



Journalist Fellowship Paper

The case for developing a Modern Reporter's Notebook

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August 2022

Trinity Term

Sponsor: Australian Broadcasting Corporation

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Introduction

Enormous energy has been devoted to studying the impact of the ‘digital’ on the changing media landscape: how it impacts audience behaviours, production and distribution.¹ Scholars have studied the use of computing technology in media through the development of concepts like computer-assisted reporting and data journalism. And some practitioners have embraced reporting techniques like open-source intelligence (OSINT) that make heavy use of technology.

However, in my research I have found very little examination of the general technological tools and techniques that most reporters use as a matter of course, or how and why they use them. There is little investigation into how those every-day technologies could be improved or augmented with the specific aim of improving how they might serve the needs of reporters.

Computers have been used in journalism almost since their advent. In fact some scholars assert that computational forms of journalism predate computers themselves.² Despite this, journalists’ use of computing techniques has been thought of as somehow separate from or in addition to the core processes.

It is seen as the domain of specialist reporters with uncommonly used specialised technical skills, exemplified by pioneers like data journalist Philip Meyer.³ Thus, a focus of the academic literature around the use of computers in journalism has been attempts to categorise, define and name the specialised areas of practice such as computer-assisted reporting, data journalism or computational journalism.⁴

In reality, computers are now used in just about every aspect of journalism and by every practitioner of journalism. But precisely how they are being used and for what purposes remains relatively unexplored.

¹ “The Leaked New York Times Innovation Report Is One of the Key Documents of This Media Age,” *Nieman Lab* (blog), accessed July 14, 2022, <https://www.niemanlab.org/2014/05/the-leaked-new-york-times-innovation-report-is-one-of-the-key-documents-of-this-media-age/>.

² David Caswell and CW Anderson, “Computational Journalism,” *The International Encyclopedia of Journalism Studies*, 2019, 1–8.

³ Philip Meyer pioneered data journalism through his reporting of the 1967 riot in Detroit. For more see his book, *Precision Journalism: A Reporter’s Introduction to Social Science Methods*

⁴ Mark Coddington, “Clarifying Journalism’s Quantitative Turn: A Typology for Evaluating Data Journalism, Computational Journalism, and Computer-Assisted Reporting,” *Digital Journalism* 3, no. 3 (May 4, 2015): 331–48, <https://doi.org/10.1080/21670811.2014.976400>.

Rather than looking at technology's impact on journalistic practice, this paper will examine the issue from an alternative perspective: how have tools made available by technological change been incorporated and used by everyday journalists in the reporting process?

Further, it will attempt to identify gaps in the utilisation of technology and explain where technology might be more productively employed by reporters.

While recognising that computational tools are useful across a broad range of journalistic processes, this paper will focus primarily on the reporting process – gathering and analysing – as opposed to production tasks that transform words and images into output for an audience.

This paper will argue that, in 2022, computing technology and the skills of technologists have been more readily and successfully incorporated into journalistic production and distribution, what I'm calling the 'output' side of journalism, than into research and reporting – the 'input' side.

Further, it is in the best interests of newsrooms to ensure journalists have the time, space and freedom to explore possibilities and experiment with new tools. Newsrooms should take a strategic approach to proactively identify, and train journalists to use tools that will enhance the reporting process.

How are reporters using computers now?

David Caswell and CW Anderson wrote in their contribution to the 2019 *International Encyclopedia of Journalism Studies*:

“As digital computing became increasingly ubiquitous in society and in newsrooms during the late 1980’s, a variety of computational practices for gathering or analyzing journalistic knowledge emerged ad hoc. These practices were typically pioneered by individual journalists experimenting with computational techniques and with computational representations of journalistic knowledge, for particular objectives on particular stories.”⁵

While we’ve experienced dramatic technological change since the 1980s and computers are now used in nearly every part of the reporting process, journalism’s relationship to computing technologies and the questions and challenges it poses are as relevant as ever.

In *Why Journalism Is About More Than Digital Technology*, Barbie Zelizer argued that it is (or should be) journalism that gives technology purpose. Zelizer cautioned that defining it in terms of the technology it employs (data journalism, computational journalism, etc.) leads us to miss the bigger picture.

Comparing technology in journalism to the facade of a building, Zelizer said: “The digital remains the exterior of the journalistic enterprise, and regarding it as journalism’s savior is much like saying that a structure’s exterior surface will ensure the building’s success, plumbing and lighting be damned.”⁶

But this metaphor ignores that the ‘plumbing and lighting’ technology isn’t stagnant either. It will change as technology advances inexorably. We should consider carefully how we might best harness technology to journalism’s ends and not wait for technology to impose its affordances. Are we comfortable settling for Caswell and Anderson’s ‘ad hoc’ nature whereby technology is incorporated into journalistic practice? Should it be more than whim and happenstance that sees journalists add items to their toolkit as they practice their craft?

⁵ Caswell and Anderson, “Computational Journalism.”

⁶ Barbie Zelizer, “Why Journalism Is About More Than Digital Technology,” *Digital Journalism* 7, no. 3 (March 16, 2019): 343–50, <https://doi.org/10.1080/21670811.2019.1571932>.

Karlsen and Stavelin related the processes of journalism as defined in Meyer's book *Precision Journalism: A Reporter's Introduction to Social Science Methods*, that is, the role of journalism is to “collect, store, retrieve, analyse, reduce and communicate”.⁷

One might argue that this list of processes, although compelling, is already inflected with the affordances of technology. Another list that maps slightly differently but may be more useful for our purposes is: reporting, production, and distribution. It is in the best interests of media organisations that there be a culture within newsrooms encouraging journalists to find the best tools and empowering their use across all functions of journalism.

Let's consider those in reverse order.

