16. Information

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Information is one of those terms that is widely used in both academic and popular discourse in ways that do not always relate to a more precise, technical definition. It can be helpful, in fact, to consider the various words that *information* is often paired with as a modifier in order to know how best to make sense of it. There are four especially helpful pairings for technical communicators to know: *information theory*, *information technology*, *information design*, and *information architecture*. These four terms mark points on a timeline of information's evolution in meaning as well as conceptual shifts in the work of technical communicators as it relates to information. Interestingly, in none of these pairings is the word *information* the neutral signifier that it can sometimes seem in popular usage, as when people ask for "just information." Rather, in each of the four cases, the term marks a site of consequential contestation over the nature of technical communication and the role technical communicators play in the social settings where their work unfolds.

This entry tracks the shifts in thinking about technical communication across the four pairings in four historical moments: information theory and technical communication as transmission, information technology and technical communication as ***translation***, information design and technical communication as transformation, and information architecture and technical communication as trans-disciplinary ***knowledge*** making. In each section, *information* serves as a compass point for a trajectory of further inquiry that, necessarily, exceeds the scope of this short essay.

Information theory is a mathematical formulation credited to MIT and Bell Labs scientist Claude Shannon. Published as a two-part article titled "A Mathematical Theory of Communication," Shannon's (1948) work contributed two key ideas that are foundational to both computing and telecommunications. The first is a means to reliably quantify how many binary digits are required to encode some amount of data, such as a text or voice message. The second idea, which applies to transmission of messages through a channel, is the means to reliably calculate the signal to noise ratio for the channel and to understand how the ratio varies given the channel bandwidth. Shannon's formulations of information entropy—the way the quality of a signal degrades under certain conditions—are the basis for compression and error-checking routines widely used today that allow for fast, clear, global communication (Collins, 2002). But Shannon's ideas have had more than instrumental influence. They also arguably underlay our current economic and political orientations to the term *information*, wherein we take

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it to be common sense that information is the valuable part of a signal (and all other stuff is "noise"), and where the consistent reliable flow of information is understood to be vital but "information overload" is also a known threat. So how did a highly technical mathematical theory hatched in a telecommunications laboratory gain broad cultural cache?

In 1949, a colleague of Shannon's at Bell Labs, Warren Weaver, collaborated with Shannon to publish a book-length version of the original article under a slightly modified title: *The Mathematical Theory of Communication*. The move from "A" to "The" in the title signified an implicit argument about the generalizability of the ideas in the book. A model was born that would be taken up in many ***research*** and industry areas and applied to business and social affairs. The Shannon-Weaver model of communication also had a significant impact on technical communication, though not an uncontroversial one. To see why, a look at the model (Figure 16.1) is helpful.

Where is the work of technical communication in the Shannon-Weaver model? What is implied about the nature of that work? If we take this model from its original technical context and apply it more broadly to systems populated by humans, the technical communicator is most plausibly a "transmitter," a functional role that does not contribute any information value to the signal apart from error correction and compression, always with the risk of introducing rather than reducing information entropy. Not surprisingly, technical communication as a field has resisted this reduction to the value added by technical communication and has produced robust critiques of this "transmission model" of communication as well as alternative formulations that turn, in part, on alternative conceptions of "information" (c.f. Miller, 1979; Slack et al., 1993). Perhaps the most popular of these alternative formulations is the technical communicator as translator or, as once metaphorically represented in a since-retired Society for Technical Communication logo, a bridge.

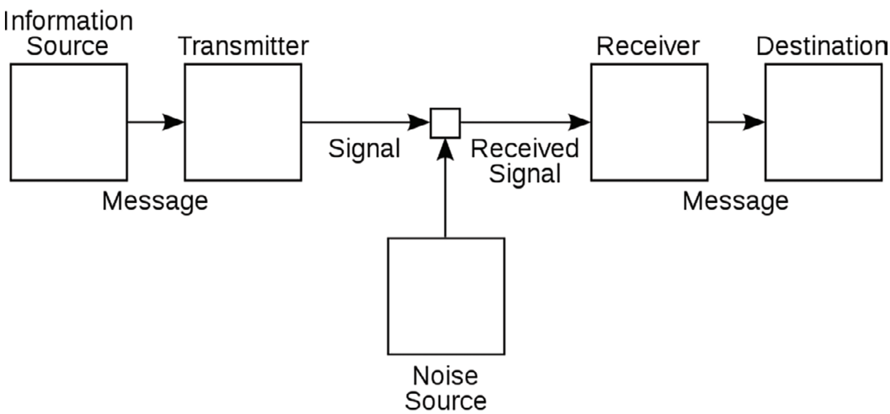

Figure 16.1. Shannon-Weaver Model of Communication.
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This metaphor is captured in the pairing *information technology*, a phrase whose meaning took shape as computer processors shrank in size and found their way into industrial and consumer products. Two areas of need arose that buoyed demand for technical communication: 1) experts in different knowledge domains such as health care and computing or agriculture and robotics needed to be able to understand one another, and 2) people who offer products and services needed to communicate technical information to a growing, global audience of consumers. Throughout the latter part of the 20th century, these two demands fueled the conception of information as a supporting product and, in some cases, as a companion service that had to be provided in order for increasingly technical products and services to be traded and used successfully.

