



How a COVID-19 Live Tracker Led to Innovation in Investigative Journalism

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The practice of investigative journalism is constantly pushing the boundaries of what journalism can do and should be. While certain core values remain intact, professionals readily experiment with new methods, forms of collaboration and technological solutions. In times of crisis, this inherent innovative power can be further accelerated and amplified. In this chapter, we explore the intersection of crisis, innovation and journalistic boundaries, as progress in this field inevitably produces questions and negotiations concerning both boundaries and definitions. Research on the ways in which journalists adapt or innovate during (and due to) crises is scarce, but the COVID-19 pandemic offered a unique opportunity to fill this gap. In the midst of the pandemic, a team of Norwegian researchers managed to gain access to the ongoing implementation of an

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infection-related data tracker at the most-read online newspaper in Norway. Team members were able to explore how this new tool impacted journalistic autonomy, cross-disciplinary work, and the relationship between staff and management (Konow-Lund et al., 2022).

In what follows, we will engage with these questions via our case study of VG Online's COVID-19 Live Tracker, a digital representation of facts including number of infections, vaccination rates, and actions implemented by government officials both locally and nationally. The aim of the live tracker was to update the audience with the best available information in real time. While such live trackers have been developed and implemented by many news organisations around the world, they remain poorly understood as examples of journalistic innovation. At VG Online, the COVID-19 Live Tracker gained over 472 million unique clicks in a country with a population of under 5.5 million citizens between 2020 and the fall of 2022.¹

VG Online's COVID-19 Live Tracker is an example of a crisis-driven genre innovation which merged technological affordances with audience needs and journalistic curiosity. It also represented a site of professional boundary work and negotiation. In fact, VG itself nominated the live tracker for the SKUP—the highest award in investigative journalism in Norway—based on the innovation that underpinned the project. This annual award recognises initiatives which have dominated the news agenda, emerged from new working methods and impacted society (Strømme, 2020). As VG argued in its nomination narrative, the COVID-19 Live Tracker aligned with those criteria because it involved much more than computational news production—many sources, for example, had to be contacted manually to supplement the data on the tracker. The award's emphasis on collaboration across areas and practices derives from the Old Norse concept of 'dugnad' *dugnaðr*, which means 'help, support'. It especially emphasises the importance of journalists sharing their investigative methodologies to pool knowledge and collaborate on ways to overcome obstacles, and VG saw all that possibility in its live tracker as a fundamentally crisis-driven innovation in journalistic practice.

When the COVID-19 virus first began to surface all over the world in February and early March 2020, media organisations and the rest of the society hurried to catch up to it. Months later, on 9 July 2020, WHO Director General Tedros Adhanom Ghebreyesus was still wondering:

¹Source of click total: a senior editorial developer at VG on 18 October 2022.

“How is it difficult for humans to unite to fight a common enemy that’s killing people indiscriminately?” (Picheta, 2020). Societal challenges persisted, even though, by that point, 11.8 million cases of the virus had been reported to the WHO and 544,000 lives had been lost (Picheta, 2020). A particular characteristic of the first phase of the pandemic was the uncertainty—nobody really knew the consequences of the virus in any of life’s arenas. For journalism, however, it had a dramatic impact on routines, work practices and audience behaviour. In the introduction to a special issue of *Digital Journalism*, Quandt and Wahl-Jorgensen (2021) suggest that the pandemic represented a critical moment in the ongoing transformation of journalistic practice. While much has been written and said about the impact of the pandemic on journalism, there remain relatively few studies which focus on investigative journalism in particular.

