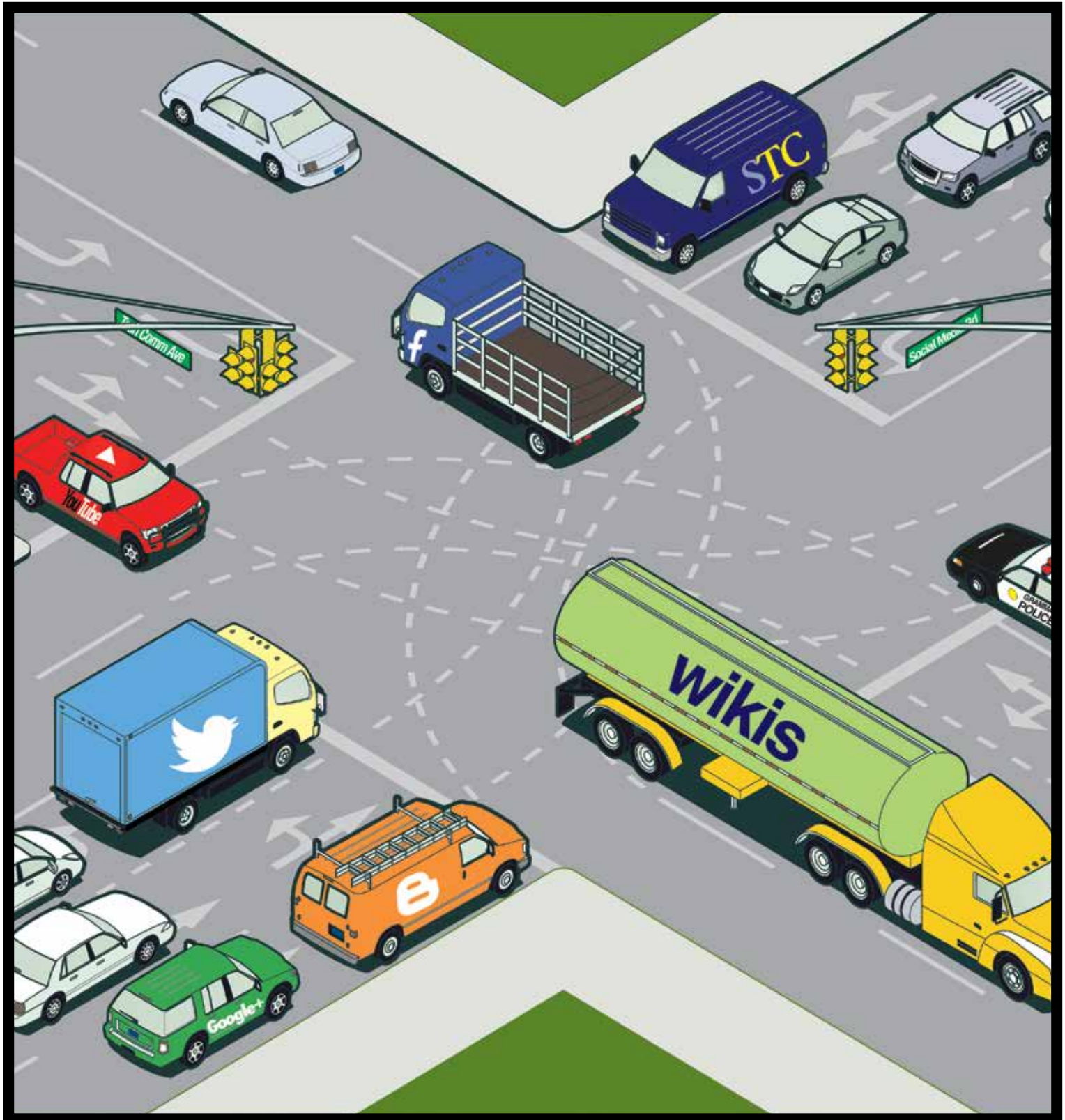


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Journal of the Society for Technical Communication





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Journal of the Society for Technical Communication

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Kit Brown-Hoekstra



MY NAME IS KIT BROWN-HOEKSTRA AND

I'M AN STC MEMBER

Technical COMMUNICATION

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MAY 2016

Journal of the Society for Technical Communication

ARTICLES

APPLIED RESEARCH

- 85** Enacting Humanitarian Culture: How Technical Communication Facilitates Successful Humanitarian Work

By Rebecca Walton, Robin E. Mays, and Mark Haselkorn

APPLIED RESEARCH

- 101** Speakers and Boards: A Survey of Instructional Video Styles in MOOCs

By José Miguel Santos-Espino, María Dolores Afonso-Suárez, Cayetano Guerra-Artal

APPLIED RESEARCH

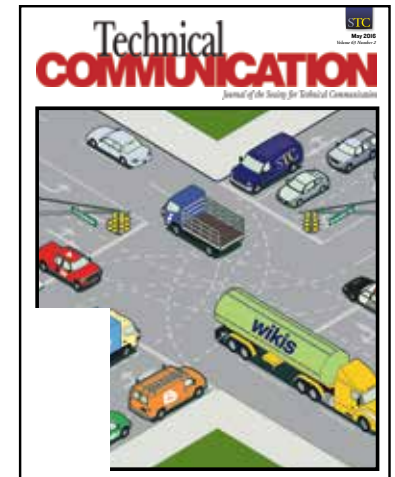
- 116** The Re-Emergence of Emotional Appeals in Interactive Data Visualization

By Charles Kostelnick

APPLIED RESEARCH

- 136** Making Memories: Writing and Designing More Memorable Documents

By Eric Sentell



DEPARTMENTS

- 81** EDITORIAL
The Courage, Generosity, and Curiosity of Research
By Sam Dragga

- 84** ARTIST'S NOTE
On the Cover

- 154** TOOLS OF THE TRADE
Review of Four Books on User Experience and Interaction Design
By Angela Robertson

- 159** BOOK REVIEWS
Jackie Damrau, Editor

ONLINE ONLY TECHCOMM.STC.ORG

- E8** RECENT & RELEVANT
Lyn Gattis, Editor

INSTRUCTIONS FOR AUTHORS

About the Journal

Technical Communication is a peer-reviewed, quarterly journal published by the Society for Technical Communication (STC). It is aimed at an audience of technical communication practitioners and academics. The journal's goal is to contribute to the body of knowledge of the field of technical communication from a multidisciplinary perspective, with special emphasis on the combination of academic rigor and practical relevance.

Technical Communication publishes articles in five categories:

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Sam Dragga, Editor



The Courage, Generosity, and Curiosity of Research

This issue of the journal offers you four articles to inform and inspire your thinking about this always-evolving field of technical communication. Two of the articles are single-authored and focused on issues related to information design, while two are collaborative studies that examine emerging directions for teaching and practice—MOOCs and humanitarian enterprises. In addition to the usual summaries, I will try in this introduction to offer you insight on the genesis of each article. After their manuscripts were accepted for publication, I asked the authors about the rigors of getting from initial idea to published page. I think their perspectives here serve as important reminders of the fragile and impressive human beings who generate this research, who identify questions and compile tentative answers, who write and revise and try to verify and clarify their findings, who incorporate advice from reviewers and revise again, and who put their ideas and reputations on trial for all of us to judge.

In “Enacting Humanitarian Culture: How Technical Communication Facilitates Successful Humanitarian Work,” Rebecca Walton, Robin Mays, and Mark Haselkorn examine the nature of technical communication practices adapted from business environments to nonprofit organizations. Their multimodal and multilayered study—using observations and interviews of

practitioners in six international locations—reinforces the centrality of localization, audience analysis, and collaboration but also reveals that the communication practices of humanitarian organizations must be driven by humanitarian principles of supporting human dignity and equality as opposed to the usual objectives of clarity and efficiency. Ordinarily, the way communication is practiced, especially the inclusion of stakeholders in the process, is more important to the humanitarian effort than the communication product itself. Walton, Mays, and Haselkorn thus give us a foundation—in both methods and results—on which to build thoroughgoing studies of writing in alternative environments.

I queried the three authors about their writing of this manuscript. While you might anticipate comments on collaboration, their answer focuses on the liability in questioning tacit conventions of the field:

One unique challenge for us has been overcoming the common assumption that successes of for-profit organizations can be translated directly into solutions for humanitarian organizations. Rather, we have found that for-profit solutions can actually distract us from effectively learning, developing and applying advances to non-profit work. Some disagree with

the propositions we offer: that the humanitarian environment is fundamentally different from the for-profit environment; that the nature of humanitarian work is not well understood; that to gain this understanding we must start at ground zero of studying the work itself and the communication which supports it; that to do this we must conduct complex, time-consuming qualitative field studies. While the evidence is undeniable for us, the burden is ours, as authors and communicators, to reveal that which is unseen; to make the case for a new approach; and to convince readers that this is worth our time.

Their experience is also that dialogue and transparency will be essential to success if you are considering research projects of this kind:

Our advice would be to partner with humanitarian insiders by building some relationships. Look for connections (not sameness but synergies) among your respective interests, needs, and expertise. Then work together to establish a type and level of partnership that works

well for all. Sometimes that means hands-on collaboration at every step: designing data collection materials, identifying partners as PIs on IRB applications, and co-publishing together. But that level or type of involvement may not be worthwhile or relevant to all humanitarian partners. At minimum, we'd recommend collaborating on the purpose of the research and envisioning together the desired outcomes for each party. An early scoping phase is useful for homing in together on research questions that are relevant to each party.

In "Speakers and Boards: A Survey of Instructional Video Styles in MOOCs," José Miguel Santos-Espino, María Dolores Afonso-Suárez, and Cayetano Guerra-Artal also adopt multiple methods to examine their subject. Their analysis of five platforms for MOOCs (Massive Open Online Courses) serves to identify seven dominant video styles and a continuum from speaker-centric to board-centric (i.e., lectures and interviews versus slides and screens). A subsequent examination of 116 MOOCs uncovers the frequency of each video style and statistically significant correlations with the course subject area. The methods and the findings of this study have wide applicability for technical communicators developing and testing instructional videos for a wide array of products and services.

The three co-authors have been working together on video-based learning for several years,

noticing that widely adopted claims are ill supported:

We are currently exploring how different video features and styles are being used by instructors in online courses such as MOOCs. We have observed a widespread belief in the research community: most MOOC videos are based in lectures and they rely on few communication styles. Despite numerous anecdotes, we were not able to find empirical data that support these assertions. That moved us to make a quantitative survey on the actual video style usage in international MOOC platforms.

As their project makes clear, research studies might be driven by questions or reservations about prevailing ideas or by a desire for more rigorous methods in compiling and analyzing the evidence that is the basis for theory and practice.

In "The Re-Emergence of Emotional Appeals in Interactive Data Visualization," Charles Kostelnick makes the case that the affective design of charts and graphs—a practice virtually dormant during the modernist minimalism of the 1900s—has been revived in the age of digital technologies and collaborative multimedia. Professor Kostelnick traces the origins of emotion in statistical illustrations to the ingenuity of designers in the 1800s (e.g., Booth, Minard, Mulhall, Nightingale). He claims their integration of sensory stimuli (e.g.,

color, pictures) has again been adopted but reinforced by a new impetus—the ability of viewers to individualize the display of information. He urges technical communicators to recognize the history of emotion in the design of illustrations and to seize the opportunities of interactivity to invigorate the creation of meticulously informative and sincerely engaging data displays.

Obviously, every article about information displays must include clear and compelling examples to support its claims: I thus questioned Professor Kostelnick as to how he decided on the 12 examples he uses in this article. He explained:

Designers in the late nineteenth century produced a rich array of data displays, as have contemporary digital data designers, so selecting examples to include in the article was very challenging because there are so many examples to consider.

I tried to select examples, both past and present, that showed a full range of emotional appeals. Victorian aesthetics pervaded all aspects of design in the later nineteenth century, including data design, perpetuating the legacy of Romanticism and its emphasis on emotion. The rich visual language of contemporary digital design has re-opened the door to emotion. In short, examples of emotion in data design abound in both eras, and my intent in selecting the examples was to show the connection between the two.

Sam Dragga, Editor

If you're looking for more information on this subject, Professor Kostelnick has co-edited a new book with Miles Kimball: *Visible Numbers: Essays on the History of Statistical Graphics* (Ashgate, 2016). He also recommends the website *Visual Complexity* and *Flowing Data* for their examples of inventive data visualizations.

In "Making Memories: Writing and Designing More Memorable Documents," Eric Sentell interviews 20 high school students and teachers about their memory of key information and specific details from flyers lining a corridor. He discovers that contrast, color, and imagery are important factors, but more important is the viewer's sense of identity and the relevance the viewer thus ascribes to the information on the flyer. This finding leads to a six-step process for creating materials that will genuinely stick in the minds of viewers—strategies that would likely be invaluable for technical communicators designing cautions and warnings, meeting notifications, or action-required messages.

In answer to my questions about this article: Professor Sentell explained that it emerged from his growing recognition during his PhD studies of the impact of design on attention and memory. In his dissertation, he sought to address this little-examined question, because he considered it theoretically interesting but ripe with practical implications. As he notes,

To me, memory's importance and potential power are

obvious. One can refer back to a document instead of recalling it, of course, but memorable ideas, images, and texts have the potential to become iconic and to exert lasting influence on readers, society, and culture. So if the audience doesn't remember what one says, then one is not communicating very powerfully. Yet theories of writing and design rarely, if ever, discuss how one can make information memorable. I felt compelled to develop some strategies for doing so.

If you are interested in this issue of memorability, Professor Sentell has several recommendations about resources as well as directions for research:

For background knowledge about memory, I suggest Marion Joan Francoz's "Habit as Memory Incarnate," Stewart Whittemore's "Metadata and Memory," and the work of Elizabeth Loftus. Francoz offers a thorough but succinct review of often-used metaphors and conceptions of memory. Whittemore's article describes the "memory system" used by ancient orators, which accounts for much of memory's rhetorical history, and its applications to technical communication. Loftus' work presents our modern psychological understanding of memory. To dig deeper, one can also read Frances Yates and Mary Carruthers for thorough histories of memory's rhetorical

significance, Frederic Bartlett's seminal psychological study of memory, and Whittemore's recent book, *Rhetorical Memory*.

In terms of studies, there are many intriguing research questions one might investigate. Does this heuristic work in other genres or for other audiences, and if so, how? How do genre conventions constrain and enable memorableness? How does the medium affect an audience's encoding? How do different physical spaces affect attention and memory? How does the concept of collective self-schema change theories of audience and/or the practice of audience analysis?

I believe that you will find the four articles in this issue to be as provocative and gratifying as did I and as did your twelve conscientious and anonymous colleagues who reviewed the manuscripts. The courage of the authors in sharing their research and the generosity of the reviewers in advising the authors are vital sources of innovation and are exceeded only by the unyielding curiosity that invigorates this field.

On the Cover



A recent Google search of “social media in technical communication” revealed a number of visually powerful images that included a rewiring of our brains, the coming down of walls, and the intersecting of ideas regarding social media and the traditional roles of technical communicators. Of these, I chose the image of an intersection as the foundational idea for my cover illustration. Many technical communicators haven’t embraced social media and still view its varied forms as intruders in the world of technical writing. And as much as these professionals would like social media to go away, modern trends demonstrate that social media is not going away and that it will continue to transform how we communicate.

For these reasons, my illustration orchestrates both social media and technical communication into a working model using the traffic intersection metaphor. Instead of a chaotic intersection rife with accidents, this intersection is effectively managed using traffic signals and traffic control patterns. Not only does the intersection convey an intersection of communicational forms, but it also conveys an intersection of ideas, attitudes, and behaviors.

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About the Artist

Richard T. Mangum is an assistant professor at Embry-Riddle Aeronautical University, where he teaches technical communication. He also is a PhD student in the Technical Communication and Rhetoric program at Texas Tech University. He lives with his family in Arizona, where life is always an adventure. He is available at mangumr@erau.edu.

Enacting Humanitarian Culture: How Technical Communication Facilitates Successful Humanitarian Work

By Rebecca Walton, Robin E. Mays, and Mark Haselkorn

Abstract

Purpose: Technical communicators should look beyond for-profit industry to develop a fuller understanding of how technical communication can support, enable, and constitute successful work practices. To illustrate, we report a subset of findings regarding how technical and professional communication supports successful humanitarian work.

Method: We conducted a three-phase longitudinal study of an international humanitarian organization. In Phases 1 and 2, we conducted phone/Skype interviews with 25 practitioners, a group including international, regional, national, and local levels of the organization. In Phase 3, we engaged in ethnographic observation of work practices in six countries and conducted a total of 95 additional interviews (in person) with humanitarian practitioners.

Results: Communication plays an important role in the success of practitioners' day-to-day work when that communication pursues goals relevant to humanitarian culture, such as showing respect for local ways of operating. Specifically, our findings show that enacting humanitarian culture led practitioners to (a) localize how they speak, (b) collaboratively produce written documents, and (c) encourage bottom-up organizational communication.

Conclusion: We found that while many of our field's skills and areas of expertise carried over to humanitarian environments, the values and motivations associated with humanitarian culture are what influenced the effective application of these skills and are, therefore, key to the effectiveness of communication. In particular, fine-grained localization and empowerment at the lowest level are central to professional communication that supports successful humanitarian work.

Keywords: humanitarian organizations, organizational culture, workplace study of practice

Practitioner's Takeaway:

- Takeaways can be summarized in a two-pronged implication: (a) many important skills and considerations of our field—such as localization, audience analysis, and collaboration—are necessary for successful humanitarian work, and (b) to support successful humanitarian work, the application of these skills and considerations must be undergirded by values and motivations congruent with humanitarian culture.
- Communicative practices, often more than communication products, are key to successful humanitarian work. For example, the utility of project management documents was not only—in fact, not primarily—in the content of the documents but in the process of creating them.

Enacting Humanitarian Culture

Introduction

The predominantly narrow context of technical communication—business environments—is insufficient for framing the role and influence of our work (Agboka, 2013; Blyler, 2004; Ding & Savage, 2013; Durão, 2013; Jones, Savage, & Yu, 2014). To develop a fuller understanding of how technical communication supports, enables, and constitutes successful work practices, we should look beyond for-profit industry to examine the role of technical communication in a wider range of contexts: for example, advocacy organizations (e.g., Jones, 2014), international development projects (e.g., Dysart-Gale, Pitula, & Radhakrishnan, 2011; Walton, 2013), extra-institutional contexts (e.g., Ding, 2009; Kimball, 2006), and, as we argue here, humanitarian organizations. Offering an alternative to technical communication's traditionally business-centric focus, humanitarian organizations serve as an important subset of the broader category of nonprofit organizations.

Although rarely featured as sites of technical communication practice and research, humanitarian organizations are representative of a broader scope of nonprofit work in which organizational values, culturally appropriate power structures, cross-cultural communication, and moral considerations play especially central roles. Humanitarian work supports a mission initiated by the Red Cross in the late 1800s to alleviate suffering during armed conflict (American Red Cross, 2011). The objectives of humanitarian action have since expanded to include disaster prevention and recovery efforts: “to save lives, alleviate suffering and maintain human dignity during and in the aftermath of man-made crises and natural disasters, as well as to prevent and strengthen preparedness for the occurrence of such situations” (Good Humanitarian Donorship, 2003, p. 3). The number of humanitarian workers worldwide has grown to approximately 274,000. About 4,400 nongovernmental organizations (NGOs) consistently engage in humanitarian work, with United Nations humanitarian agencies, Red Cross and Red Crescent national societies, and a small group of large, well-established international NGOs receiving the majority of funds and leading the implementation of efforts on the ground (Taylor et al., 2012). There is an increasing global importance of humanitarian

work and, therefore, expanding sites of practice and research for technical communicators whose expertise can support this work. Further, some issues of growing importance in our own field—such as participatory approaches to localization (Getto, 2014; Sun, 2013) and preserving human dignity through professional communication (Agboka, 2013; Dura, Singhal, & Elias, 2013)—have long been a central focus for humanitarian organizations. Thus, each field has expertise to share with the other.

Illustrating the value of studying technical communication in humanitarian contexts, we present a subset of findings from our three-phase research study “Valuing what works: Success factors in disaster preparedness,” which was collaboratively planned and conducted over an 18-month period with an international humanitarian organization (Mays, Walton, Lemos, & Haselkorn, 2014). The larger research study covers a full spectrum of successful practices in disaster preparedness, whereas this paper focuses on the implications of that study for (a) design and use of successful communicative practices and (b) the field of technical communication. Among other things, we found that bottom-up power structures and highly localized communication are key to supporting successful practice. The technical communication facilitating these humanitarian practitioners’ work—e.g., illustrations of proper hygiene practices, building plans for temporary shelters, and training materials for engaging with community members—are adapted based on these factors of fine-grained localization and empowerment at the lowest level. We share these findings particularly for the benefit of technical communicators who “seek other sites of practice outside of business and industry, where technical communication practitioners who are committed to promoting human rights and social justice in the development and uses of technologies might be more effective” (Jones et al., 2014, pp. 146–147).¹ With growing interest in nonprofit sites of technical communication (Ding & Savage, 2013; Jones et al., 2014; Walton, 2013), practitioners, researchers, and instructors need more research-based recommendations to inform practice specifically within these sites.

¹ Although the findings of our study may be valuable to some degree in for-profit business contexts, those contexts are not the focus of this article. The potential research benefits described to participants as part of the IRB-approved informed consent process specified that we sought to fill a research gap related to an understanding of humanitarian practice. In sharing outcomes and implications of the study, we seek to support and promote humanitarian practice.

Humanitarian Culture

Organizational culture is “the set of artifacts, values, and assumptions that emerge from the interactions of organizational members” (Keyton, 2010, p. 1). Thus, organizational culture is collective but is enacted by individuals comprising the organization (Hofstede, 1998; Keyton, 2010) and therefore observable and inferable from their actions, including communicative actions (Hofstede, 1993; Thatcher, 2012). Language both influences and replicates values (Miller, 1979; Rude, 2004), and this dual role of language has implications for improving the work of organizations (Jones, 2014). For technical communicators to conduct research in nonprofit organizations that improves the work of those organizations and amplifies the agency of vulnerable people, we must better understand nonprofit organizational culture.

Distinctions between for-profit and nonprofit organizations can be understood partially by the different legal frameworks that have been built to define them and from which their respective cultures are partly derived. For example, U.S. law obligates businesses to maximize profits for shareholders—making profit the central organizational goal—while other value systems play secondary roles in these organizations (Lane, 2015). In contrast, nonprofit organizations are legally obligated to be “obedient” to their mission (Lane, 2015). By law their financial resources must support their mission and are specifically restricted from supporting profit (Lane, 2015; Salamon, 1999). The humanitarian culture, in particular, provides a clear contrast between for-profit business and nonprofit organizational values and objectives and, hence, ways of operating and communicating. These differences are represented in distinct, specific legal guidelines. Where businesses are legally accountable for creating profits for shareholders, humanitarian work is specifically beholden to (a) international humanitarian law; (b) the humanitarian charter upholding the humanitarian principles of humanity, neutrality, and impartiality; and (c) the Code of Conduct of the International Federation of the Red Cross and Red Crescent Movement and NGOs in Disaster Relief² (Advisory Service, 2004; Code of Conduct, 1994; Humanitarian

Charter, n.d.). These distinct legal foundations reflect very different organizational values and objectives (e.g., maintaining a code of conduct rather than maintaining profit), organizational structures (e.g., flat hierarchies or a bottom-up, decision-making authority), and constraints (e.g., constrained more by the means than the ends in organizational practice) (Chambers, 1997; Mays, Racadio, & Gugerty, 2012; Walton, Mays, & Haselkorn, 2011).

Nonprofit organizations’ central accountability to value other than profit, and therefore different overall work objectives, can be seen at all levels of evaluation. For example, business environments focus on discreet end products and services, often measuring performance by cost and task efficiencies. In contrast, nonprofit work is primarily focused on process (i.e., meeting the mission while maintaining a moral code) and the factors central to defining success are complex, interrelated, dynamic, and human centric (Mays et al., 2012). Quantifiable measures are not only difficult to come by but may be irrelevant to organizationally appropriate views of success (Tomasini & Wasenhove, 2009; Walton et al., 2011). Where humanitarian work interprets success in terms of inclusive transactions of participation, learning, and empowerment of communities in decision-making and planning, for-profit work measures success in transactions of money exchange. These core differences necessarily give rise to vastly different organizational support and communication systems that cannot be understood without replacing assumptions rooted in for-profit organizational values with values appropriate for the organization being studied. Therefore, technical communication practices that are implicitly based on the values and practices of for-profit business can be unfriendly toward, and inhibited from, serving nonprofit work.

Humanitarian agencies tend to organize work around a *preparedness* component and a *response* component, although these are highly interrelated (Mays, Walton, & Savino, 2013). Relevant to technical communication in these organizations, the evolving practice of community based disaster risk response (CBDRR) approaches within humanitarian work reflects a drive to support lowest-level empowerment through participatory methods and localized, contextualized communications:

2 This professional code was developed by eight of the world’s largest disaster response agencies and does not solely apply to the Red Cross. As of January 2016, 602 organizations were signatories of this professional code. (See http://www.ifrc.org/Global/Documents/Secretariat/Code%20of%20Conduct%20UPDATED_JANUARY%202016.pdf)

Enacting Humanitarian Culture

Top-down policies have largely failed to prevent the occurrence of disasters, thus prompting practitioners supported by some social scientists to suggest an alternative, bottom-up framework for reducing disaster risk. CBDRR fosters the participation of vulnerable communities in both the evaluation of risk and in ways to reduce it. CBDRR empowers communities with self-developed and culturally, socially and economically acceptable ways of coping with natural hazards. (Gaillard & Mercer, 2013, p. 97)

The participatory, bottom-up approach of CBDRR aligns with the work of Robert Chambers, a leader in advancing NGO practices since the mid-1990s. Chambers works to educate and influence practice toward greater realization of values central to humanitarians by drawing visibility to the inappropriateness and ineffectiveness of top-down approaches:

Human relationships can be seen as patterned by dominance and subordination, with people as uppers and lowers. Uppers experience and construct their realities and seek to transfer these to lowers.... in normal top-down, centre-outwards development, new technology is developed in central places by uppers and transferred to peripheral lowers...normal professionalism, teaching, careers, bureaucracy help to explain errors in development, but not fully how and why they persist so long without uppers learning. (1997, p. 56)

In other words, when technology—and, we would argue, communication—does not recognize and reinforce power of lowest-level decision makers through localized methods and tools, it does not support successful humanitarian work but rather contributes to a pattern of “errors in development” (p. 56). We believe that technical communicators whose practice is informed by the values of humanitarian organizations (see Code of Conduct, 1994) would be well-positioned to help advance past this repeated failure in learning.

The importance and impact of these values and practices in disaster preparedness can be seen more readily when the work transitions into the response component (which is supported by preparedness work). This component of humanitarian work is characterized

by an environment of uncertainty; emerging/ad hoc, inter-cultural, and cross-organizational networks; and highly dynamic and incomplete information. For example, Walton et al. (2011) linked the success of humanitarian logistics operations to work systems that uphold these values, evidencing the central roles of localized solutions, communication, and lowest-level control of decision-making for humanitarian logisticians. A deeper understanding of communication in humanitarian work is vital for improved practice. Technical communication could play an important role in developing this understanding—but only if our research and practice moves beyond traditional, business-oriented assumptions about how work is most effectively accomplished. One key strategy for moving beyond these assumptions and facilitating a culturally informed understanding is to include members on the research team with insider and outsider perspectives of humanitarian organizations. For example, in the research reported here, Mays, a practitioner-researcher and humanitarian insider, played a key role in recognizing and explaining cultural norms, while Walton and Haselkorn, research scholars and humanitarian outsiders, could make explicit the implicit, shared assumptions of humanitarian culture.

Method

Our research study investigated on-the-ground practice within an international humanitarian organization in partnership with a center newly formed to support disaster preparedness work across the organization. Before launching into support activities, the center first wanted to understand what successful practices were already being enacted by practitioners. Their approach to supporting practitioners avoids common problems that emerge when organizations develop tools, technologies, and other resources with a “disregard for the ways in which people organise their work, coupled with a disdain for the ordinary resources on which they rely” (Heath & Luff, 2001, p. 3). This is especially important in humanitarian work environments, in which the primary mission to meet local needs takes precedence over organizational systems. When there is a mismatch between local conditions and organizationally standardized processes and tools, adapting to local conditions is necessarily prioritized to meet humanitarian central values, such as those laid out in the

Humanitarian Charter (n.d.) and the Code of Conduct of the International Federation of the Red Cross and Red Crescent Movement and NGOs in Disaster Relief (1994). For example, participants described altering the architectural, standard house plan for a community member with an eye condition. Because bright light impedes her sight, her home was built without the standard window so as to better meet her needs and to honor a commitment to the humanitarian imperative to take action “to prevent or alleviate human suffering arising out of disaster or conflict, and that nothing should override this principle” (Humanitarian Charter, n.d., para. 1).

When mismatches between local needs and standardized approaches occur, important elements of successful humanitarian work can be hidden from what Chambers (1997) called the *upper* organizational knowledge. Present in any type of organization, hidden work is especially central to the success of humanitarian organizations with their flat or reversed hierarchical structures. Elements of successful work occur where *lower* decision-making leads the upper organizational support and often resides within implicit expertise, informal relationships, unstructured communication, informal social networks, and unwritten work practices (Walton, Mays, & Haselkorn, 2016). Our full research study aimed to make these factors explicit, observing and distilling practitioners’ perspectives and work practices, ultimately revealing what strong humanitarian practitioners value and how those values shape and inform their day-to-day work. In this paper, we report a subset of findings especially relevant to technical communication: three of the ways that humanitarian practitioners enacted successful work through communicative practices.

Phases 1 & 2: Scoping

The research study was approved by the University of Washington IRB (human subjects application #44762) and was conducted in three phases. The first two phases involved six months of scoping in preparation for ethnographic field research in Phase 3. During Phases 1 and 2, we conducted 25 semi-structured interviews of approximately one hour by phone and Skype. Participants included preparedness practitioners from 19 countries, representing all major levels of the organization: international, regional, national, and local levels. We engaged in purposive sampling by asking

each participant to identify additional countries or practitioners in the humanitarian organization whom they knew were doing good disaster preparedness work; participants were also asked to describe successful work and the factors affecting good preparedness. Thus, the definition of success informing our research emerged directly from experts identified by their peers as particularly strong disaster preparedness practitioners. Similarly, the Phase 3 research questions and selection criteria for potential field sites were directly guided by patterns that emerged from open coding the Phase 1 and 2 data. This research approach, which acknowledged the expertise of research participants and deferred to them in naming and defining the issues of focus, is congruent with Blyler’s (2004) call to decentralize research authority and make space for a more active role for participants. It is compatible with participatory perspectives of research authority that relinquish the fiction that all relevant authority resides with researchers (Mumby, 1993), that acknowledge participants’ authority to name issues that emerge in research (McLaren, 1991), and that share with—even defer to—participants the ownership of research questions (Smith, 1997).

Phase 3: Fieldwork

In Phase 3, we conducted two-week research visits to six countries that had been named for doing good preparedness work and that were representative of key attributes identified by Phase 1 and 2 participants as relevant to preparedness programming. In Phase 3, we conducted a total of 95 additional interviews with humanitarian practitioners at the lowest organizational levels and engaged in ethnographic observation of work practices. To reduce the risk of coercion and to create a safe environment for participants to share their perspectives, all data were anonymized upon transcription, and quotes are not labeled with identifying information. To analyze the Phase 3 data, we used a grounded theory approach (Strauss & Corbin, 1990) to identify patterns in the data, patterns common across practitioner experiences. We open-coded transcripts (i.e., inductively identified patterns, per Emerson, Fretz, & Shaw, 2011) to determine themes for a focused-coding scheme. The coding process included both humanitarian insider and outsider perspectives, with at least one coder who had humanitarian experience and one coder who was a qualitative researcher who participated in the in-person

Enacting Humanitarian Culture

interview. Six student-researchers were also trained to conduct focused coding, iteratively analyzing meanings and connections among patterns that emerged across countries. For the humanitarian center that invited our research study, we produced a report overviewing our major findings relevant to a humanitarian audience (Mays et al., 2014). In this paper, we present a more in-depth discussion of technical communication elements of three of the findings named in the report as “speaking with cultural competence,” “creating clarity of roles,” and “structuring for flexibility.” In the Results section below, we present expanded examples, quotes, and descriptions from the data to illustrate the relevance of these findings to technical communication and the relevance of technical communication to successful humanitarian work.

Results

Communication plays an important role in the success of practitioners’ day-to-day work. We found that communicative practices upheld goals relevant to humanitarian culture, such as showing respect for local ways of operating and encouraging the participation and decision-making of local communities. These goals led practitioners to (a) localize how they speak, (b) collaboratively produce written documents, and (c) encourage bottom-up organizational communication.

Localizing how to speak

Localization has long been recognized as relevant to technical communication. Though often linked with language translation (e.g., Maylath & Thrush, 2000; St. Germaine-McDaniel, 2010; Walmer, 1999), technical communication scholars have also investigated the localization of academic programs (Ding, 2010), technology design (Sun, 2012), and infrastructure (Getto, 2014). Relevant to humanitarian environments is an emphasis on participatory approaches with communities that operates at a more fine-grained level than that of national culture (e.g., Agboka, 2013; Getto, 2014; Sun, 2012). In investigating factors that contribute to successful humanitarian practice, we learned that fine-grained localization is motivated and designed by values congruent with humanitarian organizational culture, as illustrated by the interview quotes below:

It is about the technique we use to approach people. You know, when you have to deal with people, you need to be honest. You need to be a responsible person, respectful, and to know that the people that you are going to meet are people who are different from you. So you need to accept them, listen to them, be patient, all of these.

It is about how to approach to people, since the time you say hello, to know how to listen to them, a very careful approach to the families.

