Technologists are Journalists Too: Expert Citizen Journalism by Computational Infrastructure Workers

Cassandra Hayes
Texas Christian University, cassandra.hayes@tcu.edu

Kerk F. Kee
Texas Tech University, kerk.kee@ttu.edu

The proliferation of digital technologies has challenged traditional notions of journalism, professionalism, and expertise. In a study on *citizen journalism*, Robinson and DeShano (2011) quoted a participant as noting "anyone can know" information and journalistic practice within the current technological age. Such widespread ease to distribute information has led to a crisis within models of journalism that focused on the field's gatekeeping function (Kovach & Rosenstiel, 2021). Despite the uncertainty around journalistic boundaries, however, the computational potentials of the digital age also have benefits, such as increased collaboration between professional journalists, citizen journalists, and technologists (Flew et al., 2012).

In this study, we interviewed advanced cyberinfrastructure (CI) professionals and analyzed digital media data about CI to identify how journalistic routines appear in the work of these computational workers. Advanced CI is a network of supercomputers dedicated to the processing of big data, as supported and promoted by the National Science Foundation (NSF) since the early 2000s. A large quality of CI's vision includes accessibility, as the innovation aims to make big data research available to a wide variety of scholars across the United States (Stewart et al., 2010). Because of this accessibility aim and publicly funded support, CI professionals often face the need to communicate their work to each other and the public.

As authoritarian movements rise worldwide and attacks on trustworthy data become more common, the public's need for accurate, transparent information about complex technologies has never been greater. Yet professional journalists often lack the specialized knowledge to report effectively on emerging computational systems. This paper examines how CI professionals step into this gap, performing journalistic functions as "expert citizen journalists" who translate complex computational work for public audiences.

Expert Citizen Journalism and Journalistic Routines

Citizen journalism arose due to technological advancements and related shifts in attitudes toward professionalism and institutions. The concept first began gaining relevance and legitimacy in the late 1990s and early 2000s in contexts of disaster, war, and other largescale tragedies (Allan & Thorsen, 2009). These times of sudden upheaval led to limited access of professional journalists to cover the events, and thus an increased reliance on eyewitness reports via the internet.

Often, scholars have studied citizen journalism in the context of how amateur or informal information dissemination practices may impact journalism as a profession, practice, and institution (Allan & Thorsen, 2009). However, widespread access to digital tools and the cutting back of professional newsrooms has also led journalistic practices to be an expectation of work in professional fields beyond journalism, including science and technology (Brüggemann et al., 2020; David et al., 2020; Droog et al., 2020). These individuals may have little formal journalistic training but are far from informal amateurs regarding the subject matter they communicate. Still, as could be seen surrounding COVID-19, expertise in a scientific or technical area does not necessarily translate to comfortability with journalistic practices or ability to communicate information effectively for a wide public.

The routine work of journalism is part of what separates journalistic practice from other forms of communication and knowledge sharing. Tandoc and Duffy (2018) outlined five routine stages of journalism in their study: (a) access and observation, (b) selection and filtering, (c) editing and processing, (d) distribution, and (e) analytics and measuring. While these routines have been articulated as important for professional journalists, “Relatively little attention has been devoted to how a broader set of social actors get involved in news production processes” (Westlund & Ekström, 2019, p. 5). In other words, little scholarship has exampled how individuals such as technologists and scientists also carry out journalistic routines, despite their established importance especially in the digital age.

Therefore, in this study we asked the research question (RQ): *How do journalistic routines appear in (a) the communicative work CI professionals describe doing and (b) digital media mentions of CI composed for the public?*

Method: Interviews and Digital Media Data

For this project, we analyzed semi-structured interviews with 40 total CI professionals, labeled via a numerical code (P01, P02, P03, etc.) during analysis and reporting. The professionals that participated included a wide array of individuals of various disciplinary backgrounds who occupy various professional roles maintaining, supporting, and advancing CI in the United States. Similar to interview participants in other studies on CI (such as Kee et al., 2021), the roles included administrators, developers/technologists, liaison/facilitators, and users of these computational tools.