Distribution

The use of technology in journalism's distribution tends to be centred in and driven at the organisational level. While individual reporters hope their stories will do well and receive wide distribution, their primary means for achieving that is to find important stories and tell them compellingly. Most rely on and expect the organisation which publishes the work to drive distribution. Individual journalists often tweet about their stories when they're published or otherwise promote them on social media to help it reach a wider audience. There is evidence this works well for journalists with large social media followings, but the contribution of this practice to overall reach for an average audience is unclear.⁸ Of the factors studied by Karnowski et al, it is still the news organisation that influences sharing performance on social media most.⁹

Media organisations now invest heavily in technology to facilitate and drive improvements to distribution.¹⁰ Newsrooms like the Australian Broadcasting Corporation use sophisticated analytics packages like Chartbeat and Google Analytics. Organisations large and small dedicate at least some effort to data

⁷ Joakim Karlsen and Eirik Stavelin, “Computational Journalism in Norwegian Newsrooms,” *Journalism Practice* 8, no. 1 (January 2, 2014): 34–48, <https://doi.org/10.1080/17512786.2013.813190>.

⁸ N. Newman, “Mainstream Media and the Distribution of News in the Age of Social Media,” 2016, <https://ora.ox.ac.uk/objects/uuid:94164da6-9150-4938-8996-badfd6b507>.

⁹ Veronika Karnowski et al., “Worth to Share? How Content Characteristics and Article Competitiveness Influence News Sharing on Social Network Sites,” *Journalism & Mass Communication Quarterly* 98, no. 1 (March 1, 2021): 59–82, <https://doi.org/10.1177/1077699020940340>.

¹⁰ Nicole Blanchett Neheli, “News by Numbers,” *Digital Journalism* 6, no. 8 (September 14, 2018): 1041–51, <https://doi.org/10.1080/21670811.2018.1504626>.

analysis with the aim of developing insights about their audiences and improving distribution.

Despite often-strained relationships, news organisations remain quite dependent on big digital platforms for distribution and work hard to actively exploit the network effects of social media to get their work in front of audiences.¹¹

Search engine optimization is a well-established practice. For more than a decade, newsrooms have employed SEO specialists to understand best practice, implement strategies, and curate content with the aim of exploiting search engine ranking algorithms.¹²

Production

News organisations work hard to find and provide the right tools to get their reporters' work in front of the audience with high production values.

A commercialised ecosystem of tools exists that is focused on the production functions of journalism. Content management systems, although sometimes a frustration, are largely 'mature', sophisticated pieces of technology. ('Mature' tools are those developed and improved over, say, many years, and built by organisations with longevity, stability, and with technological support in place.)

News organisations are increasingly looking to improve their digital product offering as a means to improve audience experience, generate revenue and secure market share. Innovation, now a sometimes derided buzzword, is nevertheless highly valued by media organisations which look to incorporate successful experimentation into their standard offerings, introduce new formats and publish on emerging social platforms, among other things.¹³

Highly valued in the realm of production is the third-party tool that newsrooms can use that yield high production values while demanding minimal technical knowledge from its journalists. Tools like Datawrapper and Flourish are now widespread among media organisations and provide valuable options in the

¹¹ Rasmus Kleis Nielsen and Sarah Anne Ganter, "Dealing with Digital Intermediaries: A Case Study of the Relations between Publishers and Platforms," *New Media & Society* 20, no. 4 (April 1, 2018): 1600–1617, <https://doi.org/10.1177/1461444817701318>.

¹² Murray Dick, "Search Engine Optimisation in Uk News Production," *Journalism Practice* 5, no. 4 (August 1, 2011): 462–77, <https://doi.org/10.1080/17512786.2010.551020>.

¹³ The New York Times, "Journalism That Stands Apart," *The New York Times*, January 17, 2017, sec. insider, <https://www.nytimes.com/projects/2020-report/>.

production toolkit. Since the celebrated *New York Times* story *Snowfall* caught the attention of media organisations a decade ago by showing what high production value digital content could look like, newsrooms have increasingly emulated, extended, and standardised that kind of highly visual storytelling. This has also led to the commercialisation of tools like Shorthand, giving newsrooms a simpler way to achieve similar effects. I would argue, though, that to get the best out of tools like these, newsrooms must not treat them as turnkey production solutions.

Reporting

All reporters use computers in their daily practice. My research suggests that for many reporters, however, they are using apps and programs on a desktop or laptop that were never designed for reporters, and are lacking in key areas. It is in the best interests of newsrooms to strategically locate and implement tools that are journalism-focused.

Journalists use computers and programs during the reporting phase of a story, but the way they adopt technologies and techniques differs from production and distribution for two key reasons:

1. The choice of tools is often left up to, and motivated by the needs of, individual journalists when compared with production and distribution. Where tools used in reporting are provided (or worse, imposed) by the organisation, it's generic, enterprise software like the Microsoft Office suite.
2. The ecosystem of tools focussed on reporting is less mature and accessible. There may not be enough money in it, so the commercial incentives to develop quality products focussed on the journalistic use cases may be lower. Where tools do exist, there are often organisational roadblocks to their use – for example, restrictions on what individuals can install on their computers or policy disallowing or discouraging use of un-vetted digital services.

News gathering or story identification may be the area where technology use and tool creation is most advanced and sophisticated. Many journalists and newsrooms routinely use tools like CrowdTangle and Google Trends – both quite mature tools – to help identify emerging stories that may be worth pursuing. CrowdTangle is a social media monitoring tool designed to identify issues emerging on social media. Google Trends provides insight into what Google users are searching for and surfaces local and global trending search terms and topics.

However, this is somewhat distinct from the reporting process itself. The focus of this paper is on understanding how to best support journalists to use the best technology – software, mostly – while they are gathering and organising their source material. Making sense of source material is a key function of reporting and having the right tools in the kit can improve efficiency and accuracy and help reveal story opportunities or angles that might otherwise be overlooked by busy reporters. Journalists must have access to the best reporting tools and it is in the best interests of newsrooms to help their reporters find the best technology for high-quality work.

One of the more prominent technology-enabled reporting techniques of recent years is open source intelligence. Reporters collect and analyse data and information that is already publicly accessible to create new, publishable insights. OSINT is a technique rather than a tool, however, journalists seeking to use this technique must be able to find and extract the open-information efficiently and accurately, often relying on a set of context specific tools to do so. OSINT tools are often difficult to find, highly technical, difficult to use, and unreliable.