Professional communication is classically concerned with audience analysis and rhetorical strategies crafted to resonate with specific audiences. And, as illustrated in the above quotes, this concern is central to the professional communication of humanitarian organizations as well. But what makes humanitarian communication distinct is the core humanitarian obligation to uphold human dignity (see “right to life with dignity” in the Humanitarian Charter, n.d.). Successful humanitarian communication is intentionally and centrally undergirded by the humanitarian mission to support the right to human dignity. For this communication to facilitate successful disaster preparedness work, it must be informed by the organization’s central humanitarian goals and values. Participants explained that even the timing of communication is relevant: for example, visiting communities early in the morning before people begin working in the fields and avoiding scheduling community meetings when people are likely to be hungry and therefore less engaged.

Practitioners emphasized that it is not just techniques that are important but the underlying mission of human dignity that make these techniques effective. This reflection of humanitarian values in the design of humanitarian work and the communication facilitating it is notable for technical communicators entering these organizations as sites of research or practice because it suggests important specific considerations of what makes localization effective. A wide range of considerations can inform appropriate localization practices (Agboka, 2013; Getto, 2014; Sun, 2012), and organizational values are key considerations in humanitarian contexts. Humanitarian practitioners emphasized word choice, nonverbal cues, indirect

approaches to difficult topics, and explicit connections to issues of concern for individual community members.

Word choice Regarding word choice, practitioners said that they show respect by using local terms and language that could be readily understandable by community members:

The language is also very important. We don't use a very technical language. So it is not like we are the professionals and they are the community, but it is a peer-to-peer approach.

If you use the term "malaria" in the community, people will look at you as if you were an alien. But if you use the term "paludisme," they will understand you.

In the field of technical communication, we are keenly aware of the importance of word choice in making communication audience appropriate. But our focus has typically been on making technical communication easily understood so that the audience can take quicker, more efficient action and does not get frustrated or confused. While understandability is also relevant in humanitarian environments, we see here that using easily understood words appropriate to the local community is also an important way to reflect humanitarian values of promoting dignity and respect, values that are central to facilitating successful work.

Nonverbal cues Strong practitioners have developed an advanced understanding of the importance of localizing how they speak, drawing from a variety of experiences and sources including those outside of the humanitarian organization, but, organizationally, this importance is much less known. We see an important role here for technical communication in amplifying the organizational visibility of localized communicative practices. Many strong practitioners described explicitly addressing how to speak when they themselves train new humanitarian practitioners. For example, one practitioner said that when he trains health education volunteers, he instructs volunteers to pay attention to community members' body language as a way to gauge the appropriateness of their own communication. Similarly, another practitioner said that he teaches new humanitarian practitioners how to ask, how to listen, and how to show respect when speaking with community members:

When you are assessing, you have to listen, teach them [new humanitarian practitioners] how to listen and how to pick the right information, how to ask. At times when I go to those communities, . . . someone gives you a seat. They sit down on the mat, and if you want the information, you have to be like them. If they give you a mat, then you sit on the mat. Be calm. Show them that you're like them. That's when they give you information.

Another trainer described role-playing activities that he facilitated with volunteers to help them pay attention to how they speak:

After training the volunteer, we give him the data collection [interview] techniques. We then try to make a simulation. We choose one volunteer to play the role of the interviewer, and the other volunteers play the role of the community. The interviewer then comes and performs the interview in front of everybody. In the meanwhile, some will be noting down the strong and weak points of the interview. Everything is followed-up: the way he talks, the way he looks at people, the way he is dressed, his mastery of the text—did he stick to the text or did he twist some parts. These are some examples. Once the interview is over, he will first do a self-evaluation before the other observers give their point of view. These role-playing games are notation criteria and when a volunteer gets good grades, it means he is well trained and will bring back good results when we send him on the field.

The above two quotes explicitly connect communicative practice and effective humanitarian work. For humanitarian practitioners to, for example, collect important information from community members, those practitioners should not only "stick to the text" but dress appropriately, look at people in an appropriate way, and speak in an appropriate way. These aspects of training for successful practice illustrate what it looks like to teach technical communication-relevant skills to new representatives of the humanitarian organization, empowering them to engage in some of the fine-grained localization of communication that characterizes humanitarian culture.

Indirect approaches Many practitioners said that how they approach people was at least as important as

Enacting Humanitarian Culture

what they said, especially when broaching topics that could be sensitive. For example, one practitioner told a story of volunteers who approached a local butcher who did not follow sanitary practices. The volunteers were blunt and direct, saying that his business was suffering because of the unsanitary practices, and the butcher ran them off, waving his knife. The information may have been accurate, but the communication was counter-productive. Other practitioners described positive examples of broaching sensitive topics, such as how to inquire about whether community members' children had lice or how to instruct women in the proper use of sanitary products without embarrassing or offending them. Practitioners described coming at these topics in a roundabout way after building rapport with individuals by chatting about related but innocuous topics such as the number and age of children the community member has and whether she plans to have additional children.

Connection to community priorities The broader collection of research findings indicated that as practitioners develop relationships with communities, these personal connections inform their ability to localize how they speak to communities (Mays et al., 2014). Their communication helps to develop and strengthen a sense of oneness—a process that Burke called identification (1969). Identification is centrally facilitated by communication, particularly spoken words in combination with nonverbal communication like gestures and underlying factors like attitude or motivation (Burke, 1969). Using this combination of communicative factors, practitioners align their communication, as well as themselves and their work, with the community, deferring to its ways and interests. This identification of practitioner communication and the work it facilitates with a community is important for successful practice in humanitarian environments.

Collaboratively developing written documents

Humanitarian work is highly collaborative, particularly between humanitarian practitioners at the local level and community members but also involving government actors and partners such as other nonprofit organizations. These stakeholder groups, including local communities and the humanitarian organization itself, are not monoliths but are comprised of disparate subgroups and individuals, creating a complex

collaborative environment for humanitarian work. Research within the humanitarian and international development fields has focused on developing more effective ways to work with communities, with a strong emphasis on participatory methods. A communicative practice key to successful participatory work is “creating clarity of roles” among the full range of stakeholders (Mays et al., 2014, p. 15). To achieve this clarity, practitioners facilitate the collaborative development of written plans, projects, and contracts. In creating these documents, successful practitioners facilitate the tedious and explicit defining of each party's responsibilities—responsibilities that are mutually agreed upon by the community, partners, government, and the humanitarian organization:

It is all about knowing your role and accept it and division of labor.... Another factor is the involvement and participation of all stakeholders, of sharing the responsibilities across [stakeholders] has been a critical issue.

The above quote shows the importance of sharing responsibilities across stakeholder groups. Also key is mutually deciding upon the responsibilities and creating a record of who is doing what. For example, one participant described “as a matter of pride for us” being asked to coordinate a collaborative workshop involving the chiefs of government offices, police, army, community members, and other stakeholders. In this workshop, the group defined roles for each stakeholder, carefully creating a written record of mutually agreed upon responsibilities. It is an arduous and time-consuming process to collaboratively develop written agreements that are directed by the community's priorities and decisions, but the effort is imperative for building community trust:

We have managed to gain community trust as the Red Cross, you know? We are always there when a disaster happens, and we've also initiated what we call beneficiary accountability. Previously, we'd only account to those who give us the funds and we'd ignore those we seek to serve, you know? But now [there is] the fact that we engage the communities themselves to identify the areas of project implementation. And it was a very intense, it was a very intense exercise.

Engaging in these intense exercises of collaborative planning and accountability creates mechanisms for shared transparency and decision-making with communities, principles important to humanitarian organizations. For example, practitioners described using a community-driven assessment process to develop action plans that were very detailed, including each step involved in, for example, building a water tank, with an entry for each step designating who is responsible. We observed team and community meetings in which practitioners facilitated agreement among disparate stakeholders by leading the whole group, line by line, through written documents intended to express clear and mutual agreement. Other written communication that facilitated humanitarian work included contracts, in which volunteers and project partners would ratify and personally declare their commitment to their roles as part of the group. This written record, collaboratively created in the presence of all stakeholder groups and signed by them, is pivotal for mutually clarifying roles. These signed agreements are valuable not only for planning work but also for sustaining it because the written agreements can be consulted at a later time to hold parties accountable. In fact, when asked about what they did when people did not follow through on their agreed-upon tasks, practitioners referenced the collaboratively developed written records and said that because the roles are clarified and written down, it is rare for parties not to follow through. In some cases, external factors, such as unavailability of a certain material like concrete, may delay stakeholders from fulfilling their duties, but the written documentation helps to prevent complete disengagement.

Practitioners expressed the need for stronger organization skills and attention to detail to engage in communicative practices that would create a shared written record to clarify parties' roles. Moving forward, developing and maintaining records and reports requires keen administration skills to sustain projects over the long term. To build community capacity to sustain this work, some practitioners trained community members—those who had been nominated by the community to form a project action committee as well as members of the broader community—in how to develop records and reports for themselves:

We got community representatives in each, trained them on how to write reports and recordkeeping,

you know, just basic skills, leadership roles, you know? And also trained the wider community on what risk reduction is all about, how can they participate in risk reduction. And for me, I think that has been the reason why, besides the usual being the first on site when a disaster happens, I think that has also helped gain their trust in us.

In other words, when professional communication is designed to support humanitarian objectives such as community empowerment, it facilitates successful work in disaster risk reduction. Organizational values prompted practitioners not only to collaboratively develop written documents but to train community members in technical communication skills like developing records and reports to facilitate project management. The documents that communities produce facilitate collaboration with local government groups who receive copies of these reports so that community risk reduction plans can be incorporated into local government plans. Again, we see that communication developed in accordance with humanitarian values facilitates successful work in disaster risk reduction. Underlying this strategy of involving the many community stakeholders in developing the written plans is the recognition that they each have valuable contributions to make:

We tell them to draw the action plan, the community action plan, which they own. It's drawn by them. We only support them in facilitating, and we're just guiding them. But the ideas are theirs.

In summary, written documentation plays a key role in facilitating humanitarian work in part because this documentation is developed according to work practices congruent with humanitarian culture—participatory processes focusing on mutual agreement and accountability as opposed to top-down direction. The development of this documentation provides a forum for collaborative decision-making and expresses respect for the authority and capacities of all parties to make valuable contributions to the proposed work. And when practitioners model relevant skills in professional communication and project management and then train community members in those skills, they facilitate successful work over the long term by building community capacities.

Enacting Humanitarian Culture

Encouraging bottom-up internal communication

Whereas the first two findings describe communicative practices between humanitarian practitioners and stakeholders, such as community members and government agencies, the third finding relates to communicative practice within the organization itself. Internal organizational communication is a promising area for contributions by technical communicators who understand humanitarian culture and the centrality of its values to effective bottom-up communication and organizational decision-making. This contribution is especially important in the current environment, in which much academic work that seeks to inform nonprofit organizational communication and practice ascribes to inappropriate business values and models (Chambers, 1997; Mays et al., 2012). Practitioners described internal communication that is key to facilitating successful work as being characterized by open and approachable leadership and by distinct roles at the local and national levels to adapt tools and practices locally and to share knowledge broadly across the organization, respectively.

It is humanitarian practitioners at the local level, as opposed to those in positions of national or international leadership, who best know how to localize communication with communities, expertise which provides evidence for the appropriateness of humanitarian decision-making at the lowest level:

How do people communicate? What do they use to communicate? If you find out that there is very little reading in the community and instead they spend more time listening to the radio, so, in terms of preparedness, you don't waste your time in printing written materials. Instead you choose to use your money for soap operas in radio or in key advertising in radio.

In addition to localizing communication media as described in the above quote, practitioners at the local levels often partner with community members who speak local dialects and are familiar with local communicative norms to adapt written materials, such as questionnaires, based on knowledge of a particular community:

It's essential for the questions to be well oriented so that they are well adapted for the population because the populations are not the same. . . . The wording of the question can also make it easy to get the desired answers.

What this fine-grained localization means is that for internal organizational communication to be effective, it must have a strong bottom-up flow of communication and decision-making. Successful work is achieved by empowering local-level practitioners as leads (i.e., subject matter experts) in the development of external communication materials. Sometimes this process involved starting with standard versions of documents passed from national to local practitioners, who would then localize the materials and share them back with the national level. Sometimes this process involved starting with collections of localized materials, which practitioners reviewed to inform the development of materials that incorporated the strengths of several localized versions. Those with the most specific knowledge of communities led the fine-grained localization of materials focused not at national or regional levels but at the level of particular communities. Consistently, the internal organizational communication that practitioners described as facilitating successful work had a strong bottom-up flow, which reflects the flipped organizational structure common to nonprofit organizations.

For local-level expertise to have a long-term and widespread impact, it is important to have mechanisms for sharing materials and formalizing insights and contributions across the organization. One example that illustrates how this may happen is that of a modified shelter design used in a refugee camp. When volunteer practitioners were building shelters in the refugee camp, one refugee informed them that no one would use the shelters as designed because the mats were hung on the wrong side, indicating death. For the shelters to be appropriate (that is, to be used by people and to be beneficial to their lives), the mats should be hung on the other side. The practitioners immediately changed the way that they built the shelters, which shows that they were empowered to adapt their work to local contexts without requiring organizational approval to make changes. They then shared their new knowledge with the team leader, who was offsite at the time, to enable the change to be formalized in new shelter drawings.

This technical communication, the shelter drawings that documented the design of a humanitarian work product, was key to formalizing local knowledge and sharing it across the organization. The respective roles of headquarters and local levels were distinct, and both were important for supporting knowledge sharing: The local level led adaptations for specific environments and conditions, and the headquarters shared what had been learned across the organization.

The above example also illustrates the point that key decision-making occurs at the lowest level of the organization, with those in team leadership roles conveying openness and approachability to support local decision-making. Approachability was conveyed in several ways, such as intentionally creating both public and private spaces for questions. For example, one practitioner leading a team said that he makes a point of starting the day with a team-wide meeting in which people are encouraged to bring up questions or problems, which he tries to address on the spot so that all can benefit from the exchange. This same person said that he also seeks out team members one-on-one to ask how they are doing and to provide an opportunity for them to raise questions they may not have felt comfortable asking in a more public setting, whether because of the topic or because they are shy.

Other examples of how the design of internal communication is central for bottom-up flow included lessons-learned workshops in which honest and open information-sharing was the established norm. Practitioners also have traditional, long-standing project management tools such as log frames and even, occasionally, borrow tools such as SWOT (strengths, weaknesses, opportunities, threats) analysis from business disciplines, but all are used in a way that is congruent with organizational values such as lowest-level empowerment. Practitioners are trained in emergency-response practices in which they are to collect and share particular information. But they said that as an emergency situation changes or their understanding of community needs becomes clearer, they are encouraged to freely contact their leaders with changes, corrections, or additional information beyond what is designated in the standard forms if they feel that information to be relevant. In other words, higher-level roles in humanitarian organizations tend to serve more of a support function to facilitate effective humanitarian practice on the ground, deferring to

the expert knowledge of local practitioners as the lead decision makers regarding specifics of the work. Internal communication plays a key role in facilitating successful work as local-level practitioners lead the adaptation of materials and practice and as organizational leaders share and formalize that knowledge across the organization.

Discussion

Workplace studies is a productive area of inquiry for technical communication scholars because many of us seek not only to meet immediate workplace needs but also to produce research that can improve work practices (Spilka, 2000). To do so, scholars must uncover and understand current practices. This means not only learning about “the ways in which individuals, both alone and in concert with each other, use tools and technologies in the practical accomplishment of their daily work” (Heath & Luff, 2001, p. 4) but also learning about how the values and motivations related to organizational culture play out in the practical and effective accomplishment of that work. With their mission-driven organizational cultures, nonprofit organizations offer rich sites for workplace studies of practice in which technical communicators can conduct research that improves the communication facilitating work that alleviates human suffering and saves lives. This contribution—i.e., the ways our field can support and improve life-saving work—has huge implications for research, practice, and pedagogy. In analyzing the professional communication of humanitarian organizations, we can realize (in the sense of understanding clearly) the power that this communication has in structuring and facilitating humanitarian practice. And in preparing students to work in humanitarian organizations, we can realize (in the sense of making real) the largely dormant power that our field holds for contributing to these sites of work and the missions these organizations pursue.

This study has brought to light several specific takeaways for technical communicators interested in humanitarian organizations as sites of practice and research. These takeaways can be summarized in a two-pronged implication: (a) many important skills and considerations of our field—such as localization, audience analysis, and collaboration—are necessary for successful humanitarian work, and (b) to support successful humanitarian work, the application of these

Enacting Humanitarian Culture

skills and considerations must be undergirded by values and motivations congruent with humanitarian culture. For example, when engaging with community members, humanitarian practitioners were careful to use understandable language that was not overly technical. Gauging the appropriate level of technical language for a particular audience is a classic focus of technical communication. However, the reason that nontechnical word choice was so important for supporting successful humanitarian practice was because it is one way that practitioners preserve the human dignity of community members and engage with community members as peers whose concerns are at the core of humanitarian work. In other words, in humanitarian environments, using nontechnical language is a strategy for recognizing and amplifying another's dignity and power.

Similarly, both humanitarian practitioners and technical communicators are concerned with appropriate localization to facilitate understanding and to do so respectfully. But, again, our research shows that in humanitarian work, localization occurs not primarily for the purpose of being understood by the audience but, rather, primarily, for the purpose of opening a space for shared understanding and decision-making by the community: that is, for showing dignity and respect and developing a Burkean identification with communities. The overall research findings indicated that it was not just these communication strategies that supported successful work but employment of these strategies motivated by care and respect for communities that made the strategies effective. Technical communicators preparing for work and research in humanitarian organizations must be aware of how central the values comprising humanitarian culture are to the successful enactment of communicative practices.

Another finding with implications for technical communication scholars is that communicative practices, often more than communication products, are key to successful humanitarian work. In other words, it is the shared understanding (Burkean identification) cultivated through mutual trust and relinquishment of power that makes for useful deliverables. For example, the utility of project management documents was not only—in fact, not primarily—in the content of the documents but in the process of creating them. Project participation was supported by the process of gathering the wide range of stakeholders together and collaboratively laying out plans, with specific tasks

mutually agreed upon by the parties. The participation of stakeholders in these projects was supported by the process of deciding together who was responsible for what and collaboratively documenting those responsibilities in writing. Also key to the power of documents to facilitate successful disaster preparedness was the community-level localization driven by lowest-level expertise and decision-making. The localized documents themselves are useful for facilitating successful practice, but underlying the successful practice is the flipped organizational structure that allows for decision-making at the lowest level, as is congruent with humanitarian culture. Oral communication was similarly at least as much about “how” as about “what.” The way that practitioners approached people, the timing of their visits, how they listened to community members—these were keys to successful communicative practice emphasized by practitioners. This finding is congruent with previous research on humanitarian practice that argues humanitarian work systems are primarily means-oriented versus utility-oriented (Mays et al., 2012).

Supporting Rude's (2009) call for a greater variety of methods to address research questions in our field, one implication of our findings is that technical communication research not be limited to the analysis of text (even text broadly conceived to include “print, digital, multimedia; visual, verbal” p. 176). Rather, our work must also be informed by an understanding of how that text is produced, how it is used in everyday work, and the motivations underlying communicative practices—culturally and socially contextual knowledge more likely to be gleaned through fieldwork than solely through text analysis. Many scholars ascribe to broader scopes of technical communication research than textual products, for example considering contexts in which text is produced (Rude, 2004), documentation in the broader sense of designing processes (Grabill, 2000), and not just production but conduct (Miller, 1989). We concur with these scholars' broader vision of technical communication research. Particularly regarding the study of nonprofit organizations, we emphasize the importance of conducting field research that includes analysis of not only communication products but also communicative contexts and processes. This broader vision of our field's research can inform a more complete understanding of the ways in which technical communication facilitates work practice in a variety of contexts.

Conclusion

We argue that technical communicators should look beyond for-profit industry to develop a fuller understanding of how technical communication supports, enables, and constitutes successful work practices. To support this position, we have reported a subset of findings regarding how technical and professional communication supports successful humanitarian work. We found that while many of our field's skills and areas of expertise carried over to humanitarian environments, the values and motivations associated with humanitarian culture are what influence the effective application of these skills and are, therefore, key to the effectiveness of communication. In particular, fine-grained localization and empowerment at the lowest level are central to professional communication that supports successful humanitarian work.

Moving forward, we see several promising areas for future work. First, our field needs more workplace studies of practice in nonprofit organizations. This research could provide detailed pictures of what it looks like to engage in professional communication in the day-to-day work of, for example, humanitarian logistics teams, free healthcare clinics, and peer-counseling programs for at-risk youth. These studies could then provide a foundation for taking action to improve the ability of these groups to meet their respective missions, and longitudinal studies could track the outcomes of these actions intended to improve practice. A significant enough collection of case studies could then allow us to develop a generalized understanding of how our field's expertise supports mission-driven, as opposed to profit-driven, organizations.

Future work should also include incorporating into our academic programs topics, assignments, and classes that would prepare technical communication students to work in humanitarian and other nonprofit environments. To inform our students' understanding of their own field, we could bring in humanitarian practitioners and other professionals from a wide range of organizations to speak about the relevance and importance of professional communication to their work. As our students engage in service-learning activities, we should take care not to frame nonprofit and community organizations as sites where they can practice for the "real world" of technical communication but as viable career paths for those "for whom issues of

peace, social justice, equal rights, and environmental justice represent higher values" (Jones et al., 2014, p. 147) and who wish to enact those values in their careers.

Technical communicators operating outside of traditional sites of practice must learn about the organizational values that individual practitioners enact in their daily work and be open to a much broader vision of what it may look like to enact those values. When some of the same words are used in both humanitarian and for-profit industry contexts, it can be even more challenging to develop a clear understanding of the implicit values enabling successful communicative practice. "Empowerment" is a prime example. Clark (2007) explored the rhetoric of empowerment, pointing out that many knowledge workers have not been truly empowered through increased access to information, but "at least they are not digging ditches" (p. 156). This phrasing was striking to us because digging ditches—trenches, actually—represents an example of empowerment we encountered in this study—e.g., of people walking in their own power to prepare the community for disaster. This example of empowerment emerged when discussing how a practitioner would engage in in-depth participatory assessments with communities that regularly suffer flood damage to their homes and crops. The practitioner facilitated reflective activities in which community members consider what the community itself can do to protect itself and prepare for these emergencies. In this case, community members recalled that their grandfathers' generation had dug trenches around the community to divert flood waters. The community organized itself to dig and maintain trenches, and when the community was spared flood damage the next year, this practice spread to nearby communities that were also then empowered to take action to protect themselves.

In humanitarian environments, effective communication often focuses on drawing out local knowledge that facilitates communities walking in their own power, which can take many forms, including digging ditches. This example of empowerment in humanitarian contexts shows what we may find when we answer Blyler's (2004) call to "rethink issues of power to put a priority on empowerment" (p. 145). Humanitarian environments offer technical communicators rich opportunities to enact this priority by engaging in and improving communicative practices vital to the work of amplifying agency.

Enacting Humanitarian Culture

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Enacting Humanitarian Culture

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Speakers and Boards: A Survey of Instructional Video Styles in MOOCs

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Abstract

Purpose: This paper offers an account of the current usage of communication styles and features in MOOC instructional videos. The aim of the study is to provide a better understanding of instructional video patterns and typologies and to find associations between video style usage and course attributes such as the MOOC platform and course subjects.

Method: Five global, generalist MOOC platforms were selected for this study, which was conducted in two phases: First, a qualitative survey was made to identify frequently used video styles and build a classification scheme. Second, a sample of 115 courses in the selected MOOC platforms was used to account for video features and style frequencies. Various statistical tests were performed to discover associations between course characteristics and video style usage.

Results: Seven video styles were identified as the most frequent in MOOC courses. They fully describe the video stock of 85% of the sampled courses. A typical course uses two different styles. The study reveals two broad competing approaches to display instructional contents in MOOC videos: *speaker-centric* (a visible person speaks the contents) and *board-centric* (a large rectangular surface displays the contents). The actual usage of each approach is significantly related to the course subject area: Arts and humanities courses exhibit a preference for speaker-centric styles, while engineering and hard science courses favor board-centric videos. Social sciences and health courses are more neutral.

Conclusion: Current MOOCs are focused on few representational styles, with *speakers* and *boards* as the two main models. The observed usage is consistent with a strong attachment to the lecture as an instructional technique.

Keywords: instructional video, MOOC, audiovisual communication, multimedia learning, instructional design

Practitioner's Takeaway:

- Popular MOOCs rely on very few and basic communication techniques for building instructional videos.
- The speaker-centric versus board-centric classification characterizes two prevalent representational approaches in MOOC videos.
- Course subject influences the instructional video representational style.
- Current demographic data on MOOC video usage is provided that may be useful for researchers of multimedia learning and for MOOC course designers.

Speakers and Boards

Introduction

xMOOCs and learning with video

Massive Open Online Courses (MOOCs) have arisen in recent years as a new model of large-scale online learning in the context of higher education. At present, there are several MOOC platforms that provide thousands of online courses in a wide range of disciplines (see Karsenti, 2013, for a critical review of the MOOC history and characteristics). As of 2015, the media coverage on MOOCs has cooled down compared to the initial hype in 2012, but that does not mean there has been a business decline: The MOOC market keeps growing at a fast pace in course offerings, enrollment, and revenues (Shah, 2015).

MOOCs raised early attention in the scientific community (Liyanagunawardena, Adams, & Williams, 2013), including the research in video-based learning (Giannakos, Jaccheri, & Krogstie, 2014). MOOC providers, teachers, and scholars have a growing interest in the research of instructional video production techniques and how they relate to factors such as production cost, learning efficiency, and student engagement.

It is important to point out that there are two pedagogical models of MOOCs: the cooperative cMOOCs and the more conventional xMOOCs (Rodriguez, 2012). A cMOOC emphasizes collaboration between learners and is a platform that facilitates knowledge sharing and construction, whereas a xMOOC relies on a more traditional pedagogy, based on the delivery of learning content from instructors to learners. xMOOCs have an instructional design heavily based on audiovisuals, most of them short video units provided by the course instructors. Many xMOOC videos have the format of recorded lectures or talks, or screencasts or Powerpoint-like slideshows, all of them presenting descriptive content about the course topic (Karsenti, 2013). cMOOCs follow a *connectivist* pedagogy, while xMOOCs adhere to a *cognitive-behaviorist* model (Anderson & Dron, 2011).

xMOOC platforms appeared later than cMOOCs and were usually associated with commercial ventures. Most large and well-known MOOC platforms, like Coursera, edX, Khan Academy, and Udacity are all xMOOCs. This study will focus exclusively on this dominant xMOOC course model and how videos are used to provide learning content. In this article, we

will use the term MOOC as a synonym of xMOOC, a common custom in press and research works.

Objectives of this research

In this study, we want to explore the usage of instructional videos in current xMOOC platforms. Our purpose is to obtain a reliable account of the actual usage of communication styles in MOOC videos and how these styles are associated with MOOC characteristics, such as the platform, language, and subject.

The study also proposes a categorization of MOOC video styles, based on their relative frequency and communicative approach. In addition, this article includes a final discussion on the possible causes of the observed usage of video styles.

We believe that this work will contribute to a better understanding of instructional videos in MOOCs and will help researchers in the characterization of video features, production techniques, and communication patterns.

Typologies of online educational videos

To accomplish the aforementioned objectives, it is necessary to define a conceptual framework for categorizing MOOC videos. Extensive research effort has been taken to build general classifications of online educational videos, resulting in several proposals. Table 1 shows a summary of some selected classification schemas, described below.

An early work by Goodyear & Steeples (1998) identified six main communication styles used in video clips shared within communities of practice. The JISC organization (Thornhill, Asensio, & Young, 2002) adapted the Goodyear & Steeples' classification to the then-emerging field of streaming video in education, suggesting seven frequent usage patterns: talking head, events, instructional, simulation, think aloud, fly on the wall, and real life.

Schwartz and Hartman (2007) developed a conceptual model that classifies educational video around four classes of learner outcomes: seeing, engaging, doing and saying. For each outcome, the authors established four or five video genres, as shown in Table 1.

Kay's (2012) literature review of research on video podcasts includes a classification that uses four dimensions: purpose, segmentation, pedagogy, and academic focus. Among the video types, Kay identifies *lecture-based*, *enhanced* (slides with added voiceover), *supplementary* (administrative support, real-world demonstrations, summaries), and *worked examples* video podcasts.

Table 1. Summary of selected classification schemas for educational videos

Reference	Video typologies	
Goodyear & Steeples (1998) <i>Subject: videoclips</i> <i>Context: sharing of working practice</i>	Fly on the Wall Think Aloud Action with Commentary	Talking Head Prepared Script Professionally Acted
Thornhill, Asensio & Young (2002) <i>Subject: streaming videos</i> <i>Context: best practices in education</i>	Talking Head Events Instructional Simulation	Think Aloud Fly on the Wall Real Life
Schwartz & Kartman (2007) <i>Subject: designed videos</i> <i>Context: instructional design</i>	<i>Seeing:</i> Tour, Portrayal, Point of View, Simulation, Highlighting <i>Engaging:</i> Ad, Trailer, Trigger, Narrative, Anchor <i>Doing:</i> Modeling, Identification, Demonstration, Step-by-step <i>Saying:</i> Association, Chronicle, Analogy, Commentary, Expository	
Kay (2012) <i>Subject: video podcasts</i> <i>Context: literature review</i>	<i>Purpose:</i> Lecture-based Enhanced Supplementary Worked examples <i>Segmentation:</i> Non-segmented Segmented	<i>Pedagogy:</i> Receptive viewing of podcasts Problem-solving podcasts Learner creation of podcasts <i>Academic focus:</i> Practical Conceptual
Majid, Khine, Oo & Lwin (2012) <i>Subject: YouTube videos</i> <i>Context: Information Literacy teaching</i>	Lecture Tutorial Discussion	Slide Show Presentation Interview
S. Moes (2012) <i>Subject: video lectures</i> <i>Context: best practices in education</i>	Weblecture Slidecast Knowledge Clip Screencast	Tutorial Pencast Webinar Virtual Classroom

Majid, Khine, Oo, & Lwin (2012) analyzed several features of YouTube educational videos in the field of information literacy. They used six communication styles for categorizing videos: lecture, tutorial, discussion, slide show, presentation, and interview. The EU-funded REC:all project defined a model for lecture capture technologies (Moes, 2012), framed in Bloom's Taxonomy. Their model involves six types of lectures, such as the *knowledge clip*, a genre that REC:all project investigated in depth.

Classifying MOOC video styles

Researchers have tried to characterize and classify the video styles that are prominent in MOOCs. There are two recent works that provide remarkable results on the classification of MOOC videos. In the first study, Hansch et al. (2015) assessed current MOOCs and

identified a set of 18 video style typologies (see Table 2) based on their qualitative reviews and interviews with MOOC designers and instructors.

Second, the study by Guo, Kim, and Rubin (2014) measured the influence of video production style over student engagement in MOOCs. The authors labeled videos using six production styles: slides, code (screencast), Khan-style, classroom, studio and, office desk. The study was limited to a small set of courses of scientific and technology disciplines in the edX platform.

Discussion of classification schemas

At present, there is no standardized taxonomy of educational video styles. In addition, the terminology is still maturing as new video techniques emerge and neologisms are coined. We have noticed that older classifications tend to be organized around features, such

Speakers and Boards

Table 2. Typologies of MOOC videos proposed by other authors

Reference	Video typologies	
Guo, Kim & Rubin (2014)	Slides Code (<i>screencast</i>) Khan-style	Classroom Studio Office Desk
Hansch et al (2015)	Talking Head Text-Overlay Actual Paper/Whiteboard Webcam Capture Green Screen Classroom Lecture Live Video Recorded Seminar Interview	Conversation Presentation Slides with Voiceover Picture-in-picture Screencast Khan-Style Tablet Capture Udacity-Style Tablet Capture On-Location Animation Demonstration

as teaching purposes or communication patterns, while newer classifications tend to be more aware of genres, a trend that is revealed by the increasing appearance of terms such as *screencast*, *webinar*, and the like.

The two MOOC classification schemas share a concern of researchers on the video setting or background, which drives the building of the typologies. Half of the Guo, Kim, and Rubin's categories are actually scenario settings (classroom, studio, office desk).

Related work

Several systematic characterizations have been devised to classify other video features. Koumi (2006) distilled decades of expertise in The Open University into a multifactorial framework that describes video qualities such as affordances, functions, and usage patterns with a practitioner's focus. Ploetzner and Lowe (2012) built a characterization of expository animations based on a systematic literature search and analysis. Santos Espino et al. (2013) outlined a multi-layered taxonomy model to classify online instructional video features.

Yousef, Chatti, Schroeder, and Wosnitza (2014) used structured questionnaires to assess teacher and learner preferences on various MOOC course aspects, including video content, user interface, and video layout, but little emphasis was made on video styles. Features that were assessed included the use of slides and teacher image, text size, and text location.

Finally, YouTube is a platform where researchers have made several quantitative studies on instructional video styles and features. Swarts (2012) explored how-to tutorial videos in YouTube to discover links between

narrative patterns and popularity. More recently, ten Hove & van der Meij (2015) conducted a survey of a class of instructional videos in YouTube and found significant associations between certain production features and video popularity.

Study Design

Research questions

This research will classify videos according to their communication style: how the instructional contents are expressed in the video by arranging visual items and sounds in space and time. It is important to remark that communication style deals with the representational features of videos and not with the video production technique. Therefore, we will categorize the product outcome, not the way it has been produced.

With this definition given, this study has two main research questions to investigate:

1. What are the communication styles and features used in instructional videos in current MOOCs?
2. Are there significant differences between MOOC platforms or course subjects, regarding the usage of representational styles in their instructional videos?

Method overview

Five MOOC platforms were chosen for this study: Coursera and edX from the United States, FutureLearn from the UK, MiriadaX from Spain, and FUN from France. These all are generalist MOOCs serving worldwide communities: a global

audience for Coursera and edX, English-speaking people for FutureLearn, Spain and Latin America for MiriadaX, and the Francophone community for FUN. We chose not to study popular MOOC sites like Khan Academy and Udacity because they cover very narrow fields of knowledge, like mathematics or computer programming.

The study was developed in two stages. In the first phase, a qualitative survey was made to investigate what types of video communication styles are most frequently used in the selected MOOC platforms. This study resulted in the identification of seven video styles and the emergence of a broad categorization of board-centric and speaker-centric styles, as we will discuss below. The second phase consisted of a quantitative survey of video style usage in a sample of 116 MOOCs. With these data, a statistical analysis (descriptive and inferential) was made to answer the research questions and to extract more general conclusions.

