

Artificial Intelligence and the Intellectual Legacy of Johndan Johnson-Eilola

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Johndan Johnson-Eilola passed away suddenly on November 12, 2023. Literally that day, Johndan, Eric York, one of his colleagues at Clarkson University, and I were putting the final touches on an article for a special issue of the *Journal of Business and Technical Communication* on the effects of artificial intelligence tools in pedagogy, practice, and research. My first co-authored publication with Johndan appeared in 1992, and this article with Eric is the last one (Johnson-Eilola, Selber, & York, 2024), but Johndan's intellectual legacy will be alive for many years to come, helping the field to grapple with truly important questions of our time.

In whatever we wrote, Johndan and I always did our best to think explicitly and carefully about how to make our work on technology relevant to an uncertain future. Media do indeed have specificities, and communication situations always involve local forces and realities, but there are ways to write about technology that allow research and scholarship to have a shelf life for audiences: One power of rhetoric is that it can help you conceptualize and organize what might appear to be a jumble of objects, processes, relations, and actions—human and non-human.

Our main approach to thinking more durably about technology was to invent heuristics for helping people reason through the intricacies of wicked problems. As we explained in the introduction to our co-edited volume *Solving Problems in Technical Communication* (2013), we understood heuristics to be “tentatively structured procedures for understanding and acting in complex situations” (p. 4). The procedures could involve probing technological contexts with a series of critical questions, modeling or mapping communication dynamics in consequential settings, conceptualizing categories for pattern elements or relationships, developing extended examples to illustrate concepts and processes, leveraging binary oppositions for descriptive and analytic aims, and more. Heuristics are valuable to thinking in our field because causality is often complicated and circular (rather than linear) and because meaning is often contingent on the surrounding context. They help us approach complexity and messiness in ways that are both rhetorically sensitive and systematic, at least tentatively, for invention purposes and beyond.

In this tribute to Johndan, I illustrate the durability of his work by showing how three of his heuristics can help us think productively about generative artificial intelligence (Gen AI). I have intentionally selected pieces from his early work to demonstrate just how prescient he could be about the future of technical communication. The first essay, "Control and the Cyborg: Writing and Being Written in Hypertext (1993)," used the imaginary of the cyborg from feminist biologist Donna Haraway to reconsider received understandings of control in human-machine environments. The second essay, "Relocating the Value of Work: Technical Communication in a Post-Industrial Age" (1996), applied a symbolic-analytic framework from former Secretary of Labor Robert Reich to help us move our work up the organizational value chain, academic and non-academic. The third essay, "Little Machines: Understanding Users Understanding Interfaces" (2001), mapped a history of help systems to argue for reconnecting the how and the why of technical communication in instructional documents. I will take each piece in turn, providing a brief summary and then focusing on what is particularly salient to Gen AI.

Essay #1: "Control and the Cyborg: Writing and Being Written in Hypertext"

This theoretically oriented essay responded to the celebratory tenor in much of the initial work on computers in the writing classroom. As in many of his essays, Johndan drew on a wide range of interdisciplinary perspectives to help teachers make some sense of the complications of hypertext writing and reading, which, in the examples he used, instantiated postmodern theories of textuality and challenged status-quo thinking about the nature of contemporary texts. He employed the imaginary of the cyborg to argue that the distributed control afforded by certain types of hypertext can allow teachers to simultaneously foreground process and product or writing as both an activity and an artifact. For Johndan, the cyborg was an instructive imaginary because this "machine-organism entity is necessarily partial and contradictory" and because it invites us "to question some normally submerged aspects of the fundamentally technological nature of much of our lives" (p. 384).

I encourage you to (re)read the essay for more about how Johndan appropriated the cyborg figure as a heuristic, but the following advance organizer reflects his continued interest in the development of self-critical modes, addressing our own submerged biases:

This essay is not a call for technological 'progress' or, conversely, Luddism. This essay tries to remind us that we are neither moving forward to utopia nor backward to Eden; we are doing something else entirely—but, to a great degree, we are failing to think critically about what that something is and failing to consider our technological activities in a deeply social way. (p. 384)

Johndan understood that discourses about technology can be deeply polarized, missing the nuances of meaning and practice between binary oppositions. Such polarization was and sometimes still is a barrier to advancing knowledge in technical communication. Consider how the discourses of Gen AI often construct AI

as either a savior or destroyer of literate activity.