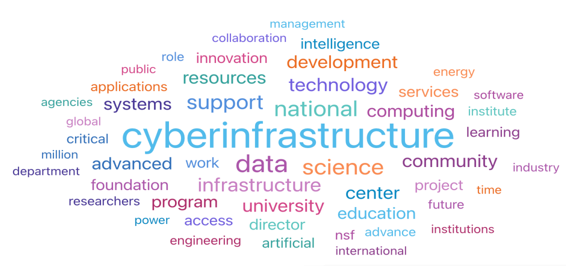
To identify participants, we employed purposeful, random, and snowball sampling techniques. The first author conducted 20 interviews Jan. through March 2022, each interview averaging around 58 minutes and conducted via Zoom. In addition, we analyzed an additional sub-set of interview transcripts conducted 2016-2019 after wondering if the widescale transformations and disruptions of the COVID-19 pandemic might be skewing the findings from the first dataset. This second dataset, led by the second author, includes 178 interviews with 132 CI professionals, as some participants were interviewed twice through a member check process. For this paper, we randomly selected 20 transcripts from the second dataset to analyze in addition to the 20 interviews from 2022.

We approached the data analysis process through a grounded theory perspective (Strauss & Corbin, 1990). Through completing coding process, we realized that the routines within the CI community correspond to journalistic practices, and we began conceptualizing that computational work may be connected in some cases to what we call “expert citizen journalism.” To triangulate and expand our findings to both a public and current context, we also used the social listening tool Sprinklr to gather and analyze digital media data relating to the keyword “cyberinfrastructure.” For Jan. 1 to Dec. 31, 2024, Sprinklr yielded 6.57K digital media mentions of “cyberinfrastructure,” primarily on news websites and on the social media platform X/Twitter.

Findings: Computational Workers Perform Journalistic Rituals

Both in CI professionals’ descriptions of their work and in public-facing digital media mentions of CI, journalistic routines appear. The top terms that appeared in 2024 digital media mentions of CI showcase the journalistic values of the CI community. Among several technical words such as “data” and “computing,” as well as practical words relating to the terminology of the organizations connected to CI such as “advanced” and “national,” other value-bound words appear, including “collaboration” (1,070 mentions) “innovation” (1,624 mentions), “community” (2,343 mentions) and “education” (2,040 mentions). The specific terms identified by Sprinklr are depicted in Figure 1.

Figure 1. Top terms identified by social listening, digital media monitoring tool Sprinklr within 2024 digital media mentions of “cyberinfrastructure.”



The values that appeared in the top terms in the 2024 digital media mentions of CI also emerged throughout our conversations with the computational professionals involved with CI. Our conversations with CI professionals contextualized those values further reflecting journalistic routines (Tandoc & Duffy, 2018). The communication practices that CI professionals described showcase a type of "expert citizen journalism" conducted by these computational workers. Table 1 specifies the journalistic routines and the CI professionals' corresponding communication practice.

TABLE 1. JOURNALISTIC ROUTINES REFLECTED IN COMMUNICATION PRACTICES THAT OCCUR WITHIN THE CYBERINFRASTRUCTURE COMMUNITY.

Journalistic Routine	CI Communication Practice
Access and Observation	***Collaborating***—working on projects with people outside of CI
Selection and Filtering	***Interpreting guidance***—outlining how to use CI
Editing and Processing	***Translating***—communicating technical CI-related concepts
Distribution	***Sharing spaces***—offering physical resources for people outside of CI
Analytics and Measuring	***Assessing***—ensuring CI is fulfilling its values and justifying expenses

While CI professionals did not use the specific label "journalism" to describe their communicative work, their descriptions of routines conducted within the community parallel the practices and values of journalism. The CI professionals described (a) working with collaborators in various disciplines and areas of expertise, (b) making sense of collaborator and institutional guidance and interpreting it for use, (c) translating CI for different individuals and audiences, (d) organizing spaces to share their tools and knowledge, and (e) providing transparent evaluations of their community and actions. All these activities correspond directly to the routine work of a journalist, who gathers facts and then synthesizes them to report to audiences. Table 2 includes some specific quotes that showcase this overlap.