Method for phase 1

The main goal of the first stage was to set up a useful classification schema for the video communication styles. A small sample of courses from the evaluated MOOC platforms was examined by the authors and was contrasted with preceding classification proposals in order to build a taxonomy of styles whose elements should exhibit a good balance of these criteria: (a) meaningful for non-scholars, (b) non-ambiguous, and (c) non-overlapping.

Method for phase 2

Sampling period All the selected platforms offer courses in time windows, so the course population varies over time. In order to reduce sampling biases related to season, five sampling periods were defined in a time window covering the first semester of 2015: February 11–14, March 24–31, April 20–May 11, May 20–June 8, June 18–July 8.

Course selection For FUN, FutureLearn, and MiriadaX platforms, we enrolled in all the courses that were available in each sampling window. Coursera and edX have a large amount of available courses (more than 300 courses during the sampling window), so we enrolled in a subset of courses, following the same sequence shown by the platform's course search page. Some courses had not published the full course material when the sample was made; those courses having

available less than one third of the full syllabus were discarded from the sample.

Video selection For each course, we examined the full stock of instructional videos they contain. Some courses included links to external videos as part of reference material; this kind of video was not considered for the study. Other videos that have been discarded are course presentation videos, welcomes, promotional clips, and descriptions on how to use the course material. Finally, we have not considered recorded hangouts and other additional videos that sometimes can be found in course discussion forums.

Video styles and features For each course, a number of data was collected: subject area (see below), video styles used and other video features, freehand writing or marking, background (plain, office, outdoors), in-video quizzes, use of cartoons, and use of actors instead of instructors. The video styles were coded using the definitions set in Phase 1 by a team of three evaluators. Each course was evaluated independently by two persons. When a discrepancy in the coding occurred, the evaluator pair had to reach consensus on a unanimous decision. Some videos are composed of segments that may use different styles; if this was the case, all styles were accounted for. If a video could not be clearly assigned to any of the seven styles, the evaluator would assign it to the “others” category as well as write an explanation.

Subject areas Every course was assigned to one of these seven subject areas: arts and humanities, business and management, social sciences, natural sciences and mathematics, health and medicine, engineering and computing, and everyday life. This last category has been conceived to assign non-academic, practical courses about common life matters such as training for finding a job.

Phase 1: Identifying Video Styles in MOOCs

Among all the reviewed classification schemas, we have considered the catalog by Hansch et al. (2015) as a good starting point. However, we consider that this typology intermingles different dimensions in a single list, making it unnecessarily long and concealing the existence of some category groupings. For example, the “Talking Head,” “Webcam Capture,” and “Green Screen” types share much more in common than they do with other types; in fact, these three only differ in the scene setting

Speakers and Boards

or background. That led us to simplify Hansch et al.'s scheme as well as add the "Documentary" style that we observed in a significant amount of Phase 1 sample courses. We decided to suppress the "Animation" and "Demonstration" types because of the lack of relative frequency in the courses we previewed.

The resulting seven styles are named "Talking Head," "Live Lecture," "Interview," "Slides," "Screencast," "Virtual Whiteboard," and "Documentary." Some of these terms have well established meanings while others need a precise definition for the context of this research, which we will provide below. Sometimes a MOOC video uses a combination of these basic styles, but usually a single style is the dominant one.

Table 3 sketches the mapping between our seven styles and the list by Hansch et al. (2015). It can be seen that our taxonomy works roughly as a grouping of Hansch et al.'s typologies in higher-level classes.

Table 3. Mapping between authors' typologies and Hansch et al (2015) typologies

Styles in this study	Correspondences with Hansch et al (2015)
Talking Head	Talking Head Text-Overlay Actual Paper/Whiteboard Webcam Capture Green Screen On-Location (*)
Live Lecture	Classroom Lecture Live Video (*)
Interview	Recorded Seminar Interview Conversation Live Video (*)
Slides	Presentation Slides with Voiceover Picture-in-picture (**)
Screencast	Screencast
Virtual Whiteboard	Khan-Style Tablet Capture Udacity-Style Tablet Capture
Documentary	On-Location (*)
Other styles	Animation Demonstration

(*) "On-Location" and "Live Video" types match more than one style.

(**) "Picture-in-picture" is equivalent to our "Head and slides" substyle.

Style definitions

This section contains definitions for the seven main video styles as they will be considered along this paper. Figure 1 shows screenshots of all these styles. We made an effort to construct definitions that ease the following phase of style coding in the course sample, therefore avoiding ambiguity.

Talking head It is a video podcast whose most frequent shot is a talking human speaker who covers a large frame area (+30%) and is not surrounded by slides or other text-rich elements. The speaker addresses the audience: she or he looks at the camera most of the time in a pretended eye-to-eye contact (the learner is treated as second person). Sometimes overprint text is shown to enforce key ideas of the narration or the scene switches to show another kind of material (still images, short video clips, etc.). Those insertions represent a relatively small amount of video time.

Live lecture It is the live recording of a classroom lecture or conference talk. An in-classroom audience is visible or implied. The learner's role is third person. The video should show some degree of edition (i.e. switching shots and cameras) but always keeps the overall perception of being recorded in a single take.

Interview One or more persons answer questions about or discuss a topic. An interviewer may or may not be present. There are two main approaches for the interviews: the dialogic (several people are involved in a conversation) and the declarative (each speaker answers a tacit question, but there is no explicit conversation). The key feature that differentiates an "Interview" from a "Talking Head" video is that in the first case, speakers don't address the audience and don't show direct eye contact (learner is third person).

Slides In its most basic form, it is an animated sequence of Powerpoint-like slides with a voiceover talk (slideshow or slidecast). Most frequent versions of this style display the speaker as a small "talking head" placed in a marginal area of the frame (most commonly at the right bottom). Sometimes this substyle has been referred to as "picture-in-picture" (Hansch et al., 2015; Kizilcec, Papadopoulos, & Sritanyaratana, 2014), but we prefer to call it a more specific term—"Head and Slides"—to avoid confusion with other picture-in-picture layouts.

Screencast This is the visual recording of a computer session screen output, as defined by Udell (2005). It will usually include a voice narration with a description of the actions being taken.

Virtual whiteboard This style has been popularized by Khan Academy videos. A virtual whiteboard is shown where an instructor draws content (e.g., mathematical formulas, diagrams, or short text). The whiteboard is often blank at the video start. The instructor's face is usually not displayed, though some variants of this style show human hands and/or a pen doing the drawings.

Documentary This is the standard cinematographic genre whose typical structure consists of a narration and filmed segments of stock material about a topic. The narrator may or may not be displayed; in this latter case, their presence represents a minimal fraction of the video length.



Figure 1. Screenshots of most frequent video communication styles found in MOOCs. (a) Talking Head, (b) Interview (dialogic), (c) Interview (declarative), (d) Live Lecture, (e) Screencast, (f) Documentary, (g) Slides, (h) Head and Slides, and (i) Virtual Whiteboard.

Characterization of styles

Every style can be characterized by a set of features:

- The *content displayer* is the main representational item that provides instructional information within

the video frame. All styles but one use a human speaker or a rectangular board for this purpose. We will discuss this in a following section.

- The *learner's role* is the position of the viewer in the video narrative: second person or third person (O'Donoghue, 2013).
- The *text density* is the average amount of written text that is displayed in the video frame. Some styles use substantially more text than others.
- The *setting* or scenario may be *natural* (a classroom, an office, etc.) or *artificial* (chroma display, computer screenshot, etc.).

The characterization for all the styles is shown in Table 4.

Speaker-centric versus Board-centric videos

During our qualitative study, we noticed that most MOOC videos take a single structural item as its main provider of instructional content. Depending on what type of item plays that role, we find two classes of videos: board-centric and speaker-centric.

- **Board-centric** videos use a rectangle-shaped surface (a board) where instructional contents are presented. This board fills a large frame area or the full frame.
- **Speaker-centric** videos use a visible human speaker as the main vehicle to provide content. The speaker is visible most of the time. Sometimes more than one speaker may be present.

Figure 2 shows examples of both style families. Board-centric styles include virtual whiteboard (Khan-style tablet drawings), slides (including Head and Slides), and screencasts. Speaker-centric styles include Talking Head videos, Live Lecture recordings, and Interviews.

Table 4. Characterization of the video styles

Style name	Content displayer	Learner's role	Text density	Setting
Talking head	speaker	2nd person	low/medium	variable
Live Lecture	speaker	3rd person	low/medium	natural
Interview	speaker	3rd person	low	natural
Slides	board	2nd/3rd person	high	artificial
Screencast	board	2nd/3rd person	medium/high	artificial
Virtual whiteboard	board	2nd/3rd person	medium	artificial
Documentary	not applicable	3rd person	low	variable

Speakers and Boards



Figure 2. Speaker centric videos (left) and board centric videos (right) in MOOCs

Speaker-centric videos tend to provide oral information, while in board-centric videos, the visual information (text or figures) is principal. Visual content items like charts and pictures may be also present in speaker-centric videos, but in that context they often work as a complement to the primary spoken contents. On the other hand, board-centric videos may display a speaker (as a small picture-in-picture or occasional interleaved full shots), but this representation often works as a stylistic complement whose main role is not to provide content by itself but to help in other purposes such as enhancing attention or engagement, as suggested by Kizilcec, Papadopoulos, and Sritanyaratana (2014). Engagement and attraction originated in speaker presence may also be related to the development of an intimate tutorial relationship observed by Adams, Yin, Vargas Madriz, and Mullen (2014) in their exploration of the learning experience of MOOC students.

The board- and speaker-centric divide has links with video production techniques. Board-centric videos tend to be rooted on screen capturing procedures, while typical speaker-centric videos are based on real-life video recordings.

Finally, we have to note that this classification works actually as a spectrum. One can find “pure” board-centric styles, such as a screencast or a slideshow, and “pure” speaker-centric videos like an unedited lecture capture; in the middle, there are styles with a combination of degrees of board and speaker centrality. This occurs with the Head and Slides substyle, which is still board-centric but shows some degree of speaker presence.

Phase 2: Quantitative Survey

Course demographics

A total of 116 courses were evaluated. One of them didn't use videos at all, thus it was removed from the study, leaving a total of 115 courses. Table 5 shows the distribution of courses by MOOC platform and course subject area.

Surveyed courses were made by 84 institutions from 15 countries worldwide: the United States (44 courses), Spain (20), the United Kingdom (19), France (15), Latin America (7), Eastern Asia (4), Australia (3), and other European countries (3).

English is by large the most used language (74 courses), followed by Spanish (25), French (15), and Portuguese (1). All courses made in French language were provided by FUN, while Spanish-speaking courses came from MiriadaX (20), Coursera (4), and edX (1). The course in Portuguese was hosted in MiriadaX.

Table 5. Number of sampled courses, grouped by MOOC platform and course subject

	Coursera	edX	FUN	FutureLearn	MiriadaX	Total
Arts and Humanities	3	5	1	7	3	19
Business and Management	7	3	1	1	2	14
Engineering and Technology	5	8	4	1	5	23
Everyday Life	2	0	0	2	2	6
Health and Medicine	4	1	2	2	5	14
Science	3	6	2	3	0	14
Social sciences	4	6	5	6	4	25
Total	28	29	15	22	21	115

Video styles

Tables 6 and 7 show the usage of video styles across MOOC platforms and course subjects, respectively. Talking Head and Slides were the most used styles in general, but there were some differences across platforms: Slides was the most used style in Coursera and MiriadaX while Talking Head was the most frequent in edX and FutureLearn.

Slides

Slide-based videos were the second most frequent style, nearly tied with the Talking Head style. There were several variants of the slideshow whose usage is shown in Table 8. The most frequent format was the Head &

Slides, found in 44% of courses with slide-based videos (25% of all courses). It is remarkable that 23 courses (20% of total) used slideshows with no visible speaker.

Freehand writing and marking

Only nine courses contain videos that can be considered pure Virtual Whiteboard (Khan style or similar). This scarcity contrasts with the high reputation that this style holds. We have also accounted for the use of handwriting in any form: occasional writing, marking text areas on screen, etc. A total of 30 courses (26%) exhibit some form of handwriting in their videos. This feature happens mostly over slides (13 courses) and during screencasts (8 courses).

Table 6. Video style usage by MOOC platform. Each cell shows the count of courses that use videos with the corresponding style, and the percentage from total number of courses in the column's MOOC platform. Notice that one course may use several video styles; thus, the sum of percentages in each column may be higher than 100%. FL = FutureLearn. MX = MiriadaX.

	Coursera	edX	FUN	FL	MX	All platforms
Talking Head	15 (54%)	21 (72%)	6 (40%)	21 (95%)	10 (48%)	73 (63%)
Live lecture	2 (7%)	9 (31%)	1 (7%)	2 (9%)	1 (5%)	15 (13%)
Interview	7 (25%)	12 (41%)	6 (40%)	13 (59%)	6 (29%)	44 (38%)
Slides	21 (75%)	9 (31%)	11 (73%)	10 (45%)	15 (71%)	66 (57%)
Screencast	6 (21%)	9 (31%)	1 (7%)	2 (9%)	5 (24%)	23 (20%)
Virtual whiteboard	5 (18%)	7 (24%)	1 (7%)	0	2 (10%)	15 (13%)
Documentary	2 (7%)	1 (3%)	2 (13%)	7 (32%)	4 (19%)	16 (14%)
Other styles	3 (11%)	4 (14%)	3 (20%)	3 (14%)	4 (19%)	17 (15%)

Table 7. Video style usage by course subject area. Each cell shows the count of courses that use videos with the corresponding style and the percentage from total number of courses in the column's subject. Notice that one course may use several video styles; thus, the sum of percentages in each column may be higher than 100%. Hum = Arts and Humanities. BMg = Business and Management. Soc = Social Sciences. HMed = Health and Medicine. Sci = Natural Sciences and Mathematics. Tech = Engineering and Technology. EL = Everyday Life.

	Hum	BMg	Soc	HMed	Sci	Tech	EL
Talking Head	18 (95%)	8 (57%)	18 (72%)	6 (43%)	7 (50%)	13 (57%)	3 (50%)
Live lecture	3 (16%)	2 (14%)	3 (12%)	1 (7%)	3 (21%)	2 (9%)	1 (17%)
Interview	10 (53%)	6 (43%)	10 (40%)	5 (36%)	4 (29%)	8 (35%)	1 (17%)
Slides	4 (21%)	8 (57%)	15 (60%)	8 (57%)	8 (57%)	18 (78%)	5 (83%)
Screencast	2 (11%)	2 (14%)	1 (4%)	0	4 (29%)	14 (61%)	0
Virtual whiteboard	0	2 (14%)	1 (4%)	1 (7%)	5 (36%)	6 (26%)	0
Documentary	7 (37%)	0	3 (12%)	3 (21%)	1 (7%)	2 (9%)	0
Other styles	2 (11%)	0	3 (12%)	6 (43%)	3 (21%)	2 (9%)	1 (17%)
TOTAL courses in subject	19	14	25	14	14	23	6

Speakers and Boards

Table 8. Frequency of Slide substyles

Slideshow types	courses	% from slideshows	% from total
All slideshow classes	66	100%	57%
Head & slides	29	44%	25%
No visible speaker	23	35%	20%

Background and setting

Guo, Kim, and Rubin (2014) speculate about the influence of the background and setting where the speaker is placed. They suggest using natural and simple settings such as an office. This hypothesis applies mostly to our Talking Head style, since the other ones are bound to a natural or artificial setting. We have explored the kind of background that is used in the Talking Head videos. Rows in Table 9 show how many courses use Talking Head videos with a given scenario: a working place or office, a neutral background (i.e. chroma), a TV studio, outdoors, a classroom, a conference room, or a theater.

Table 9. Background setting usage in Talking Head videos

Background/setting	courses
working place	29 (40%)
neuter background	17 (23%)
TV studio	8 (11%)
outdoors	6 (8%)
classroom / theater	6 (8%)

Other features

Other minor features were also annotated:

- 12 courses made use of actors instead of instructors, mostly in documentary fragments, demonstrations and storytelling.
- 8 courses made use of cartoons and animated movies.
- 4 videos made explicit use of humor to communicate ideas.

- 8 courses used in-video quizzes, 7 of them in Coursera and the other one in edX.
- 4 courses made use of voiceless videos: 3 in MiriadaX and 1 in FutureLearn.

Statistical Analysis

Style diversity

A typical course uses two different video styles (mean=2.36, SD=1.16, mode=2). Individual diversity measures for each platform and course subject are shown in Table 10. FutureLearn and edX hosted slightly more diversity than the other platforms. On the side of subjects, we found a group of lower diversity areas (business & management, social science, and health) and one with higher diversity (arts & humanities, science and technology).

Sixty-three courses (55%) can be entirely described with just three styles: Slides, Talking Head, and Interview. Only 17 courses (15%) used videos that cannot be labeled with the seven styles identified in this study. These additional styles included roleplays, storytelling, cartoons, how-tos, and others. These data reveal a low diversity of styles in MOOC courses.

Style co-occurrence

Given that a typical course uses two video styles, we analyzed the co-occurrences of styles within a single course. The most common style pairings are listed in Table 11.

The most frequent pairing (Talking Head with Slides) had a lower frequency than was expected if styles were chosen at random. To obtain deeper conclusions, we performed chi-square tests of independence for all the 21 style pairings ($N=115$ for all tests). A statistically significant relation ($p<0.05$) was found in five pairs. For those cases, the Yules' Q statistic has been calculated to state the sign of the association (positive or negative).

Table 10. Style diversity (number of styles used in a course), by platform and subject. Average and SD.

	Coursera	edX	FUN	FutureLearn	MiriadaX	
diversity	2.18 (1.09)	2.52 (1.27)	2.13 (1.30)	2.64 (1.18)	2.24 (0.94)	
	Humanities	Business	Social Sc.	Health	Science	Tech & Eng.
diversity	2.47 (1.17)	2. (1.04)	2.2 (1.0)	2.14 (0.77)	2.5 (1.09)	2.83 (1.5)

Table 11. Top five style pairings

Pairing	Number of courses using that pairing
Talking Head with Slides	34 (30%)
Talking Head with Interview	30 (26%)
Slides with Interview	22 (19%)
Slides with Screencast	13 (11%)
Talking Head with Screencast	13 (11%)

These are the three positive associations:

- Virtual Whiteboard with Screencast ($p=0.04$, $Q=+0.53$)
- Virtual Whiteboard with Lecture ($p=0.01$, $Q=+0.64$)
- Interview with Documentary ($p=0.03$, $Q=+0.53$)

And these are the two negative associations:

- Slides with Lecture ($p=0.01$, $Q=-0.63$)
- Slides with Talking Head ($p=0.003$, $Q=-0.54$)

Furthermore, we have performed a similar test for independence for Slides against all other styles and against the speaker-centric family as a whole. The results are: (a) the usage of slides and all other styles were independent ($\chi^2=0.236$, $p=0.627$), and (b) a significant negative association was found between slides and speaker-centric videos in general ($\chi^2=8.67$, $p=0.003$, Yule's $Q = -0.64$).

This set of associations suggests a trend in course design to avoid combinations of slide-based videos with speaker-centric modalities. The data also suggest that when a speaker-centric course needs to benefit from board-centric instructional material, there is a slight preference for Screencast and Virtual Whiteboard video instead of Slides.

Associations between style and course attributes

We performed chi-squared tests of independence to find statistically significant relations between the style usage in courses and other variables: platform, language and style. An alpha level of 0.05 has been used for all tests. A Fisher's Exact Test was made when data were not adequate for chi-squared tests. When considering subjects, we have excluded "Everyday Life" courses, since this subject category involves only 6 courses.

Given those considerations, the only significant relation found was between style usage and MOOC platform: $\chi^2(24, N=115) = 43.41$, $p<0.01$.

Board-centric versus speaker-centric styles

All reviewed courses make use of board- or speaker-centric videos. Only 30 courses (26%) harness styles outside the board-speaker-centric spectrum. We have searched for associations between board-speaker centrality and two aspects: the MOOC platform and the course subject area. For that purpose, every course has been labeled as serving speaker-centric videos, board-centric videos, or both.

Table 12 shows the distribution of the three course classes across MOOC platforms. Tests for independence reject significant differences between platforms, chi-squared: $\chi^2(8, N=115) = 13.07$, $p=0.109$, and Fisher's Exact test: $p=0.088$.

Table 13 shows how the three course classes are represented in each course subject area. The category Everyday Life was omitted, since it provides too few courses (6) and it has no representation in all platforms. A statistically significant association was found between course style approach and course subject area by using Fisher's Exact Test: $p<.0001$.

Figure 3 plots the ratio between speaker-centric and board-centric style preferences for each subject area, excluding Everyday Life. Each point (x,y) represents the x proportion of courses having exclusively speaker-centric videos and the y proportion of courses having

Table 12. Distribution of pure speaker-centric, pure board-centric and mixed courses across MOOC platforms

	Coursera	edX	FUN	FutureLearn	MiriadaX	All platforms
Pure speaker centric	4	11	3	11	6	35
Pure board centric	7	6	5	1	7	26
Mixed	17	12	7	10	8	54

Speakers and Boards

Table 13. Distribution of pure speaker-centric, pure board-centric and mixed courses across subject areas

	Humanities	Business	Social Sc.	Health	Science	Tech. & Eng.
Pure speaker centric	13	5	10	5	1	0
Pure board centric	0	2	4	4	6	7
Mixed	6	7	11	5	7	16

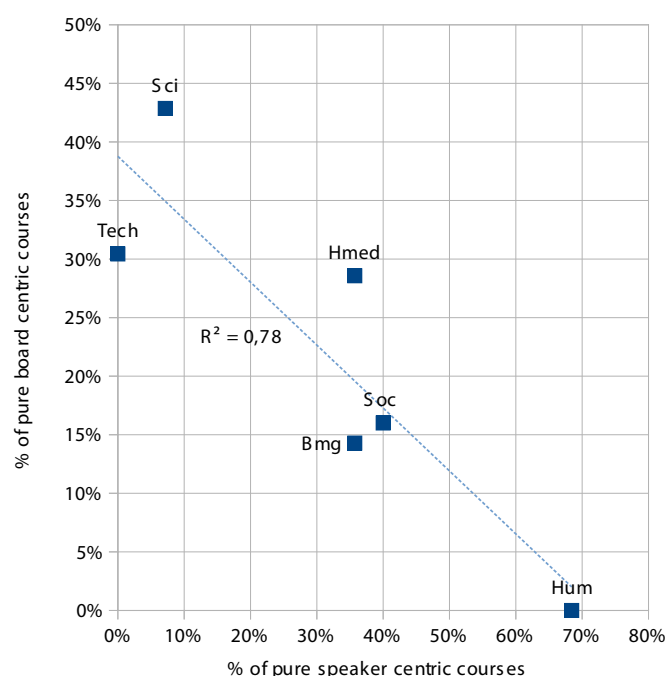


Figure 3. Proportions between pure speaker centric and pure board centric courses for each subject area. The linear regression function is plotted as a dashed blue line. Hum = Arts and Humanities. Bmg = Business and Management. Soc = Social Sciences. Hmed = Health and Medicine. Sci = Natural Sciences and Mathematics. Tech = Engineering and Technology.

exclusively board-centric videos. When a linear regression is applied, this speaker/centric ratio shows a high correlation ($R^2 = 0.78$). Figure 3 also reveals a certain art-to-science cline that starts from art & humanities, passes through soft science, and ends in hard science. In this subject spectrum, humanities clearly favor speakers, hard science and technology prefer boards, and soft sciences keep an intermediate position.

Discussion on Survey Results

This survey evidences a low diversity of communication styles in MOOC videos, both internal (a typical course employs two styles) and as a population. Seven

styles describe the majority of courses and three of them (Talking Head, Slides, and Interview) can label more than a half of the whole sample. Some well known communication styles such as storytellings, live demonstrations, and cartoons have a testimonial presence in the examined MOOCs. Much variation of MOOC video styles can be explained with the speaker-centric to board-centric spectrum.

There are observable differences between humanistic and technological disciplines in the frequency of use of board-centric or speaker-centric videos. This relationship between speaker/board centrality and course subject may be linked to cultural factors or there may be some relation to intrinsic properties of the contents: for example, teaching about mathematical formulas or complex engineering structures may be hard without displaying equations or diagrams. That would explain part of the science and technology preference for board-centric videos. The actual source of these differences in communication styles is something to be explored in further research. Whatever the case, the advice is not to immediately generalize a research finding on the learning efficiency of instructional video styles when the research has been limited to one particular subject area.

Interpretation of MOOC Video Style Diversity

We want to finish this paper with a reflection on the systemic causes of the observed MOOC focus on Speakers and Boards videos and the observed lack of style diversity.

Many MOOCs found in generalist platforms are built from existing face-to-face courses. Usually the original course is adapted to the MOOC format, changing the interfaces and course materials but keeping the same instructional design. Most redesign effort is pushed into course assignments and discussion forums management due to the course attendance change of scale (Kellogg, 2013; Fredette, 2013).

The results from our survey are consistent with the observation that the underlying didactic technique

in most MOOCs is the classic instructional lecture (Karsenti, 2013). Lectures are often adapted from the classroom to the MOOC platform with no fundamental changes, except for the audience decoupling. There are two simple approaches to accomplish this direct adaptation: one is to record your lecture talk (and edit it) and the other one is to print out your lecture notes. These two approaches lead, respectively, to the Talking Head and Slides communication styles. These kinds of videos not only are cheaper to record than other modalities but easier to design out of current conventional course material. Other communication styles and techniques; like Khan-style tutorials, storytellings, or animated demonstrations; would require more elaboration and therefore will tend to be relatively scarce in the current MOOC ecosystem. This reasoning may partially explain the distribution of video communication styles that this study reveals.

The attachment of current MOOCs to the video lecture has received criticism, as it has been acidly quoted by Ian Bogost (cited by Adams et al., 2014, p. 203): “MOOCs . . . still rely on the lecture as their principal building block. . . . The lecture is alive and well, it’s just been turned into a sitcom.” Despite the critics, the fact is that MOOCs have been successful, at least in terms of course volume and attendance. Indeed, their pedagogical conservative strategy may be one of the factors behind that success: It may have facilitated a fast transfer of educational content to the new online platforms. More disruptive or innovative approaches would have increased course production costs and, consequently, would have slowed the MOOC ecosystem growth. The production costs of MOOCs have been considerable: Hollands & Tirthali (2014) estimated a production cost ranging from USD 38,980 to USD 325,330 per MOOC. Being too innovative should lead to poor sustainability. Moreover, some tools have been created to significantly reduce productions costs. For example, Head and Slices short-length videos can be recorded and edited with the Polimedia framework (Turro et al., 2010) in almost real time with a very affordable investment.

All things considered, the conservative scenario depicted by this study may be just a sign of the early stages of a MOOC ecosystem that has been focused on the growth of course offerings, thus favoring pre-existing course reuse. It is feasible that in the near future, MOOCs will add more diversity and more innovation

in their audiovisual styles as more courses will be developed free from the ties of legacy contents. Today, some may consider it ironic that one of Coursera’s courses on digital storytelling production (Coursera, 2015) is made up of slideshow videos and talking head lectures. Instead, we can view it as a natural step in MOOC evolution, in which the current system leverages its modest resources to help teachers learn new communication styles so they can build more innovative, next-generation MOOCs.

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Speakers and Boards

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The Re-Emergence of Emotional Appeals in Interactive Data Visualization

By Charles Kostelnick

Abstract

Purpose: I argue that emotional appeals, prevalent in charts and graphs during the later nineteenth century but largely dormant since then, have rapidly re-emerged in contemporary data visualization. Changing the relationship between designer and user, this new form of data design has intensified the affective impact of data displays by eliciting emotions ranging from excitement and empathy to anxiety and fear.

Methods: This article draws on historical and contemporary sources to build its case. It gives an overview of emotional appeals in the rhetorical tradition, from Aristotle to modern theorists like George Campbell, who emphasized sensory responses through personalization and proximity. The article provides an historical overview of pathos appeals in data design during the later nineteenth century and the shift to modernist minimalism in the twentieth century. Contemporary examples from companies, nonprofits, government agencies, and individual designers illustrate how data visualization arouses emotion.

Results: Emotional appeals during the nineteenth century focused primarily on color and design novelty, which, by appealing largely to the senses, fostered emotional responses such as excitement and curiosity. Contemporary data visualization makes similar emotional appeals through the use of color, novelty, and multimodal features; however, digital technology also allows designers to appeal to the emotions by personalizing displays through interactivity, spatial and temporal proximity, and aesthetic and expressive elements.

Conclusion: Pathos (emotional) appeals have become an integral part of contemporary data visualization, largely because of the multimodal and interactive affordances of digital technology. Designers who understand this dimension of data design can deploy technology to make their displays more engaging, humane, and usable.

Keywords: Visual communication, data visualization, charts and graphs, visual rhetoric, history of data design

Practitioner's Takeaway:

- Although emotional elements in data design are often avoided in favor of concise objectivity, they have a long history and are becoming increasingly prevalent online.
- Deploying color and multimodal features creates visual stimuli that arouse users emotionally, creating excitement and enhancing user engagement.
- Adding interactive features enables users to customize the data and the data's graphical design, fostering both usability and a stronger emotional attachment to the display.
- Visualizing real-time (or fluid) data increases the user's temporal proximity to the display, heightening its emotional impact.
- Affording users opportunities for feedback and discussion invests them emotionally in the design by building community and enhancing interest and understanding.

We stand in the midst of an explosion in data visualization that rivals the “golden age” of the nineteenth century (Funkhouser, 1937, p. 330; Friendly, 2008) in invention and ingenuity and that far exceeds that era in its capacity to make data accessible to massive audiences. With trillions of charts and graphs now generated annually (Tufte, 1990, p. 9), data design has become a major activity in business, technical, and professional communication. Interactive data visualizations now appear all across the Internet, generated by government agencies, news outlets, private companies, nonprofits, and a growing multitude of freelance digital designers (see McCandless, 2010). These digital charts and graphs offer new design dimensions that differ radically from static displays. The data sets are frequently large and complex, containing thousands of data points, and are often dynamic rather than static; they typically allow users to shape or alter displays, redefining agency (Rawlins & Wilson, 2014), and even allow users to interact with designers and other audience members. And the growing array of visualization forms often contain novel, multimodal, or hybrid elements, which can engage and delight users as well as challenge and stretch their interpretive skills.

Surprisingly, given these profound and rapid changes in data design, scant attention has been given to how these new and potent forms are reshaping the user’s experience emotionally—of how they are humanizing data design to engage and persuade audiences. This reintroduction of emotional elements is both startling and predictable: after playing a large role during the golden age of statistical graphics, pathos appeals had largely been avoided in serious data design over the past century, as modernist minimalism and other factors conspired to leach them out, relegating them mostly to mass media infographics laden with what Tufte famously demonized as “chartjunk” (1983, pp. 107–121). With the advent of online interactive graphics, however, emotional appeals have now been re-established and tacitly legitimized (see Kostelnick, 2008).

Here, I will argue that pathos appeals are intrinsic to the new digital media by way of design elements and through user affordances that make data visualization even possible. This infusion of emotion happens in two ways—one a revival and the other largely new:

1. Data visualization revives the nineteenth-century profusion of *sensory stimuli* through design features

like color, multimodality, animation, pictorial elements, and novelty—all of which arouse emotional responses.

2. Data visualization personalizes data design by developing a close proximity between data and audience. It accomplishes this personalizing effect by:
 - enabling users to shape and scale data displays to meet their needs;
 - affording interaction with other users and designers;
 - visualizing fluid (often real-time) data, heightening the immediacy of the data; and
 - encouraging self-expression, including the visualization of personal data.

Data designers can deploy these and other digital features to arouse users emotionally, creating excitement and enhancing user engagement and understanding. Although emotion in data design has been debunked in favor of concise objectivity and cognitive efficiency, emotion should less be loathed and evaded than acknowledged, deployed, and controlled. By exploiting this opportunity to connect with their audiences emotionally, designers can humanize their displays, drawing on a long, foundational tradition from which they can glean both precedent and inspiration.

Emotional (Pathos) Appeals in Historical Context

Although emotional appeals have historically received far less attention than the study of rational appeals (Waddell, 1990, pp. 381–382, 397), the concept of pathos has had an enduring role in the study of rhetoric. Arousing emotional responses in verbal language begins at least with Aristotle, who views emotion from two different perspectives: on the one hand, as a possible barrier to rational thinking that undermines logic with overly subjective responses and on the other, as a key element of persuasion that powerfully engages audiences (Jasinski, 2001, p. 421). Regarding the latter perspective, in which emotions enhance arguments, Aristotle (2007) defines and analyzes emotions rhetorically as “those things through which, by undergoing change, people come to differ in their judgments and which are accompanied by pain and pleasure, for example, anger, pity, fear, and other such things and their opposites” (p. 113). For example, in the pain/pleasure dichotomy, anger is the

Emotional Appeals in Data Design

opposite of calmness, enmity that of friendliness, fear that of confidence, and so on (Aristotle, pp. 116–147). The speaker seeks to evoke and manage these emotions in trying to persuade an audience in a judicial proceeding or other forum, an art that Roman orators like Cicero and Quintilian greatly expanded and refined (Katula, 2003).

The applications and attributes of emotional appeals have been addressed by many modern rhetoricians, probably most extensively by the Enlightenment philosopher and theologian George Campbell. In his *Philosophy of Rhetoric* (1776), Campbell establishes a central role for emotion in constructing persuasive speeches and sermons: “To say, that it is possible to persuade without speaking to the passions, is but at best a kind of specious nonsense” (p. 199). Passion “animates” our ideas and gives them “spirit and energy” (p. 199). In short, the emotional (“pathetic”) and the rational must go hand in hand to construct persuasive speeches (p. 201). Echoing Edmund Burke’s 1757 treatise on the *Sublime and Beautiful*, Campbell claims that the senses have the strongest ability to arouse passion. “A passion is most strongly excited by sensation” (pp. 207–208), claims Campbell, followed by memory and imagination, the last of which fosters the first two (pp. 207–208). Campbell describes the “circumstances” by which imagination stimulates the emotions: “probability, plausibility, importance, proximity of time, connexion of place, relation of the actors or sufferers to the hearers or speaker, interest of the hearers or speaker in the consequences” (p. 209). Some aspects of emotion, then, pertain to “proximity of time,” especially the immediate past or immediate future (pp. 221–224), and the “connexion of place” (pp. 224–226). In other words, we usually experience stronger feelings relative to those people or situations closest to us.