INNOVATING INVESTIGATIVE JOURNALISTIC PRACTICE IN A CRISIS

As argued elsewhere in this book, the genre of investigative journalism seeks above all to hold power to account, and this mission lends both depth and relevance to crisis communications in the newsroom. Stetka and Örnebring (2013, p. 3) define it as ‘sustained news coverage of moral and legal transgressions of persons in positions of power [...] that requires more time and resources than regular news reporting’. Other definitions of investigative journalism note that certain transgressions might also be concealed by the powerful behind turbulence of events and actions. (This aspect of things is especially relevant in times of crisis, when the authorities may want to do what is right but lack the knowledge or ability to do so.) In our historical overview in this book, we suggested that traditional gumshoe investigative journalism is related to precision journalism (Meyer, 2002 [1973]), which may be regarded as a precursor to computational journalism. ‘Precision journalism’ was coined by Philip Meyer to label his conviction that journalists can learn much from the research methods used by scientists—in short, he wanted ‘to encourage my colleagues in journalism to apply the principles of scientific method to their task of gathering and presenting the news’ (Meyer, 2002 [1973], p. vii). Computational journalism promotes what Jeanette M. Wing calls ‘computational thinking’, or a way of ‘solving problems, designing systems and understanding human behaviour that draws on the concepts fundamental to computer

science' (Wing, 2006, p. 33). According to Wing, this approach comes with a 'universally applicable attitude and skillset everyone, not just computer scientists, would be eager to learn and use' (p. 33). Astrid Gynnild pulls the two approaches together in her notion of 'computational exploration in journalism (CEJ)', which captures 'the multifaceted development of algorithms, data, and social science methods in reporting and storytelling' (Gynnild, 2014, p. 1). She stresses that CEJ does not abandon actual human intervention or the characteristics of traditional journalistic practice, which are rather 'taken for granted' (p. 7). As an example, Gynnild points to the work of the cross-disciplinary 'Toxic Waters' team at the *New York Times*, which employed CEJ but did not require every team member to be equally versed in data-journalistic methods (p. 8). Similarly, the implementation of VG's COVID-19 Live Tracker combined computational scope and human skills, but in this case during a time of considerable duress beginning in March 2020. Its data was generated via the acquisition of official datasets as well as traditional reporting methods and even legwork. The audience was given the ability to click through the data and offer feedback. The tracker data was also used in VG's reporting and graphics.

While they are not antithetical as such, the relationship between regular journalists and editorial technical developers has earned academic attention (Karlsen & Stavelin, 2014). However, the pandemic placed new demands upon such collaborations even as it forced many parts of society to accelerate a general trend toward organisational digitisation (Konow-Lund et al., 2022; McKinsey Report, 2020). Journalistic renewal often arrives from the side and finds its way to the centre when these 'newcomers' bring added value to news production in the form of their innovative practices and approaches. Holton and Belair-Gagnon (2018) state that 'strangers' to the journalistic field (such as web developers and programmers) are 'importing qualities to it that do not originally stem from the journalistic profession' and have thus 'helped to introduce new ways of identifying what news is, how to deliver it more effectively, and how to better engage with news audiences' (Holton & Belair-Gagnon, 2018, p. 72). While studies exist addressing how technologists contribute their tools to journalism (Cohen et al., 2011), few researchers have looked at how the collaboration between technologists and journalists develops in the midst of the negotiation of occupational norms and values. One exception is the work of Lewis and Usher (2013, 2014) on the transnational hacker network. They write: 'Most research has looked at the potential

tools that hackers might create for journalists [...] rather than examine the actual relationships between these two groups' (Lewis & Usher, 2014, p. 385). The present chapter seeks to remedy this situation by engaging with the ways in which such innovation propels transformation in practices related to editorial decision making and management, media strategy and journalistic production.

Clearly, VG Online's COVID-19 Live Tracker both arose from and occasioned further innovation in that newsroom's journalistic practice, engagement with its audience, and cross-disciplinary collaborations, especially between developers and journalists. Nevertheless, researchers observe that many media organisations continue to link innovation to business and commercial success rather than the work of journalism itself. Creech and Nadler (2018) argue that this myopic view overlooks the impact of innovation on various historical, structural and cultural aspects of journalism. Storsul and Krumsvik (2013, pp. 16–17) argue that innovation is not only important to the platforms, processes and external promotion of brands but also a potential driver of paradigmatic change in the 'organization's mindset, values and business model'. More recently, Krumsvik et al. (2019) added that journalistic innovation could even be related to the news media's social purposes (see also Ní Bhroin, 2015). New combinations of media products and services—and existing combinations of them used in new ways—might improve the quality of life of citizens and drive positive change in society (Mulgan 2007).

