see job opportunities wane.

7 Conclusion

Data-driven storytelling, digital verification and artificial intelligence have become part of news production and media consumption alike. They require new skills. To spread these skills, they require that newsrooms are organised in new ways. Journalists need new tools to avoid the risk of adding to confusion, misinformation and disinformation. Today, these spread at great speed through social media platforms and even, at times, via media organisations themselves. The manipulation of information sharpens societal divides and polarised political discourse as it circulates across the globe. The storming of Capitol Hill in the United States in January 2021 is a case in point.

Journalists need data skills to be able to cut through the noise and ensure that they deliver reliable, accurate and truthful information despite the time pressure of today's 24-7, up-to-the-minute news flow. Many newsrooms need to upgrade their knowledge of how to work with data, artificial intelligence and digital investigation tools to use these efficiently and responsibly. A review of the data journalism research literature in conjunction with interviews with experts, conducted as part of the MediaNumeric project from 2021-2023 underlines that working with data and digital verification validates news work. Investing in training is obviously essential to encourage more story-tellers to adopt data and digital verification skills. Fostering cooperation between media workers will likely lead to more in-depth storytelling that uncovers previously unseen mechanisms and processes. This may well in turn encourage public institutions to open up their databases to public examination. All of this will require a shift in attitude among news editors to no longer see data journalism as a niche specialism. Reorganising and converging newsrooms would seem a key element in incorporating data and AI. Digitisation is an irreversible process. While newsroom convergence sounds like a choice, it is hard to see how data journalism and fact-checking in the centre can be kept out of the centre of the newsroom or how data skills could remain the specialisation of data journalists.

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9 List of Informants Quoted in the Article

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Eugene Kiely, **FactCheck.org**, Director (USA)

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Baybars Orsek, International Fact-Checking Network, Director (USA)

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