Reporters use a variety of computational tools (R, Python, SQL, etc.) within specialised journalistic disciplines like data journalism. These tools can be invaluable reporting tools where large or complex datasets need to be queried, analysed, and understood to tell a story. Unfortunately, though, for the regular reporter looking to create a narrative out of, for example, a large property price dataset, a national budget or leaked emails, R, Python and SQL are tools that they have not had the time or training to incorporate into their toolkit. Having reporters with these skills in the newsroom can provide a lot of value, but they are likely to remain specialists until tools for this type of analysis become less technical.

Most reporters use software for note taking, research and organisation, generally taking the form of generic word processing software. A subset of reporters is beginning to adopt more specialised note taking tools as a standard part of their toolkit. This note taking, research, organisation and thinking function will be a focus for this paper.

Arguably, the adoption of tools and computing techniques is most comprehensive and advanced in the output functions of journalism (production and distribution) – especially in larger newsrooms with well-resourced digital operations. While these functions are vital to achieving journalism’s aims, without reporting there is nothing to produce or distribute. This is a reporter’s core business. It is time to improve how we use technology in the reporting process.

The imperative for journalists to take quality notes, ensure accuracy, cultivate and protect sources and provide context may even be made more important and onerous by the emergence of new technologies.

However, adoption of the tools and techniques computing can provide for reporting – both by individual reporters and newsrooms – has been uneven: both in the types of technology adopted and in the parts of the reporting process where computing technology and its attendant skills have been brought to bear.

In general, reporters are not using (and sometimes not even seeking to find) new technologies and tools that could enhance their reporting. Newsrooms rarely support (and sometimes actively limit) the capacity for journalists to explore and adopt new tools for reporting. To their detriment, organisations may lack a strategic approach to incorporating new technology and technical skills into their reporters' toolkits.

What does a modern reporter need?

Caswell and Anderson provided a discussion of how computer use for journalistic ends has evolved since the late 1980s, then argued that ‘revolutionary’ ideas for applying technology to journalism like automated writing (e.g. the *LA Times*’ [Quakebot](#)), sensor journalism, conversational journalism (e.g. chatbots) or data monitoring had ‘overshadowed’ the development of more general purpose journalistic reporting tools like [DocumentCloud](#) or [The Overview Project](#).¹⁴ These last two tools seek to harness the strengths of computation in the context of large text repositories.

But even here we see mostly tools that have a relatively narrow use case. While a lot of tools are available to journalists to use in the reporting process, those tools often provide solutions for problems with a narrow scope. Incorporation of those tools into the regular kit remains relatively ad hoc, and largely driven by an individual’s own initiative. There doesn’t appear to be a widespread culture of actively seeking new tools. The way journalists are educated is beyond the scope of my enquiries for this paper, but anecdotally, use of more technical tools and techniques for reporting gets little attention in journalism courses, perhaps contributing to a culture which lacks initiative to explore the possibilities.

When looking at what a modern reporter uses day to day, on every project they work on, the technology is surprisingly simple. I interviewed reporters who described ways of working that were organised and methodical and others who had more intuitive and organic processes. The actual software my interview subjects employ is relatively homogenous.

Such a result could reflect the possibility that these tools are a good fit for requirements and have achieved mass adoption for that reason. But, maybe just as likely, these tools are seen as ‘good enough’ and other constraints exist for my interview subjects that prevent them from seeking and adopting better tools.

This section will discuss tools in use today as a common part of an everyday reporter’s toolkit as well as the broader ecosystem of digital tools less frequently employed in the reporting process, but becoming better known.

¹⁴ Caswell and Anderson, “Computational Journalism.”

Through my interviews with a variety of journalists, practising across many countries and subject areas, some common tools emerged as almost ubiquitous.

Interviews were conducted either in person or over video conference with 12 reporters from seven different countries – Australia, Uruguay, Norway, Kenya, Colombia, United Kingdom and Canada – and working across a variety of reporting beats and styles including investigative, documentary, technology accountability, culture, science and political.

Most reporters use:

- a physical notebook and pen
- a digital notebook equivalent, usually traditional word processing software such as Microsoft Word or Google Docs
- email and other roughly equivalent communications tools such as Slack, Microsoft Teams and WhatsApp
- internet search engines, primarily Google, but occasionally other context- or subject-specific products

The humble, physical notebook

It may be no surprise to find that nearly every reporter I interviewed uses a physical paper notebook. However I noted a fairly wide variety of practices around how the notebook is used and how physical notes are retained and later generate a story.

Some considered the notebook to be their primary tool in the reporting process even while recognising that it may be more habitual than a considered choice of best tool for the job. When asked if it was a deliberate choice to use a physical notebook in preference to other note taking tools, Guillermo, a reporter and editor from Uruguay, told me he hadn't put much thought into it. "It's that I'm used to working that way ... I'm used to it, so you think it's the best way." Investigative reporter and correspondent Robyn from the United Kingdom, who similarly saw her notebook as a fundamental and primary reporting tool, described how she now sometimes augments her notebook use with Otter – a widely used transcription app – on her phone if "I have to get the quotes really precise". It's an evolution rather than a step-change in favour of new tools. She definitely doesn't see Otter as a potential replacement for her notebook. "I don't use Otter for everything; it's just annoying."

Others considered a physical notebook almost window dressing. Hanne, a science reporter from Norway, said that during in-person interviews she used “notebooks because it just makes you look like a journalist and [is] sort of expected”. However Hanne also considered that a physical notebook had some advantages in specific circumstances, including those times “when you’re calling somebody and they’re a bit anxious, and you don’t want them to hear the sound of that keyboard”.

People often describe falling back to using a physical notebook where they found resistance or gaps in their digital tools. Maeve, an investigative reporter in the United Kingdom, said, “I find it easier to kind of map out my thoughts in a notebook.”

People also found joy in physical note taking and organisation that they felt digital tools couldn’t provide. Maeve told me:

“I find pleasure in being able to tick things off and scratch them through and, well, I know there’s kind of online or computerised options to do that, but I think it is the physicality that I quite enjoy.”