Media innovations appear to accompany the audience's changed or intensified need for information in a crisis, and the main task for both journalists and their editors is to accommodate this need via whatever collaborations are necessary between individuals and departments and practices. Pavlik (2013, p. 183) defines news media innovation as 'the process of taking a new approach to media practices and forms while maintaining a commitment to quality and high ethical standards', arguing that innovation is a prerequisite for achieving a 'viable revenue model for the twenty-first century'. He associates innovation with four aspects of journalistic practice: (1) creating, delivering and presenting news content; (2) engaging the public in an interactive news discourse; (3) employing new methods of reporting optimised for the digital, networked age; and (4) developing new management and organisational strategies for a digital, networked and mobile environment (2013, p. 183).

During crises, though, innovation is not only implemented but also negotiated based upon the occupational norms and values of the

newsroom (Lewis & Usher, 2014), and this process inevitably challenges existing journalistic boundaries, genres and identities. The professional identity of the journalist is increasingly fluid in character, but at the same time stable and in some ways resistant to change (Wiik, 2010). The anthology *Boundaries of journalism* (Carlson & Lewis, 2015) applies Thomas Gieryn's sociological concept of 'boundary work' to a range of situations in journalism impacted by the constant negotiation of professional boundaries. Such negotiation can take place with external actors and fields of practice—recall Meyer's discussion of the boundaries between science and journalism. It can also take place when new actors, or 'strangers', bring alternative logics and mindsets with them into their journalistic practice (see, for example, Eldridge II, 2018; Holton & Belair-Gagnon, 2018). Inter-professional collaborations on innovative projects demand boundary work around issues such as jurisdiction within a certain field, or 'questions as to who may possess – and act on – legitimate knowledge' (Carlson & Lewis, 2015, p. 3). The impact of these negotiations lies in their 'epistemic authority', which 'binds knowledge and power together as authority carries concomitant rewards of prestige, autonomy, and material benefits' (Carlson & Lewis, 2015, p. 3). At times of crisis-driven innovation, existing understandings and arrangements become subject to interrogation, and new possibilities arise. The VG COVID-19 Live Tracker supplies an excellent case of such real-time boundary work and the ways in which our expectations for journalistic products and practices can shift.

METHODOLOGICAL APPROACH

The methodology for this chapter involves a single case study—the implementation of VG's COVID-19 Live Tracker—as a window into the complexities of journalistic practice during the first pandemic in a century. Here, the case methodology will enable the depth of inquiry that we need to understand the impact of a crisis on a media organisation in terms of its structure, routines and processes (Yin, 2017). The COVID-19 pandemic was a collective traumatic event which challenged journalists to fulfil their roles as professionals even while suffering its consequences along with everyone else. There have been few such occasions in modern history where journalists have themselves struggled to make sense of the critical event on which they are reporting (Konow-Lund & Olsson, 2016). As the pandemic spread, journalists had to quickly adapt to new routines, such as working remotely, and researchers had to adapt as well. The methods

report from the VG team, submitted for the SKUP award, sheds light on the actual tools which were developed and deployed, but to grasp the subtle negotiations and situated experiences of the journalists and editors involved, we opted for several additional methodological approaches: (1) We conducted semi-structured qualitative one-on-one interviews using videoconferencing software. (2) We sought out informants in three distinct groups: those comfortable with meta-journalistic discourse and trained to analyse journalism itself in contexts such as the pandemic (this group included informants from the Norwegian Journalist Union, the Association of Norwegian Editors, and Faktisk.no [Norwegian Factcheckers]); regular news workers across disciplines; and editors and managers. (3) We interviewed informants both during the lockdown and afterward.