By control, Johndan meant who can do what, or who tends to do what, in literacy contexts. More specifically, he was interested in how technology conditions and shapes the practices of writers and readers. Much of the early scholarship on hypertext contrasted its qualities with those of print, and the really insightful essays did not pit one against the other but rather deployed this rhetorical move to build a bridge between overlapping media. But using the cyborg imaginary allowed Johndan to emphasize distinctions that animate issues of control. For print, he explained, one of the greatest preoccupations of an author is “controlling the passage of the reader through the text” (p. 385). Readers of this journal do not need me to elaborate on the nature of writerly intention structures or readerly practices for print: Technical communication research has attended to print rhetorics since at least the mid-twentieth century. I will simply note that historically control has been located in the author function, even if readers have always been able to defy the linearity of printed texts.

In hypertext, however, readers can become authors by writing their own versions of texts through navigational choices or by producing actual content (think editing Wikipedia pages) or metadata that contributes to meaning construction (think rating product reviews). The insight from Johndan was that control would come to involve more than just a reconfiguration of dynamics in a writer-reader dyad. As he put it, “In hypertext, the computer becomes an active participant in structuring and navigating the text. Although some of the computer’s control is a result of the original author’s manipulations, many controlling characteristics of hypertext are the result of software and hardware activity” (p. 386). Adumbrating the posthuman turn in the field, Johndan envisioned technology not as intelligent in the human sense, as AI evangelists would lead us to believe, but as an aspect of communication situations that has effects, that plays a role in how causation operates in technical communication. The activity of computers helps rearticulate control, distributing it, however unevenly and temporarily, across people, objects, processes, contexts, and more. In this view, the writer-reader dyad is succeeded by a multifactorial network, one that focuses to a large extent on power relationships.

Although Johndan did not offer a definition of power in this piece, for my purposes here, I will stipulate that power is what stabilizes or fixes meaning in particular situations, at least for a period of time. In the landscape of control, Gen AI can contribute to how power is exercised in a variety of ways, from producing output shaped by problematic bias in training data to storing prompts in open libraries for crowdsourcing work. But we will need to be judicious in how we think about the concept of distributed control. As Johndan warned decades ago, it “holds both empowerment and danger” (p. 383) for the field.

Essay #2: “Relocating the Value of Work: Technical Communication in a Post-Industrial Age”

This essay offered a new take on the relationship between technology and communication that still promises to strengthen and raise our stature as an applied discipline. Johndan was alert to barriers that limit the contributions of technical communication by positioning our work as a low-level facet of knowledge production. This piece, which won The Nell Ann Pickett Award for best article in *Technical Communication Quarterly* in 1996, began with a compelling problem statement that traces the emergent shift from an industrial to postindustrial economy in the United States; this shift began to appear more visibly with the rise of online information services for both consumers and professionals.

Generally speaking, the focus in an industrial economy is on manufacturing goods, such as machinery, computers, cars, and other tangible products. Manufacturing is still important to a post-industrial society, of course: Producing a tremendous supply of computer chips and energy sources will be essential to the development of AI server farms, for instance, and trucking tangible products literally helps drive the economy in all sorts of ways. But in a post-industrial society, information and communication also become primary products. In other words, in the twenty-first century, people are buying and selling technical communication because it has intrinsic value, a new reality that Johndan anticipated in his scholarship.

Using the symbolic-analytic framework from Reich as a heuristic for conceptualizing a more empowering model of technical communication, Johndan argued that we should remap the field for the new economy, shedding, or at least shrinking considerably, our identity as a service or support field that simply traffics in routine production work and in-person service work. These two types of work emphasize technology over communication and thus ultimately leave us on the outside looking in when it comes to knowledge production, organizational decision making, research, strategic management, and other higher-order roles and functions. In fact, Johndan admonished that "If technical communicators do not take action to change their current situation, they will find their work increasingly contingent, devalued, outsourced, and automated" (p. 262). This admonishment has become an imperative in a dawning age of AI-generated writing.