Often people expressed an opinion that “thinking visually” or sketching in digital spaces was a poor experience and the tools got in the way of their thinking as much as they might have aided it. In other cases, there were simply gaps in the tools they knew about or had access to – hardware like tablets that facilitate sketching better are expensive and people seemed to lack knowledge of digital whiteboard style apps like [Miro](#) or [Mural](#).

In fact, many journalists expressed a reluctance to try new digital tools. The reasons for the reluctance varied and will be discussed in more detail in the section looking at impediments and limitations to the adoption of new tools.

Google Docs

Although most journalists still use a physical notebook in one way or another, it is also clear that a large part of every reporter’s note taking and information gathering has gone digital. All reporters I spoke to took notes and organised information in a digital form while reporting.

Use of Google Docs as a note-taking and drafting tool was almost ubiquitous. Occasionally people also used Microsoft Word for this task, but Google Docs appears to have the competitive edge (even when the organisation journalists work for

provides another product). Word processing software was often considered the digital equivalent of, or replacement for, their physical notebook.

When embarking on a new investigation, the first thing Robyn, the reporter from the United Kingdom does, was to “open a Word document or Google Docs document, and then I just use it like a really rough notebook”.

Many journalists used this digital space as somewhere to collect and organise their research. It would be a place to store links, clippings, quotes and general notes in a single central document.

Sometimes, even when there was a widely known and understood tool built specifically for the task, people preferred using their notes document. As an example, Hanne, the science reporter from Norway said, “you can, of course, bookmark stuff in your browser, but I never find it again [...] I have links to stuff that I know is going to be important to either reference or just read [as notes in a Google Doc]”. Having a central, default place to consolidate notes and links to other resources related to a story appears to be an important element of the workflow for most people.

The practices within this digital notebook varied substantially among journalists. Where some journalists had a more or less standard structure they would use story after story, others had almost no structure to speak of, to the point where they rarely even used headings and did not necessarily group items like a list of contacts or sources but had them scattered throughout. Could a note-taking tool that provides an unobtrusive but accessible structure be helpful in this scenario?

While some of my interviewees treated the digital notebook as almost an append-only document (similar to a physical notebook) and rarely rearranged content, others worked hard to maintain order and rearranged content to aid comprehension and organise their thoughts.

Most journalists I spoke to also created separate digital documents for other source material such as interview transcripts or data. Most started a fresh document when it came time to start writing rather than adding to or trying to convert their research notes into a draft.

Email

Email, one of the oldest technologies of the internet, is used as ubiquitously as you would expect by journalists. However, while some functions of email have been replaced by other tools, its functionality has also been co-opted to solve problems that it was not designed to solve.

Some functions of email have been replaced by newer communications tools like Slack, Microsoft Teams, or chat apps like WhatsApp and Signal. Journalists I spoke to experienced these tools as mixed blessings. While people found utility in them, several reporters expressed frustrations with some aspects like the difficulty of locating information now buried deep within long chat logs or the regular interruption they facilitate.

Perhaps more interesting for this paper is the non-standard ways email is used. Much like word processing software is used in ways for which it was not designed, email's functionality can and has been utilised to other ends – functionality for which there are (or should be) better, purpose-designed tools. It is common for reporters to email notes from a mobile device to work on later, or incorporate into research and back-up source documents, notes and draft versions of a story.

The back-up function particularly is a job that would be much better solved with purpose-designed tools, but it appears journalists often don't have access to these tools for either technical or economic reasons.

Google

It almost seems too obvious to mention, but global search engine Google is the gateway to digital research. Reporters use Google to find out more about their subjects, locate previous reporting (including their own) fact-check dates and timelines, among many other tasks.

Everyone uses it, though it is so foundational that often it took a prompt before interviewees recognised it as a tool they use. In many ways Google's search engine is the quintessential example of a technological tool so generalised, so easy to use, that it has ceased to be even recognised as a piece of technology in the toolkit.

Other tools

Word processing software, email, Google search and a physical notebook were the most widely used tools in the reporting process. However, reporters were increasingly incorporating other, less widely known tools into their practice. For most, there were relatively few in the standard kit, but some reporters were making use of a much broader set of technology based tools.

Transcription tools like [Otter](#) or [oTranscribe](#) and tools to aid interrogation of large collections of text documents like DocumentCloud or [Google Pinpoint](#) came up repeatedly. Where data existed to interrogate or incorporate into the reporting, reporters commonly cited using spreadsheet software, though their skill levels varied. Some reporters I spoke to expressed dissatisfaction with their perceived capability. “All that I can do with Word or Excel is self-taught,” said Maurice, an investigative documentary filmmaker from Kenya. Journalists also reported using spreadsheets for organisational purposes like checklists, timelines, and lists of contacts. These are tasks for which spreadsheet software is not specifically designed, but is flexible enough to accommodate. Like word processing software for note taking, it may not be the best tool for the job, but it will get the job done. Journalists “make do” with what they have access to and lean on the skills they already possess.

An aside: it is worth noting here that one advantage generalised tools possess is the future compatibility that standardisation provides. When investing time in creating and refining a spreadsheet, the reporter is not locking the data it contains into some esoteric format that might be difficult or impossible to open if the software’s creator goes out of business or stops supporting it. Information stored in a spreadsheet will likely remain accessible and usable far into the future (though this is less true of hosted software where the data lives not on your local system, but on the software maker’s servers), whereas the better features provided by more specialised tools may also make data less compatible and future proof.

Vendor lock-in is something people should be aware of when adopting new tools as there is often a tradeoff between new features and compatibility with other current or future tools. Does your prospective new tool have an export function? What format does it export to and what information or utility is lost in the export process?

Although everyone I spoke to used word processing tools for note-taking in some part of their process, a minority also used or had at least tried other note taking software.

Cameron, a reporter from Australia, uses [Notion](#), a web-based note-taking and organisational tool with accompanying mobile and desktop apps. Cameron uses it extensively, though not exclusively, for note taking and organising his reporting.

“I have documents for stories, I have documents organised by people I’ve spoken to, sources and meetings and interactions I’ve had with them. And then I’ve also got some based on resource areas. So [...] a list of [...] things to do with the Australian far-right or that kind of thing.”