Information in this model is not, by itself, inherently valuable. But without a manual, one might never learn to use a piece of expensive software. Or, without a documented programming interface, a software developer might not be able to connect one system with another. This view of information as knowledge to be translated gives rise to the role of technical communicator as a "bridge," either between disparate expert areas of knowledge or between an expert and a layperson. This model goes well with the way information is understood in the phrase *information technology*, wherein a technical device or object functions to do something useful without the user needing to "do the math" implied in information theory to derive the benefits. That is, the information in information technology—the representation of messages as quantities, calculations performed on those quantities, and the rapid communication of bits back and forth via microcircuitry—is "blackboxed" to the user. So your rice cooker that uses "fuzzy logic" may well use sophisticated computing algorithms, but as the cook you only need to add rice and water and push a button. You may also need a guide, and the manufacturer who developed the machine likely needed ***documentation*** from the company who manufactured the circuit board in the appliance.

The value of information products as ancillary also came into scrutiny by members of the field for the way it still positioned technical communicators not as creators of knowledge but as processors of it. This model left the hierarchies of expertise in place, even if it placed technical communicators in an important middle position between the originators of knowledge and those who needed to learn more. What changed, according to Johndan Johnson-Eilola (1996), was a shift accelerated by how we could interact on global networks such as the World Wide Web, a shift that predicated the re-ordering of the value of work across all of our categories of professional activity.

With the advent of the Web came a melding of what had previously been a quite clear split between the "product" and "information about the product"; with it, the value proposition that had supported the bridge model became far less clear (Hart-Davidson, 2001). Many of the most successful companies in the world began succeeding by selling information. And with Apple as perhaps the signature example, these companies would go on to develop service models that turned the old hierarchy upside down. Now, the device (such as the iPhone) was a gateway to a monthly service and a "content ecosystem" where the main commodities were information products. Today, the Society for Technical Communication's mission statement no longer refers to technical communicators as bridges or translators. Instead, it reads, "The Society for Technical Communication advances technical communication as the discipline of *transforming* [emphasis added] complex information into usable content for products, processes, and services."

Pairing "information" with the verb "design" offers one conceptual path to understanding technical communicators' work as transformative. As the kinds of products that technical communicators produced or helped to create—documents, websites, tutorials, infographics, videos, apps—evolved, so did a new understanding of information as raw and, potentially, re-usable material to create useful, usable products. The information of information design is malleable and valuable. It arrives from a variety of sources in a variety of formats and feeds any number of content streams where it might become part of a document, a tweet, an infographic, or a video. The value of the information can be measured in its potential, but is more often understood when an information asset is set in motion and users begin to engage with it. How much and what kinds of engagement an information asset accrues will determine how it might be repurposed and/or transformed further.

Karen Schriver's 1996 book *Dynamics in Document Design: Designing Texts for Readers* offered a thorough treatment of how technical communicators might realign their work such that it would be judged not by how documents looked but rather by what users of those documents did with them. While the focus of that book was on documents, the book is still in print today because it lays the groundwork for seeing the real value in information design not as visible in a product adhering to some technical standard or aesthetic benchmark. Rather, information design succeeds when the behavioral results of readers and users can be measured as outcomes.

The concept of information paired with design invites action from technical communicators across the full scope of the traditional ***rhetorical*** canons—invention, arrangement, style, memory, delivery. In this way, it differs dramatically from the transmission model, where technical communicators' only role was to smooth delivery largely using the tactics of ***plain language***. And, importantly, this work is never done, because there are always opportunities to make engagements richer, more satisfying, more effective, and, importantly, as Miriam Williams and Octavio Pimentel (2012) argue, more inclusive and inviting to other groups. And as Laura Gonzales (2018) has argued, this focus on transformation to facilitate inclusion also calls us to remediate our understanding of terms like *translation* that have been at the center of our work.

The work of technical communication today is often aligned with another professional area with "information" as a modifier: architecture. Information architecture names both a set of professional practices as well as an academic area of study with conferences and research journals and a professional identity with a well-defined career pathway. Rather than replace technical communication, information architecture, or IA, can be considered a complementary path to practicing technical communication skills and applying technical communication knowledge. In this pairing, information does not just exist *a priori*, nor do technical communicators or information architects wait for others to create it. Rather, information is seen as a potentiality to be maximized, realized, and capitalized.

Today, nearly everything we do—down to the most minute, involuntary gestures, such as eye-blinks or heartbeats—has the potential to become information stored in a system, fed to an algorithm, aggregated, analyzed, and visualized for our own or somebody else's use (Hart-Davidson & Grabill, 2012). That end-to-end conceptualization of an information lifecycle describes the scope of activity implied in the pairing of information and architecture. Technical communicators might realistically play a role in all of the phases where data becomes information and information becomes knowledge.

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