TABLE 2. QUOTES FROM CI PROFESSIONALS CONDUCTING "EXPERT CITIZEN JOURNALISM" IN THEIR WORK WITH THE COMPUTATIONAL TOOLS OF CI.

CI Communication Practice	Example Quotes from a CI Professional
Collaborating	"We're always writing proposals" (P21, 2022); "Very little of what we do is done in isolation. It almost always involves collaborating with somebody outside of your field" (P24, 2022).
Interpreting Guidance	"So, a lot of our funding comes from National Science Foundation, and the National Science Foundation, I think, does a really good job of giving input from the community about what are the challenges and what's needed to address them. So, there is a virtuous cycle from the community providing this kind of guidance" (P26, 2022).
Translating	"... speak a language that all they all kind of understand" (P22, 2022); "Students that come in and new people coming into this community, they typically don't speak the programming languages. They don't use computers in this way" (P04, 2016).
Sharing Spaces	"We're providing places where people can actually physically meet, where local expertise is available to help solve problems" (P04, 2016); "I think that there's a real danger in things becoming more and more ephemeral too, as then the past is lost… An awful lot of what's done is just gone now. And, well, even in terms of physicality, you think about—what's an archaeologist going to find?" (P33, 2022).
Assessing	"Sort of reassuring and showing the researchers that this is a worthwhile thing, right?" (P05, 2016); "A challenge to this [justifying CI versus commercial Cloud services] is non-technical people's expectations for the Cloud, and what the value is of having your own CI versus just, oh, we'll just rent what we need from Amazon" (P24, 2022).

Therefore, the computational workers of CI perform a sort of "expert citizen journalism"—carrying out journalistic routines despite not formally being trained in journalism, while having expertise in their various research disciplines and the technologies of CI.

Moreover, we argue that citizen journalism has historically emerged when individuals happen to be in the right place at the right time, equipped with smartphones and internet access to document unfolding events. These citizens temporarily take on journalistic roles by overcoming a geographic barrier: they are physically present when professional journalists cannot yet reach the scene, enabling them to break news and provide vital, immediate information (Allan & Thorsen, 2009).

CI professionals occupy a parallel position, but in the domain of scientific computing rather than breaking news. They are at the right place and the right time within a rapidly evolving technological landscape. Here, the barrier is not geographic but technical: most journalists lack the highly specialized knowledge required to accurately report on complex computational systems (Droog et al., 2020). As a result, CI professionals serve as "expert citizen journalists," using their communicative expertise to translate CI concepts into accessible narratives for broader publics. Just as citizen journalists make visible what would otherwise remain unseen due to distance, expert citizen journalists make legible what would otherwise remain unintelligible due to complexity. In both cases, proximity—whether physical or technical—creates the conditions for new forms of journalism to emerge.

TABLE 2: THE CORE LOGIC OF THE PARALLEL BETWEEN CITIZEN JOURNALISM AND EXPERT CITIZEN JOURNALISM.