Cameron’s preferred tool here, Notion, could be described as a ‘knowledge management’ tool or system. Notion allows him to curate and catalogue his understanding of the beats he covers and the sources he uses in a way that makes the information highly accessible for future reference through search, interlinking and structure.

Craig, another reporter I spoke to from Canada, has a similar system. He uses [Evernote](#) – a tool others I interviewed had sometimes heard of and occasionally also used, though not as extensively. Evernote is one of the more established pieces of software in the note taking and personal knowledge management space with millions of users across a wide variety of disciplines and industries. Of all the reporters I spoke to, Craig had most fully embraced and explored what technology could offer his practice as a reporter. His reflections on using a physical notebook are illustrative:

“I always travel with one, but I almost never use it. You know, stuff goes into my phone, I will email myself something and then file that later in Evernote or in an email folder. I will open up Evernote on my phone. I will see something online and save it to [Pocket](#). My workflow is pretty much all digital at this point.”

Craig described a clear, well-defined, highly custom, and relatively complex system of digital tools for finding and reporting his stories that work well to address the “collect, store, retrieve, analyse, reduce and communicate” tasks Meyer defined. Craig described these tools, Evernote particularly, as invaluable to his journalistic practice.

Where does this leave us?

In general, the interviews point to a conclusion that journalists are not eager adopters of new technology. For many, a clear return on investment is required before trying a new tool and quick validation of that expectation is required before it gets added to the standard kit. Otter is a standout example that meets these requirements. A clear value proposition is evident with Otter – faster and easier transcription of interviews – and that promise is fulfilled on the first use.

In addition to not being early adopters, journalists vary in their interest in seeking new tools. Where some journalists express an active interest in trying new tools and techniques, the majority of people I spoke to said they rarely if ever actively sought new technological solutions. A typical reporter will generally adopt a new tool only when first prompted by multiple personal recommendations from colleagues.

Reporters are generally time poor with little patience for experimentation. They like to see fast results. They trust personal recommendations from peers more than managerial solutions.

A vision for a Modern Reporter's Notebook

From the interviews, it is clear that the power of computation has not been explored or harnessed as effectively as it could be to enhance the reporting process. What would happen if journalists thought more comprehensively about how technology might aid their professional practice – especially around reporting – and looked to actively incorporate what works in their everyday toolkit?

The genesis of this paper was the idea that one might be able to build a Modern Reporter's Notebook™.

Of the reporters I spoke to, Craig and Cameron came closest to incorporating a tool like this into their everyday journalistic practice (Evernote and Notion, respectively). Neither of the tools they use were designed specifically with journalism in mind.

The idea of building a modern reporter's notebook rests on a conviction that an **underlying and unobtrusive structured data layer** could supercharge a reporter's ability to **make connections and build the evidence** base required for high quality, high impact stories that hold the powerful to account.

The idea also recognises the possibility that **collaboration between journalists is under-utilised** and one key reason is the inadequacy of tools that facilitate it. Reporters face important cultural and economic impediments to collaboration that should not be overlooked, and any tool aimed at improving or increasing collaboration between journalists would need to understand those constraints.

To create a tool with reporting as its primary purpose, we must first understand the way reporters currently achieve their tasks (what is being used), the strengths and weaknesses of the tools they currently use (how are tools being used effectively, how they map to practice, and what function is required), and the reasons for adoption (why we do and don't choose to use tools).

What tools are being used?

Journalists have a habit of co-opting tools intended for another purpose to fill a need in journalistic practice. An early reference to 'computational journalism' in the academic literature demonstrates this well.

“SocialAction was a tool developed by and for those outside journalism – in this case by computer scientists for ‘researchers’ (SocialAction, n.d.) – which attracted interest from those within journalism, who used it, for example, to analyze and visualize the social networking links between those implicated in the use and supply of performance-enhancing drugs in baseball (Perer & Wilson, 2007).”^[6]

The world of journalism, particularly digital journalism, is overflowing with lists of co-opted tools. Tools for research, tools for open source investigations, tools to monitor social media, tools to monitor the movement of people and goods, tools to organise, tools to verify... the list of lists goes on and on.

Many of these tools are worth examining and using in specific circumstances. They appear on these lists because they have been useful in the reporting process. Often they address a specific need one might have for a specific story.

But just as often they are immature, unmaintained, unreliable or overly technical. The landscape of OSINT tools, for example, is in a constant state of flux as a cat-and-mouse game is played between investigators and platforms.

In my research, I have found that tools developed inside newsrooms or by individual journalists are rarely properly funded or maintained and tend to fall into disrepair.

In 2019 ProPublica [launched](#) Collaborate, an open source web application that aims to facilitate better collaboration between journalists and newsrooms on large data sets and crowd-sourced data.¹⁵ Development of the software, which could be “launched and customised without the help of a developer” or tailored to a newsroom’s specific needs thanks to the open source licence, was funded though the Google News Initiative. But since then, development appears to have stagnated.

Even some of the most widely regarded tools developed inside newsrooms have a reputation for poor usability. For example, Mayeta, a reporter from Australia said that despite finding DocumentCloud quite useful, she had more or less given up on it. “It’s just not very intuitive to use,” she said, but she also found their policies around account validity difficult to navigate. “I actually applied for another DocumentCloud account,” she told me. But even though she found it useful, the user

¹⁵ ProPublica, “ProPublica Launches ‘Collaborate’ Tool to Help Newsrooms Tackle Large Data Projects Together,” ProPublica, accessed July 15, 2022, <https://www.propublica.org/atpropublica/propublica-launches-collaborate-tool-to-help-newsrooms-tackle-large-data-projects-together?token=hOnQZdHJTqbmH1LsDLO0b4yyvVLFJq3M>.

experience was a significant barrier. “I can’t remember if it’s been approved. I haven’t used it again,” she said.

Limiting our tool sets to the ‘office suite’ also significantly constrains the potential of digital tools. Particularly with Microsoft Word or Google Docs, the structure around which those tools are conceived – the physical printed page – shapes and constrains those tools in fundamental ways. For example, embedding interactive or external content and hyperlinking to other documents are still relatively recent features in word processing software. The implementations are limited and feel alien to the format – a direct consequence of their provenance as software designed to produce printed material.