For example, Campbell observes that when we read about “accidents” we are more concerned (and moved emotionally) by one that occurs “in our neighborhood” than “the most deplorable accidents in countries distant and unknown” (p. 226). The most potent circumstance, Campbell argues, is “interest in the consequences” (pp. 227–229) because here the audience sees itself as having a personal stake in the subject, even if only vicariously. This personal aspect of pathos—often fostered by the close proximity of space and time—plays a central role in the emotional elements that I will explore in contemporary data visualization.

The physiological and psychological aspects of emotion, often prompted by sensory experience, still

infuse contemporary rhetoric. However, the traditional separation of emotion and reason has somewhat diminished with contemporary rhetorical scholarship (Jasinski, 2001, pp. 424–425). Some contemporary theorists view emotion through a cognitive framework that encompasses the ability to reason and that, therefore, dovetails with a rational (logos) response (Jasinski, 2001, pp. 424–425; see also Katula, 2003, pp. 5–6). In short, emotion can complement rather than contradict logical analysis, an important theoretical insight for data design where emotion and reason are often placed at odds.

Emotional Elements in the Golden Age of Statistical Graphics

Like other design forms—painting, architecture, sculpture, graphic design—data design also has a history of invoking pathos appeals, especially during the “golden age” (Funkhouser, 1937; Friendly, 2008) when Romantic and Victorian values dominated all forms of design. During this period, in the second half of the nineteenth century, a rich variety of new graphical forms appeared, building on innovations of William Playfair (1801) and other pioneers (see Friendly & Denis, 2001, for a detailed timeline of significant examples). Charles Joseph Minard’s famous flow chart of Napoleon’s Russian campaign (1878; see also Tufte, 1983, p. 41); Florence Nightingales’s area charts for documenting conditions in military hospitals (see Brasseur 2005); Charles Booth’s poverty maps of London (1902); and the panoply of charts, graphs, and maps in the U.S. statistical atlases (Walker, 1874; Hewes & Gannett, 1883; Gannett, 1898) and in the French national statistical albums (Ministère des Travaux Publics)—all contributed to the growing array of forms available to professionals and the public. This new medium for representing quantitative information engendered emotion through sensory experience, novelty, and excitement, with a combination of physical and psychological stimuli that engaged the reader’s eye, brain, and heart. Graphical elements that evoked pathos appeals included lavish color, pictorial elements, innovative new genres, and epic narratives.

Abundant use of color

When it burst forth in late nineteenth-century data design, color stirred the emotions, both perceptually and

culturally. The printing technology of chromolithography supported the inexpensive reproduction of color, and designers took full advantage of it. The U.S. statistical atlases used a full palette of colors to visualize census data, shown in Figure 1 in the area chart and accompanying map from the 1898 *Statistical Atlas of the United States* (Gannett, Plate 22). This huge chart shows the relative size of population groups from the founding of the country to the present, with the “Native Stock” in the center a light, flesh-colored tone and various other segments (European foreigners on the left, African Americans on the right) in darker shades, notably a darker shade of pink for British (suggesting the greatest affinity with the native stock), dark green for the Irish, and light brown for African Americans. This lavish use of

color reflects not only the cultural and political attitudes of the era but also Victorian values about the capacity of design to arouse emotion through sensory stimulation (see Kimball, 2006).

Novelty/playful breaking of boundaries

Many nineteenth-century designs introduced novel design elements, creating excitement and prompting discovery. Design conventions were still in a state of flux, as designers experimented with new forms, like the massive area chart in Figure 1, which has few predecessors and few progeny. Even quotidian data can arouse curiosity and foster engagement when visualized in novel, colorful ways. Figure 2 from the 1881 French *Album de Statistique Graphique* (Ministère des Travaux Publics, Plate 1) displays the tonnage transported by railroads across France in 1879, color-coded by region to distinguish railroad lines emanating from Paris. The lines of variable thickness show quantities of tonnage, large

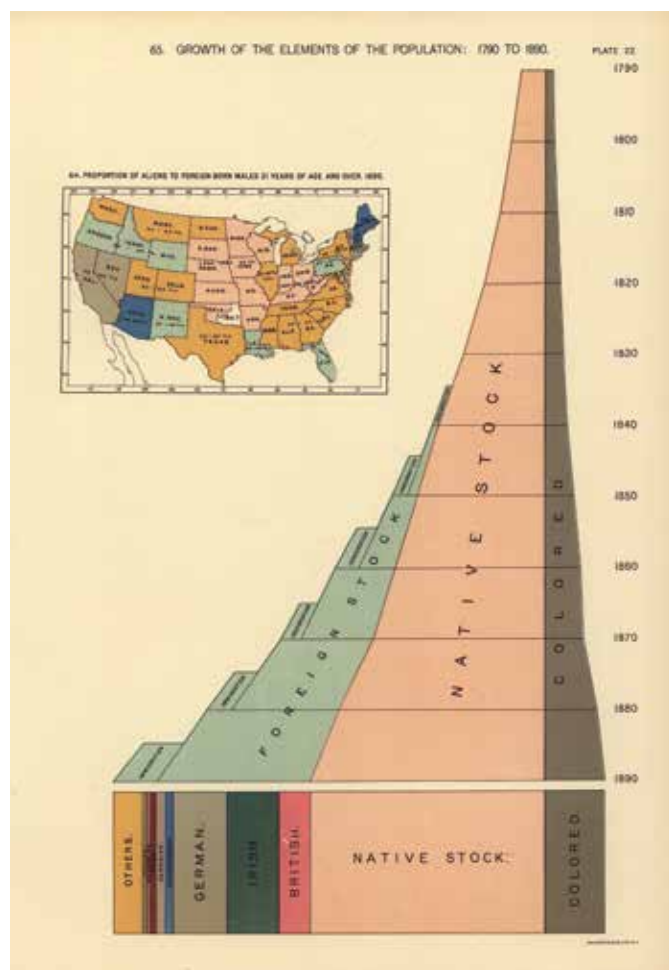


Figure 1. Area chart and map from the 1898 *Statistical Atlas of the United States* showing segments of the population for each census since 1790 (Gannett, Plate 22). Courtesy of the Library of Congress, Geography and Map Division.



Figure 2. Map showing the amount of railroad freight transported across France in 1879 along several regional routes (Ministère des Travaux Publics, 1881, Plate 1).

Emotional Appeals in Data Design

(thick) and small (thin), and extend to every department and virtually every town across the entire country, personalizing the data for each French reader.

Designers also innovated within conventional plot frames—for example, snaking bars back and forth to make the data fit the genre, as shown in the bar chart in Figure 3 (lower arrow) from the 1883 *Scribner's Statistical Atlas of the United States* (Hewes & Gannett, Plate 123). Here, the production per capita of tiny Rhode Island exceeds the limits of the x-axis, so the bar impishly curls around and heads back in the other direction. The line graph in the lower part of the plate shows the cost of cotton, which, during the Civil War, literally went through the roof, breaking through the plot frame and extending all the way to Lake Michigan in the map above (upper arrow). This graphical disruption must have startled readers as well as posed a painful reminder of

the economic hardship the war inflicted—and relief that some things had returned to normal.

Pictorial elements: enargeia

Vivid visual description (or *enargeia*), both textual and visual, has long fostered emotional responses from audiences, and pictorial elements can serve that function in data displays, creating interest and excitement and personalizing the data. Although today pictorial elements are often viewed as superfluous “chartjunk” (Tufte, 1983), they had no such stigma when they first appeared in the late nineteenth century. In *Mulhall's Dictionary of Statistics* (1884) Michael Mulhall, one of the leading innovators, used picture charts to compare nation-states on their agriculture, shipping, steam power, and military weapons, a technique that appeared in *Peale's Home Library of Useful Knowledge* (Peale, 1886, p. 363), with several of the same kinds of pictorial charts occupying a single plate (Figure 4). Although using area for visual comparison lacks perceptual integrity,

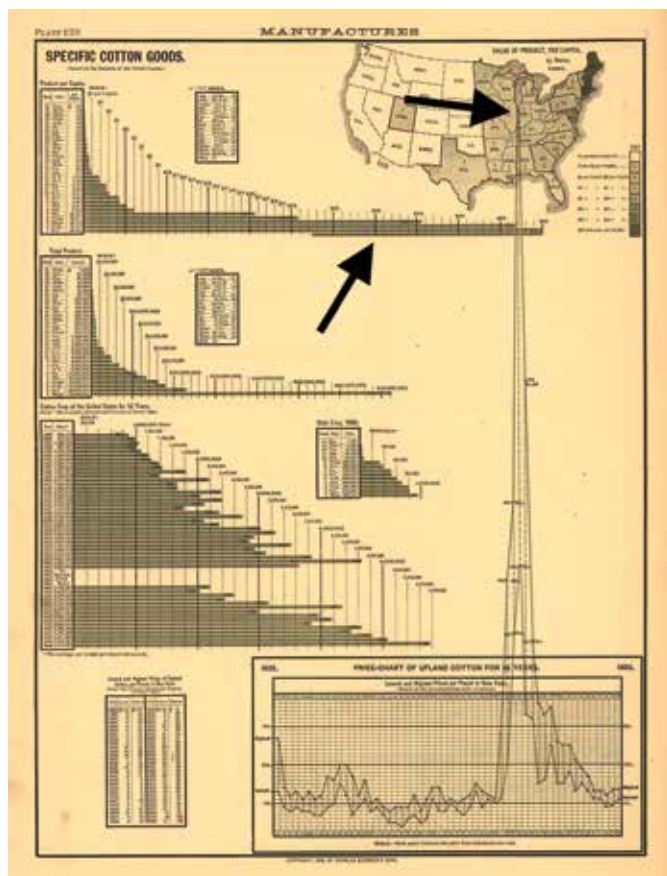


Figure 3. Novel breaking of boundaries (indicated by arrows) in the 1883 *Scribner's Statistical Atlas of the United States* (Hewes & Gannett, Plate 123). Courtesy of the Library of Congress, Geography and Map Division.

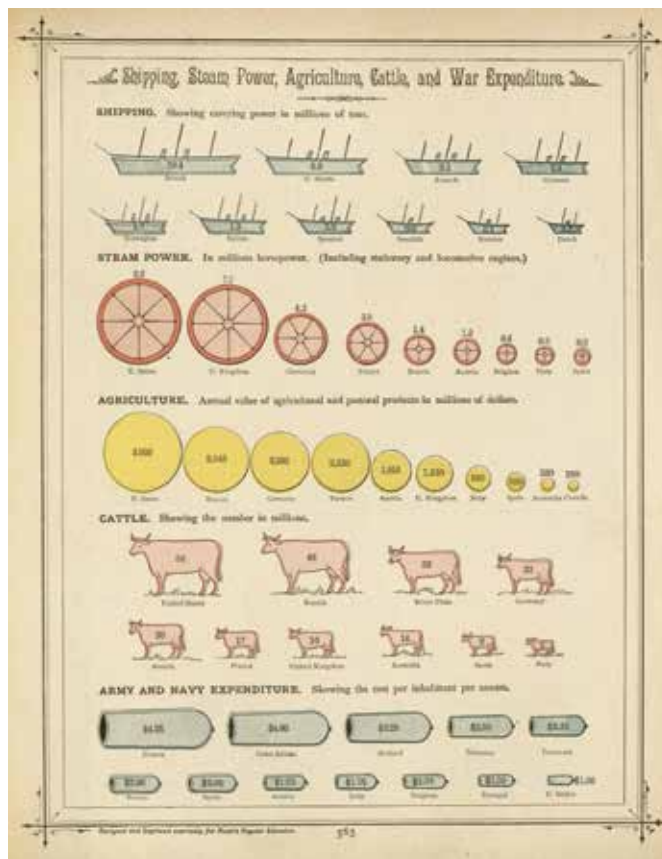


Figure 4. Pictorial charts from Richard Peale's 1886 *Home Library of Useful Knowledge* (p. 363).

Mulhall's pictorial method effectively drew readers into the data through visual stimulation and excitement, especially British and American readers, for whom the charts validated their global dominance (see Kimball, 2016). Intensive pictorial representations of data reached their zenith in the *Scientific American Reference Book* (Hopkins & Bond, 1913), which envisioned an array of U.S. national data in novel and sometimes fantastic designs using volume and area to show manufacturing, agricultural, government, and other measurements.

Epic narratives

Many displays in the golden age visualize vast narratives that tell compelling “stories,” as Tufte puts it (1990, pp. 37, 108), about people and events, like the chart in Figure 1 that narrates the immense growth of a nation since its founding and the “Carte Figurative” of Minard (1878) visualizing Napoleon's Russian campaign. Minard earlier pioneered the graphical technique of using line thickness on maps to show variable trade routes, a display method echoed in the massive railroad map in Figure 2. In Minard's Napoleon chart, the shocking loss of life that he visualized with thick black bars receding from Moscow tell a foreboding story about foreign military adventures as well as serve as a grim memorial to his contemporaries who served on this calamitous campaign. Epic charts like Minard's and those of the U.S. statistical atlases visualized national narratives that evoked a wide range of emotional responses.

Collectively, data design during the golden age engaged readers emotionally by engendering curiosity, excitement, surprise, and national pride. These displays deployed color schemes and a plenitude of design elements typical of the Victorian age, which embodied the legacy of Romantic values aimed at arousing powerful feelings. Moreover, many of these displays told compelling, even epic, stories about historical events, population movement, economics, crime, and disease, often in a nationally competitive framework that revealed the audience's strengths and vulnerabilities.

Modernist Minimalism and the Emphasis on Functionality

The rich, inventive design of the late Victorian era that aroused the senses and the imagination was subsequently subdued by early modernism's emphasis on simple, functional design, stripped of all embellishments.

Early twentieth-century modernism coincided with a dearth of innovation in data design (Friendly, 2008, pp. 529–530), at least compared with the golden age that preceded it. Although this hiatus can be attributed to many causes, modernist aesthetics certainly played a role, with its emphasis on simplicity, stark functionalism, and perceptual immediacy. Modernism aimed to wring out emotion in all forms of design—architecture, painting, furniture, graphic design—by emphasizing objectivity and universal, geometrical forms that audiences could grasp without the mediating influences of culture, aesthetics, or sentiment.

Through this minimalism and emphasis on structural transparency, strict rationality (logos) regained its dominance over data design, clearly evident in the U.S. statistical atlases of the early twentieth century where a small range of data displays replaced the intricate, colorful forms of earlier atlases. Figure 5 shows two minimalist pie charts from the 1914 *Statistical Atlas of the United States* (Sloan, Plate 212.1, detail) that display data about the growing influx of immigrants, a hotly debated topic at the time, the passion about which is completely absent in these charts. Subsequently, minimalist charts like these appeared fairly routinely in U.S. Government reports (see, for example, U.S. Works Progress Administration, December 1937, p. 14; Committee on Interstate and Foreign Commerce, 1953, pp. 149–179). This modernist emphasis on simple, highly perceptible design was epitomized by the Isotype pictographs of Otto Neurath (1939) with their flat, machine-like forms, a style brought to the U.S. by Rudolf Modley (1937; see Crawley, 1994).

Later graphical theorists continued to advocate a highly functional approach that emphasized the connection between image, eye, and brain. For Jacques Bertin (1981), visual “information-processing” through perceptual efficiency provides the foundation for effective design, as graphical particles are manipulated to reveal patterns that can be *seen* (rather than read). Tufte (1983) also strives for perceptual efficiency with his “Lie Factor,” “data-ink” and “data density” formulas, and his exhortations against “chartjunk” (pp. 57, 93, 107, 162), largely embracing what Lee Brasseur (2003) calls the “perceptual cognitive-based school of thought” (p. 4; see also Zachry & Thralls, 2004, p. 453). In this rational, functional approach to design, emotional elements serve as a decorative distraction that threatens to compete with or even corrupt the data.

Emotional Appeals in Data Design

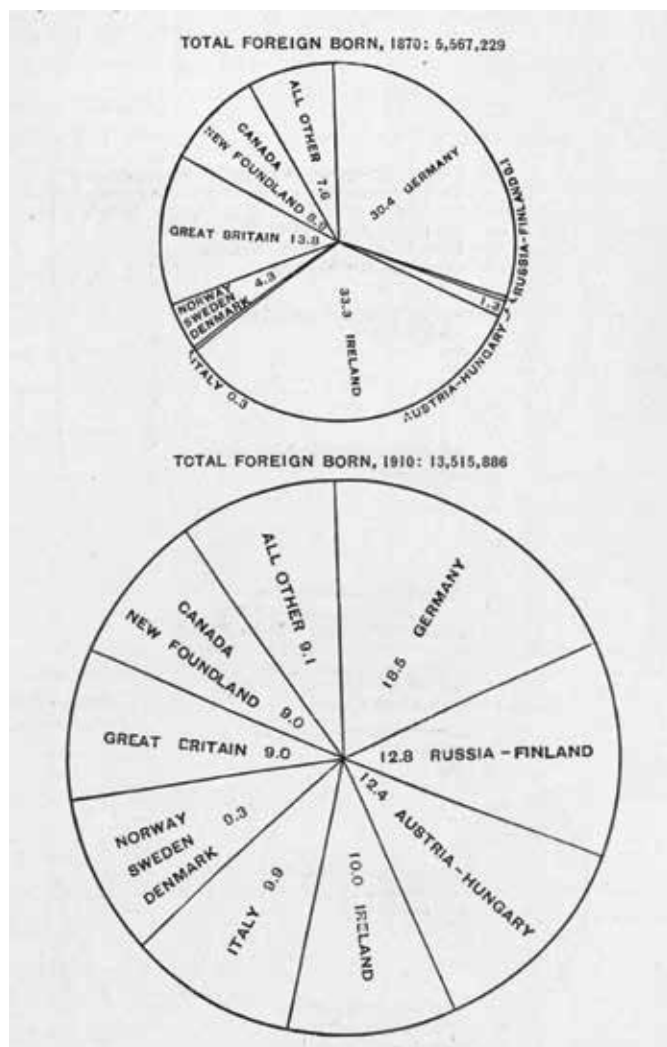


Figure 5. Plain pie charts from the 1914 *Statistical Atlas of the United States* showing the size and nationalities of the foreign-born population in two censuses (Sloan, Plate 212.1, detail).

Emotional Aspects of Contemporary Data Visualization

Despite the anti-pathos proclivity of modernism, emotional elements were not completely expunged from data design. Designers like Nigel Holmes (1984) in the popular media reinstated emotional elements—through 3D pictorial elements, vivid color, and hyperbole—cleverly embedding people, buildings, landscapes, and other objects into line, bar, and pie charts. However, these designs remained outside the realm of serious statistical graphics, dismissed by Tufte (1983) as bombastic hype aimed at perking up listless readers,

though his argument about feckless “chartjunk” has been challenged by Bateman et al.’s empirical study (2010).

Nonetheless, several leading theorists of contemporary data design have acknowledged some aspects of emotion or subjectivity in data design, if not argued explicitly for them. In the larger realm of document design, for example, Karen Schriver (1997) observes that “Readers’ interpretations of documents are shaped by thinking and feeling, by the subtle interplay of cognition and affect” (p. 189). More specific to charts and graphs, Edward Tufte, despite his perceptual/cognitive bent, occasionally makes nods to the “wonder,” “beauty,” and “graphical elegance” of data design (1983; pp. 121, 137, 177), and he promotes what Stephen Few (2012, pp. 295–306) and Nathan Yau (2013, pp. 61–68) describe as the “storytelling” capacity of data displays. Lee Brasseur (2003) critiques the cognitive/rational approaches, which she traces to the Cartesian spit between mind and body, asking pointedly, “Can good decisions be made about graphs which deny a place for emotion?” (p. 21). Sam Dragga and Dan Voss (2001), moreover, argue on ethical grounds for including emotive elements in data displays that show human suffering or loss as a way to “humanize” displays (p. 269). So several scholars, to varying degrees, have acknowledged or advocated emotional elements in data design at the onset of the digital revolution.

Although the modernist paradigm still dominates print displays, the digital age has rapidly departed from its stark functionalism. The technology of digital design and the era of “big data” have destabilized Tufte’s minimalist maxims, if not rendered them increasingly irrelevant. In this second golden age of data design, pathos elements have experienced a remarkable but yet largely unrecognized resurgence that digital design has fostered in at least three ways:

1. It revives the sensory stimulation prevalent in the late nineteenth century, with color, novelty, animations, and other multimodal features, eliciting a physiological response long associated with pathos from Aristotle to Campbell to the present.
2. It implements Campbell’s principles of personal proximity, of situating the circumstances in the audience’s own neighborhood, by enabling users to shape the display, by increasing their temporal and spatial proximity to the data, and by enabling interaction with the designer and other users.

3. It fosters expressive design by appealing to the audience's aesthetic sensibility or inviting users to interact with personal data, further increasing proximity between user and designer.

All three of these approaches to data design elicit emotional responses from audiences, with the latter two largely new with interactive data visualization.

Arousing the senses with the new digital vocabulary

Digital technology gives designers an array of visual elements that can engage audiences through sensory stimulation and in doing so engender a range of emotions—from excitement and delight to fear and anxiety. The infusion of new visual language has injected emotion back into data design on several fronts, including full color, multimodal features like sound and animation, and novel forms.

Coloring data In online digital design, color appears ubiquitously, often across the full spectrum of RGB values—unlike print where the financial cost of CMYK color still constrains its use. Online color engenders emotional responses on at least three levels: physiological, aesthetic, and cultural (see Richards & David, 2005). Physiologically, color fosters an almost immediate response that differs between warm colors and cool colors, with the former causing excitement or anxiety and the latter tending to soothe the viewer (see Mackiewicz, 2007, p. 147, for a summary of research). Heat maps offer a classic example of such emotional swings, with red and orange suggesting intensity or danger and blue and green stability and moderation. The U.S. National Gas Price Heat Map on the GasBuddy.com website (Coupal, Toews, & Gasbuddy/OpenStore LLC, 2016) illustrates this phenomenon, with bright red representing high prices and dark green low prices around the country. Aesthetically, color can also arouse emotional responses by pleasing or exciting us, depending on how well hues complement each other in the same field of vision or differ to create emphasis. However, sometimes the defaults on popular graphing software create gaudy combinations of hues, disrupting our aesthetic sensibilities. Culturally, color also plays on the emotions by triggering conventional interpretations that associate colors with various organizations, causes, events, and situations. For example, red can evoke joy and festivity (Chinese culture) or caution and anxiety (red ink in the U.S.). The emotional rollercoaster of

cultural interpretations can vary widely based on where in the world the audience is located, a daunting dilemma for online data designers with global audiences.

So deploying color to represent data opens a floodgate of possible emotional responses that designers have to be constantly vigilant about. Indeed, the lack of color in online visualization calls immediate attention to itself, as if the visualization had relapsed into the vacuous minimalism of the 1950s. Figure 6 shows a bar chart from the Bureau of Economic Analysis (U.S. Department of Commerce, 2016) with color distinguishing each category. This U.S. Government chart differs from the census chart in Figure 5, partly because it introduces a full palette of color within the plot frame, and because it allows users to customize the design (more on that later). Although the colors are muted (perhaps reflecting the chart's bureaucratic ethos), and depending on how many categories from the left panel are chosen for display (up to 10 are possible), the chart has the capacity to arouse the senses and stir emotion, especially the colored bars that fall below the x-axis and signal economic woes. The subtle pathos of this display's color, however understated, is nearly unavoidable in an online interactive display with such rich data.

Animating data Historically, one of the most effective emotional appeals involves telling a story to the reader, engaging the reader in a narrative. Many digital data designs do that by featuring animations that show change over time or space, enabling audiences to track variations in data through motion—across a map, scatterplot, or other plotting area. These compact, dynamic forms of storytelling create a sense of immediacy and add drama to the display. Digitally, animations thread together a series of “small multiples” (Tufte, 1983; pp. 170–175) in the form of individual data snapshots in the same plot frame (rather than spread over a print surface; indeed, some animations would fill many print pages of small multiples). Although researcher Danyel Fisher (2010) discovered perceptual drawbacks of displaying data in motion, he also found the animation he studied “to be more engaging and emotionally powerful” than static displays (p. 337).

This is certainly the case for the chart in Figure 7, which shows one of the world's most famous data animations, the Gapminder software (Rosling, Rosling Rönnlund, & Rosling, 2015; see also Rosling, 2006). Gapminder displays economic, health, education, and other sociological data from nations around the world

Emotional Appeals in Data Design

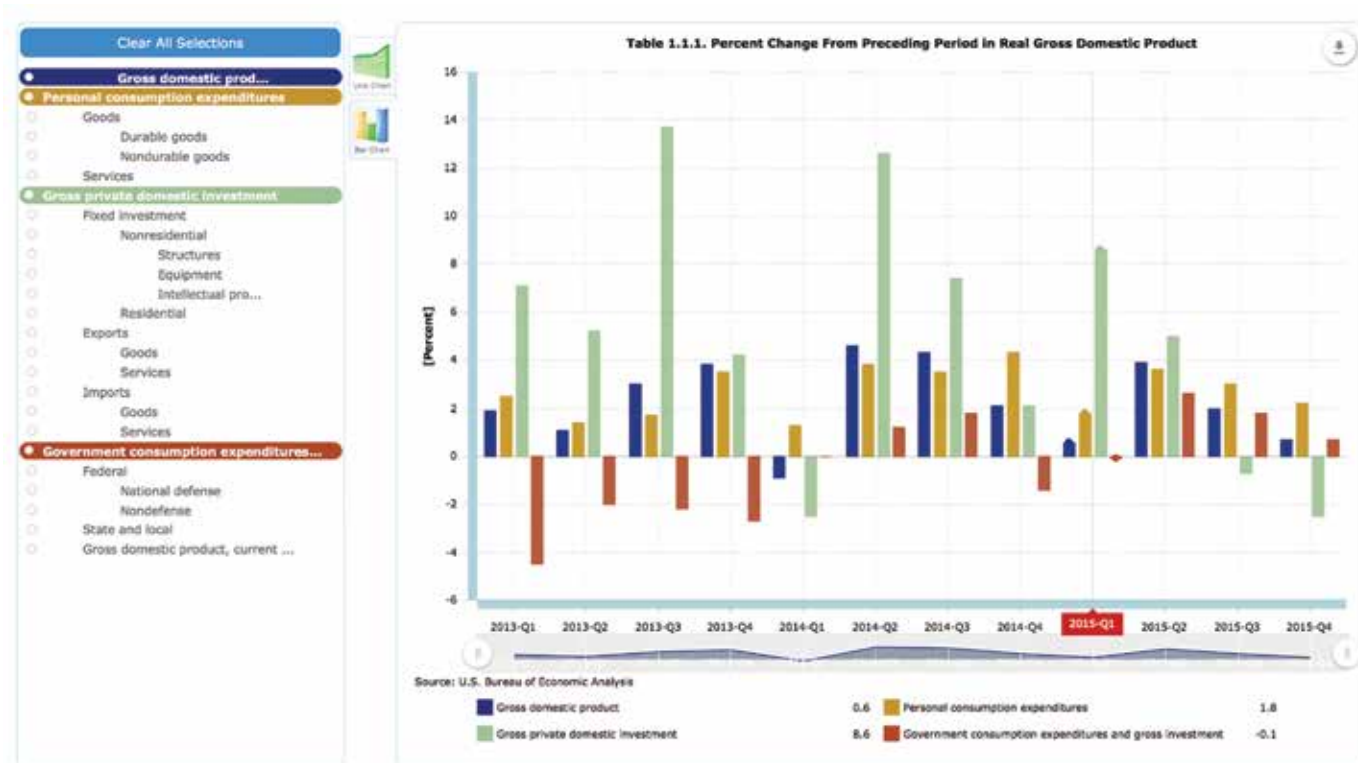


Figure 6. Interactive chart showing the percent change in parts of the gross domestic product by quarter of years (Bureau of Economic Analysis, 2016, Table 1.1.1). Courtesy U.S. Department of Commerce, Bureau of Economic Analysis.

on an animated scatterplot encompassing over 200 years, beginning in 1800. The Gapminder chart in Figure 7, for example, juxtaposes data about per capita income on the x-axis and longevity on the y-axis. As the story unfolds on this chart, nations color-coded by continent get larger, and as their economic conditions improve, their health typically improves as well, with the circles often bouncing around as they gradually drift to the upper right of the plot frame. As the narrative progresses, the animation fosters curiosity, excitement, and delight, revealing a great success story for most of humanity, though with some areas of the world lagging noticeably behind, heightening the drama by dampening optimism and fostering empathy.

The data animation in Figure 8, designed by Tim Klimowicz (2007), narrates grimmer data—deaths during the Iraq War. Echoing Minard's famous chart of Napoleon's Russian campaign, Klimowicz's design is a dramatic memorial to military personnel in the coalition who lost their lives in Iraq, displaying on the map vivid red bursts for each successive death as the conflict continued over several years, with each explosion

gradually fading into a black dot as successive bursts appear. The visual bursts of color are accompanied by the audible rattling of simulated gunfire that increases and decreases with the number of deaths represented visually. To focus the display, the viewer can select any of the nations in the coalition from the panel on the right. Although the designer wanted to remain "objective" (Klimowicz, Conclusion), this powerful multimodal display mourns and honors those losses, eliciting sadness and shock and depending on the viewer's connection to this conflict, grief, pride, pity, bitterness, or indignation.

Reinventing genres Invention and creativity play a large role in many online digital displays, resulting in novel forms that often combine or redefine existing genres. As we've seen, nineteenth-century readers were constantly scrutinizing new forms and observing the breaking of boundaries. The new online hybridization also creates curiosity and surprise that may be initially disorienting. Socially constructed genres are tenacious and stabilize user experience, especially in print, where they are most likely to be respected. Digitally, however, genres are often reshaped, experimented with,

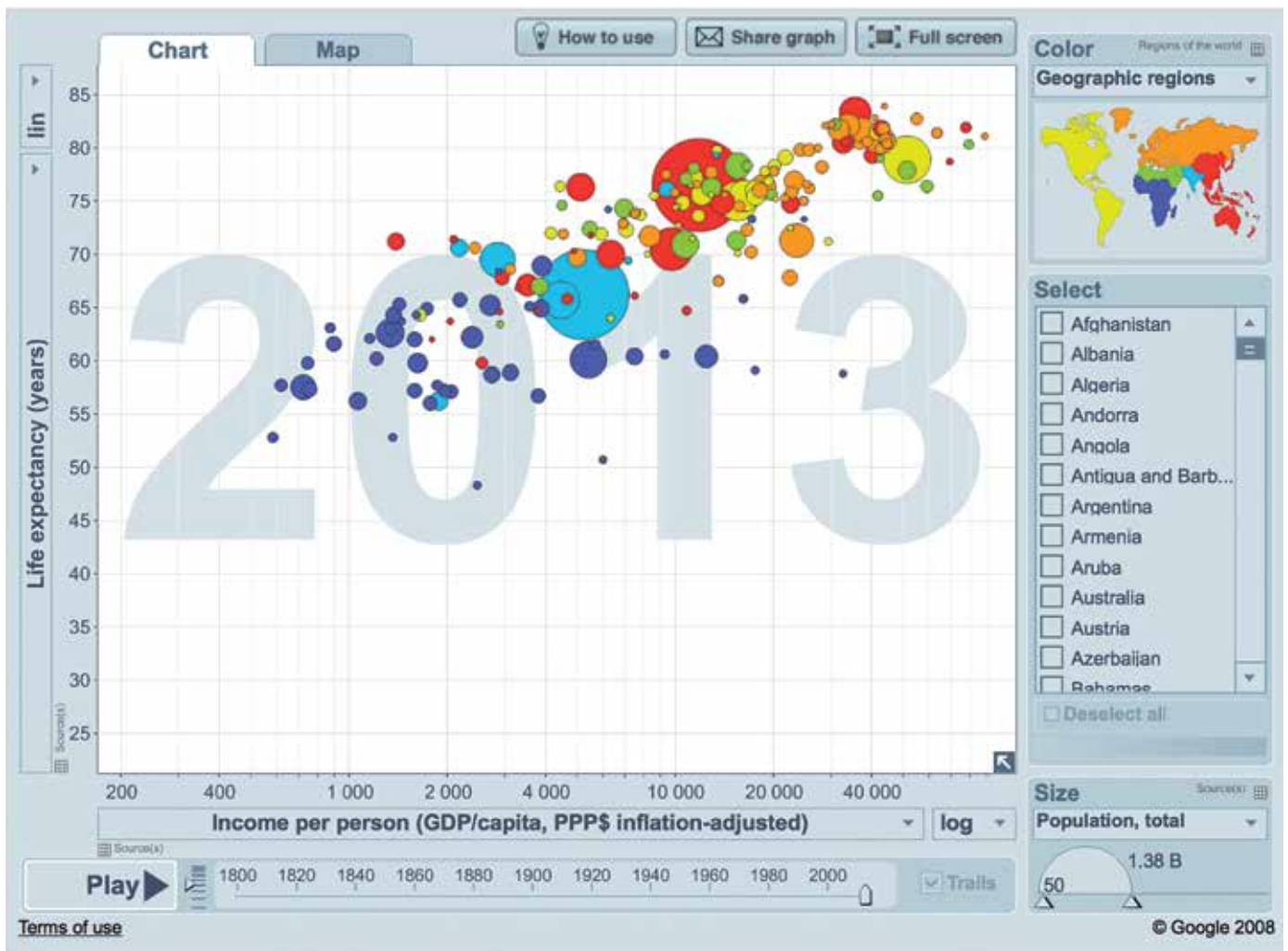


Figure 7. Gapminder animated scatterplot showing the relationship between life expectancy and income from 1800 to 2015 for people in countries around the world (Rosling, Rönnlund, & Rosling 2015). Source: Free material from www.gapminder.org

juxtaposed, and blended into hybrids. For example, treemaps are a contemporary form of mosaics, which were invented in the nineteenth century. New forms like word clouds, parallel sets (Kosara, 2016), and flower charts (Organisation for Economic Co-operation and Development, 2016) are not infographics designed to amuse but serious attempts to display complex data. The Gapminder chart in Figure 7 contains novel and hybrid elements, where area (the size of the circles) is integrated into a scatterplot (to show the relative population of each nation), color locates nations geographically, and animation narrates the data, with the years appearing successively within the plot frame. Many readers who first encounter this display have never experienced anything like it, evoking surprise, excitement, and

perhaps some initial bewilderment. The Iraq fatality chart in Figure 8, which is essentially a thematic map, elicits similar emotional responses through novel elements—the bursts of red, clicking sounds, and rapid movement through time.