The more empowering model that Johndan offered foregrounds collaboration, experimentation, abstraction, and system thinking, four capacities that are easily discernible in prompt engineering, the practice of using instructional writing to elicit output from Gen AI chatbots. Johndan acknowledged that technical communicators already sometimes act as symbolic analysts, but as a field we have not advanced a coherent and robust enough approach to "inver[t] the relationship between technical product and knowledge product" (255), failing to reposition our expertise in communication as a key component of meaning-making processes in both design and use settings. By collaboration, Johndan meant the capacity to function in teams that work across complex disciplinary domains and to recognize how power dynamics in teams can diminish or enhance the status of technical communication. By experimentation, Johndan meant the capacity to conduct richly contextualized research that attends to the "broader and more complicated concerns" (p. 259) in problem-solving contexts, especially the social concerns that are almost always lurking in the background of functional tasks. By abstraction, Johndan meant the capacity to see "patterns, relationships, and hierarchies," that is, the bigger

rhetorical picture, “in large masses of information” (p. 260). And by system thinking, Johndan meant the capacity to understand where a wicked problem comes from in the first place and trace how it develops in a particular space and time to help change systemic conditions.

A wicked problem addressed by prompt engineering can come from nearly anywhere, but a commonplace example is that people often turn to AI because they believe it will help them improve work efficiencies, as in saving time or money. A technical communicator functioning as a symbolic analyst has the capacity to critically assess this seemingly singular belief in technology, which is rooted in the earliest industrial landscapes, including scientific management, in order to think systemically and act productively in the post-industrial present. As Johndan so aptly put it, “technology is easy to come by, but understanding and strategic use are both rare and valuable” (p. 257). Strategic use here might mean understanding that AI tends to both solve and create problems: Google retrained its Gemini robot to be more sensitive to diversity issues, but the robot then hallucinated racially diverse images of Nazi soldiers and the Founding Fathers. Although there are ways to improve work efficiencies, no silver bullet exists in complex situations. Any long-term solution will most certainly involve teams leveraging the epistemic dimensions of technical communication—prompting is principally a writing activity that has been appropriated by the discourse of engineering without much outcry from us—and testing the efficacy and limitations of prompt sequences, including sequences purchased from AI marketplaces, which people use to outsource and automate technical communication and to sell it as a primary product.

In addition, any long-term solution for improving work efficiencies will need to involve abstraction. AI actually works by abstraction, meaning that prompting output is based on pattern matching for a massive corpus of decontextualized texts. Although AI output can be useful in many different ways, this sort of abstraction separates texts from their action contexts and thus fails to attend to the particularities of technical communication situations. In contrast, what Johndan meant by abstraction is the ability to structure information appropriately for “specific types of users in certain contexts” (260). He anticipated perhaps the most critical step in the process of working with Gen AI: Adapting, transforming, and rewriting output for more relevant and targeted results.

Essay #3: “Little Machines: Understanding Users Understanding Interfaces”

This essay used the example of online help systems to challenge the commonsense view that technical communication should be a minimalist type of communication modeled after a “politics of amnesia” (p. 120). Although Johndan acknowledged the need to bracket or strategically forget information in a world of information overload, a minimalist approach with a narrow focus on instrumentality and brevity, while useful in the short run, ultimately disempowers users by separating the why from the how in work-related tasks. “Instead,” Johndan argued, “we must help users understand communication, production, thinking, and living as an often messy, complicated, open-ended activity, one that often requires attention

to not merely the simplest functional activities but also the larger frameworks and contexts of that work” (p. 126). Always a teacher, Johndan encouraged us to extend our pedagogical objectives and practices to non-academic settings and to think of users of technical communication as our students. Although decades old, this is a capacious vision for the future of the field.