While reporters I spoke to noted that they liberally add hyperlinks or URLs to their notes, the additional utility provided by these features only marginally extends the utility of these spaces as tools for thinking and organising. There is so much more the software could do toward these goals.

But tools are on the market that may be more fit for purpose, if only journalists had the time, space, budget, and ability to find and experiment with them.

How are tools being used effectively?

Many good note taking apps exist. The value proposition for a reporters’ notebook lies squarely in the extent to which it meets the specific needs of reporting.

Further research should be conducted into journalistic information gathering, the tools and techniques people use for those purposes and how the process might be better supported by tools. Craig, the reporter from Canada, explained how, especially in the early stages of reporting a story, he seeks ways of getting information flowing at him. “I like to think about ways of capturing and organising and then also ways of having information flowing at me which I’m then able to easily capture and organise. So setting up things like Google Alerts, signing up for particular email newsletters [...] creating a Twitter list [...] are [the] sort of tools that I would use to try and get information flowing at me,” he said.

But Craig said it was also important that the information flows were then evaluated and ‘filtered’ through his brain before it got added to his notes.

I want stuff coming at me, but then I have to evaluate it. I have to read it. I have to see it because that process of me seeing it in Google Alerts,

potentially clicking on a link or two, looking at it and then deciding if it's worth saving is important.

It would be useful to understand this process and how other journalists use these techniques more fully before considering how tools might be made to enhance the process.

Evernote and Notion, already discussed, are two examples of note taking and knowledge management software that start to deliver on some of the possibilities an ideal tool might provide. Craig, the reporter from Canada, uses the concept of tagging – a function of Evernote and similar knowledge management apps – extensively in his notes to organise and link ideas. Any new story idea he thinks is worth pursuing gets a unique tag, say 'digital-ad-fraud', and every note, clipping or link he saves with relevance to that story gets tagged.

When starting a new story, Craig will create a new note in Evernote and then, he said, "I'll drop in some URLs or things like that and then tag it in a way that I can pull it up later." Although that sounds very similar to the way other reporters I spoke to use Google Docs, a key difference is that Craig can rely on a more capable tool to do some heavy lifting around organising his information. The value that provides over time is immeasurable for a busy reporter like Craig. He has been building this "repository" of notes for over a decade and now values that knowledge base so highly that the idea of moving away from Evernote and potentially losing the utility that tagging has provided is almost unthinkable.

"I'm able to have some kind of a structure to the information where I can do free text searches, but I also can tag things and have them available. I'm a person who's a big believer in just getting stuff out of your brain and captured so that you can access it later, so that you don't forget it. And so that it's actually organised. So for me, having a taxonomy with tags and things like that [is valuable]."

Craig also leverages a function of Evernote called the Web Clipper – a plugin that adds a button to your web browser – for capturing information in his notes as he's researching:

"If I'm reading an article and I wanna save that as part of my research for an ongoing story, I clip it with Evernote and I save it there. And so that's one really big core tool that I use pretty much every day and have been using for more than a decade."

Again, it's possible to view this as not too different from simply copying text or taking screenshots and pasting them into a Google Doc, but once that becomes a function of the notebook software it opens up more possibilities around automating the collection and organising the content. It would be easy, for example, to neglect to save a link to the source of a text snippet or screen grab when doing that process manually. The right software can ensure that happens every time with no additional effort from the reporter.

Persist with a tool like this long enough and embed it as part of your standard workflow and it becomes a kind of personal Wikipedia – an interlinked and well organised repository of knowledge that's searchable and discoverable.

Quite a few tools in this 'personal knowledge management' category are worth considering, including [Roam Research](#), [Obsidian](#), [Athens](#), [Evernote](#), [Notion](#), [Nette](#), [Scrivener](#), [Bear](#), [Tiddlywiki](#), [Simplenote](#), and [Muse](#). My research shows that these tools offer a great deal to the busy, modern reporter working on multiple stories, and often for different news outlets, whose work must be timely, accurate and traceable.

Mapping practice to potential solutions

Our trade resists generalisation: every story, to an extent, is different and this presents a challenge to developing tools with broad utility for journalists.

There is such a wide variety of beats and reporting styles that demand different approaches. One reporter might be dealing with a highly confidential source that makes retaining a record of communication problematic, another might be engaged in detailed reporting of a scientific advance where clear sourcing and detailed research is paramount. The prospect of one tool being able to provide an optimum approach for all situations is very slim.

But that shouldn't prevent us from attempting to harness the powers of computation for the benefit of reporting. Many see a divide between computational tools that seek to add formal structure, precision and statistical concepts to journalism, and the more humanities-based linguistic roots of storytelling and natural-language sense-making of more traditional journalistic practices.

What if we could bridge that gap and find ways for these quite different approaches to come together more synergistically? Caswell and Anderson say:

“Probably the most significant cultural boundary present at the heart of computational journalism is the boundary between the sciences and the humanities. Defining computational journalism by its representation of journalistic knowledge as structured data entails assumptions about the need for precision, the value of accessibility to logical and statistical inference, and a separation between the collection of data and its communication, which – taken together – align the field with the quantitative social sciences. In contrast, traditional journalism’s assumptions are rooted in the representation of journalistic knowledge as natural language, informed by nuance, ambiguity and style, and inextricably tied to individual authorship. These distinctions, and others, have proven to be formidable barriers to the development of, and adoption of, computational journalism systems. True partnerships between editorial and technical constituents are difficult to forge and are therefore rare, and many computational journalism projects fail due to insufficient appreciation of editorial realities during development, lacklustre adoption of technologies in newsrooms, or both.”¹⁶

A modern reporter’s notebook that respects the existing affordances of journalism and the realities of working in a modern newsroom while also providing utility that supercharges the reporter’s ability to research, synthesise and report effectively remains appealing. One way to achieve this goal is an **underlying and unobtrusive structured data layer** that augments, and is derived from, the work reporters are already doing and sits within familiar note-taking and research practices.