Regarding the first group of informants, Carlson (2016, p. 350) has defined meta-journalistic discourse as a ‘site in which actors publicly engage in processes of establishing definitions, setting boundaries, and rendering judgments about journalism’s legitimacy’. In this sense, it captures the ways in which journalists themselves frame the conversation about their work (Perreault & Vos, 2019; Vos & Perreault, 2020). While some aspects of the meta-journalistic discourse address the extended COVID-19 media ecology, other aspects look inward to the journalistic community itself. By reaching out to actors who may not have had first-hand experience with producing journalism during the pandemic, we hoped to secure an institutional perspective regarding the pandemic’s impact on journalism as an industry. These informants included managers at media organisations, editors, senior journalists, and a technological expert, and our first six interviews took place in January 2021. The next round of interviews took place in April and May and involved mostly regular news workers—that is, breaking-news journalists, investigative reporters and editorial developers. The last group of interviews returned us to managers and editors and concerned mostly decision making. The interviews lasted from 50 minutes to one hour. The interview guide focused specifically on topics such as innovation in practice, digital technology, the implementation of the COVID-19 Live Tracker, reflections on the various roles in the newsroom, and collaboration and tension between occupational and organisational professional discourses. All the interviews were transcribed and manually coded and categorised.

This chapter, then, aligns itself with Pavlik’s four aspects of innovation and structure: (1) the creation/delivery of a product; (2) how methods

are optimised; (3) how to engage the public; and (4) the development of management and strategies. Using these distinctions as our point of departure, we then ask how journalistic innovation takes place through new methods of reporting, how audiences are being engaged and whether new management and organisational strategies are arising as well. These three aspects will be balanced against the ongoing negotiation of professional and genre boundary work in the newsroom.

VG'S COVID-19 GROUP: CREATING, DELIVERING AND PRESENTING EXCLUSIVE DATA

On 26 February 2020, the Norwegian Institute for Public Health announced that someone had tested positive for COVID-19 (Nilsen & Skjetne, 2020). In their methodology report to the Association of Investigative Journalists of Norway, the VG journalists recalled that their news organisation had been taken by surprise and lamented the fact that ‘a global pandemic constitutes a perfect basis for the rise of disinformation and conspiracies’ (Nilsen & Skjetne, 2020). As it had done during other critical events, VG began to look for opportunities for change and success in their practice despite the pandemic—opportunities based on responding to whatever needs for information would arise (Barland, 2012; Konow-Lund, 2013). In short, VG managers and journalists took a twofold approach. (1) They tried to understand what VG users needed, even if those users did not know it yet, and prepare a response or solution.² For example, when the Icelandic volcanic dust grounded planes in Europe in 2010, VG developed a ‘hitchhiker central’ service to help people get around; this kind of adaptation has also been referred to as ‘service news’ (Konow-Lund, 2013). (2) They tried to rise to the occasion and reinvent their organisation, processes and products to serve people better and improve their practice along the way.

Though news workers had heard and read about the pandemic, they were not particularly aware of it even as late as March 2020—most of VG’s newsroom staff, in fact, had travelled to New Orleans to attend the annual National Institute for Computer-Assisted Reporting (NICAR) conference only the week before Norway went into lockdown on 12 March. The first person to discern a potential need to implement a COVID-19 Live Tracker was an editorial developer with extensive newsroom experience. He

²National Institute for Computer-Assisted Reporting (NICAR).

explained that he was visiting his in-laws in the southern part of Norway and decided to switch on his computer, and his online searches convinced him of the importance of developing better tools for the coverage of the virus. This informant as well as others noted that world-class media organisations like the *New York Times* and *Washington Post* are considered trustworthy and reliable as sources, particularly during times of crisis. How might VG earn that reputation for itself?

During VG's development of the pandemic live tracker, the organisation's potential in terms of distributed autonomy was realised in a completely new way. While most of the editorial developers were at the NICAR conference in the United States, the one remaining developer and a reporter colleague initiated the project because the authorities did not have an aggregator of numbers and facts about COVID-19. These two staff members asked themselves three essential questions: (1) What information did VG already have concerning cases? (2) What other information could VG turn up? (3) How should VG share this information as meaningful statistics? Clearly, the public (and the VG staff) wanted help with very basic survival questions: How many people are infected in my neighbourhood? How many people can I have in my house? How do I protect myself and my family? How do I travel safely? When the editorial developers and data reporters rejoined the team after the New Orleans conference, the sole focus at VG became a technical solution to accommodate this need for information.