Personalizing data through close proximity

Interactive data displays draw the audience closer to the data, fostering more intimate engagement. As George Campbell (1776) asserted in the eighteenth century, audiences care about, and are likely to make an emotional investment in, people and events nearby them, as opposed to those distant in space and time. Interactive data visualization achieves this proximity with audiences by enabling them to customize displays, by providing

Emotional Appeals in Data Design

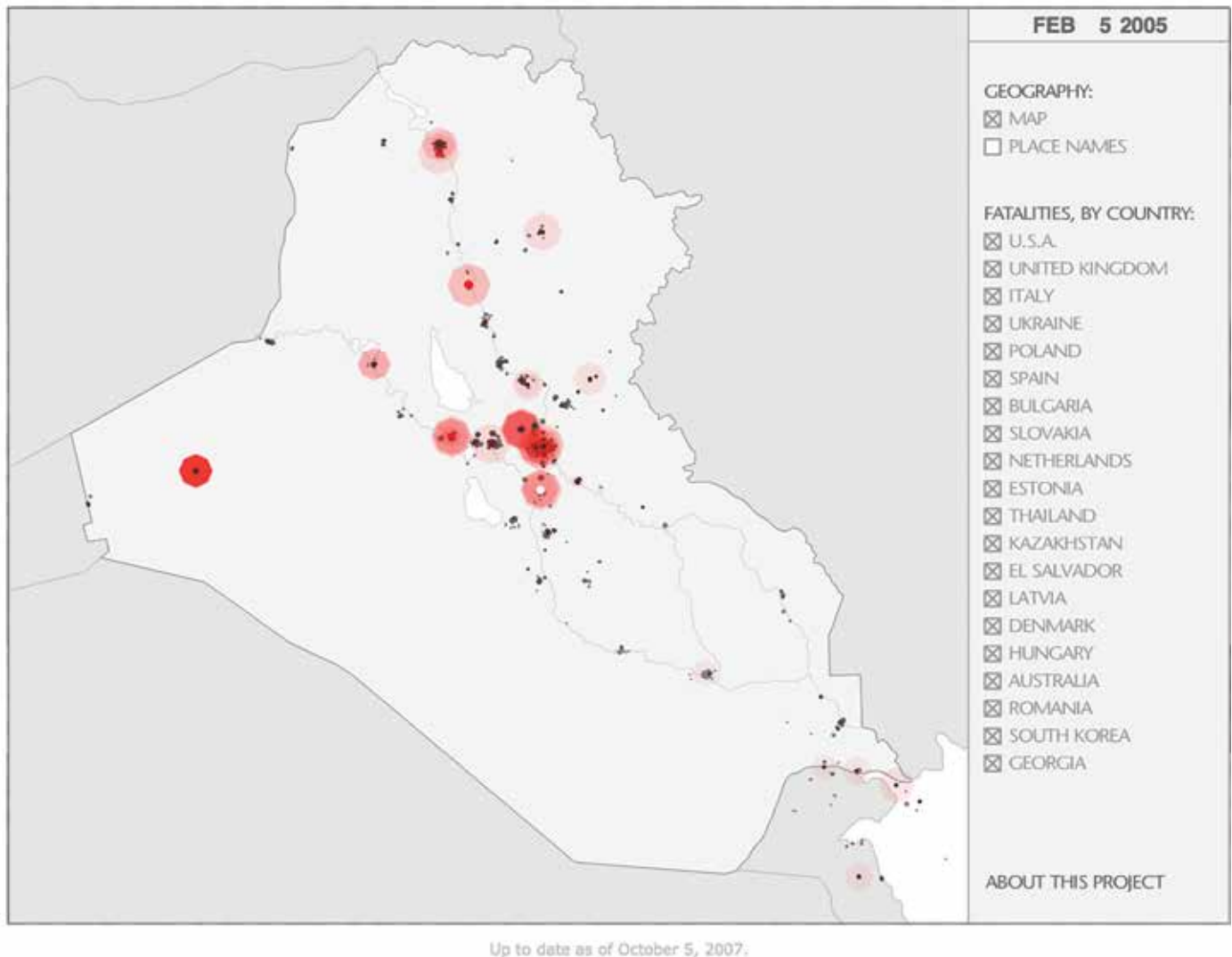


Figure 8. Animated chart with sound designed by Tim Klimowicz (2011) that visualizes coalition fatalities in the Iraq War from 2003 to 2007. Reproduced with the permission of Tim Klimowicz.

visual access to real-time data nearby them, and by enabling them to participate in communities of users.

Custom displays: personalizing your design

Interactive data design changes the relationship between audience and visualization by enabling the audience to choose which data to visualize and often in what form. In this way, users can envision data at both what Tufte (1990) calls the “macro” level and “micro” level (pp. 37–51), or what Barton and Barton (1993) refer to as the “synoptic” and “analytic” views. Viewing data at the macro-level (or synoptic view) enables users to see the big picture, while viewing data at the micro-level (or analytic view) enables users to customize the view, to zoom in to details in the user’s own neighborhood (see

Kostelnick, 2008, pp. 124–125). In short, interactivity allows audiences to personalize the data, visualizing what matters to them and hiding what doesn’t.

Interactivity also often allows audiences to personalize the display itself: its genre (bar chart, scatter plot, line graph) and its graphical language (background color, coding of lines and bars). In these ways, every user has—or is at least afforded the possibility of—a unique, individualized experience with the display, a level of user agency that far exceeds that of static displays, even though that agency can vary considerably from one display to another, depending on the nature of the display and its interactive features (see Rawlins & Wilson, 2014).

With each audience member allowed to explore privately, the individual's interests and desires dominate this kind of visual experience, creating an emotional connection with the display. That highly private, individual experience whereby the user zooms in on local areas of interest invokes one of Campbell's "circumstances" (p. 209) associated with emotional appeals—the proximity to an audience member's own world, to things important to that individual. This kind of personal engagement can occur with graphical displays on virtually any topic—from finance, education, and politics to crime, weather, travel, and health. The Bureau of Economic Analysis chart (Figure 6) allows audience members to choose from dozens of data sets to envision, and within each set to choose categories they wish to display, and within this display to choose which genre (bar chart or line graph). Gapminder also allows the audience to choose categories from a detailed menu of nations (on the right of Figure 7) and thereby to isolate individual nations as the animation unfolds, as well as to choose several other data sets available on the website for similar display. The Iraq War fatality chart (Figure 8) also allows the audience to choose nations from the coalition, focusing the graphical display on victims of special concern.

The potential to personalize displays is increased exponentially in the charts in Figure 9 from the website StockCharts.com (2016) that show the fluctuations of the Dow Jones Industrials Average over 10 days in January 2016. This relatively streamlined display consists of candlesticks showing daily movement of prices and vertical bars below showing market volume. Figure 9, however, reveals only a fraction of the available charting options, which include the ability to display several technical indicators with areas, lines, and other graphical elements. Audiences can personalize the display by customizing the data (numerous time periods and data variables) and by customizing the graphical display. They can choose from over a dozen chart genres and from dozens of color schemes for the plot frame itself, depending on the mood the audience prefers, including the "Default" on the top of Figure 9 and "Night" on the bottom. Personalizing data design in these ways heightens the proximity between audience and display, intensifying the audience's stake in it and emotional connection.

Data dynamism and temporal proximity Most data displays, especially static paper displays, visualize phenomena that have already occurred—weeks, months,

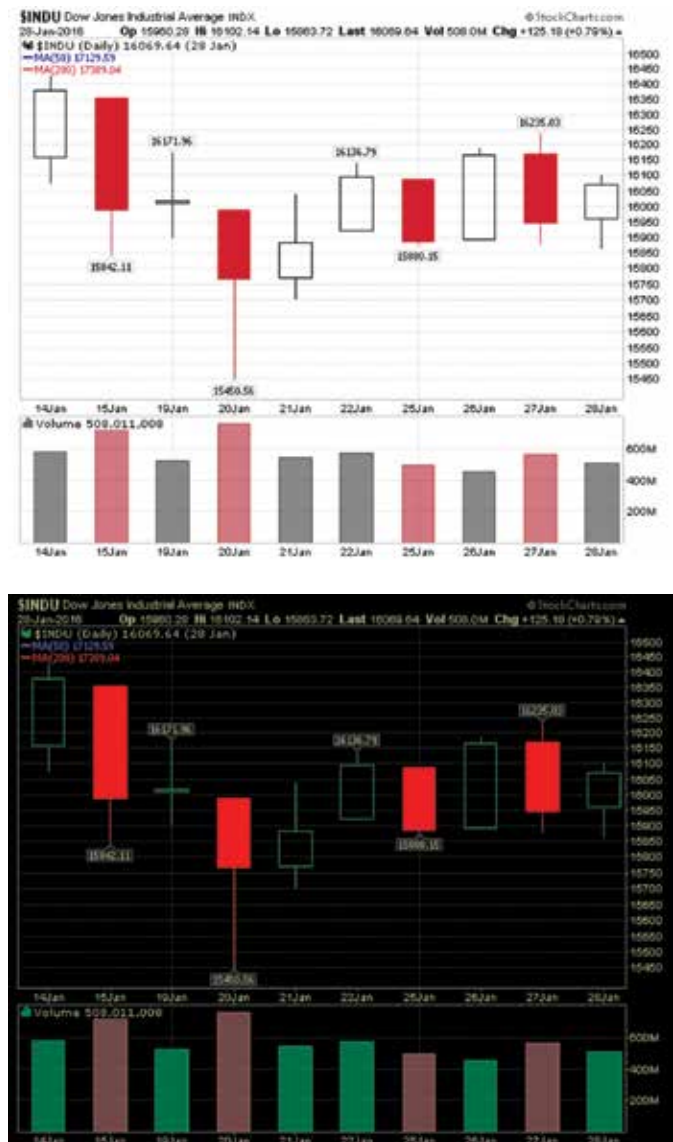


Figure 9. Charts from the StockCharts.com website showing the Dow Jones Industrial Average over 10 days in January 2016, with the default background (above) and with the background adjusted to "Night" mode (below). Copyright StockCharts.com. Charts courtesy of StockCharts.com.

or years ago. Many interactive displays, however, envision a constant flow of data, sometimes in real time, about markets (stocks, bonds, commodities), transportation (gas prices, highway traffic, airline flights), criminal activity, sports performances, and weather conditions and other natural phenomena. As data constantly refresh, moment-by-moment, and the graphical display changes accordingly, audiences feel

Emotional Appeals in Data Design

connected to that display in the immediate present, as temporal proximity fosters an emotional bond.

When the personal stakes are high—especially when life, health, or property is implicated—the potential for fear and anxiety increases with real-time data. Displays that show fresh data about natural disasters or criminal activity, for example, can evoke feelings of anxiety, terror, or relief. However, even displays that envision more quotidian matters like investments, interest rates, gas prices, and traffic flow can engender delight, distress, or surprise. For example, the StockCharts.com chart in Figure 9 refreshes the Dow Jones Industrial average minute by minute, one of dozens of online charts that visualize stocks prices in near real time, creating the illusion of standing on a trading floor. For readers of these charts, the temporal immediacy and dynamism of visual data create an engaging experience fueled by constant anticipation. The dynamism of temporal proximity both energizes and enervates readers, depending on the corresponding emotions it engenders, ranging from anxiety or expectation, to joy or euphoria, to disappointment or dejection.

Too close for comfort: risk and fear Increasingly, online data visualizations are addressing large public audiences by alerting them to risks they face, ranging from natural disasters (earthquakes, hurricanes, sea-level rise) to crime to communicable diseases. These visualizations engender empathy if they are perceived as distant threats but arouse fear and anxiety when they are close at hand. As Aristotle pointed out, fear is aroused by that which “has the potential for great pains or destruction, and these [only] that do not appear far off but near, so that they are about to happen” (p. 128). In other words, as Campbell later argued, both spatial and temporal proximity have the capacity to arouse the emotions. Because contemporary visualizations typically allow users to customize the display to focus on their immediate location, that close proximity triggers and heightens the emotional response. To residents of Tampa, an animated warning map tracking a typhoon in the Philippines can engender empathy, but a similar animation of a hurricane wandering across the Gulf of Mexico threatening their lives and property will induce fear and anxiety. Other visualizations, at varying degrees of abstraction, can engender similar responses:

- heat maps that deploy shades of red, orange, and yellow to show impending dangers like severe storms, tornadoes, or forest fires;

- crime maps that identify at street level various kinds of crime with icons or that provide pictures of local sex offenders; and
- risk maps that show the probability of an earthquake, volcanic eruption, or flooding in a given location.

In all of these examples, because of the proximity of the danger that threatens them or their loved ones, audiences become engaged emotionally in the visualization.

For example, interactive maps created by the National Oceanic and Atmospheric Administration (NOAA, 2016) visualize the risk of sea-level rise along coastal areas in the U.S. Figure 10 shows a risk map for flooding along the North Carolina coast. By clicking on the icons, users can see a picture of a landmark building in the area and can select a water depth to see the effects on that structure, which in Figure 10 is a lighthouse. This dramatic picture provides descriptive detail, or *enargeia*, that warns readers of the devastating effects of rising waters at varying depths from one to six feet. Pictures like this one appear on NOAA’s sea-level rise map across the U.S. Atlantic, Gulf, and Pacific coasts, raising audience awareness by visualizing familiar places—docks, streets, bridges, parks, and public buildings—inundated with floodwaters. Proximity fosters pathos: the emotional trauma an audience experiences by seeing its own neighborhood (or property) underwater, however imminent or hypothetical, is hard to measure. On the other hand, knowing that a house or business escaped a natural disaster can surely pacify anxious readers.

Risk from human threats is visualized in Figure 11, a crime map of Chicago, Illinois, that appeared on the CLEARMAP: Crime Incidents website, created by the Chicago Police Department (2016) to visualize criminal activity across the city. The interactive map in Figure 11 displays crimes in a Chicago neighborhood over two weeks, using descriptive icons for each type of crime: a gun for aggravated assault and battery, brass knuckles for simple assault and battery, a mask for robbery, a figure tampering with a car for auto theft, and a sprawled body for homicide and manslaughter. The interactive map on another crime mapping website, Crimemapping.com™ (The Omega Group, 2016), uses a mask for robbery, a clenched fist for assault, and a fractured hood/windshield for a car broken into. Yet another crime mapping website, SpotCrime.com (2016), uses

crosshairs for a shooting, a figure in a dark clothes for burglary, and a figure toting money bags for robbery. The icons on these interactive crime maps vary in their level of abstraction, analogy, and hyperbole, and, in doing so, might heighten (or belie) the gravity of the data they represent, eliciting a variety of emotions. For victims of these crimes, or those who know the victims, the map could be a painful reminder of the event or provide comforting reassurance that justice will prevail; for those who live in a given area, the map is an anxiety-inducing warning of dangers that lurk—or emotionally empowering if it fosters vigilance and control.

Conversations over the digital fence: user/designer interaction In the larger realm of digital

technology, James Zappen (2005) describes a “new digital rhetoric that encourages self-expression, participation, and creative collaboration” (p. 321)—activities in interactive data visualization that arouse emotion and differ sharply from the ways audiences previously interacted with data displays. Traditionally, most charts and graphs have appeared to their audiences as fixed entities—final, reified artifacts that manifest what Walter Ong called the “closure” of print (1982, pp. 132–135)—whereby audiences individually analyze and evaluate them in isolation from the designers or other audience members. As a result, audiences for static displays largely forego any particular attachment to the display or its creator; in contrast, interactive displays

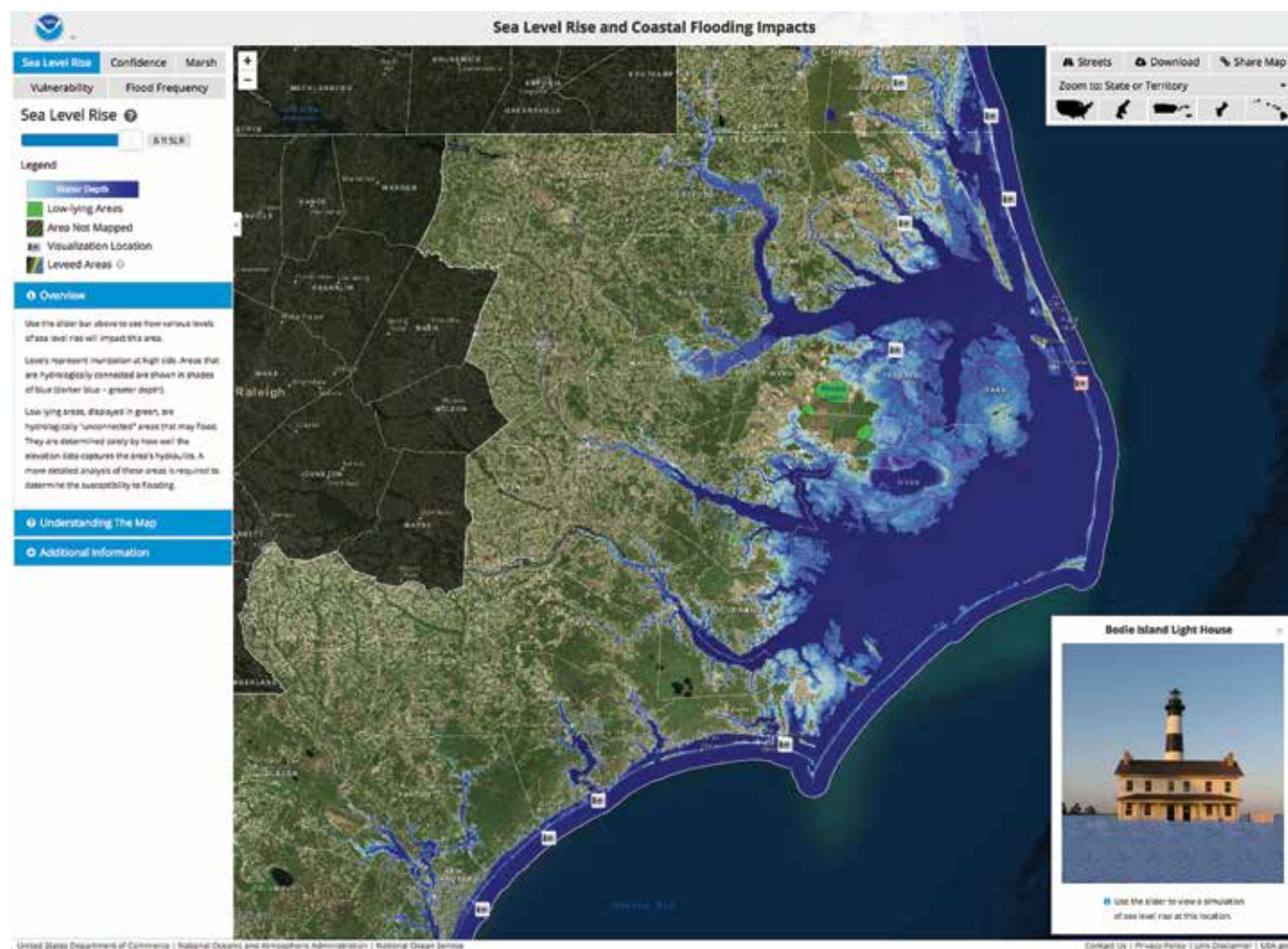
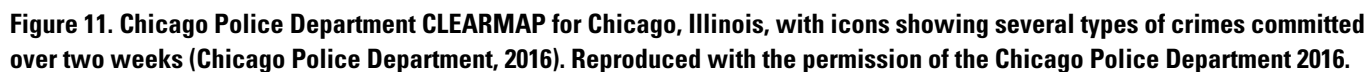


Figure 10. Interactive map showing the likely effects of 6 feet of sea level rise on the coast of North Carolina, with a picture illustrating the consequences for a local lighthouse (National Oceanic and Atmospheric Administration, 2016). Figure courtesy of NOAA. Used by permission. Copyright © 2016 Esri and its data providers. All rights reserved.



- instructions by the designer on how to use the display, or an About page explaining how and why it was created, accompanied by an invitation to seek further information about the designer or the data;
- blogs in which audiences provide feedback or public commentary on a design, sometimes with responses from the designer, or from which audiences merely gain additional insights into a design; or

- a Contact link, whereby audience members can provide confidential commentary directly to the designer, and the designer can respond to it.

Through proximity, these affordances personalize the interaction between designer, display, and audience, replacing the distant and sterile relationship of static print displays with a dynamic, familiar one that invests the audience emotionally. All of the interactive displays discussed in this article afford, at a minimum, some level of contact between audience and designer (or the organization that sponsors the design) or with other related agencies. For example, the StockCharts.com chart (Figure 9) has a “Report Problems” link beneath the chart that enables users to critique or comment on a given chart, and on a SpotCrime map, mousing over a given crime icon provides details about the case and enables users to access the local police department, where they can ask questions or provide information.

Expressive displays: visualizing the self

Emotional appeals also include expressive elements that arouse an audience’s aesthetic sensibility or, like expressive writing, originate from within the individual, giving a communication voice and authenticity. Expressivism in data visualization encompasses both of these aspects through designs that show qualities of beauty, or otherwise appeal to the audience aesthetically, and designs that give audiences glimpses into the designer’s personal life, increasing the proximity between audience and designer.

A growing mode of expressive data design is what Nathan Yau (2013) calls “data art,” a form of self-expression “where the imagination runs wild, data and emotion drive together, and creators make for human connection” (p. 74). The goal of these expressive designs is “to experience data, which can feel cold and foreign” (Yau, p. 74)—in other words, for data design to realize its capacity to arouse the emotions. Lev Manovich (2013) acknowledges the capacity of contemporary “information-visualization designers” to “evoke particular emotions in the viewer” (pp. 12–13), and Noah Iliinsky (2010) touts the novelty and beauty of contemporary data design and the excitement it offers its audiences. Expressive “data art” has almost unlimited forms, which Yau illustrates in two- and three-dimensional designs visualizing phenomena as varied as the overhead skies, athletic performances, and dating websites (pp. 74–84). Although some of these designs might be more poetic

than functional, and more appropriate for an exhibition gallery than a PowerPoint, they illustrate the expressive capacity of digital design, which even the serviceable financial chart in Figure 6 can’t completely contain.

Expressive data design is also occurring in the growing trend to “quantify” the self, whereby designers collect and visualize data about their daily lives. To encourage personal data collection, Quantified Self Labs organizes meetings and forums and offers “a guide to self-tracking tools” for individuals interested in monitoring data about themselves (Wolf, Kelly, & Quantified Self Labs, 2015, “About the Quantified Self”). In this rapidly growing movement, designers visualize data about their health, work activities, finances, travel, and social interactions and often post their designs online. Exemplars of these kinds of displays have appeared on the Internet as personal annual reports, such as those of designer Nicholas Felton (2015) and of programmer/data designer Jehiah Czebotar (2015).

Figure 12 shows an interactive donut chart that appears in Czebotar’s 2014 annual report. The display visualizes his visits to coffee shops in the New York City area over a year, with each segment of the donut having an interactive feature that displays a bar chart showing

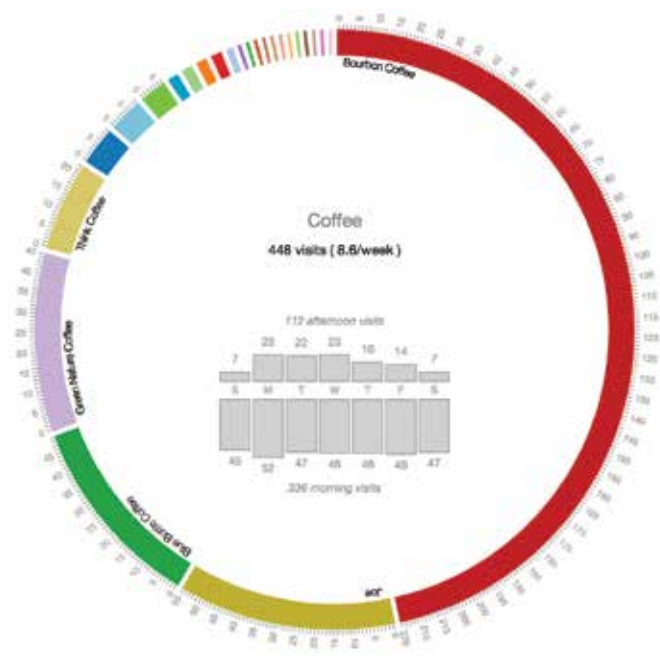


Figure 12. Interactive chart from Jehiah Czebotar’s 2014 personal annual report that shows time spent at several New York City area coffee shops. Copyright 2016 Jehiah Czebotar. Reproduced with permission of Jehiah Czebotar.

Emotional Appeals in Data Design

visits to that particular coffee shop each day of the week, divided into mornings (bottom) and afternoons (top). Visualizing self-collected data reveals the private activities of designers to anyone who wishes to observe them, a form of data design that should not be dismissed as mere self-indulgence. Like expressive writing, these designs originate entirely from within the self but also have functional and emotive value by giving users insights into behavioral patterns that they might share and prompting them to consider (and perhaps quantify) other such patterns in their own daily lives.

Benefits, Drawbacks, and Implications of Envisioning Emotion

Given this new data design landscape, what are its benefits and drawbacks and what are the implications for practice? These new forms obviously have great power to engage, persuade, and motivate audiences by eliciting emotions ranging from surprise and delight to empathy and fear. By entering the domain of the subjective, irrational, and personal, these displays can wield potent and perhaps unprecedented rhetorical power.

As such, designers and their audiences stand to accrue many benefits from data visualization. Readers gain the ability and confidence to explore complex data sets that might otherwise remain hidden or inscrutable to them, and they can do so under their own control, a level of micro-level accessibility that personalizes the experience. Access to customizable data, sometimes real-time data, can also give audiences a sense of empowerment for decision-making, even in the face of anxiety-inducing risks. Audiences also have the opportunity to critique a given design, query its creator, or interact with other audience members, socializing the visualization among a community of designers and users.

On the other hand, online data visualizations can place interpretive demands on readers who might be moved emotionally by design features but puzzled by their lack of obvious functionality. The richness of digital graphical language, with full color and animation, along with other multimodal features, can create a fine line between engagement and distraction. Moreover, the increasing trend of users to access displays on small screens (tablets, smartphones) poses challenges for data-rich, multimodal designs with interactive features that might not be as perceptually or emotionally compelling as they appear on laptop or desktop screens.

The emotional aspects of contemporary data visualization have several implications for designers:

1. Deploying color and multimodal features elicits a wide range of emotional responses from their audiences at both a physiological and a cultural level that can be used to focus attention and persuade.
2. Enabling users to customize displays at a micro-level can make the displays more personal and satisfying. Also, micro-level details in the form of data labels and descriptions can compensate for perceptually challenging designs that rely on area, circles, or gradients. In addition, providing a downloadable Excel data file will further increase user interactivity with the data as well as user trust.
3. Giving the audience opportunities for feedback and discussion socializes the display, enhancing audience engagement and understanding. Contact information, a comment/message board, or a link to a blog or social media can provide these opportunities.
4. Displaying fluid and even real-time data increases temporal proximity, heightening the emotional appeal and credibility of the display. Connecting the display to an active database, including a date on the display, and building an archive of previous visualizations can bolster user confidence in its timeliness.
5. Integrating expressive elements, however modest, can personalize the designer's voice, drawing readers into the data and creating a stronger relationship with the display. Thematic color or pictorial elements, data-bearing icons, and designer bios or commentaries can provide some options without devolving into "chartjunk."

Also, interactive data visualization will likely reshape some of the design conventions of traditional paper displays, changing audience expectations. Simulating in print some interactive conventions (color, micro-level features, designer/user interaction) might also heighten the emotional appeals of static print displays.

Conclusions

Emotional appeals are rapidly being reintegrated into data design, changing reader expectations about visualizing increasingly larger and more complex data sets. Like the explosion in innovation in the late nineteenth century, the new golden age of data visualization offers a feast for the senses, stirring the

emotions through ubiquitous color, novelty, and multimodal features. As the shift from modernist minimalism to dynamic digital displays continues, the surge of emotional appeals will only intensify, impelled by the personalizing effects of interactivity, spatial and temporal proximity, and expressive design.

Understandably, given the proclivity to view data design as an entirely rational process, some designers (and users) might be reluctant to accept—indeed strongly resist—the notion that data design might be enhanced by emotional appeals, let alone that emotion may already infuse displays that they construct or interact with. Like any form of information design, however, the new visual language of interactive data design must continually be scrutinized. Designers who understand this new language—and its rhetorical power—can successfully deploy and control it in order to make complex information more humane, relevant, and usable.

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Making Memories: Writing and Designing More Memorable Documents

By Eric Sentell

Abstract

Purpose: This paper presents results from a primary study investigating the qualities of memorable documents and extrapolates principles for making documents more memorable, and thus more effective, for audiences.

Method: I asked twenty subjects to walk down a high school hallway decorated with flyers and posters. I interviewed them immediately afterward and one week later to determine which information “stuck” over time as well as the subjects’ self-reported reasons for recalling information. I then analyzed the most-often remembered documents to correlate the subjects’ responses to the documents’ content, design, style, etc.

Results: Contrast, color, and imagery are inherently attention-catching and memorable. However, engaging the audience’s collective self-schema, or identity, impacts memory even more powerfully by prompting readers to ascribe relevance to information and thus strive to remember it. Accordingly, I propose the following heuristic for creating more effective, mnemonic documents: (a) convey practical value; (b) use contrast, color, and imagery; (c) tap the familiar; (d) introduce unexpected elements; (e) build social currency; and (f) arouse emotion.

Conclusion: Technical communicators can enhance their documents’ effectiveness by using the proposed heuristic to make information more memorable for their readers.

Keywords: attention, memory, schema, audience, design

Practitioner’s Takeaway:

- Documents influence readers’ memories through their design and content.
- Contrast, color, and imagery are inherently attention-catching; thus, they can make information more memorable.
- Engaging the audience’s collective self-schema, or identity, prompts the audience to ascribe relevance to information and thus strive to encode it into long-term memory.
- The following strategies can catch attention and engage readers’ self-schema: (a) convey practical value; (b) use contrast, color, and imagery; (c) tap the familiar; (d) introduce unexpected elements; (e) build social currency; and (f) arouse emotion.

Introduction

In technical communication, discussions of memory usually explore managing one's composing, research, or reading processes (van Ittersum, 2007, 2009; Whittemore, 2008, 2015). However, memory can also be viewed as a trait of documents. Numerous eye-tracking studies have observed a positive relationship between attention and recall (Lee & Ahn, 2012), because a person must pay attention to information to encode it into long-term memory for later retrieval (Nairne, 2011). It follows that writers can impact readers' memories by presenting information in ways that facilitate effective encoding. As Richard Lanham (1993) puts it, rhetoric "allocates emphasis and attention" (p. 61).

Lanham (2007) also points out that human attention is the primary commodity and scarcity in a knowledge-based economy, and thus it "should not surprise us that the dominant discipline . . . is [now] design" (p. 17). Information can be present in a document yet likely excluded from the reader's recollection due to poor or unethical design (Allen, 1996; Kostelnick, 1996). Since design manipulates attention and attention enables memory, document design is essential to memorable communication. And memorableness is increasingly essential in our information-saturated world; readers must recall information to be able to use it. Standing out does little good if the audience merely notices and does not encode or remember.

To learn how to improve a document's memorableness, I investigated the following research questions:

1. What design elements cause a reader to attend to information in such a way that he or she will remember that information?
2. How do these design elements enhance a document's memorableness?

I interviewed twenty subjects about their recollections from various posters and flyers, their reasons for remembering this information, and the likelihood that they might apply it. One week later, I conducted a follow-up interview to determine which information "stuck" and why. I coded the subjects' interview responses with common design and psychological terms.

The subjects' memories were consistent from the first to the second interview, indicating that documents influence long-term memory. Certain posters and flyers were remembered much more often than others, demonstrating that rhetorical and design strategies affect documents' memorableness. When asked why they recalled certain documents, the subjects often cited contrast, color, and/or imagery. Contrast, color, and imagery are inherently distinctive and attention-catching, thus increasing the chances of information conveyed through them being remembered.

While design influenced subjects' attention and memories, the subjects' self-schema were even more influential. Self-schema, or conceptual frameworks about oneself, affect a person's judgment of relevance (Markus, 1977). That is, people tend to view information as personally relevant if it fits their sense of self or identity. Certain groups have similar self-schema as a result of belonging to the same discourse community (Porter, 1986). My subjects often referred to the (ir)relevance of documents, and they seemed to judge (ir)relevance based on their self-schema. Thus, writers and designers should engage readers' collective self-schema so that readers ascribe relevance to information and endeavor to encode it. The following heuristic lists the design and rhetorical strategies that seem to effectively engage audiences' self-schema: (a) convey practical value; (b) use contrast, color, and imagery; (c) tap the familiar; (d) introduce unexpected elements; (e) build social currency; and (f) arouse emotion.

Traditional heuristics for communication include criteria such as accuracy, brevity, clarity, and achieving the reader's goals (Dragga & Voss, 2001). These qualities are rightfully valued as markers of a text's efficiency and effectiveness. But I argue that communication is more effective and powerful if the reader can easily remember it, and thus technical communicators can benefit from a heuristic for composing and designing more memorable documents. A reader can often refer back to a text, of course, but then the document's usability becomes an issue (Manning & Amare, 2006). Moreover, long-term memory contains the experiences that form our identities and attitudes, that make us who we are, and therefore it is a more influential rhetorical site and medium than short-term memory (i.e., relying on referencing a text). The research and heuristic described in this paper will help technical communicators work within the site and medium of memory, enhancing their effectiveness as communicators.