Functionality

The most basic fundamental capability of a reporter’s notebook is unquestionably **text editing**. The majority of reporters I spoke to used Google Docs this way – primarily as a text-based note taking tool, for example taking notes in real time while talking to a source over the phone or cutting and pasting snippets of text from source documents. Reporters I spoke to valued the simple, familiar, and straightforward user experience that Google Docs provides for typing notes or cutting and pasting quotes, URLs and other reference material. However, the importance of additional functionality provided by Google Docs – particularly **collaborative editing** – should not be underestimated.

¹⁶ Caswell and Anderson, “Computational Journalism.”

But our primary tool for note taking should be more capable than simple text notes. Tools like Google Docs can do more, but their full capability often remains unexplored by reporters and only rarely do reporters seek new tools that might extend the capability even further than what is offered by a relatively generic word processing package.

Reporters I spoke to had a variety of practices around note organisation and methods for searching previous or contemporary notes. Many people relied on Ctrl+F to search within a single document, but fewer utilised capabilities for searching across multiple documents at once (or realised they existed). This can slow us down, limit potential connections, and relies on memory to find other relevant pieces when organising and analysing source material. Reporters are bound to ‘miss things’. A capable, intuitive and universal **full-text search** over notes and source material has potential to improve accuracy and speed. Further small modifications to working practices like the routine use of **tagging** or similar taxonomic systems, which provide human-created **metadata** to work with, open up more possibilities for computational assistance.

The ability to embed **visual content** in notes and arrange it spatially can be vital when collecting evidence and making sense of the raw materials gathered through reporting. This is one area where reporters I spoke to felt digital tools were letting them down. While many copied and pasted screenshots and other images into their note taking tool almost nobody used digital tools for organising or **sketching** visually. Where that capability was desired they usually reverted to a pen and paper, eliminating the possibility for computational analysis on the structures and ideas being recorded.

No one tool offers all the capabilities described (nor, perhaps, should it). So the challenge then becomes finding the tool that is most fit for purpose while finding ways to connect other tools that provide those technical capabilities that are missing from your primary note taking tool of choice. This is where the idea of an application programming interface (API) becomes essential. An API, in this context, is a set of functions offered by a piece of software that would enable third party developers to extend the software’s functionality.

With the right API a relatively simple note-taking tool can be transformed in myriad ways to support capabilities that may never be incorporated into the tool itself because they are of relatively niche value or the focus of the tool’s developers is elsewhere.

Connections between other systems or software and note taking software could be manual (copy and paste or listen and transcribe) but in many cases they could also be automated. With the right software and API, a journalist could connect their notes with, for example, other systems that support highlighting and annotating PDFs or other documents in a **document library**, so the most important reference material all lives in one place and links to originals are automatically created.

For another simple example, with the right API, a plugin or extension could be made which expands capabilities around embedded visual content. Current tools (and particularly the tools commonly in use by reporters I spoke to) have limited if any capability making the content of screenshots and other embedded imagery discoverable through mechanisms like search. Better tools would **recognise text in images** and read other **image metadata** like timestamps, location and creator or source accessible and usable for search. While all these capabilities exist in disparate pieces of software, making them available within a reporters' notebook could provide highly contextual information improving a reporter's efficiency, or even exposing critical information that would otherwise have been overlooked.

Once we have a tool that lets us expand what is accessible via search and available to the software for other purposes, it's possible to contemplate further automation, computer aided discovery and organisation.

For example, defining and **detecting entities** like people, places, organisations, dates and more would begin to facilitate creation and interrogation of **networks** and **timelines**.

Once named entities have been identified, either by a reporter or an automated process, further capabilities around those entities can be considered. The idea of **data enrichment** could have useful journalistic applications through the semi-automated collection of data and other information about people and organisations of interest to a reporter. Again, there are tools that already exist that provide capabilities like this – [Maltego](#) is a notable example – but adding these capabilities to a reporter's notebook may provide efficiencies and other advantages that a completely separate tool doesn't provide.

Why do we adopt some tools, and not others?

Prospective makers of tools aimed at reporters face a number of challenges around adoption. Annenberg School's Barbie Zelizer does not lay blame, but has noted that:

“It is often said that journalists are resistant to change, but perhaps what they resist more is the diminution of their craft that often comes with it.”¹⁷

While this relatively high-minded way to view journalists’ resistance to change has some truth to it, another plausible explanation is that journalists are conditioned to accept the status quo. They are constrained by time and economic concerns. Unlike in the wider technology industry, there is no prominent journalism culture for experimenting and seeking new tools. The pace of technological change within the media industry foments a resistance to change that isn’t absolutely necessary or forced on practitioners.

“Journalism’s technologies are expansive, resembling an ever-intensifying matrix of new and refashioned capabilities, and they morph assertively, building in both direct and indirect ways on technologies of yore.”¹⁸

There is so much change that we *must* undertake – new content management systems, reporters being asked to do more production, putting the same story out on multiple digital platforms in multiple formats, professional development around new communications or management tools like Slack or Trello – that to deliberately go in search of more new ways of working may seem overwhelming or absurd. This is to say nothing of the challenges that smaller budgets, understaffing, shrinking ad revenue, and a diminishing workforce place on journalists.

Many feel the tools they do have, though not perfectly fit for purpose, are “good enough”. Without a very compelling reason, time-poor journalists will “make do”, so there is no need to change. This could be mistaken for resilience, however, individual reporters and entire newsrooms are missing out – and therefore, so are audiences.

Newsrooms are also, understandably, cautious with their budgets. As Craig put it to me, “One problem is just, like, newsrooms don’t wanna pay for stuff.” And beyond that, newsrooms (like other consumers) may have become conditioned to getting things for “free” from big tech companies.

Reporters working in a team must find ways to communicate efficiently with colleagues, which includes sharing information across platforms. This is why another impediment to reporters seeking new technologies might be their

¹⁷ Zelizer, “Why Journalism Is About More Than Digital Technology.”

¹⁸ Zelizer.

reluctance to create barriers between themselves and peers. Ironically, even the tools that have features for collaboration can create new barriers. As Craig, who uses Evernote extensively for note taking and organisation, told me:

“You don’t know who else uses Evernote. So [despite Evernote’s collaborative capability] I think of Evernote as really my personal little brain and filing cabinet. And then I’m often taking those items and reorganising them in Google Docs to be able to share with other people.”