Almost immediately, a small VG staff group—two breaking-news reporters and two developers—was granted full autonomy free of management oversight to figure out how to develop the system. Some of them worked from home, and most of their internal communication was via Slack. The group started with a Google Sheet spreadsheet because this cloud-based system was set up to readily combine columns and cells into existing graphic design templates at vg.no and allowed multiple people to work on it at the same time (Method report, SKUP, 2020). To begin with, the VG spreadsheet had 19 rows, and each row included information on a single case. Each registered case had its own number, the name and number of the municipality, the county, the date, and the outcome of the infection, as well as the gender of the infected person. Early on, there was little information available from the authorities; even the Norwegian Institute for Public Health did not indicate where infected people were located geographically. It was this kind of missing information which the news workers wanted to obtain and share, so they first set about mapping all the

cases and determining how many infected cases were arising in each municipality. This investigative work was undertaken by both reporters and developers, who checked the municipalities' webpages, then called the local doctors and compared what they found against the local newspapers as well. In this sense, the COVID-19 Live Tracker represented a sort of 'all-in-one' news graphic which gave the audience the ability to locate whatever statistic they sought but also served the internal news production process. Live tracker-generated data and numbers would turn into online breaking-news stories. Ultimately, the COVID-19 Live Tracker was not only a database which conveyed numbers and statistics acquired from authorities but also a source of exclusive news content. The latter, of course, relied on legwork and traditional investigative efforts like calling community doctors or expert sources directly to ask about the unique and exclusive data. The live tracker became a news hub for both newsroom staff and the audience.

NEW METHODS OF REPORTING OPTIMISED

As pointed out previously, what is 'new' here is not the COVID-19 Live Tracker itself but the innovative workings of this media organisation, and, in particular, the ways in which the various departments of VG came together during a crisis and optimised existing production methods using new combinations of positions and skills. By enabling cross-disciplinary collaboration through the allocation of developers, breaking-news journalists and experienced investigative journalists, this project's negotiations led to alternative ways of doing things.

While the initial idea of the live tracker was pushed forward by two individuals under autonomous conditions, it gained its organisational traction because editorial managers embraced it. Likewise, both workers and managers overcame the traditional tension between a breaking-news focus on speed (Konow-Lund, 2013; Schlesinger, 1978) and a watchdog-journalism focus on long-term investigations (Hamilton, 2016), as well as the gap between computational and editorial mindsets. These kinds of negotiations allowed VG to respond to the audience's need for credible facts related to the pandemic to be published as soon as possible; VG would also enjoy a certain amount of exclusivity in its coverage if it managed to succeed. The departments which pooled their resources included breaking news and the relatively new digital content development area, while the project coordinator was an editor from the investigative

journalism area. The initial team consisted of two breaking-news journalists and two technical developers; within six months (by fall 2020), the group had increased to over 30 members.³ No one was sure how to classify the group's practice and enormously successful product:

We were really uncertain whether this was investigative journalism or not when we submitted the methodology report to the investigative journalists of Norway. We told ourselves that the COVID-19 Live Tracker methodology report would be a dark horse in the competition for the investigative award. It would either win the best award for investigative journalism, or it would get nothing at all. Because it might not fulfil the conditions for receiving the award, right? Because it is difficult to pinpoint the contribution of the live tracker. (Editor-in-chief Gard Steiro, VG, 23 July 2021)

This lack of certainty regarding how to categorise the live tracker demonstrates how innovative it was as journalistic practice. When asked about their innovation, both the editor-in-chief and the journalists emphasised that nothing comes from nothing, and the practice and production associated with the COVID-19 Live Tracker in fact emerged directly from previous experience: 'This means that the COVID-19 Live Tracker is based on parts of what we have done before in computer-assisted journalism when we have aimed to publish huge amounts of data as well as systemizing the data. If we did not have the experience with such work from before, we would not have managed' (Editor-in-chief Gard Steiro, VG, July 2021). That organisational and individual experience also allowed VG to move forward quickly and efficiently:

VG's strategy is to take the lead, and that we claim that position [...] so that the users find what they need and that we have the information they're looking for, because that will be the reason for them to not go anywhere else. I think that's the most important issue, that we're ahead [...] So, this project is a bit different – this is about building a service that will exist for a long time. I think that to be able to get in early and take that lead position is strategically sound, although why that is so isn't something I've given much thought. (Editorial developer, VG, 5 May 2021)

³ See <https://journalisten.no/korona-kortnytt-oda-leraan-skjetne/vgs-koronaspesial-harpassert-250-millionersidevisninger/435322>

The demands of the pandemic for new and accurate information overrode cross-disciplinary differences in journalistic practice; everyone was motivated to contribute. Journalistic culture has long been considered ‘a particular set of ideas and practices by which journalists, consciously and unconsciously, legitimate their role in society and render their work meaningful for themselves and others’ (Hanitzsch, 2007, p. 369). With the arrival of the pandemic, though, this set of ideas and practices (and the ways in which people used it) changed—developers, for example, began to negotiate with sources and authorities for access to information, which they had never done before.

ENGAGING THE PUBLIC IN INTERACTIVE NEWS DISCOURSE

According to Pavlik, news innovation often involves finding new ways to engage the audience. In relation to the COVID-19 Live Tracker, this goal was partly about finding the most relevant topics and creating a database of information which was readily accessible to all. It was also about asking for feedback from the audience and adjusting the tracker along the way. According to our informants, there were lots of tips from the public which contributed to the statistics on the live tracker. Success proved to be a challenge all its own: as the number of unique clicks on the tracker increased, production was slowed by downloads and became more difficult to manage. In time, the risk of human error increased as well—if someone wrote in the county code instead of the municipality code, for example, the system could not correct the error. Despite ongoing technological improvements to the mechanisms involved in the live tracker, one reporter pointed out what an intense and enormous job it was to keep track of each infected person: ‘We could not call one hundred community doctors each day. So, in April [2020], while still manually registering, we installed an automatic import from MSIS, a surveillance system for communicable diseases. But we kept registering manually’ (reporter, VG, 14 April 2021).

The COVID-19 Live Tracker team also set up an email for tips from the audience: coronavirus@vg.no. Data discovered online was always carefully cross-checked as well:

When the first virus cases emerged, most of us felt that we had no control. We lacked an overview of the situation [...] Several of us wanted to gather information in a systematic manner to attain an overview [...] As journalists

we had a specific graphic design software available to us, and we started by developing the first graphics, showing the number of cases. (Reporter, VG, 12 May 2021)

These strategies clearly worked, and the unique clicks kept increasing—that year, for example, the live tracker surpassed 400 million unique clicks.

DEVELOPING ORGANISATIONAL STRATEGIES FOR A DIGITAL ENVIRONMENT

The editor-in-chief recognised that the implementation of the COVID-19 Live Tracker meant involving new actors in new types of production, and our informants also remarked upon the cultural shift which went along with the project. The live tracker occasioned a hybrid professional model which relied on open communication and exchange between the online and traditional journalism camps. According to our informants, management responded well by both stepping back from the day-to-day development of the tool and agreeing to supply what the team needed to do its work. Additional newsroom roles also became involved over time, including researchers, developers, extra breaking-news reporters, and digital graphics reporters, all of whom required rather complicated training. The original reporter who established the initial pilot of the live tracker was made responsible for this training, which combined computational and traditional journalistic mindsets in very innovative ways, according to the editor-in-chief:

The product ... was innovative. It represented the first time we had managed to combine so many different sources of data which were hard to work with [...] everything from pdf documents to other sources that we managed to combine. We were also updating 24/7, and this meant that it was not a dataset you create one time but [one you] generate continuously into a database. It was the very first time we had done this to such an extent. This is one part [...] where the innovation is located. Then I would say that there was innovation involved in how the data was being visualised. There were no other media [out there at the time] which managed to visualise data live in this manner. Then there was also an obvious innovation in the start-up phase of the COVID-19 Live Tracker when traditional journalistic methods were combined with data journalism. We need to remember that, in the beginning, the data was not accessible. Official public authorities did not have this data, so we methodically called both infection control doctors and

municipalities to acquire data to build our database. So, I believe there is an interesting aspect which nobody, or few people, has talked about: the fact that, along the way, we also created a new journalistic tool [...] a new content management system for journalists to aggregate data, and this was crucial for us to manage to update [the live tracker] so quickly. (Editor-in-chief Gard Steiro, VG, 23 June 2021)