Making Memories

Literature Review

Memory in technical communication

Usability studies often address memory, or “memorability,” but these studies tend to focus on users’ memory practices rather than texts’ memorableness (see Nielsen, 1999). Similarly, the most developed technical communication scholarship on memory describes how writers manage their research and writing processes to “off-load” or “embody” both cognition and memory, but this scholarship does not address the qualities of documents that make information memorable. Other scholarship discusses memorable visual rhetoric, yet it does not fully explore how to engage readers’ memories through visual and written means.

In *Rhetorical memory: A study of technical communication and information management*, Stewart Whittemore (2015) uses a case study approach to analyze six technical communicators’ information management practices. He argues that developing writing expertise involves a process of cultivating social and embodied habit, defined as a memory stocked with shared, collective knowledge that can be drawn upon when needed. This book is a significant step in the study of memory in technical communication, but it focuses on writers’ memory practices rather than documents’ memorableness.

Whittemore and Derek van Ittersum have each published journal articles dealing with memory. Whittemore (2008) critiques the interfaces of content-management systems (CMSs) for not enabling sufficient tracking of metadata, thus overloading technical communicators’ memories. He argues that CMSs should visualize content and context (through print preview, highlighting, or annotating functions) to reduce writers’ cognitive loads. Derek van Ittersum (2007, 2009) explains how graduate students use digital writing tools such as Endnote or OneNote to create organized, searchable memory systems. Their positive and negative experiences illustrate the complexity of developing digital composing and memory practices. These authors ground their research in classical *memoria*, particularly the architectural mnemonic in which orators mentally visualized information as distinctive symbols placed in familiar settings (Carruthers, 2008; Yates, 1966). They also focus on how writers manage their composing and research rather than the characteristics of memorable documents.

The remaining technical communication articles on memory focus on visual rhetoric. A.S.C. Ehrenberg (2000) describes memorable graphs as simple, minimalist, and clear, with depictions and captions that reinforce each other’s content. John McNair (1996) describes how to design more memorable computer icons by setting vivid symbolic images against contrasting backgrounds. Brian Regan (1998) found that asymmetrical or irregular layouts may be more memorable due to a natural distinctiveness that facilitates encoding. Lastly, Michelle Borkin et al. (2013) showed subjects a stream of visuals (graphs, pictures, etc.) and asked them to indicate when they noticed repeated images. The memorable visuals used more color, contrast, uniqueness, and natural-looking characteristics, but this study measured only recognition, not comprehension or retention. Taken together, these publications suggest the power of contrast for engaging memory. However, they do not explore the rhetorical possibilities and pitfalls afforded by the nature of human memory.

Reconstructive memory, schema, and self-schema

Most scientific fields view memory as reconstructive and mutable, in contrast to previous conceptions of memory as data storage (Francoz, 1999; Braun-LaTour, Braun-LaTour, Pickrell, & Loftus, 2004). Rather than merely a record-keeping and data-storing function memory is a dynamic, socially situated process of reconstructing previous events and stimuli. Our reconstructions can morph over time and can be influenced by new information without our conscious awareness. Therefore, reconstructive memory is both a site and a medium of discourse, persuasion, and power.

In his seminal *Remembering*, Sir Frederic Bartlett (1932) first described memory as reconstructive. He recounts several experiments in which he asked subjects to recreate a story, picture, or other stimulus from memory. Invariably, the subjects reconstructed the stimuli rather than reproducing it, excluding, modifying, fixating on, or even fabricating various details. Reconstructive memory resembles imagination, but Bartlett distinguishes between pure imagination and “imaginative reconstruction” based on the scope and emphasis of one’s cognition (p. 214). According to Bartlett, reconstructive memory focuses on specific events or details while pure imagination ranges freely among settings and interests (p. 313). Furthermore, his

subjects reinterpreted various details without realizing it; usually, they insisted their version was exactly what they had originally perceived.

After Bartlett, Elizabeth Loftus is the preeminent psychological researcher on memory. One of her experiments (Loftus & Palmer, 1974) observed a significant difference in subjects' speed-estimates of cars involved in an accident when the interviewer used the word "smashed" instead of "hit." Another experiment (Braun-LaTour, Braun-LaTour, Pickrell, & Loftus, 2004) used misinformation to induce false memories of an impossible meeting with the Warner Bros. character Bugs Bunny on a childhood trip to Disneyland. These misinformation studies show that our perceptions of events sometimes merge with information learned afterward, leading to a reconstructed memory so unified we cannot distinguish which information came from which source (Loftus & Palmer, 1974; Loftus, 1997, 2005). Reconstructive memory can both facilitate and impede communication.

When we reconstruct memories, we usually recall the relevant schema, or conceptual frameworks, that help structure our perceptions and recollections. If we alter our schema to incorporate new information, then we encode that information into long-term memory. Socio-cultural background can affect this process; Bartlett's (1932) subjects embellished, added, or deleted details based on their socio-cultural subjectivities (p. 87). For example, American subjects did not have to significantly alter existing schema for Disneyland to incorporate Bugs Bunny (Braun-LaTour, Braun-LaTour, Pickrell, & Loftus, 2004), but they might have had more difficulty incorporating dissimilar or unfamiliar misinformation. Since schema function like adaptable heuristics for organizing new information in relation to prior knowledge, it follows that writers need awareness of readers' potential schema (looking to the readers' socio-cultural background for clues) and should attempt to induce readers to incorporate new information into their existing schema.

Psychologists widely recognize that a person's various identities (e.g., husband, father, teacher) combine to form a "social self-schemata," or a unique memory structure, that influences behavior and cognition (Forehand, Deshpande, & Reed, 2002, p. 1086). In other words, self-schema are conceptual frameworks about oneself. In a seminal article, Hazel Markus (1977) found that self-schema "function as selective

mechanisms which determine whether information is attended to, how it is structured, how much importance is attached to it, and what happens to it" (p. 64). While schema organize known and incoming information, self-schema act like filters for one's attention by screening irrelevant stimuli and highlighting relevant information. This process seems to be mostly unconscious; we may be aware that certain stimuli interest us more than others, but we do not consciously decide whether stimuli match our self-schema.

Document design

Design is important to memorable communication because it can direct readers' attention and emphasize or underplay ideas (Kostelnick, 1996). Emphasizing certain information over other material can affect readers' interpretations (Kostelnick & Roberts, 2011), which may then affect their reconstructions. Thus, design is essential to producing memorable documents, since it can substantially influence what we attend to, how we attend to it, and how we recall it later. Common design principles can be used as starting points for both assessing documents' memorableness and creating memorable documents.

The design principles most commonly taught and practiced include contrast, repetition, alignment, proximity, similarity, order, enclosure, and balance (Johnson-Sheehan, 2012; Williams, 2008). These principles are most effective when used in tandem, creating a "visual hierarchy" that "preprocesses" the document's content so it can be understood quickly and easily (Krug, 2006, p. 31). If these elements are used together effectively, they create clear, user-friendly layouts for information. It then stands to reason that easily understood documents should be easier to encode and recall. The principle of contrast is especially important to memory since it attracts and directs attention by exploiting the tendency to notice distinctive elements (Baker, 2006; Jones, 1997; Williams, 2008).

Font and color can also affect memory. Readers perceive fonts as having distinct personalities, making type an important design and rhetorical consideration (Holst-Larkin, 2006; Vance, 1996; Brumberger, 2003a, 2003b). Type influences perceptions of a document's *ethos*, and varying fonts can create attention-catching contrast and reveal clues about a document's structure and purpose, clarifying its

Making Memories

layout (Johnson-Sheehan, 2012; Brumberger, 2003a, 2003b). Well-used color makes information more eye-catching and appealing (Jones, 1997) and can add contrast, create moods, and symbolize familiar cultural meanings (Johnson-Sheehan, 2012). Americans, for instance, view red, white, and blue as patriotic colors, but Chinese citizens do not (Baker, 2006). Since font and color influence emotions, they can also enhance a document's memorableness by making information more stimulating (Berger, 2013). The more arousing information is, the more likely it will be encoded into long-term memory.

In *Universal principles of design*, Lidwell, Holden, and Butler (2010) frequently connect effective design to attention and memory. Most notably, they suggest making information distinctive to encourage “elaborative rehearsal” or “deep processing” (p. 72) and using pictures and text together to facilitate better recall (p. 184). The more distinctive a stimulus, the more people need to process it. The more they process it, the more they encode it into memory. Imagery can add distinctiveness as well as reinforce messages. Similarly, Kostelnick and Roberts (2011) describe how “emphasis strategies” can make information more distinctive and thus “draw the reader’s attention to key elements in a visual field” (p. 175). Through manipulating attention, effective design can help readers encode information into long-term memory.

Audience and memory

The proposed heuristic hinges on understanding an audience’s collective self-schema, or collective memory and identity. As philosopher Charles Scott (1999) explains, “people cannot think similar thoughts without sharing similar cultural, institutional memories” (p. 247). For example, the phrase, “It’s the economy, stupid,” has a clear meaning and reference point for those whose shared cultural memory includes Bill Clinton’s first presidential campaign. Seeing the phrase could prompt this group to focus on some core problem or essential information the author wishes to emphasize. But for other readers, the phrase will lack meaning without additional explanation; they will neither recognize the phrase nor think what the author intends for them to think upon reading it. Technical jargon offers countless more examples of shared memory’s importance to communication as well as memorableness.

In one sense, my research situates Kenneth Burke’s theories of identification and consubstantiality in the context of document design (in addition to writing and rhetoric). In *A rhetoric of motives*, Burke (1969b) explains, “insofar as their interests are joined, A is *identified* [emphasis in original] with B. . . . In being identified with B, A is ‘substantially one’ with a person other than himself . . . at once a distinct substance [or individual] and consubstantial with another” (pp. 20–21). In his earlier work, *A grammar of motives*, Burke (1969a) states that a group’s consubstantiality most often comes from a shared cultural or historical background, or what Scott (1999) calls “similar cultural, institutional memories” (p. 247). Burke says the group’s individual members form their identities, or self-schema, in terms of the collective’s commonplaces or discourse community (Porter, 1986). Collective self-schema influence the audience’s judgement of information’s relevance, which in turn influences the effort to remember that information.

Lynda Walsh, Derek Ross, and Kendall Phillips each allude to the potential for engaging an audience’s (self-)schema and influencing its memory. In her survey of STEM *topoi*, Walsh (2010) writes that *topoi* link “people, texts, and experiences” (p. 122), and discussion sections in STEM articles relate novel findings to familiar patterns (p. 142). Though she does not explicitly address memory, one can view the linkages of *topoi* as engaging collective memory and the connecting of novel and familiar knowledge as reshaping readers’ schema. Ross (2013) adds, “commonplaces . . . actuate an audience’s existing understanding of a situation” (p. 91). In other words, commonplaces frame a topic in terms of the audience’s existing schema. As Ross explains, a given commonplace activates “a system of associations . . . that allows complex concepts to be rapidly processed against previously established knowledge [or schema]” (p. 96). Using the word “proof,” for example, invokes scientific *ethos* without actually giving scientific facts and figures (p. 96). Lastly, Phillips (2010) argues that enthymemes involve memory since the audience must supply an unstated premise cued by the writer. The author’s cue might fail if the audience does not share the memory of that premise. Taken together, Walsh, Ross, and Phillips show that writers must consider their audience’s collective memories and self-schema when developing content.

Methods

Populations, benefits, and risks

This research was approved by the Human Subjects Review Committee of Old Dominion University. The subjects, or audience, for this study consisted of ten high school and middle school teachers in the Clearwater School District in Piedmont, Missouri, (eight female, two male) and ten students enrolled in an evening community college course taught in Clearwater High School (five female, five male). These populations were a fairly authentic audience for the hallway's documents. In educational research, the word *authentic* generally refers to tasks, simulations, or problem-solving similar to real-life experiences and situations (Nicaise, Gibney, & Crane, 2000; Perkins & Blythe, 1994). Many posters and flyers contained information relevant to the teachers, and the rest were aimed at roughly the same demographic as the college students. The documents were also authentic in terms of my study's purpose, for they were competing to attract attention. A hallway decorated with posters and flyers can be characterized as an embodiment of Lanham's attention economy, in which attention is a commodity. While technical communicators work in manifold genres, their work occurs within the attention economy, and thus they can benefit from knowing what qualities make documents both arresting and memorable.

All subjects were selected based solely on their willingness to participate in the study; I did not offer any incentive, and there were no negative consequences for nonparticipation. Both populations were readily accessible and eighteen years or older during the study. Participation may have benefited subjects by increasing their awareness of effective design strategies, but it did not pose any risks. To exercise extra caution, I replaced subjects' names with alphanumeric codes to preserve their anonymity and minimize any unforeseen risks of their participation.

Procedures

The following procedures could be adapted to various workplace contexts and rhetorical situations. I described the study's purpose and read the Notification Form to each subject (Appendix A). Next, I asked each subject to walk, individually, down the main hallway of Clearwater High School, and to allow his or her attention to naturally

wander. I conducted the study after school hours, and the hallway was empty, silent, and free of distractions. It was already decorated with a variety of bulletin boards, posters, and flyers by the school's administrators, teachers, and students. Some of these documents, such as anti-drunk driving messages, had been posted for a number of years. Others were posted more recently to advertise a school club or an upcoming event.

Following each subject's walk, I conducted an oral interview to avoid the mnemonic effects of a written survey. I asked the subjects for some demographic and contextual information as well as their recollections (Appendix B). Collecting this information inserted some time between viewing the hallway's documents and recalling them, ensuring that I measured long-term memory rather than short-term or working memory. It also enabled potential correlations of subjects' teaching areas or (intended) majors/minors, grade levels, and attentional contexts with their responses and the documents. I did not ask for more detailed demographics (such as race, sex, or age) because I identified this information while conducting the interviews.

Additionally, I asked the subjects if they recalled seeing any of the hallway's posters or flyers before participating in the study. Asking subjects about their prior exposure to the documents allowed me to assess the impact of repetition on a poster or flyer's memorableness. Repetition, of course, is a common and effective encoding strategy, and it is also part of the rhetorical situation for posters and flyers (i.e., they are meant to be seen repeatedly over a given timeframe). Some might view previous or repetitious exposure to the documents as a confounding variable. However, the study's results indicate that prior or repeated exposure, or lack thereof, did not significantly affect the subjects' recollections. While repetition cannot be ignored since it is inherent to a poster's or flyer's rhetorical situation, repetition is not the decisive characteristic of memorable documents.

One week after each subject's first interview, I conducted a follow-up interview to test the documents' impact on memory over time by determining what, if any, information had stuck and why (Appendix C). In a 1991 study, Conway et al. replicated Ebbinghaus' "forgetting curve" with college psychology students (Wood, Wood, & Boyd, 2008, p. 217), confirming that forgetting occurs in a regular, measurable pattern. For this study's purposes, the forgetting curve indicated a reasonable time interval at which subjects could be

Making Memories

expected to recall some information. At the second interview, my subjects did not view the documents or walk the hallway again. Instead, they recalled information and details to the best of their abilities, and I added these responses to my notes. Finally, I photographed the bulletin boards, posters, and flyers for later analysis.

Data analysis and coding

Like the study's procedures, the following methods of data analysis could be adapted to various contexts within technical communication. To analyze the interview data, I counted and coded both the information and specific details that the subjects reported. Then I further separated the data based on the subjects' previous exposure to the documents and demographic information. Lastly, I compared the survey responses to the actual documents, observing connections among the subjects' perceptions and the documents' actual designs, content, styles, etc. These methods enabled a more detailed understanding of the interaction(s) among the texts and the subjects' attention and memories.

Counting the remembered units of information and details required qualitative interpretations. I counted any response that indicated a coherent memory as a single unit of information. For example, the Constitution, Bill of Rights, and Declaration of Independence were three different posters, but I counted them as one "unit" of information since subjects invariably reported them together. Then I distinguished between information and specific details based on scope. If a subject recalled the Constitution, for instance, then I coded that as recalling information. If a subject recalled the font of the Constitution then I coded that as recalling a detail. To most accurately depict the responses, I sometimes double-counted recollections as both information and detail. If subjects remembered "the FBLA poster," for instance, then they remembered the poster as a unit of information as well as the specific detail of its title or most prominent text (FBLA stands for Future Business Leaders of America).

Coding the subjects' responses about why they recalled certain information and details also required subjective analysis. My codes for these responses consisted of common design and psychological concepts from *Universal principles of design* (Lidwell, Holden, & Butler, 2010), *Dynamics in document design* (Schrivier, 1997), *Made to stick* (Heath & Heath, 2007), *Contagious*

(Berger, 2013), and psychological research on memory and attention (Appendix D). The subjects' responses did not always neatly fit under a particular design or psychological concept. I found it necessary to use multiple codes for some reported reasons for recalling information; for example, "schema" and "relevance" were often intertwined. Since certain responses could not be described in exclusive terms, I believed that using multiple codes was more accurate and appropriate.

Additionally, I coded the types of specific details the subjects recalled. These details were always either an image or some text. I used the following subcategories to code the types of images recalled: archetype, iconic representation, person, scene, object, and aesthetic. "Archetype" refers to images invoking a concept, and "iconic representations" use images to symbolize something. The other categories are self-explanatory. For text, I used these sub-categories: name, title, date, slogan, and action. The term "title" means the most prominent text on the poster or flyer, whether it is clearly intended to be a title or simply became a title in the subjects' responses. "Slogan" refers to emphasized statements ("Don't Drive Drunk"), and "action" refers to promoting a desired action (e.g., paying club dues). "Name" and "date" are self-explanatory. Next, I used Schriver's five text-image relationships (redundant, supplementary, complementary, juxtapositional, and stage-setting) to describe the subjects' responses that invoked the relationships between text and imagery. Finally, I also included "color" since this term most accurately described several recollections of specific detail.

Results

The study's results clearly answer its research questions:

1. What design elements cause a reader to attend to information in such a way that he or she will remember that information?
2. How do these design elements enhance a document's memorableness?

Color, contrast, and imagery can attract an audience's attention and facilitate encoding information and details into long-term memory. Color, contrast, and imagery are naturally attention-catching, especially if used together (e.g., color can create contrast). But these elements do not automatically enhance memorableness. In this study, the most memorable documents appealed

to readers' existing self-schema, or identities, leading them to ascribe relevance or importance to the information that made it worth remembering.

Table 1 displays the amount of information and specific details each subject recalled during each interview as well as whether they reported previously seeing the documents in the CHS hallway. As explained above, I distinguished between "information" and "specific

details" based on scope, and sometimes I double-coded a response as both. The subjects' recollections were very consistent from one interview to the next, indicating that documents can—and do—influence long-term memory.

Table 2 displays the number of each type of specific detail recalled by the subjects in both interviews. As explained earlier, I coded the remembered details as subcategories of imagery, text, or the relationship

Table 1. Units of information and specific details recalled, first and second interviews

Information							
Teachers				Students			
Interview	1	2	Previous Exposure?		1	2	Previous Exposure?
Female Teacher 1	4	4	Yes	Female Student 1	4	3	No
Female Teacher 2	9	4	Yes	Male Student 2	3	1	Yes
Female Teacher 3	3	2	No	Male Student 3	3	2	No
Female Teacher 4	12	18	No	Male Student 4	5	1	No
Female Teacher 5	3	3	No	Female Student 5	3	3	Yes
Female Teacher 6	5	4	Yes	Male Student 6	4	4	Yes
Male Teacher 7	3	1	Yes	Male Student 7	5	5	Yes
Male Teacher 8	5	3	Yes	Male Student 8	2	1	Yes
Female Teacher 9	10	11	No	Male Student 9	3	2	Yes
Female Teacher 10	5	7	Yes	Female Student 10	2	2	Yes
Total	59	57		Total	34	23	

Specific Details							
Teachers				Students			
Interview	1	2	Previous Exposure?		1	2	Previous Exposure?
Female Teacher 1	2	2	Yes	Female Student 1	4	3	No
Female Teacher 2	5	3	Yes	Male Student 2	2	2	Yes
Female Teacher 3	0	0	No	Male Student 3	2	2	No
Female Teacher 4	14	8	No	Male Student 4	2	0	No
Female Teacher 5	3	2	No	Female Student 5	2	2	Yes
Female Teacher 6	4	4	Yes	Male Student 6	5	5	Yes
Male Teacher 7	4	2	Yes	Male Student 7	4	3	Yes
Male Teacher 8	3	4	Yes	Male Student 8	2	3	Yes
Female Teacher 9	8	9	No	Male Student 9	2	2	Yes
Female Teacher 10	7	5	Yes	Female Student 10	4	6	Yes
Total	50	39		Total	29	28	

N=20

Making Memories

Table 2. Codes used for the types of specific details subjects recalled, first and second interviews

Teachers				Students			
Interview	1	2	Total		1	2	Total
Image-Archetype	6	8	14	Image-Archetype	4	3	7
Image-Iconic Representation	3	3	6	Image-Iconic Representation	2	3	5
Image-Scene	5	3	8	Image-Scene	2	1	3
Text-Title	16	13	29	Text-Title	8	8	16
Text-Date	3	3	6	Text-Date	0	2	2
Text-Slogan	17	9	26	Text-Slogan	8	3	11
Text-Action	8	7	15	Text-Action	3	0	3
Redundant Text-Image Relationship	5	5	10	Redundant Text-Image Relationship	1	2	3
Juxtapositional Text-Image Relationship	2	3	5	Juxtapositional Text-Image Relationship	1	0	1
Color	3	4	7	Color	5	6	11

N=20

between imagery and text. The table shows that text-title, text-slogan, text-action, and image-archetype were by far the most common codes, suggesting that easily encoded details may be more memorable.

Table 3 lists the reasons subjects gave for recalling information and specific details. (Some of the codes in Appendix D are not listed since they did not describe or apply to any of the subjects' responses.) Contrast-color,

relevance, and schema were the most-used codes for the subjects' responses when asked why they recalled information. Relevance and schema were the most common codes for subjects' reasons for recalling specific details. It appears that relevance, memory, and schema are intertwined. That is, schema seem to influence judgments of relevance, which in turn influence attention and encoding.

Table 3. Codes used for subjects' reasons for recalling information and specific details, first and second interviews

Information						
	Teachers			Students		
Interview	1	2	Total	1	2	Total
Contrast-Size	1	2	3	3	1	4
Contrast-Font	1	0	1	4	1	5
Contrast-Color	8	5	13	5	3	8
Repetition	2	2	4	3	2	5
Alignment	2	1	3	0	0	0
Proximity	3	1	4	0	0	0
Image	3	3	6	0	0	0
Archetype	3	2	5	1	3	4
Relevance	7	6	13	9	3	12
Von Rhestorff Effect	3	2	5	1	1	2
Schema	7	6	13	4	2	6
Elaboration	5	2	7	2	1	3

Details						
	Teachers			Students		
Interview	1	2	Total	1	2	Total
Contrast-Size	0	0	0	3	1	4
Contrast-Font	1	0	1	2	0	2
Contrast-Color	2	3	5	5	1	6
Repetition	1	0	1	3	1	4
Alignment	0	1	1	1	0	1
Proximity	0	1	1	1	0	1
Image	2	4	6	0	0	0
Archetype	0	0	0	1	0	0
Relevance	4	6	10	6	3	9
Von Rhestorff Effect	0	0	0	0	1	1
Schema	6	7	13	7	3	10
Elaboration	3	4	7	4	3	7

At the end of each interview, I asked subjects how likely they would be to apply any of the information or details they recalled. Table 4 shows that relevance and schema were the most-frequent codes. Typically, relevance refers to responses dismissing the documents' possible relevance. Most of the teachers indicated that the information was not relevant; some said it was relevant because they were either teachers or parents of the children to whom the information was directed. Similarly, most of the students viewed the information and details as irrelevant; they were in college and the documents were directed at high school students. The subjects' self-schema, or identities, as teachers and college students influenced them to perceive the documents as irrelevant. This judgment occurred even for the alcohol and drug abuse posters, whose messages, arguably, should have nearly universal relevance.

Table 4. Number of each code's use for subjects' likelihood to apply information, first and second interviews

Teachers				Students			
Interview	1	2	Total		1	2	Total
Relevance	7	8	15	Relevance	9	9	18
Schema	4	6	10	Schema	3	3	6
Practical Value	2	4	6	Practical Value	0	0	0
Social Currency	1	4	5	Social Currency	0	0	0
Elaboration	2	1	3	Elaboration	1	0	1

N=20

Qualitative examples and analysis

Thanks to their clever use of color, contrast, and familiarity, the most-remembered documents were the Future Business Leaders of America (FBLA) poster (Figure 1) and the racing-themed drunk driving poster (Figure 2). The FBLA poster's high-contrast design captured attention, and the information being delivered was familiar to the subjects; the subjects already possessed a schemata, or conceptual framework, for the FBLA club. The drunk driving poster used contrast through the colors of the racecar, racing suit, text, and background. The text "Don't drive drunk" taps into the widely shared schema of anti-drunk driving messages. The text/slogan is supported by the redundant, reinforcing racing imagery, which invokes a familiar archetype or schemata. Subjects consistently

recalled the "racecar driver," but not Michael Andretti who is shown and named in the poster (see Figure 2). Most likely, the racecar driver schemata already existed for them while schemata for Andretti did not. Both posters were consistently recalled among the subjects, showing that certain strategies can make documents memorable.



Figure 1. Future Business Leaders of America (FBLA) poster



Figure 2. Drunk driving poster

But surprisingly often, documents were either noticed or ignored due to the subjects' differing self-schema. Only a few parents whose children were planning to take the ACT noticed a flyer about an upcoming ACT test enough to encode and recall it. A paper cross was hanging from one teacher's door for all to see, but only a religious studies student noticed it. Only one subject noticed a flyer for a gun raffle, and she described herself as a hunter. These are only a few notable examples of how one's existing identity, or self-schema, seems to determine what one notices, encodes, and remembers. Logically, the audience's demographics should exert some influence on its self-schema, although my small sample size did not yield consistent trends based on specific demographic factors.

Making Memories

Limitations

Some subjects reported seeing the posters and flyers in the hallway prior to participating in the study. One might view previous or repetitious exposure to the documents as confusing whether the subjects recalled documents due to their memorable characteristics or due to repeatedly seeing and encoding them. Moreover, the subjects' performance in the follow-up interviews may have been improved thanks to seeing the documents between interviews, this time with greater cognizance. But as Table 1 shows, repetition did not give any subjects an advantage, and in fact, some subjects without any previous exposure to the documents performed better than subjects with it. It is also possible that repetition actually inhibited some subjects' recall, since repeatedly seeing a stimulus can inoculate one to its presence. But given the similar number and type of memories among all subjects, I believe repetition was an insignificant limitation on subjects' performance whether it may have benefited or inoculated them.

Reporting memories may have helped further encode them into the subjects' long-term memories, an unavoidable limitation in all but the most tightly controlled research designs. I avoided such designs due to my fear of creating an inauthentic context, circumscribing the study's scope, and preventing the subjects from contributing any surprising or unexpected responses. Also unavoidable in this design, the subjects may have made a special effort to encode the posters and flyers they reported during the first interview so that they could "pass the test" of the second interview by recalling the same documents. This tendency could be especially true of the students, who must often prove their knowledge. Yet even a more tightly controlled, inauthentic study would likely suffer from the possibility of subjects striving to perform well.

Other possible limitations include the distance between the subjects and the intended audience of the documents as well as the possibility of personal interest in certain documents. The subjects may not have remembered information and details as well as they could have because of difficulty relating to documents intended for a younger audience with different concerns. Conversely, some subjects may have remembered certain documents due to a personal interest in their content. In either case, the study's purpose was to determine what qualities make documents memorable, not to evaluate

the subjects' recall. Perhaps the subjects' recall suffered due to the study's design, but the study still yields insight into memorableness. While possibly confounding the study's raw data, the effect of personal interest also supports the argument that collective self-schema affect readers' recall.

Suggestions for future research

Future researchers could repeat this study and correct for its limitations. A researcher might use different documents that more closely fit the subjects or different subjects that more closely fit the documents. Different genres, such as essays or reports, could be used instead of flyers and posters. Various audiences could replace teachers and students. Researchers could also design a more tightly controlled experiment that avoided overtly asking the subjects for their recollections, minimizing the mnemonic effects of reporting their memories and/or preparing for a follow-up interview. Additionally, material space and context could be foregrounded in future research. Different spaces position us to do or not do certain things (e.g., a hallway vs. a waiting room), which may affect our formation of memories.

Discussion

This study complicates existing perspectives on document design and suggests alternative practices for technical communicators. Current design practices focus on arranging information in clear, easy-to-follow layouts with aesthetic appeal and directing the audience's attention through said layouts. In this study, however, contrast, color, and redundant text-image relationships exerted the strongest influence on the subjects' attention and memories, whereas other design principles and visual rhetoric had little to no impact. The results emphasize the importance of these elements' use and also suggest the benefits of reframing other design principles as ways to achieve them. For instance, principles like alignment and proximity can be used to add contrast to titles, headings, or other information. At minimum, technical communicators would be well-advised to focus more on using contrast, color, and imagery, especially when conveying essential information that ought to be indelible. Effort at efficiency, aesthetics, and other design principles has its own value and reward, but strong contrast can have a much more memorable impact.

More importantly, this study suggests that design attracts attention but does not necessarily improve memorableness. Both practitioners and textbooks expend tremendous energy on document design, yet design by itself does not guarantee effectiveness in communicating, much less impacting readers' long-term memories, beliefs, and attitudes. To communicate memorably to a given audience, a writer or designer must tap into that audience's existing collective self-schema so the readers will ascribe relevance to the document and its information, which in turn will motivate their encoding of that information into long-term memory. A person's self-schema shapes the perspective by which he or she processes information, filters the relevant and the irrelevant, and focuses and allocates attention (Markus, 1977). By filtering information, self-schema determine what can be encoded and recalled. The more a document engages self-schema, the more memorable, impactful, and effective it will be.

Whenever the audience is larger than one person, we must think about the audience's self-schema as a collective. Kenneth Burke explains that individuals form and define their identities in terms of the collective, making themselves simultaneously one and not one with it. This process of identification establishes a common interest among otherwise divided people, leading to a feeling of unity or oneness that Burke calls consubstantiality. Consubstantiality most often derives from a shared cultural or historical background (Burke, 1969a, 1969b). This shared knowledge-base—or public memory or collective schema—enables distinct individuals to think similar thoughts (Scott, 1999; Phillips, 2004; Walsh, 2010; Ross, 2013).

Technical communicators may identify an audience's collective self-schema any number of ways, augmenting their usual audience analysis practices. Members of a given organization usually learn about its history, values, structure, purpose, policies, procedures, and so forth in some kind of orientation and then continue learning about the organization while working for it. Thus, technical communicators can safely assume the presence of schema for the organization's history, values, etc., in an organizational audience's collective memory. While not influential in this study, demographics may also provide key clues to an audience's collective memory and schema. Certain age groups, races, or ethnicities may include certain events or narratives in their collective memory that others do not. This collective memory

contributes to a shared identity, or a collective self-schema, which then filters information.

Of course, certain departments within the same organization as well as certain groups within the same citizenry might have very distinct experiences and perceptions. If possible, then, one should narrow the intended audience and focus the analysis as much as possible. This may be difficult or impossible, however, when technical communicators have multiple audiences with different expectations and agendas for the same document (Reiff, 1996). However, any given audience belongs to a common discourse community whether it is as general as "America" or as specific as "corporate tax attorneys" (Porter, 1986). Obviously, more general discourse communities like America or Boeing will encompass multiple audiences. In any case, a given discourse community's common paradigm, concepts, and language can be viewed as a collective memory or schema.

Whether focusing on common experience, demographic, or discourse, it is clear that communication depends on shared knowledge and schema and that memorableness relies on engaging the attentional filter of self-schema. A document's color, contrast, and imagery draws our attention, and then we process its information through our self-schema, determine its relevance, and either encode or forget it. If technical communicators focus too much on design, even contrast and imagery, they may fail to push information through readers' filtering self-schema and thus fail to communicate. Conversely, engaging self-schema can be a powerful rhetorical strategy. Readers may be aware that their assessment of relevance involves their identities as teachers, students, parents, etc., but they do not consciously recognize their self-schema's influence. Being unconscious, the influence can be potent.

Heuristic for engaging collective schema

Once an audience's collective self-schema has been identified, analyzed, and understood, several strategies can engage the self-schema so that the audience ascribes relevance to information and thus endeavors to encode the information into long-term memory:

1. Convey practical value.
2. Use contrast, color, and imagery.
3. Tap the familiar.
4. Use unexpected elements.
5. Build social currency.
6. Arouse emotion.

Making Memories

This is likely only a partial list of strategies; future research may reveal many more, but these strategies seem promising based on my secondary research and my study's results.

If information has practical value, people will strive to remember it for later use (Berger, 2013). Memorable communication, therefore, should convey information's practical value for the audience. In many cases, the value may be obvious to a reader due to his or her context. As one subject said, the date of the upcoming ACT exam was relevant and useful because his daughter wanted to take it. A software programmer will likely see practical value in a technical description of the client's needs and desires for the program. In other cases, information's value may need to be conveyed. An end-user might ignore a section of an instruction manual with unclear practical value, but an attention-catching statement of the section's value and/or necessity could prompt the end-user to read it after all. Of course, information's value will vary according to the audience's needs, necessitating understanding one's audience and its collective self-schema.

Even the most practical message must receive some attention before it can be perceived and encoded. Contrast and color create a natural distinctiveness, especially if used together, that arrests attention, indicates importance, and prompts encoding. Imagery engages interest and attention, symbolizes the text's message, builds repetition into the document, and provides another method for tapping into the audience's collective self-schema. The racecar driver was not needed for the message, "Make a choice you can live with. Don't drive drunk" to make sense. But that image added visual interest, engaged attention, subtly reinforced the theme and content, and, most importantly, tapped into a collective schema for racecar drivers. The image helped make this poster one of the most memorable documents in the study. Technical communicators can similarly use contrast, color, and imagery to both direct attention and tap into readers' schema; the right color and image, for example, could symbolize the textual message, such as when one uses bright red font and a hazard symbol to reinforce a warning.