Citizen Journalism	**Expert Citizen Journalism (CI Professionals)**
Right Place, Right Time – *Geographic Proximity:* Citizens are physically present at the scene of a breaking event (e.g., a natural disaster, protest, accident) before professional journalists can arrive.	**Right Place, Right Time – *Technological Proximity:*** CI professionals are embedded in the technical and organizational structures of cyberinfrastructure as it is being developed and deployed, giving them insider access to emerging knowledge before journalists or the public can fully grasp it.
Key Tool: Smartphone or Social Media: Citizens use readily available digital tools to capture and share real-time content (photos, videos, posts).	**Key Tool: Communicative Expertise about CI:** CI professionals possess the *specialized knowledge* and vocabulary needed to translate complex computational processes into accessible narratives for external audiences.
Journalistic Opportunity: They can report because no one else is there yet; professional journalists face a **barrier of distance and time**.	**Journalistic Opportunity:** They can explain because no one else has the expertise yet; professional journalists face a **barrier of technical complexity and access**.
Outcome: Citizen journalism emerges as a legitimate form of reporting, filling a temporary information gap.	**Outcome:** Expert citizen journalism emerges as a legitimate form of reporting, filling a persistent knowledge gap between technical communities and the public.

Just as citizens with smartphones can capture pivotal moments before professional journalists arrive, CI professionals have privileged access to computational developments before these systems are legible to the general public. For instance, during the COVID-19 pandemic, several CI centers rapidly shared data visualizations and modeling results with policymakers and the general public, stepping into a role that resembled traditional science journalism. If they do not step into this role, complex scientific narratives risk being misunderstood or misrepresented, creating opportunities for misinformation to take root.

While geographic barriers prevent journalists from reaching breaking news events quickly, knowledge barriers prevent them from accurately interpreting emerging computational systems. Autocratic actors often exploit the opacity of advanced technologies to spread confusion or exert control. By translating CI into accessible narratives, expert citizen journalists can disrupt these tactics and foster transparency. CI professionals thus do not merely have the option to communicate at times—they carry a responsibility to act as translators of technical truth, ensuring that complex computational developments are shared responsibly with the public.

DISCUSSION & CONCLUSION

In recent years, the erosion of trust in institutions and the deliberate spread of misinformation have created environments where professional journalism alone cannot fully safeguard public knowledge. These dynamics are particularly visible under autocratic regimes, where attacks on free press, science, and other knowledge-producing institutions undermine the transparency and accuracy of information flows. As threats to trustworthy data grow worldwide, professionals outside traditional journalism—including computational workers—play a crucial role in maintaining open, accurate communication. The specialized knowledge required to understand and explain CI places CI professionals in a unique position to prevent the distortion of complex technical issues. By translating their work into narratives that are accessible and precise, these "expert citizen journalists" help counteract the vacuum of reliable information that authoritarian actors often exploit, thereby supporting public accountability and informed decision-making.

To answer RQa, journalistic routines appear in the work CI professionals describe doing through their communicative practices of collaborating, interpreting guidance, translating, sharing spaces, and assessing. To answer RQb, digital media mentions showcase journalistic routines in the values repeatedly emphasized within conversations about CI. In both instances, the communication regarding CI reflects journalistic routines as outlined by scholars such as Tandoc and Duffy (2018). These findings contribute to understandings of citizen journalism when conducted by experts, such as scientists and technologists. In addition, these findings showcase yet another connection between computational work and journalism in the digital age.

Beyond the immediate boundaries of the CI community, these communicative practices have broader societal implications. In a world increasingly shaped by data-driven decision-making, public understanding of large-scale computational systems is essential for democratic participation and resilience. By explaining CI to non-experts—whether policymakers, journalists, or members of the general public—CI professionals contribute to a more informed society capable of critically evaluating emerging technologies and the policies surrounding them. Even if indirectly, their work strengthens the foundations of transparency and collective problem-solving. In this way, expert citizen journalism not only sustains the internal functioning of CI networks but also helps safeguard the public sphere against misinformation, mistrust, and the systemic vulnerabilities that can arise when technical knowledge remains inaccessible or opaque.

In a time when autocratic regimes seek to control narratives and manipulate technical information, the communicative work of CI professionals becomes more than internal documentation—it becomes a form of resistance. By enacting expert citizen journalism, these computational workers safeguard the public sphere, strengthen trust in data, and foster transparency in the very systems that shape our shared future.

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