The type of minimalism Johndan critiqued is based on the principle of transparent design, on the idea that good design melts into the background so that the primary task can occupy the center stage of the work platform. The development of online environments helped to defend and advance this principle, as Johndan explained: “In print, the medium was the message, but that was always the problem with print—it got in the way. Online, we can make the medium disappear and leave the pure message (or so the argument goes)” (p. 121). What Johndan grasped early on is that there is a tradeoff between short-term problem solving and long-term solutions. In the short run, users of minimalist technical communication can get quick answers to questions that create impasses and thus slow or stall progress. If users of a word-processing program do not know how to create columns or hanging indents, for instance, they can call up the online help system for procedural instructions. Such instructions are indispensable because they allow users to stay focused on the task at hand, but they support training, not learning, which is essential to long-term solutions.

To illustrate the distinction, Johndan worked through an extended example involving a software wizard in Microsoft Word that at the time helped users create memos, resumes, legal pleadings, and other technical-communication documents. After initiating the wizard, users confronted a series of basic questions and templates; based on their answers, the wizard walked them through the process of creating the document. Although this feature now exists as an annotated document template (versus automated software sequence), it would be easy enough to recreate the wizard with Gen AI. The problem for Johndan was not so much the basic questions, which could serve invention purposes with the right framing, or even the templates, which reflect typical genre elements in technical communication, but that the wizard represented the writing process as a simple checklist of static considerations: Pick your genre, design, and style, and voila! You have a document! But is the document effective? The obvious answer is no, at least not fully, because document elements like genre, design, and style must invariably be tuned to audiences, purposes, and contexts, not applied in a blanket fashion to any and all situations. According to Johndan, the wizard worked because it “disguise[d] itself as a neutral tool rather than an incomplete environment, never suggesting that the user might want to think about the operation or learn background theories” (p. 126). Unmasking this supposed neutrality is still a crucial initiative for the field, not to create some sort of academic gotcha moment, as it were, but to ask what else we need to do to complete the environments in which we leverage information technology.

If wizards attempted to automate the development of key document elements, Gen AI goes an order of magnitude further by automating writing itself. And that writing, in the eyes of many people, is good or good enough for a variety of uses, including technical communication. The challenge we face is developing a pedagogy

for prompt writing that emphasizes learning, as Johndan advised. For the most part, what we have been seeing so far is a training approach to prompting that aims to help users elicit better and better output: The approach concentrates on how to craft effective prompts and on how to reprompt robots until the content is acceptable. If we can become skilled enough at prompting robots, so the logic goes, we can outsource writing to Gen AI. Writing is reduced to a form of human-computer interaction based on statistical probability.

In contrast, a first principle of a pedagogy of learning is that people need to know more about technical communication, not less, to employ Gen AI productively. It addresses the limitations of AI, seeing AI as an incomplete environment for writing and communication, and it involves the capacities of humans in production activities, including decision making around the rich array of rhetorical dimensions of texts and their contexts. A pedagogy of learning reconnects the how and the why of technical communication, combining functional instruction with conceptual instruction, as Johndan imagined it, empowering people—technical communicators and users—rather than marginalizing them. A simple example is asking students to use rhetorical heuristics to guide the evaluation of AI output. How well does the output accommodate the audiences, purposes, and contexts for the document? Reflect what we know from research about effective technical communication? Employ strategic as well as conventional approaches? Attend to ethical and legal considerations? These are just a few of the questions that foreground the complexity of our expertise, and of writing, in the seemingly unfinished project of demonstrating the relevance of the field to the world.

A Brief Conclusion

I cannot claim to be objective when it comes to Johndan and his work, but Johndan also reminded us that objectivity is a relative rather than absolute concept. There are many valid ways to measure an intellectual legacy, and one reasonable method, surely, is to judge the extent to which, and how well, the work remains relevant to this day. This tribute did not write itself, but I only really struggled with personal feelings. Applying the essays reviewed here to Gen AI came quite naturally and easily. It was as if the essays had been written for our current moment.

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