Familiarity influenced my subjects' recollections because the information was already present in their schema and thus easier to re-encode and/or retrieve. Many things may be familiar to a given audience based on its socio-cultural and institutional memory, but well-known titles, slogans, and archetypes stand out in this study. Teachers and students alike included the familiar

title "FBLA" in their self-schema, which facilitated their encoding of the poster even though most did not find its information personally relevant. In some cases, my subjects even transformed less-familiar information, illustrating familiarity's mnemonic power. The decades-old slogan "Don't drink and drive" was already present in their schema and was thus more-often reported (i.e., more memorable) than the more concise phrase they actually saw and read, "Don't drive drunk." Similarly, the archetype of a "racecar driver" was more familiar to the subjects than Michael Andretti, so they encoded his image as this generic archetype and ignored his name on the poster. Therefore, technical communicators should identify the titles, slogans, and archetypes already present in the audience's collective schema, and then they should use this collective familiar to make their documents easier to encode and recall. A company's marketing slogan, mission statement, or logo might seem extraneous to internal audiences, but such additions could facilitate encoding of the document and its information.

Of course, writers must sometimes convey the unfamiliar. If familiarity influences memory so strongly, then it may be disproportionately difficult to make the unfamiliar memorable. One strategy might be to identify some subtle or hidden familiarity, such as an applicable image or saying that one would not normally associate with the unfamiliar information. Juxtaposing the familiar and unfamiliar could not only attract attention through surprise but also help alter an existing schema or create a new one. Another option could be parodying something familiar, creating new entries within existing schemata. Changing a well-known catchphrase to include an unfamiliar term or detail, for instance, creates a bridge between the familiar and unfamiliar. But it could also be possible to embrace the unfamiliar. According to Heath and Heath (2007), unexpected elements can break schema by alerting people to errors or inconsistencies. People form schema because they facilitate cognition and memory. If they are incorrect, people want to correct them. Unexpected elements arouse curiosity and prompt the revision of schema. The unfamiliar, therefore, can be a mnemonic aid if presented as a knowledge gap that needs to be filled or corrected. To accomplish this, technical communicators can inform readers what they do not know and why they need to know it before launching into the information itself. Although some concision or efficiency may be lost, the information will become more memorable and impactful.

By nature, people try harder to encode ideas or experiences that they wish to share later, and Berger (2013) explains that both social currency and arousing emotions tend to motivate sharing. An idea has social currency if it garners a person social approval by making him or her seem remarkable in some way. Gaining social approval is a fundamental human motivation, making information with social currency worth remembering. Technical communicators, then, can emphasize the practical, helpful, humorous, shocking, or otherwise remarkable nature of the information they present, prompting readers to view their documents as worth remembering and sharing. Berger has also found that people are less likely to share information that causes less-stimulating emotions like contentment or sadness. But arousing emotions like excitement, awe, anxiety, or anger make people want to take action, including sharing whatever produced these stimulating emotions. Thus, even in technical documents, one may try to evoke or create rousing emotional connections to information rather than only emphasizing its importance or practicality.

When used together, these strategies should prompt audiences to view information as relevant and worth-remembering so they will incorporate it into their existing self-schema and/or their schema for the topic at hand. Effective design organizes information and directs readers' attention, but design alone does not make information impactful or memorable. Contrast, color, and imagery draw attention to the information to be encoded. Then, familiarity can facilitate encoding, unfamiliar knowledge-gaps can arouse curiosity, and both familiar and unfamiliar ideas can be imbued with practical value, social currency, and arousing emotion. Readers are more likely to encode information with these qualities into long-term memory, where that information can have a lasting impact on their knowledge, beliefs, attitudes, and actions. Thus, the proposed heuristic can help technical communicators produce more memorable, effective documents.

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Making Memories

APPENDIX A

Notification Form

Title of Project: Creating Memories

Investigator: Author

Department: English

Phone number: xxx-xxx-xxxx

The purpose of this project is to investigate readers' self-reported reasons for remembering information from a given document.

I understand that, as part of this project, I will view documents and then report what I recall from them and why I recall this particular information. I will provide this information once at the beginning of my participation and again one week later.

I understand that there are no risks associated with this procedure or with my participation in this project.

I understand that my participation is voluntary; I may refuse to participate and/or discontinue my participation at any time without penalty or prejudice. I understand that my participation or lack thereof will in no way affect my standing at Southeast Missouri State University or Clearwater High School.

I understand that all information collected in this project will be held confidential; I understand that my survey responses will be anonymous and no identifying information about my participation or responses will be collected during the study.

I understand that by agreeing to participate in this project and signing this form, I have not waived any of my legal rights.

I understand that any questions or concerns I have will be addressed by the above named investigator. If I have further questions, I may contact the Responsible Project Investigator, Dr. Julia Romberger, or Author at xxx-xxx-xxxx or Author's University Email.

APPENDIX B

Interview Questions (First Round)

- 1) Name?
- 2) Grade/Year (if applicable)?
- 3) (Intended) Major (if applicable)?
- 4) (Intended) Minor (if applicable)?
- 5) In general, describe the typical context in which you notice flyers or posters. Where are you? What are you doing?
- 6) After walking down the hall just now, which flyers or posters do you remember?
- 7) Why do you remember these flyers or posters?
- 8) Do you remember any specific information from the flyers or posters?
- 9) What, if any, specifics do you remember from the flyers or posters?
- 10) Why do you remember this information?
- 11) How likely would you be to use or apply this information in the future, and why?
- 12) Do you recall previously seeing the flyers?

APPENDIX C

Interview Questions (Second Round)

- 1) Which flyers or posters from last week do you remember?
- 2) Why do you remember these flyers or posters?
- 3) Do you remember any specific information from these flyers or posters?
- 4) What, if any, specific information do you remember from the flyers or posters?
- 5) Why do you remember this information?
- 6) How likely would you be to use or apply this information in the future, and why?

APPENDIX D

Coding Cheat-Sheet

Similarity	when something looks similar to other features in the document
Contrast	when something looks different from other features in the document; or when appearance stands out (e.g., color, size, etc.)
Repetition	when certain design principles are repeated, such as the bolded words to the left; or when a given document, text, image, or other stimulus recurs
Alignment	when features are lined up a certain way, such as the bolded words to the left
Proximity/ Chunking	when features are grouped together or spaced apart
Iconic Representation	when an icon represents a concept, idea, object, person, or thing
Images	when an image or picture catches attention due to its vividness
Text-Image Relationship	redundant (reinforcing); complementary (restating); supplementary (adding info); juxtapositional (unexpected relationships); stage-setting (contextualizing)
Archetypes	memorable qualities of archetypical characters, stories, images, metaphors, etc.
Elaborative Rehearsal 1) Complexity 2) Distinctive 3) Relevance	qualities that lead to deeper processing and thus more encoding into memory – 1) complexity, 2) distinctiveness, and 3) relevance to the user.
Propositional Density	when the complexity of a statement or text necessitates deeper processing to comprehend it, e.g., innuendo or a proverb, i.e., “it makes you think”
SUCCES	Simplicity; Unexpectedness; Concrete; Credibility; Emotion; Stories
STEPPS	Social Currency; Triggers; Emotion; Public Visibility; Practical Value; Stories
Von Restorff Effect	when something is memorable because of its uniqueness or unusual qualities
Schema	a conceptual framework that structures understanding and memory
Primacy	memorable nature of first item in a list
Recency	memorable nature of last item in a list
Elaboration	making connections between some information and other information (development)

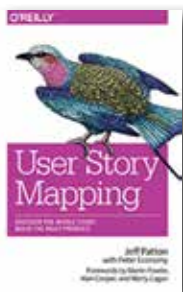
Review of Four Books on User Experience and Interaction Design

By Angela Robertson

Introduction

If you have worked as a technical writer in the software development industry, the terms *user experience* and *interaction design* should be familiar phrases. Knowing exactly what these terms mean and understanding how to apply the concepts to your work might be things that you'd like to know more about, but time is limited. The following four book reviews aim to provide you with a few resources to get started.

User Story Mapping: Discover the Whole Story, Build the Right Product



Read *User Story Mapping: Discover the Whole Story, Build the Right Product* if you read only one book about user experience or interaction design. Patton writes an excellent resource for all things related to implementing successful design practices. There is one piece of information missing from this book:

an adequate explanation that too many organizations are ill-prepared to follow the guidance provided in the 18 chapters. If you happen to work in an environment not ready to implement user story mapping principles, this book likely frustrates you because you know what life could be like if you had a more mature development organization.

The book is organized linearly so it's best to read it once and later reference specific sections. If you are not familiar with the term *user story mapping*, here is Patton's definition: User story mapping is the task of organizing user stories in a model that allows you to understand a system's functionality. With this model, you can plan releases of code to deliver value to both users and the business.

Patton cautions that actions speak louder than words when it comes to mapping user's stories. Specifically,

technical writers can appreciate the following statement in the "Read This First" preface: "Shared documents aren't shared understanding" (p. xxxii). We know that writing something is no guarantee that people read or understand. We have to create a framework in which people are engaged and understanding flows from this engagement.

With this introduction, the first few chapters explain why and how to create story maps. Here's an example of how Patton frames the discussion, "It *all* seems important. But then we step back and think about the specific people who will use our product, and what they'll need to accomplish to be successful" (p. 30).

After we understand user story mapping basics, chapters 5–9 explain the implementation phase. I argue that some examples oversimplify the process, but no one can understand how messy and uncomfortable it is to engage in this type of design process until you live the process with a software development organization.

The hard work is to create an organizational understanding of the need for this design work. People want to see words on the screen and functioning code. Yet, experienced writers know that if we find users and observe people working, we can design and write about software in a way that is empathetic with the user's needs. We do not have to write everything when we talk about who should use software, how these people "can minimize output and maximize outcome" (p. 84).

Chapters 10–18 add depth to the ideas outlined in the first nine chapters. To make *User Story Mapping* more appealing to engineers and people with little to no understanding of the design disciplines, I would edit this book differently. I would have presented a more logical, business-oriented argument for why businesses need to invest capital into revamping their organizations to allow for the messy work of design. Other books tackle this issue, yet this book chooses to go in depth regarding what is user story mapping.

User Story Mapping ends with a strong statement that should resonate with all readers: "Software is never really done. . . . Outcomes are never insured. . . .

Improvements made after release are the most valuable” (p. 256). Too often new features and functions are tacked on after a release. After reading this book, we know that we can do better.

Designing for Emerging Technologies: UX for Genomics, Robotics, and the Internet of Things



When I agreed to review this book, I did not notice the most important fact to know about it: The book is a collection of essays where people in the industry write about designing for emerging technologies. The editor deserves praise for organizing the essays that makes reading easy and the subject matter fun.

Each section can be read like a short story; I found myself reading out of linear order. After starting with the obligatory first chapter, “Designing for Emerging Technologies,” I skipped to the last chapter, “The Changing Role of Design.” I mention that I altered the chapter order to indicate that the book can be read like a collection of short stories. You probably derive more enjoyment from the organization set by the editor, but there is no harm in reading this book out of order.

The chapter topics span from design discussion to industrial design, including chapters about the design of toys and musical instruments. There is a fun chapter about wearables, a couple of chapters about robotics, and a chapter about biology. As someone who would not have sought out essays on each of these topics, I am glad that I was obliged to read *Designing for Emerging Technologies: UX for Genomics, Robotics, and the Internet of Things*. I would have missed essays on topics that I find fascinating.

As I read the book, I find myself talking to people about it. People wonder if I have a favorite chapter, but what I love about this book is the use of visual design. Most of the essays include some type of visual aid that improves my understanding. The photographs are in color, which brings the subject matter to life.

Illustrations are in black-and-white text, which makes me think I am reading an issue of the *New Yorker*. And there are some tables and diagrams, which use a consistent visual style that mix a shade of blue with the black-and-white text. The editor took great care to

ensure the visual elements tie the essays together in the cohesive form of a book. Instead of being distracted, I am impressed. As someone who understands publishing, I realize the time and care that went into these decisions.

Great time went into the resources provided at the end of the book. Appendix A is a list of companies and products referenced in the book. A 23-page index makes it easy to find whatever I want to recall. The book concludes with a biography of each contributor that saves me a trip to my computer to research who wrote what.

What, then, does *Designing for Emerging Technologies* have to do with technical communication? The essays showcase all of the technologies where technical communicators can bring their storytelling skills to give the audience perspective on how these technologies map to our lives and why they matter. Like the user story mapping discussed in the last review, we need storytellers who can maximize outcome while minimizing the input from the users. We can frame the technologies to show why they matter. Otherwise, emerging technologies end up in the heap of misunderstood novelties.

Mobile Design Pattern Gallery: UI Patterns for Smartphone Apps



While writing this series review, I wondered how *Mobile Design Pattern Gallery: UI Patterns for Smartphone Apps* will complement the *User Story Mapping: Discover the Whole Story, Build the Right Product* and *Designing for Emerging Technologies: UX for Genomics, Robotics, and the*

Internet of Things books. The connection was evident when I read this reminder: “When we learn about things, patterns help” (p. ix). The patterns provided in *Mobile Design Pattern Gallery* give you a lexicon to apply to the design of smartphone apps.

I read this book after finishing the *Designing for Emerging Technologies* essays. After reading about a variety of emerging technologies, this book takes me back to the practical work of daily design decisions. Full of examples (more color!), *Mobile Design Pattern Gallery* is a reference guide for what to do when designing apps. Anyone who is working on content to be rendered on a mobile device should find a copy of this book.

Review of Four Books on User Experience and Interaction Design

While technical writers might not find every piece of information relevant to their work, it's a great reference guide that helps technical communicators identify the best way to send and receive information with the user. The organization of content makes this book a great reference: Chapter 1: Navigation, Chapter 2: Forms, Chapter 3: Tables, and more.

Chapter 11: Anti-Patterns is my favorite chapter about the pitfalls to avoid. A loose complement to this chapter is Chapter 8: Social Patterns. I spent some time reflecting on why the editor would not pair the chapter on social patterns more closely with anti-patterns. From a pure design perspective, the two chapters are not directly correlated. However, I argue that the more casual reader does not understand this subtlety unless the writer provides a direct explanation for why social patterns are separate from the anti-patterns.

This problem could be resolved through additional Chapter Extra sections, especially for chapters 7–11. Chapter 7 ends with a Chapter Extra by Alissa Briggs, UX Manager and Principal Designer at Intuit. After a brief introduction, she walks us through a design problem that her team solved. The context she provides to each design iteration is invaluable to advancing our understanding.

Given this criticism, if I take the perspective of the writer (and editor), *Mobile Design Pattern Gallery* is a reference guide. However, taking time to add more context at the end of at some chapters would take this helpful resource to the level of “this is the one book that you should own” when working on smartphone app development.

Designing Products People Love: How Great Designers Create Successful Products



Designing software with intention does not happen as often as you might think. To understand why designing software is important, read Scott Hurff's excellent book, *Designing Products People Love: How Great Designers Create Successful Products*. This book makes the design discipline easy to understand and should compel

anyone who works on product development to ask, “Why aren't we doing this?”

Let's say that your company is practicing design as a part of the development process. You can read this

book to deepen your knowledge of the subject and see how technical communication is a part of the design process. For example, the product guide on page 65 is a great example of how technical communicators can contribute to the design team. Chapter 4 explains how the words on the interface define, from a consumer's perspective, much of the product. I can cite more examples, but you can see that Hurff's book is a treasure for technical communicators who want to get involved as an active, valuable participant of the team.

If your company is new to design or skeptical of the value, you might read this book and feel frustrated that the people you work for are not smart. How can anyone not understand the essential nature of design and want to implement it in the organization? Take some deep breaths and read *Designing Products People Love* using a different frame. Instead of reading this book to see how technical communicators can engage in the process, use the examples provided to start conversations about how design as a part of the product development process is becoming the new normal.

The figures that Hurff uses throughout the book give you ample examples to use when talking with people. I recommend starting a pilot project. You'd need to be on the pilot project full time, for a specific period of time, but you can use this book to get started. Can you design an entire product? No. Scope your work to show the meaningful impact and explain how your work can be expanded.

You can use the “Further Reading” resources provided at the end of the book to continue learning about the design practices that Hurff explains. I'd use the resources to scope the work you are allowed to do. Hurff's book focuses on the design of a complete product. I doubt that for a first design project you will be allowed to implement design on that large of a scale. The guidance that you read in “Chapter 9: Shipping Is an Art—and a Science” needs to be revised to apply to your specific situation.

If you do not think anyone will be willing to let the current development processes be updated to include the type of design processes described by Hurff, you could look at how support or other auxiliary teams might be willing to use a design process to update a current tool or workflow. Success breeds success and that's why more companies are implementing design as the core of the product development process.

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About the Author

Angela Robertson is a technical program manager in Raleigh, NC. She currently works in Customer Content Services with Red Hat Software. Prior to her current role, she worked in a variety of content-related roles with IBM Corporation. She has a master's of science degree from North Carolina State University.

Review of Four Books on User Experience and Interaction Design

Table 1: Books on User Experience Design Compared

	<i>User Story Mapping</i>	<i>Designing for Emerging Technologies</i>	<i>Mobile Design Pattern Gallery</i>	<i>Designing Products People Love: How Great Designers Create Successful Products</i>
Audience	Beginner to Intermediate	Intermediate	Intermediate to Advanced	Beginner to Intermediate
Major Strengths	<ul style="list-style-type: none"> • Writing style designed for easy reading and learning • Great index and additional resources list • You're motivated to practice your new skills • Full-color pictures bring the information to life 	<ul style="list-style-type: none"> • Great selection of essays • Well-written content made for compelling reading • Appeals to your sense of intellectual curiosity • Another great index 	<ul style="list-style-type: none"> • Plenty of full-color examples • Detailed index • Concise analysis • Notes call-outs are helpful 	<ul style="list-style-type: none"> • References give you great resources for further learning • Natural peer-to-peer tone • Interviews provide perspective from community • Great use of figures to enhance the text-based information • Direct encouragement to practice design
Major Weaknesses	<ul style="list-style-type: none"> • More references could be provided 	<ul style="list-style-type: none"> • Content written for niche audience • Title does not accurately convey the type of content included in the book 	<ul style="list-style-type: none"> • Some analysis could be more detailed • A lot of information for a newcomer • More Notes call-outs would be ideal 	<ul style="list-style-type: none"> • The headings (which are also used in the table of contents) could be more descriptive
Comments	Excellent value. Trustworthy information delivered in a concise format.	Trustworthy anthology of essays for someone who wants to read about a variety of technologies.	Trustworthy information delivered in a concise format. Fair value.	Great value. Recommended for all audiences.
Rating (5-star scale)	*****	***	***	*****
Cost (USD)	\$34.99	\$49.99	\$49.99	\$39.99

Books Reviewed in This Issue

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|--|------------|--|------------|
| Plain Language and Ethical Action: A Dialogic Approach to Technical Content in the Twenty-First Century | 160 | How Posters Work | 168 |
| Russell Willerton | | Ellen Lupton, Caitlin Condell, and Gail Davidson | |
| Interface Design: An Introduction to Visual Communication in UI Design | 160 | Advertising Design and Typography | 169 |
| Dave Wood | | Alex W. White | |
| Genetic Counseling Research: A Practical Guide | 161 | Project Leadership: Creating Value with an Adaptive Project Organization | 169 |
| Ian M. MacFarlane, Patricia McCarthy Veach, and Bonnie S. LeRoy | | Barry L. Cross and M. Kathryn Brohman | |
| Reclaiming Conversation: The Power of Talk in a Digital Age | 162 | WordPress: The Missing Manual | 170 |
| Sherry Turkle | | Matthew MacDonald | |
| User Experience Design: Creating Designs Users Really Love | 163 | The Power of Visual Storytelling: How to Use Visuals, Videos, and Social Media to Market Your Brand | 171 |
| Gavin Allanwood and Peter Beare | | Ekaterina Walter and Jessica Gioglio | |
| Part of Our Lives: A People's History of the American Public Library | 163 | Out of the Box Thinking for Successful Managers | 172 |
| Wayne A. Wiegand | | William F. Roth | |
| Facilitator's and Trainer's Toolkit: Engage and Energize Participants for Success in Meetings, Classes, and Workshops | 164 | Applying Educational Research: How to Read, Do, and Use Research to Solve Problems of Practice, 7th ed. | 172 |
| Artie Mahal | | M. D. Gall, Joyce P. Gall, and Walter R. Borg | |
| The UX Five-Second Rules: Guidelines for User Experience Design's Simplest Testing Technique | 165 | Intelligent Content: A Primer | 173 |
| Paul Doncaster | | Ann Rockley, Charles Cooper, and Scott Abel | |
| Reading Sounds: Closed-Captioned Media and Popular Culture | 165 | Infographic Designers' Sketchbooks | 174 |
| Sean Zdenek | | Steven Heller and Rick Landers | |
| Assuring Quality in Online Education: Practices and Processes at the Teaching, Resource, and Program Levels | 166 | Digital Cosmopolitans: Why We Think the Internet Connects Us, Why It Doesn't, and How to Rewire It | 175 |
| Kay Shattuck, ed. | | Ethan Zuckerman | |
| Smaller, Faster, Lighter, Denser, Cheaper: How Innovation Keeps Proving the Catastrophists Wrong | 167 | Teaching and Learning with Technology | 176 |
| Robert Bryce | | Judy Lever-Duffy and Jean McDonald | |
| | | Training Design Basics, 2nd ed. | 176 |
| | | Saul Carliner | |
| | | Landmark Essays on Speech and Writing | 177 |
| | | Peter Elbow, ed. | |
| | | Information Age: Six Networks that Changed the World | 178 |
| | | Tilly Blyth, ed. | |

Plain Language and Ethical Action: A Dialogic Approach to Technical Content in the Twenty-First Century

Russell Willerton. 2015. New York, NY: Routledge. [ISBN 978-0-415-74104-0. 202 pages, including index. US\$44.95 (softcover).]



Plain language allows the reader to understand the writer's intended meaning upon a first reading. The criteria of readability and comprehensibility do not make plain language inherently ethical, however, for content plainly described may also be of dubious morality. Yet plain language, with its emphasis on

describing things in a way the audience is most likely to understand, does "support ethical action" through the "benefits it can provide in specific contexts" (p. 175). Imagine the opposite situation: jargon-like or bureaucratic language so obscure that it misleads the reader. Plain language, in contrast, demands clarity and precision, and in that sense implies an ethical obligation to the reader.

In *Plain Language and Ethical Action: A Dialogic Approach to Technical Content in the Twenty-First Century*, Willerton identifies a framework for diagnosing the need for plain language: BUROC, or Bureaucratic, Unfamiliar, Rights Oriented, and Critical. BUROC occurs when processes are described in great detail with little recourse to audience context (Bureaucracy); the language is rife with Unfamiliar terms; the audience's ability to act within their Rights is compromised by linguistic confusion; and the situation is or becomes Critical.

To avoid BUROC, the writer must understand the audience through Martin Buber's dialogic distinction between I-It—treating the other person as a means, an object, or tool—and I-Thou—treating the other person as an end, as a complex, unique individual. The I-Thou relationship occurs in what Buber calls a "narrow ridge" or "place between two sides of an argument where the parties can meet if they regard each other as Thou and not It" (p.43).

BUROC erodes the I-Thou relationship between writer and reader by not accounting for the actual situation in which the reader finds himself, as in a bureaucracy that reduces individuals to mindless functions within a system. Plain language, by insisting

on the I-Thou relationship as a prerequisite for communication, sets up the basis for and prompts ethical action. Knowing that the audience needs understanding within a particular context, we are morally compelled to write in terms of that specificity and uniqueness.

Understanding the audience thoroughly is therefore the primal requirement for ethical, plain language communication and can be achieved by involving users and readers as co-creators from the beginning of the writing process. The I-Thou relationship emerges through a collaborative, ongoing feedback process that requires "strong practices for writing and reviewing" (p. 178), such as milestone checkpoints, clearly defined roles and responsibilities, and testing the product on an as-you-go basis.

For plain language proponents, then, the fundamental ethical tenet is that the communicator must understand, respect, and write to the audience's specific, unique needs and not assume what the audience is like. Thanks to its practicality, Willerton's method can be immediately integrated with the technical writing process, empowering writers and users to work together in producing technically accurate and ethically sound documents.

Donald R. Riccomini

Donald R. Riccomini is a member of STC and a lecturer in English at Santa Clara University, where he specializes in teaching engineering and technical communications. He previously spent twenty-three years in high technology as a technical writer, engineer, and manager in semiconductors, instrumentation, and server development.

Interface Design: An Introduction to Visual Communication in UI Design

Dave Wood. 2014. London, England: Bloomsbury Publishing. [ISBN 978-2-9404-1199-3. 192 pages, including index. US\$41.95 (softcover).]



Interface Design: An Introduction to Visual Communication in UI Design introduces the basic principles of user interface (UI) design: user experience (UX), information architecture, and graphic design. Wood's approach contains a few principles that can be applied to development team

members, including technical writers, but its primary audience is graphic designers.

Wood opens with a chapter on basic user-centered design and the role of a graphic designer within a development team. Chapter 2 introduces information architecture structures that can be applied across different interface types (websites and video games, for example) and emphasizes iterative planning and testing to refine the information architecture. Chapters 3 and 4 delve specifically into visual communication using elements such as color, layout, and typography, and how to transmit messages and branding via those elements. Chapter 5 provides advice for working within a development team, including designing visual elements modularly so they are easier for a programmer to implement across the interface and a range of platforms. The final chapter closes with the implications of emerging technologies on the future of graphic design.

The chapters are divided into short, digestible segments with accompanying illustrations and plenty of whitespace, making the book a quick read. Each chapter ends with an interview with a practitioner whose expertise relates to the current discussion and a case study that showcases the chapter's advice using a real-world example. This structure, for the most part, works well, and the case studies are one of *Interface Design's* strongest features. At times, there is an excess of illustrations in the chapters: Some images add nothing important while a few even contradict the principles under discussion.

Another weakness in Wood's book is that the breadth prohibits depth into any single subject. It is impossible to cover every interface development aspect in a single, short volume. However, the author's intended audience is graphic designers, and he succeeds in detailing practical advice for that audience, especially in the book's central chapters.

Some of Wood's advice applies to anyone involved in developing an interface. He emphasizes focusing on your users' goals and organizing the information architecture around them from the beginning as well as refining the structure and layout throughout the process using wireframes (diagrams of the basic layout), paper prototyping, and iterative usability testing. Another key tip is "designing for modularity," or recognizing patterns of content (buttons, logos, background images) that are reused throughout the interface (p. 140). Breaking the design down into repeatable elements makes coding the interface easier and optimizes cross-platform display.

Although *Interface Design* has something to offer any development team member, it speaks best to a graphic designer because of its detailed recommendations and processes. I would recommend it to anyone who wants a general introduction to other development process aspects (such as UX and information architecture) and more detailed advice from a graphic design perspective.

Bonnie J. Shamp Winstel

Bonnie J. Shamp Winstel is a technical writer for a small software company in Huntsville, Alabama. She received her master's degree in English and Technical Communication at the University of Alabama in Huntsville in May 2013 and is a New TC Professional member of STC.

Genetic Counseling Research: A Practical Guide

Ian M. MacFarlane, Patricia McCarthy Veach, and Bonnie S. LeRoy. 2014. New York, NY: Oxford University Press. [ISBN 978-0-19-935909-7. 290 pages, including index. US\$47.95 (softcover).]



Genetic Counseling Research: A Practical Guide is intended as a guide for genetic counselors and genetic counseling students pursuing research in their field. It outlines the entire research process starting with formulating research questions and progressing through preparing a manuscript for publication.

Accompanying many chapters are useful worksheets to help the reader through each step. Appropriate research tools and resources are also referred to along the way.

The first chapter lists seven criteria for good research questions and is supplemented by a Research Idea Log in the Appendix. Completion of a literature review follows the development of research questions. Tips are presented for finding sources with suggestions on what to do when too many or too few sources are found and advice is given on critiquing research literature for both qualitative and quantitative studies. The Ethics in Research chapter covers research integrity, the process of obtaining consent from Institutional Review Boards, plagiarism, and conflicts of interest. Choosing a paradigm is another important aspect of the research process. The authors explain both quantitative and qualitative methods and

point out benefits and drawbacks of both. An overview of various sampling methods is also outlined.

The meatiest part of *Genetic Counseling Research* contains chapters on designing quantitative research studies and analyzing the resulting data. Particularly helpful are a Decision Making Flowchart (pp. 171–172), definitions of common statistical terms, and explanations of various statistical methods. The chapter on conducting qualitative studies discusses the philosophical underpinnings and responses to criticisms of this method. Finally, the authors lay out the process of preparing a manuscript for publication. The last chapter provides guidelines for directing research, either as a research advisor in a graduate training program or as a genetic counselor acting as a research team leader.

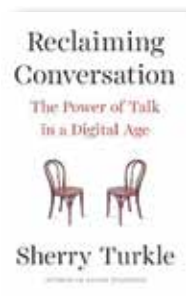
Genetic Counseling Research excels at defining terms and clearly explaining concepts. Another strength is that the authors do a great job of warning against common pitfalls and mistakes in research, potentially saving novice researchers in particular from major problems. Coverage of the research process is very comprehensive. I would consider it to be an indispensable resource for both genetic counselors and students wishing to embark on genetic counseling research projects.

Jennifer Spanier

Jennifer Spanier has been a freelance book and database indexer since 2009 and is an active member of the American Society for Indexing. Previously, she has worked as a biologist and a public librarian and indexes in a wide variety of subject areas.

Reclaiming Conversation: The Power of Talk in a Digital Age

Sherry Turkle. 2015. New York, NY: Penguin Press. [ISBN: 978-1-59420-555-2. 436 pages, including index. US\$27.95.]



Sherry Turkle is a sociologist and a licensed clinical psychologist at Massachusetts Institute of Technology (MIT), so when she discusses technology, she knows what she is talking about. Author of several books on the effects of technology on society, she speaks with authority and deep insight.

What concerns her most in *Reclaiming Conversation: The Power of Talk in a Digital Age* is the effect technology is having on our ability to empathize, which Turkle considers a key element that makes us human. She is not anti-technology but rather pro-conversation. Turkle thinks we must be more intentional about how we use technology and we must understand what we are losing when we abuse it, particularly with the use of smartphones.

Her book is a compilation of research based on data and conversations with students with insights of memoir tantalizingly scattered here and there. For example, Turkle learned the importance of privacy from her grandmother, who said that her mailbox and library record could never be violated.

But she worries now from so many conversations with students that the smartphone has become a “tiny god” that has robbed us of our solitude, so that people must always be “plugged in” to be “turned on.” The smartphone and other technologies have damaged our ability to have face-to-face conversations, and that has endangered the ability to empathize and therefore form friendships. And finally, it is hurting our mentoring of others so that society ultimately suffers from the loss of knowledge that is not passed on.

Turkle also has interesting things to say about punctuation that would amuse technical communicators who have been laboring over these issues for years. Punctuation is crucial in texting, where texts are often read as angry unless they are softened with emoticons and punctuation—lots of punctuation. “In texting, we’ve seen that punctuation is one of the main ways to express all of the information that tone of voice and body posture would convey in a face-to-face conversation” (p. 200).

Turkle’s audiences for *Reclaiming Conversation* are two-fold: one that needs to be persuaded that we have lost something and another that feels defeated but still needs to be in the conversation game. I belong to the second group, as I watch zombied young workers walk down my company’s hallways without even looking up from their smartphones and young people who don’t know how to introduce themselves at a meeting (or think that they even should). I’m very concerned that the first group will not be persuaded.

Only when technical communicators like ourselves start questioning the overreach of technology will millennials see that something is wrong. I hope others will read this crucially important book and join the fight to regain what has been lost.

Charles R. Crawley

Charles R. Crawley is a lead technical writer at Rockwell Collins and an adjunct professor at Mount Mercy University in Cedar Rapids, Iowa. He texts badly but is glad to have a conversation.

User Experience Design: Creating Designs Users Really Love

Gavin Allanwood and Peter Beare. 2014. New York, NY: Fairchild Books. [ISBN: 978-2-9404-9613-6. 184 pages, including index. US. \$44.95 (softcover).]



User Experience Design: Creating Designs Users Really Love is part of the Basics Interactive Design series that lets readers learn more about effective designs revolving around users. Allanwood and Beare state in the introduction that the book is for those who are learning about interactive design and plan to be

involved in creating a product or service for other people to use. Part One introduces readers to a brief rundown of what user experience design (UXD) is and the many roles that take place within the field. The first chapter helps readers think about user experience and then progresses readers to understanding users, concluding in the final three chapters with challenging readers to recognize and apply UXD methods.

The book has many activities for readers to perform that lets them see things such as a working with a development cycle, observing a user's journey, exploring solutions, and building a prototype. These activities give readers a chance to experience what UXD is like and how to perform it. *User Experience Design* concludes with design methods that discuss design patterns, layout, type, images, and toolsets to complete the projects. The book's conclusion states that "Experiences are more important than the products or services themselves, and this has to be considered if we are going to add value to the world with our creative efforts" (p. 170).

The book leaves readers with further resources as well as a glossary to easily access new sources and terms while reading it. When working on a project, the activities, glossary, and further sources let first-time user experience designers further invest in learning more about the field and design processes.

I enjoy how Allanwood and Beare provide case studies, interviews, and activities, giving the readers a real hands-on experience in discovering how things are done within the UXD world. With these activities, readers can actually do their own user test and build their own prototype. Throughout *User Experience Design*, users can also complete each step just as designers would during their own design process. This book has an easy-to-read layout that can be quickly scanned to find the sections that you need. Readers can depend on the simplicity in style and the use of images to make it an easy read. *User Experience Design* is packed with information that will help readers learn more about designs and includes examples from real world brands.

Kristi Wiley

Kristi Wiley is currently a PhD student in Rhetoric and Writing at Michigan State University. She focuses her research on UX, content strategy, technical writing and editing, usability, and Information Architecture.

Part of Our Lives: A People's History of the American Public Library

Wayne A. Wiegand. 2015. New York, NY: Oxford University Press. [ISBN: 978-0-19-024800-0. 332 pages, including index. US\$34.95.]