The editor-in-chief summarised the variety of innovations he discerned in the implementation of the COVID-19 Live Tracker across disciplines, as well as the different styles and speeds of newsroom work: (1) breaking-news speed, which allowed VG to position itself as first; (2) regular-news speed, which allowed the audience to locate what they needed on demand at their convenience; and (3) in-depth-news speed, which produced the exclusive news content which was circulated among VG's several platforms.

Eventually, professional distinctions among the team members faded altogether, along with a sense of hierarchy beyond what was necessary to organise and coordinate the team's work. When errors and technical challenges occurred, the VG team knew it had to listen to the users. Several informants pointed out that audience feedback had a big impact on the tracker and its services. As the team expanded, however, the need to train colleagues in the live-tracker system became something of a burden, our informants recalled (developer, VG, 5 May 2021; reporter, VG, 12 May 2021). One developer said that it was one thing to innovate a new process and tool through hybridised newsroom collaboration and another to sustain it in its later phases by painstakingly sharing the specialised knowledge required by the involvement of an increasing number of staff members (developer, VG, 5 May 2021). The later phases of a project like this, then, are all about systemising this knowledge:

By letting the computer, or robots, take over manual tasks, the journalists will be able to do more. This will free up resources to develop new projects. Without data journalism we wouldn't have been able to do that. We wouldn't have achieved what we have today. (Reporter, VG, 12 May 2021)

By June 2021, the COVID-19 Live Tracker team needed more resources as well, and their request to management was straightforward in this regard. Ultimately, the autonomy of the live-tracker team produced new practices which derived from fewer distinctions in newsroom roles and the organisation's embrace of informal decision-making based on practical

needs and challenges. This autonomy itself had three phases which paralleled the progress of the live tracker: (1) an entrepreneurial phase which established the group, system and practice; (2) a middle phase involving things like travel advice and hope concerning an end to the pandemic itself; and (3) a long final phase, including a lockdown which ultimately lasted from fall 2020 to summer 2021. Following that final phase, in fall 2021, the team was given a news editor to relieve some of the ongoing burden of work and to help organise communication between the core group and the extended members of the newsroom who were assigned to the tracker. While several informants recalled that they were anticipating the end of the lockdown phase already in fall 2020, the numbers of infected and hospitalized patients instead began to increase, and the Norwegian government reinstated a strict lockdown, so the need for pandemic-related information became greater than ever. All the way through spring 2021, the live-tracker team members mostly worked from home, though one individual was allowed to work from the newsroom. She stated: ‘The whole year has felt like a long weekend shift, because there were just as few people at work over the year as during the regular weekend shifts’ (reporter, VG, 14 April 2021). A developer from the team also pointed out that these phases in the project and the pandemic sometimes tended to blend together: ‘It feels like one specific long phase [...] It has been a non-stop rush’ (developer, VG, 5 May 2021). Others described the project as eighteen months of a single breaking-news story. This developer did acknowledge, however, that the arrival of the vaccines in early 2021 brought about a new phase of generating data for the live tracker.

CONCLUSION

Crises sharpen our shared need for information, and the pandemic was no exception, forcing changes to many professional practices, including those of the newsroom. At such times, people demand accurate and detailed information when the systems which supply and disseminate it are under the greatest stress, and responding to this demand requires both diligence and, perhaps most importantly, innovation. An event such as a pandemic, that is, makes those in the media revisit their notions of ‘the hows and the whys of journalistic practice’ (Zelizer, 1992, p. 67).