If the team you’re on uses one system (particularly near-universal systems like Google), going your own way may feel counterproductive. Getting a whole team to adopt something new is even harder than convincing an individual.

Reporters I spoke to also had a variety of other reasons for eschewing new tools, even when it seemed like they might be useful. For some it was based on their expectation that sooner or later, they would need to pay for it, or would quickly reach the limits of the free offering, maybe before it was able to provide the utility they were hoping to derive from using it. If you’re ultimately not going to want or be able to pay for ongoing use, why bother learning a new tool? For others it was about expedience; speed was of the essence and with the constant time pressure, they felt the upfront investment that would be required to try out a new tool (and the changes to workflow that would come with it) required an upfront investment of time that they couldn’t justify in their day-to-day work. Interestingly, some new tools immediately broke through this reluctance, with Otter being an example cited by multiple interviewees.

The case for change

Journalists use computers and software in their processes, yes, but the tools they use most were designed for other purposes. It is largely coincidental that their utility is general enough to make them useful for journalistic processes. So the question remains: what are reporters missing out on by settling for general purpose tools like word processing software for research, note taking and drafting? Which computational processes could be embedded in a journalistically focused digital notebook and leveraged to provide the sort of clarity and utility that software developed for another use case can’t provide? Can we build software that explicitly and strategically supports the “collect, store, retrieve, analyse, reduce and communicate” tasks Meyer describes as central to reporting?

The fact that most journalists I spoke to rely on relatively simple tools that are not purpose-designed for note taking in a reporting context lends credibility to the idea that there is space for more fit for purpose tools.

During my interviews with journalists, many of them, after being asked to explain how and why they use the tools they use, expressed a dawning realisation that maybe there was a better way. “Having this conversation makes me think maybe I should stop thinking in the old school way,” said Maurice, an investigative documentary filmmaker from Kenya.

The challenge would be overcoming impediments to adoption and demonstrating enough short-term value that reporters persist with using them over the long term.

Recommendations

My recommendations here are informed by my own nine years' experience in the journalism industry. The reporters I've spoken to for this paper have shown clearly that journalists have diverse requirements and have different ways of working. All value flexibility, efficiency and simplicity.

- Journalists should consider incorporating experimentation with new tools as a standard part of their process, particularly around note taking, organisation, analysis, and knowledge management tasks. While there might be an element of inefficiency in trying new tools, the potential upside that experimentation and discovery provides is significant.
- Where journalists possess or have access to programming skills, they should also consider developing systems or processes that extend the capability of existing tools.
- Newsrooms need to have a strategy for empowering and encouraging journalists to seek and employ new tools in the reporting process. While I'm certainly not advocating for a more relaxed approach to digital security in newsrooms (the opposite is actually necessary), room for experimentation may require cultural change in news organisations' management, technology, and information security functions. Newsroom managers should consider the question: what organisational resistance would a reporter in this newsroom meet if they wanted to install or trial a new piece of software on their work computer?
- When evaluating tools, journalists should keep in mind that reporters with more advanced adoption of digital note-taking tools have found that vendor lock-in can be a concern over the long term, but that long term, consistent use is also where the advantages really start to become apparent.
- Technology companies seeking to support journalism should build a better understanding of reporting processes before looking to build solutions. Companies would find it worthwhile – would be rewarded, in my view – if they seek to make more generalised tools that support Meyer's "collect, store, retrieve, analyse, reduce and communicate" tasks. Exploring ideas that attempt to build a bridge between data focused paradigms and more humanities based natural-language disciplines of the journalistic process holds significant promise.

- It is a challenge to build good software. Trying to do so for a market that is already starved of resources, and presents other cultural barriers to adoption, may be foolhardy. But that doesn't mean companies shouldn't try.
- One alternative to building a comprehensive piece of software that attempts to fill the requirements of a minimum viable product in this space is to focus on a narrow set of built in features, but have a well-designed API. A good API would allow for the integration of third party services to facilitate the inclusion of a diverse range of features that may be important to only a subgroup of the target market.

Conclusion

There is now a long history of computer use by journalists, the study of which has focussed predominantly on defining and understanding areas of specialist practice. There may be merit in spending more time understanding the more rudimentary use of computing technology in newsrooms and how it shapes, and is shaped by, journalistic practice.

My research examined technology usage in three distinct (though overlapping) phases of the journalistic process: reporting, production, and distribution. I argued that of those three phases, the adoption of computational processes and tools is less advanced in reporting. For organisational and cultural reasons, journalists tend to adopt computational processes more consistently in production and distribution.

To better understand the specifics of how reporters are using computational tools in the everyday practice of reporting, I conducted interviews with 12 reporters from seven countries working in a variety of journalistic contexts about the specific tools they use and how they use them, with a focus on journalistic note taking.

I examined the idea of creating a digital note taking tool with a specific focus on journalism to better support the “collect, store, retrieve, analyse, reduce and communicate” journalistic tasks identified by Meyer. This paper proposes a variety of functionality targeted specifically at supporting the journalistic reporting process.

If such a journalistic note taking tool were to exist or be created – one with functionality desirable and effective at enhancing the reporting process – significant impediments to broad adoption by working reporters would still exist. I identified some of the key challenges and the reasons they exist – the conditions that mean journalists are not eager adopters of new technologies – before briefly making some recommendations for individual journalists, media organisations and technology companies looking to support journalism through the development of new products.

In short, the idea of a Modern Reporter’s Notebook has merit but faces significant challenges around development and adoption. A more realistic approach to developing such a tool may be to focus on extending existing products to support functionality that offers new capabilities of value to reporters.

Cultural change within news organisations regarding attitudes to experimenting with and adopting new computational tools has the potential to yield significant

benefits, especially in the reporting function. Finally, technology companies looking to support journalism through the development of products have the potential to offer journalism something of enormous value in the reporting space. However, they should take the time to better understand the processes and functions of journalism, and the difficulties new products in this space face around adoption. Armed with efficient and useful note-taking tools, journalists can look forward to having greater capacity to efficiently find and tell the stories that may otherwise have gone untold.