Crises become ‘discursive opportunities for journalists to ensure the wellbeing of their interpretive community by reconsidering, rearticulating and reinforcing their boundaries and authority’ (Tandoc & Jenkins, 2018,

p. 676). In its sheer duration and global sprawl, the pandemic challenged the modern newsroom like few other events. At the same time, newsrooms were not starting from scratch in their responses to it; as Konow-Lund and Olsson (2016) observe, journalists always build on previous experiences with breaking news or critical incidents when they face new challenges in these contexts. Likewise, management knows that audience attention (such as unique clicks, for example) jumps during a crisis and often does not recede afterward (Barland, 2012; Konow-Lund, 2013). Newsroom strategy, particularly when it involves innovation, must remain cognizant of the opportunity such times offer.

In terms of the pandemic's impact upon the practice of investigative journalism, one critical question was how to share the most accurate possible overview of the number of people impacted—the infected, those who survived, and those who died—at the local, national and even global levels. Elsewhere in this book we demonstrate how investigative journalism rises to the occasion when people need it most, even innovating ways to practice within expanding international networks which encompass unsafe or unstable societies or communities (Berglez & Gearing, 2018). This chapter explored the case of VG's live tracker as a crisis-driven technological innovation which led to organisational and methodological changes. In the interests of supplying people with information in real time, both the process and the organisation must be credible and innovative. Clearly, VG Online filled a public need for information by developing and launching its live tracker. The question is, did it also point toward a new understanding of journalism as such, and investigative journalism in particular?

During this project, VG enabled its reporters, editorial developers, and newsroom managers to harness resources from the respective practices and areas of breaking news, data journalism and systematic/traditional investigative journalism to speed its way to what would become Norway's only online COVID-19 Live Tracker. By allowing its news workers to organise themselves for months in the interests of the most innovative possible outcome, VG accomplished its goal while encouraging unprecedented cross-disciplinary collaboration within its staff. In all, the extended crisis of the global pandemic spurred creativity and dedication among VG staff members which promoted both organisational goals and professional interests and made the live-tracker team into a model of VG initiative. A key factor of success was the already innovative organisational culture:

The secret behind this is that the process doesn't need to be management-led. There is something in VG's work culture and the organisation which makes it part of our work environment to intuitively look for solutions when critical events arise [...] I believe that some of the advantages at VG which facilitate this sort of organisation come from effective decision-making as well as high mobility (in the newsroom). So, what happened when the Covid-19 Live Tracker emerged was that there were already existing relationships in place between (software) designers and journalists which led them to understand each other's languages and needs in a case like this. (Editor-in-chief Gard Steiro, VG, 23 June 2021)

Beyond its obvious success in gaining audience attention via new technological advances, the COVID-19 Live Tracker case also demonstrates that investigative journalism is becoming increasingly fluid in relation to adjacent areas such as data journalism, science and the liberal arts. In its quest for truth and the exposure of transgression, this area of the journalistic field constantly challenges established professional and genre boundaries. What our study also shows is the importance of organisational culture and structures, as well as leadership, in spurring innovation. During crises and other unforeseen scenarios, the ability to be flexible and adapt can depend on the strength and viability of existing structures and relationships. When these are in place, the inter-professional character of cross-cutting collaborative teams is not seen as a threat but as an opportunity for growth. Thus, the merging of competencies in a case like VG's live tracker has the potential to drive both journalistic innovation and the expansion of journalistic boundaries.

The insights generated by this study have useful implications for newsroom practice during future crises in three ways, in line with the aspects stressed by Pavlik (2013). First, the crisis *is* the product. While journalists always try to respond to the needs of the audience, the COVID-19 pandemic pushed aside other news criteria in favour of developing ways to disseminate information which would help citizens to survive and thrive. Second, innovative production practices can not only disseminate the news but also generate it, often very quickly. Third, it is easier to engage the audience during a crisis to help journalists shape new tools through advice and feedback. In all, of course, news workers rise to the occasion during crises and take the initiative for themselves (with the support and guidance of management).

In sum, we argue that looking specifically at crisis-driven newsroom innovation increases our understanding of the transformative force of the legacy news media. Our present case, the VG COVID-19 Live Tracker, addresses questions about genre definitions, organisational preconditions and interprofessional collaborations, and the ways in which these entities can marry in the development of new journalistic methods and interactions with the audience. Challenges to society will always arise, and the lessons learned from our VG case may shed some light on how to prepare for them going forward.

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LINKS AND FURTHER READING

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