Public libraries continue to be highly regarded by Americans, even as esteem for other public institutions wanes. In *Part of Our Lives: A People's History of the American Public Library*, Wayne Wiegand, Florida State University professor emeritus of library and information sciences, traces the history of this public institution and explores why libraries have "multiplied, survived, and regularly prospered" (p. 265).

Wiegand found in his extensive research that Americans love libraries for more than the books they provide. *Part of Our Lives* is divided into chapters devoted to time periods, such as the Great Depression through World War II. As his book progresses from the colonial era of subscription-only social libraries through the first municipal library established in Boston in 1854 to the present-day wired facilities, Wiegand provides

myriad examples of the library's threefold function in the community. This public institution makes useful information accessible, offers stories that influence readers' lives, and provides public spaces where people of different cultures, genders, races, and ages congregate for many purposes. It is this combination that gives libraries their staying power and, in Wiegand's opinion, actually helps mold communities.

While he set out to write a history from the library patron's point of view—to “feature . . . the voices of generations of public library users” (p. 3)—*Part of Our Lives* is also a record of the development of the librarian as a professional knowledge worker. The juxtaposition of patron demands with the professional standards of the librarian, which were often dramatically different, provides one of the book's ongoing themes.

Another theme is the role of technology. From the public card catalog and book-card-in-a-pocket checkout system to today's computers that “support most of the public library's basic routines” (p. 250), Wiegand follows changes in library operations that include taking advantage of the very electronic media some predicted would end library usefulness.

Part of Our Lives is densely packed with facts of library history, with only a few illustrations, which could have made for tedious reading. But the many anecdotes of library users—many from original sources, such as memoirs—add a liveliness to the text that makes it very readable. While Wiegand does not provide a bibliography, his sources are well documented in his notes in each chapter.

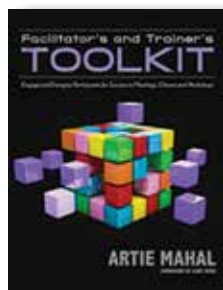
As a fan of both libraries and history, I recommend *Part of Our Lives*, not only for its survey of library history, but also for its look at what was happening in American society. What happened in libraries reflected social movements, such as racial integration, trends in censorship, and women's and gay rights, as well as the political and economic milieu library patrons were experiencing. Other readers may be as surprised as I was to discover just how integral the public library has become to American life.

Linda Davis

Linda M. Davis is an independent communications practitioner in the Los Angeles area. She holds an MA in Communication Management and has specialized in strategic communication planning, publication management, writing, and editing for more than 25 years.

Facilitator's and Trainer's Toolkit: Engage and Energize Participants for Success in Meetings, Classes, and Workshops

Artie Mahal. 2014. Basking Ridge, NJ: Technics Publications, LLC. [ISBN: 978-1-935504-89-4, 314 pages, including index. US\$29.95 (softcover).]



Artie Mahal's *Facilitator's and Trainer's Toolkit: Engage and Energize Participants for Success in Meetings, Classes, and Workshops* is mostly geared toward facilitators. The author defines a trainer as “a person who teaches,” which “impl[ies] that the trainer possesses the knowledge and ‘owns’ the learning” (p. 189). Facilitators, on the other hand, “create an environment where learning can take place” (p. 189). Since I had just completed a two-week training assignment when I read this book, I found the emphasis on facilitation somewhat disappointing. However, a trainer often also acts as a facilitator, at least during the question-and-answer period of a presentation.

The book provides a variety of checklists and templates designed for freelance facilitators. These range from capturing the basics of a given assignment through preparation for the actual workshop or group session all the way to a follow-up assessment after the event. A discussion of various techniques that can be used to engage the audience, manage group dynamics, and elicit creative responses concludes the book.

Most of these checklists come from Mahal's own work as an external facilitator and consultant. As the book title implies, much of the text is focused on practical advice. A few sections, however, also discuss more theoretical concepts, such as adult learning theory. The entire first chapter is also devoted to the “Mahal Facilitation Framework” developed by the author.

Originally from India, Mahal is keenly aware of the intercultural dimensions of group work in many companies and organizations and often points out potential pitfalls and limitations. For example, he notes, “of course, the dress code mentioned here is for Western cultures” (p. 113). As a translator who is also originally from elsewhere, I found this emphasis quite refreshing. In addition, an entire chapter by Catherine Mercer Bing is devoted to cross-cultural facilitation.

Facilitator's and Trainer's Toolkit is the first edition published by a small U.S. press. If there were a second edition, it would benefit greatly from more thorough editing and proofreading.

Barbara Jungwirth

After writing software documentation and managing an IT department, Barbara Jungwirth now translates German technical documents into polished English appropriate for a specific audience. She owns reliable translations llc (www.reliable-translations.com), writes a blog called On Language and Translation (www.reliable-translations.com/blog/), and tweets (@reliabletran). You can also connect with her on LinkedIn (www.linkedin.com/in/BarbaraJungwirth).

The UX Five-Second Rules: Guidelines for User Experience Design's Simplest Testing Technique

Paul Doncaster. 2014. Waltham, MA: Morgan Kaufmann. [ISBN 978-0-12-800534-7. 117 pages. US\$24.95 (softcover).]



The UX Five-Second Rules: Guidelines for User Experience Design's Simplest Testing Technique takes on a timely user experience (UX) topic: remote, unmoderated usability testing. Borne from a business environment where bottom lines often necessitate lean approaches to complex design problems, remote, unmoderated

usability tests have been developed to take advantage of social media technologies and the pervasiveness of the data they make available. Users now freely post terabytes of information about their habits, needs, and desires online through many applications. Smart UX researchers are attempting to leverage these social habits to create simple, affordable approaches and tools that ask users to help solve design problems.

The five-second test introduced in Doncaster's book aims to contribute a sound methodology for one specific element of remote testing: surveys that are typically tagged onto the beginning or end of tests. The author says, "A test participant is given a set of instructions, views an image of a design for a few seconds, and answers questions about it" (p. 2). Such

a simple description belies a fairly elegant and rigorous approach, however, to designing these surveys. Reading *The UX Five-Second Rules* teaches you everything you need to know about how to design a sound user survey, including how to design sound questions, how to ensure images being tested are accessible, how to properly order survey questions to maximize response rates, and more.

Doncaster correctly asserts that user surveys, a feature included in every remote testing software application this reviewer has used (that is, UserZoom, TryMyUI, UserTesting, etc.), are often considered an add-on feature to usability tests themselves. This has rendered useless a potentially powerful tool for gaining insights into user behaviors. Part of the problem, as Doncaster points out, is that these surveys are often used when a different method might produce better results. He goes on to explain that five-second tests are only suited to very simple response situations where the user can judge in five seconds whether a design element is having its intended effect on the user. A classic example is showing a user a company logo and asking him or her to judge the logo for emotional resonance, credibility, and trustworthiness.

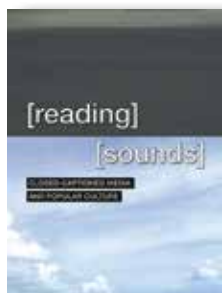
In an economical 108 pages, Doncaster presents some important considerations for UX researchers wishing to employ user surveys. Rather than provide an overview of the entire UX process, *The UX Five-Second Rules* zeroes in on one specific method and provides timely, useful advice. This book is part of a growing literature showcasing the benefits and drawbacks of specific UX methods that will hopefully encourage practitioners and researchers to refine, and ultimately systematize, their approaches to studying user behavior.

Guiseppe Getto

Guiseppe Getto is a North Carolina college professor. He is also President and Co-Founder of Content Garden, Inc., a digital marketing and UX consulting firm.

Reading Sounds: Closed-Captioned Media and Popular Culture

Sean Zdenek. 2015. Chicago, IL: University of Chicago Press. [ISBN 978-0-226-31278-1. 338 pages, including index. US\$40.00 (softcover).]



Reading Sounds: Closed-Captioned Media and Popular Culture solidifies Zdenek's position of more than 10 years' experience researching and writing about captions. Brenda Brueggemann gives the best review possible on the book's dust jacket: "There's no book like this; plain and simple, it

is one of the most original new books I've ever read." This review addresses several factors that help make this book so powerful.

Reading Sounds is clearly written and enjoyable. Commanding attention from sentence one, Zdenek builds a compelling argument not just that captions are interesting but also that captioners engage in significant rhetorical work—work that impacts D/deaf, hard-of-hearing, and hearing viewers' lived experiences. He shares more than his findings with the readers; Zdenek is transparent with his research tools and methodology. Consistent reference to his process and framework motivates with positive impact, urging readers to watch more captioned media critically. He does not focus just on "caption fails"—an easy target for new and experienced caption critics. Zdenek moves readers to watch for captioning excellence, to identify when and how captioners successfully provide full, rich access to meaning held in the soundtracks and non-speech information.

Zdenek maps out multiple research paths, topics, and potentials. This framing is potentially as important to caption studies as Blakeslee and Spilka's (2004) "The State of Research in Technical Communication" and Blakeslee's (2009) "The Technical Communication Research Landscape" are to technical communication research. Unlike Blakeslee and Spilka, Zdenek does not have a large community of technical communication scholars and researchers to draw from. Caption studies is currently comprised of a handful of practitioners—at least within the humanities-related portions of the field. Fortunately, as Zdenek makes clear throughout *Reading Sounds*, we can learn much by collaborating with captioning practitioners, researchers, and advocates.

Zdenek empowers caption research early on by presenting four basic principles and seven transformations of meaning that take place in captioning. This gifting of resources is just one example of why *Reading Sounds* is comparable to a Bag of Holding from Dungeons & Dragons for anyone moderately or passionately interested in captioning research. Like a Bag of Holding, this book contains far more than its 338 pages belie. Two other gems are:

- a 21-page bibliography that is a goldmine for anyone interested in captioning-related work and research, and
- a playful, fun, and critical analysis and discussion of diverse approaches to captioning *Futurama's* Hypnotoad as well as their possible implications and meanings. This analysis also models how a close and detailed examination of popular culture can be engaging and informative.

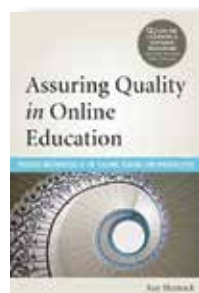
The book's companion site, ReadingSounds.net, has over 500 labeled, organized, and succinct captioning examples aligned with each chapter of the book. Even if *Reading Sounds* was not a book, this site would be worthy of close reading and review. Read the book, visit the site, and permanently change how you understand closed captioning.

Gregory Zobel

Gregory Zobel is an assistant professor of Educational Technology at Western Oregon University.

Assuring Quality in Online Education: Practices and Processes at the Teaching, Resource, and Program Levels

Kay Shattuck, ed. 2014. Sterling, VA: Stylus Publishing. [ISBN 978-1-57922-871-2. 290 pages, including index. US\$35. (softcover).]



Shattuck's edited collection offers three perspectives on assuring quality on the teaching, resource, and program levels. The seventeen chapters, plus two chapters of closing thoughts, are authored by multiple authors and balanced equally over all three levels. This is a significant strength and weakness for the book.

Buyers for professional development programs, holistic program review, and academic libraries will find value in *Assuring Quality in Online Education: Practices and Processes at the Teaching, Resource, and Program Levels*. It collects perspectives that serve the multiple audiences and stakeholders who would participate in program review, online education training, and administration. For individual stakeholders, the book holds less value. As a working faculty and former graduate program administrator, I found the book frustrating. There was just enough material in multiple chapters of the teaching and program levels to make them interesting—but there was not enough to drive me to want the book as a whole.

Each level has multiple mediocre chapters that provide overviews or descriptions. However, solid pieces; like chapter 5 on Transparency and Quality Assurance (QA) by Morrison, Paulson, and Poulin as well as chapter 8 by Bogle, Day, Matthews, and Swan; focus on collaborative and collegial approaches to online teaching, which more than balanced these weaker fillers.

Several chapters were particularly interesting. Thompson and Kuhne provide a vital and valuable emphasis on ethics in their chapter “Ethics Matters.” Besides asking core questions like what and who matter, they spend several pages discussing the ethics around employing adjuncts.

Chapter 16, “An Adaptive Model for Calculating Contact Hours in Distance-Education Courses,” presents a model for calculating credit hours in online education, an issue of consistent interest to faculty and administrators. The authors provide a good background and an interesting model. However, after several readings, I could not shake a root problem: How did they come up with the amount of suggested time for each activity? Given the detailed emphasis on time and math to calculate the contact hours, I hoped to see more explanation and justification in the reasoning or at least suggestions in how to tease out some of the complexities. A forum question that requires a short answer versus a long response that synthesizes multiple reading sources require different amounts of time. A clearer description on this issue could have helped many online educators explain how the devil is in the details to their administrators and outside critics.

Overall, Shattuck’s book has some interesting ideas, literature reviews, and several vital concepts explored. But, at the end, you have to choose carefully what you read or you might feel like you want your time back.

Fortunately, the book is clearly organized with each chapter containing multiple short sections, which may empower potential readers to review the content and assess for themselves whether they should invest in several chapters or the whole book.

Gregory Zobel

Gregory Zobel is an assistant professor of Educational Technology at Western Oregon University.

Smaller, Faster, Lighter, Denser, Cheaper: How Innovation Keeps Proving the Catastrophists Wrong

Robert Bryce. 2014. New York, NY: PublicAffairs. [ISBN-978-1-61039-205-1. 374 pages, including index. US\$17.95.]



Journalist, author, and public speaker Robert Bryce has published many articles on energy and oil use and five books such as *Power Hungry*, *The Myths of “Green” Energy*, and the *Real Fuels of the Future*, serving as a senior member of the Manhattan Institute for Policy Research. Bryce’s latest book, *Smaller, Faster, Lighter, Denser, Cheaper: How Innovation Keeps Proving the Catastrophists Wrong*, provides a positive take on the future. He argues that solutions to today’s environmental challenges will come from technology. This technology will, in the future, reflect a human need to make things better, where better means faster, cheaper, lighter, denser and smaller. This includes lighter cars and faster computers.

Reporting from locations such as California, Oklahoma, Canada, and Panama, Bryce shows how companies are providing improved products and services using newer technologies that improve our lives. Not only do they improve our lives, they are earth-friendly.

What kinds of technologies are these? Bryce mentions the printing press and mobile phones, nanotech medicine and advanced drill rigs, vacuum tubes and mass-produced fertilizer.

Which companies are involved? Bryce cites newer groups, such as Khan Academy, and established names, such as Intel and Ford, which are both start-ups and well-known companies.

The positive message appears to be focused on how we will have a better, more sustainable future as we do what humans do—make things better by making them smaller, faster, lighter, denser, and, of course, cheaper.

If you feel like the future faces social, economic, and environmental challenges, you might enjoy reading about how innovation, technology, and human drive should continue to preserve the planet and the human race.

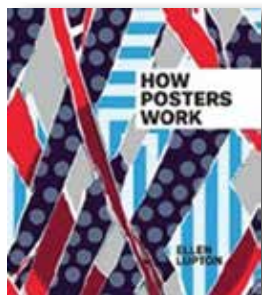
Is the book fun to read? If you don't mind optimism about the future, a look at innovation and human progress, comments about a future with abundant energy, lighter cars, and faster computers, you could find the book fun to read. You will also read about how people's lives continue to improve to be more comfortable, even addressing issues of overcoming poverty. Entrepreneurs will continue to improve technologies and provide innovation, solving current problems on our planet.

Jeanette Evans

Jeanette Evans is an STC Associate Fellow and active in the NEO community, currently serving on the newsletter committee. She holds an MS in technical communication management from Mercer University. Jeanette's published article, "Emerging Technologies: Where We Have Been and Where We Are Going," appears in STC's *Intercom* magazine.

How Posters Work

Ellen Lupton, Caitlin Condell, and Gail Davidson. 2015. New York, NY: Cooper Hewitt Smithsonian Design Museum. [ISBN 978-0-910503-82-6. 208 pages. US\$29.95.]



A poster's fundamental purpose is to share information, persuade, and act as a promoter of an event or merchandise. With reference to past events, the poster has been a potent communication and propaganda tool. The poster can be traced back to the 1500s in

the form of early printed broadsides. These temporary documents, lasting no more than one day (ephemera), were mass-produced on a large sheet of paper and printed on one side. The broadside delivered governmental notices and announced proclamations, events, and public

decrees with the poster maker's aim focused on utility rather than beauty. As printing processes became more advanced, broadsides also evolved, and woodblocks, copper, and metal engravings were the primary methods of producing illustrations and typography. Today's poster did not develop and become visible as a visual communication medium until the early 19th century.

In *How Posters Work*, the authors analyze fourteen principles of design and perception, including their relationship to the poster as a communication medium. This book showcases a diverse collection exploring aesthetic movements, disparate expressive forms, and cultural trends to form the rich visual character of contemporary graphic design. Through the designer's lens, the methods and practice of perception, persuasive language, and composition are employed into the physical construction of these reproduced posters. Lupton says on page 12 in her essay "Vision Is a Process": "This is not a book about posters. It is a book about how designers see. The works assembled here show how dozens of different designers—from prominent pioneers to little-known makers—have mobilized principles of composition, perception, and rhetoric. Each poster enacts ways of thinking and making, and each poster wants to be seen. How do we look at graphic design, and how, in turn, does graphic design look back at us?"

This book is a comprehensive, diverse, contemporary collection that examines how a designer's choices and limitations of reproduction and printing processes has dictated the making of posters as a means of visual communication. Caitlin Condell notes in her essay "How Posters Are Made," "Most of the printing methods that are represented by the posters in these pages were invented in the service of other industries, but were adopted and transformed by enterprising designers in pursuit of their graphic vision" (p. 24).

How Posters Work is essential reading for the specialized professional, design student, or anyone interested in poster art created in the international arena, including a wealth of widely recognized images and representing celebrated posters by distinguished designers such as Erik Nitsche, Felix Pfäffli, M/M (Paris), Sulki & Min, and Paul Scher. This book is a valuable resource and noteworthy contribution to the poster's historical development and production that continues to play a niche communications role in our present-day graphic language.

Richard B. Doubleday

Richard B. Doubleday is an assistant professor in the Department of Graphic Design at Louisiana State University's School of Art. He is a contributing author of Phaidon Archive of Graphic Design and Meggs' History of Graphic Design. Richard has been published in Baseline, IDEA, Print, NOVUM, Zhuangshi, and Australian Creative.

Advertising Design and Typography

Alex W. White. 2015. New York, NY: Allworth Press. [ISBN 978-1-62153-481-2. 224 pages. US\$29.99 (softcover).]



The complex nature of advertising design makes it a difficult area of study. Practitioners in this field need to be well versed in the art of persuasion as well as in how to use images, type, and space to effectively communicate with target audiences. In *Advertising Design and Typography*, White shares a

wealth of knowledge in the advertising (ad) design field. The wisdom that White imparts about the goals of effective ad design and typography apply to all design fields. The theories that he presents on strategies and executions contain some of the best insights on the use of persuasion in a way that will connect with all readers.

White argues that “there are three ingredients designers use to communicate: type, imagery and space” (p. 11). *Advertising Design and Typography* is organized so that it addresses these three topics. The first section focuses on the persuasive aspect and strategies of ad design, while the second and third sections focus on the execution of design (the use of images, space, and typography). Space is a design element that White emphasizes as being important, yet it is often overlooked and underplayed. Design books focus their efforts on the use of images and type, but space is a valuable commodity that should be treated with importance. White provides examples of designs that illustrate a complex understanding of the nature of space, which, when used along with an understanding of medium, results in some of the most powerful, persuasive design examples in his book.

Readers should read all the content within this book, including the side notes, quotations, and image captions, as they will find relevance in those sections

that complement the main content. These extras provide insight and inspiration that are also riddled with wit and humor, yet also decidedly perceptive. Additionally, White supports his content by using an abundance of images that illustrate the presented ideas. These advertising images come from the past and the present, which appear to be carefully selected as the strongest examples to help clarify White's points and arguments.

Advertising Design and Typography is a well-designed book that offers clear, concise details of how to persuade audiences within the limitations of the printed media, but also in Web and television advertising. This book is an essential resource for anyone wanting to break into the advertising design field or for those who wish to further their knowledge of designing successful layouts.

Amanda Horton

Amanda Horton holds an MFA in design and currently teaches graduate and undergraduate courses at the University of Central Oklahoma in the areas of design technology, design studio, and history of graphic design. She serves as a book reviewer for *Technical Communication*.

Project Leadership: Creating Value with an Adaptive Project Organization

Barry L. Cross and M. Kathryn Brohman. 2015. Boca Raton, FL: CRC Press. [ISBN 978-1-4822-1630-1. 208 pages, including index. US\$49.95.]



Project management is a hot topic with all sorts of self-help books appearing to help you be a better project manager. These resources range from the complex, such as the Project Management Institute's *Project Management Book of Knowledge*, to simplified versions where you can manage several projects at once, such as Campbell's *The One-Page Project Manager* that advocates for a one sheet of paper approach.

Cross and Brohman, in *Project Leadership: Creating Value with an Adaptive Project Organization*, take the discussion up one level arguing that many, if not most, projects fail because of poor leadership. They argue that leadership should be responsible for monitoring all projects, both formal and informal.

One thing worth noting: Both authors are academics at the Queen's University School of Business in Australia. However, both have had experience with international companies, so their examples are not limited to Australian situations.

They quickly identify who the reader is and who the reader is not: "... the tactics we discuss are intended for you and your peers in management, while not so much for the project team members" (p. xii). In nine chapters plus two appendices, they lay out their argument. They define leadership as "connecting the strategy and purpose of the firm to the key projects. . . . [It] provides oversight, visibility, control, and learning to all projects" (p. 40).

The first three chapters are fairly standard and easily recognized by those familiar with project management. For new project managers, the authors set the scene, focusing on the case for project leadership and why projects fail, centering their comments on their view that leadership is at fault for many failed projects.

The next five chapters also cover fairly standard topics: oversight and control (Chapter 5), risk management (6), scheduling (7), and operation (8). Again, the perspective is not that of one actually working on the project but of the oversight of leadership in one or many such projects.

And that brings us to Chapter 9: "Building an Adaptive Project Organization," which is the heart of their argument. They assert that the key to effective leadership is an adaptive environment that has control, focus, and attention on oversight and visibility: "An adaptive project organization, then, needs adaptive structures, processes, and systems . . ." (p. 160). Adaptive equates with careful reaction to surviving in changing conditions.

For those in leadership positions, *Project Leadership* could add to available leadership tools. The examples are from several areas in academic and business, so readers can adapt solutions to their situations. The book's weakness is that so much of it is highly generalized and abstract, as it must be to appeal to a variety of readers. For a technical communicator looking to increase leadership skills and seeing how his or her organization's projects often seem to fail, the book is a good first place to begin.

Tom Warren

Tom Warren is an STC Fellow, Jay R. Gould Award for Excellence recipient, and professor emeritus of English (technical writing) at Oklahoma State University, where he established the BA, MA, and PhD technical writing programs. Past president of INTECOM, he served as guest professor at the University of Paderborn, Germany.

WordPress: The Missing Manual

Matthew MacDonald. 2014. Sebastopol, CA: O'Reilly Media. [ISBN 978-1-449-34190-9. 613 pages, including index. US\$29.99 (softcover).]



WordPress: The Missing Manual is a very useful guidebook for anyone planning to create a WordPress website, from a complete beginner to someone with Web design and WordPress experience. In my case, I knew how to hand-code a website using HTML and also had experience editing WordPress sites

but needed a guide when it came to moving my website to the more convenient WordPress platform. I found it to be just what I needed to get over the hump.

MacDonald begins by explaining how WordPress works and what kinds of sites can be built with it, from basic blogs to catalogs and business websites. Two main options are available for hosting WordPress sites. One is to use WordPress.com, which is free, at least initially. The other is to use another Web host of your choice, which is called the self-hosting option. MacDonald includes a helpful table on pages 20 and 21 that compares these two options. Following are two chapters with step-by-step instructions on how to proceed with each.

From there, in Chapter 4, MacDonald describes how to create posts on your new website using the WordPress interface, Dashboard. Also explained is how to organize posts using Categories and Tags. Chapter 5 covers choosing a theme and polishing it for your own needs. The following three chapters cover how to make your posts look fancier and more interesting, including how to add pictures, how to add pages and menus, and how to allow your readers to make comments. Once mastering all these skills, many readers will have a nice, basic website that they are completely satisfied with. However, this is only the first half of the book.

The next section of *WordPress: The Missing Manual* is "Supercharging Your Blog." Here, the reader can learn how to use plug-ins to add new features, such as contact forms and mobile support, and also add special features such as picture galleries, video, and music. Chapters 11 and 12 cover adding other authors to your site and attracting a crowd of readers.

The final section, From Blog to Website, covers more specialized skills such as editing your theme to

customize your website and building a more advanced WordPress site. Many readers will never need to use this part of the book, but more experienced Web designers will enjoy it.

Throughout *WordPress: The Missing Manual*, MacDonald demonstrates each step of the process for creating a WordPress site with easy-to-understand instructions and visual support. He provides many useful figures and text boxes that go into more detail on specific topics. Also included are three appendices on Migrating from WordPress.com, Securing a Self-Hosted Site, and Useful Websites. MacDonald wrote the book in such a way that readers can start at the beginning or jump to whatever topic is of interest. I highly recommend it to everyone interested in using WordPress.

Jennifer Spanier

Jennifer Spanier has been a freelance book and database indexer since 2009 and is an active member of the American Society for Indexing. Previously, she has worked as a biologist and a public librarian and indexes in a wide variety of subject areas.

The Power of Visual Storytelling: How to Use Visuals, Videos, and Social Media to Market Your Brand

Ekaterina Walter and Jessica Gioglio. 2014. New York, NY: McGraw-Hill Education. [ISBN 978-0-07-182393-7. 224 pages, including index. US\$29.00 (softcover).]



“For 32,000 years, people have drawn. We’ve written for only 5,000,” states Dan Roam (p. ix), author of *The Back of the Napkin*, in the Foreword to *The Power of Visual Storytelling: How to Use Visuals, Videos, and Social Media to Market Your*

Brand. This powerful statement reminds the reader that storytelling is thousands of years old. Our ancestors told stories and drew pictures to convey and record information. The stories were then carried down from generation to generation. Written language has only

come about in the last 5,000 years, and the earliest languages used pictures or symbols.

Since Johannes Gutenberg invented the printing press in 1440, there has been a surge in the printed word. It wasn’t until the 21st century ushered in mobile technology, such as Apple’s iPhone and iPad, that we have the ability to once again tell stories. These and other similar devices gave rise to social media, such as Facebook, Google+, Instagram, LinkedIn, Pinterest, Twitter, and YouTube. Consumers are turning to social media rather than books or manuals to locate information and procedures. At the same time, attention span is diminishing. So, it is important for companies to use visuals, along with text, to tell our stories and use a variety of social media to reach customers.

There is power in visuals. For example, Walter and Gioglio illustrate this by pointing out the word GIRL by itself doesn’t convey emotions, nor does it tell us what she is doing or how old she is. However, just by including an image of a girl, additional information is easily conveyed. The authors point out that visuals are processed 60,000 times faster than text.

In addition, the authors point out that “viewers are 85% more likely to purchase a product after watching a product video” (p. 21).

The Power of Visual Storytelling begins by summarizing the rise of visual storytelling, and it gives an overview of the types, tips, and tactics of visual marketing. The authors explain the power of using visual storytelling on social networks. I found Chapter 4, “Developing a Visual Storytelling Road Map: From Strategy to Implementation,” to be a tremendous resource for anyone developing a social media plan for their company. This chapter stresses the importance of auditing and analyzing what to do and walks the reader through a step-by-step process to implement visual storytelling. The book concludes with real-time marketing examples of how social media is used. Also, tips, such as the “Social Media Image Sizes by Platform” (pp. 150–151), are sprinkled throughout.

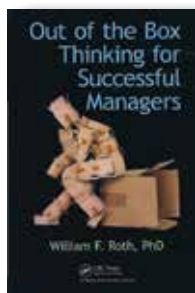
This book is an ideal reference for incorporating storytelling into your company’s marketing and social media.

Rhonda Lunemann

Rhonda Lunemann is an STC member of the Twin Cities chapter. She is a technical writer with Siemens PLM Software. Rhonda is also a member in a local writers’ group, Write Now!.

Out of the Box Thinking for Successful Managers

William F. Roth. 2014. Boca Raton, FL: CRC Press. [ISBN 978-1-4822-4706-0. 214 pages, including index. US\$49.95.]



While excited to receive a copy of *Out of the Box Thinking for Successful Managers*, my excitement quickly turned to disappointment. This book does not deliver on the title. It has some good pieces of information, but I don't know that you necessarily need to read this book to learn them. For example, you can read could read

Daniel Pink's *Drive: The Surprising Truth About What Motivates Us* to learn the same 'out of the box thinking' for managers, along with additional information that is unique to Pink's book.

I spent some time thinking about where this book went wrong. My assessment is that Roth lacked a specific audience definition. The book is written for managers, but what type of manager? For example, the "manager" label can be applied to many roles within an organization. There are the first-line managers who provide direct support for many employees. There are the more senior managers who often manage managers. There are also directors, general managers, vice presidents, and other management roles that eventually lead to chief executive officer.

I assumed *Out of the Box Thinking for Successful Managers* was written for the most common management role (to appeal to the largest audience): The first-line manager. Yet the first-line manager does not usually have the authority to implement many of the recommendations for change that Roth proposes.

Domain also matters. Writing a book for managers who work in the technology or pharmaceutical sectors differs from guidance you'd provide to managers in the retail or manufacturing industry. Roth writes the book as though the guidance works across industries and that has not been my experience.

The biggest problem I have with this book is that the organizational issues that affect change from being successful are not discussed in enough detail. All the management theory and proposals for change do not work well if the organization is dysfunctional. Roth could have provided some criteria for identifying a

dysfunctional organization and guidance for how to handle this scenario.

In addition, he could have provided guidance for companies of various sizes. Being a successful manager at a company with 100 employees is very different than being successful at a company with 8,000 employees. Organizational change is more challenging in various scenarios and this challenge is not addressed.

My take away is that you should skip this book and spend your time reading another book in the category. I want to love it, but it falls short.

Angela Robertson

Angela Robertson is a technical program manager in Raleigh, NC. She currently works in Customer Content Services with Red Hat Software. Prior to her current role, she worked in a variety of content-related roles with IBM Corporation. She has a master's of science degree from North Carolina State University.

Applying Educational Research: How to Read, Do, and Use Research to Solve Problems of Practice

M. D. Gall, Joyce P. Gall, and Walter R. Borg. 2015. 7th ed. Hoboken, NJ: Pearson. [ISBN 978-0-13-286863-1. 604 pages, including index. US\$92 (looseleaf).]



Technical communication programs recognize the importance of research related to their students' careers. Understanding and applying research in such areas as reader analysis, accessible instructions, and graphic design, among others, enhances the quality of the products future technical

communicators produce. Unfortunately, the amount of quantitative, qualitative, ethnographic, and other forms of technical communication research is minimal but growing. Besides these research projects, research in other fields can be used, as in the case with Gall, Gall, and Borg's *Applying Educational Research: How to Read, Do, and Use Research to Solve Problems of Practice*.

Much can be gained from their material. Not only are their instructions useful for a particular approach but also their use of both excerpts from research articles as

well as full text examples. They divide their text into six parts and 19 chapters. Further, they provide key points, study suggestions, a self-check and suggested answers, five appendices, a glossary, and name and subject indexes. Part One provides an overview of using research (two chapters); Part Two discusses applying research (two chapters); Part Three explores quantitative research (eight chapters); Part Four looks at qualitative research (four chapters); Part Five shows how quantitative and qualitative research can be combined (one chapter); and Part Six addresses other research methodologies (two chapters).

While education students wanting to do research are the primary target of *Applying Educational Research*, they are not the only ones that can benefit. Frequently, trainers turn to educational research to strengthen their training programs. They can apply results in the training room as well as use them to support proposals. But, are they prepared to read, accept, and apply the results? No doubt some trainers have a background that prepares them to critically analyze the research they use. Many, however, are not so prepared, and for them, *Applying Educational Research* will provide a valuable resource.

Technical communicators, especially trainers, will find suggestions on how to do many types of research. For those doing research that describes a given population (users, for example), a study that uses descriptive statistics might be most valuable. Chapter 9 offers help in determining the sample size and type; constructing questionnaires, including scales such as the Likert scale; and evaluating the evidence. In addition, those who read and apply research will find the sections on evaluating different research methodologies helpful.

Will this book be valuable to technical communicators, especially given its focus and price? It would certainly prove useful to a limited population and, as such, would find a place in a company library. The book, being in a 7th edition, means that academia accepts it, but what about outside academia? I think it would be especially useful for trainers and technical communicators who do research on information design and their anticipated audience.

Tom Warren

Tom Warren is an STC Fellow, Jay R. Gould Award for Excellence recipient, and professor emeritus of English (technical writing) at Oklahoma State University, where he established the BA, MA, and PhD technical writing programs. Past president of INTECOM, he served as guest professor at the University of Paderborn, Germany.

Intelligent Content: A Primer

Ann Rockley, Charles Cooper, and Scott Abel. 2015. Laguna Hills, CA: XML Press. [ISBN 978-1-937434-46-5. 128 pages, including index. US\$24.95 (softcover).]



Intelligent Content: A Primer by Rockley, Cooper, and Abel starts with an insightful definition for intelligent content that engages the reader and sets the pace for broader concepts that follow. They use call outs, notes, and highlighted practical advice to distinguish benefits and concepts that educate and make

content issues easier to grasp.

The authors argue that organizations need to consider a more strategic approach in finding solutions to the content conundrum. Rockley, Cooper, and Abel support their argument with research, business intelligent data, real-world scenarios, and ideas that take a leap into a world where content moves from “productivity-zapping” mode to quality content experiences. Through anecdotal case studies, they drive the point that intelligent content is the revolutionary way to reach sustainable business solutions.

Professional writers and those creating or managing content would find Chapter 4, The Benefits of Intelligent Content, an information reservoir to shift the needle from siloed thinking and practices. This chapter heightens the practical and business-sense argument: that intelligent content helps organizations achieve positive bottom-line impact derived from changing consumer needs and expectations that are satisfied. The fact that intelligent content helps to outpace a competitor makes its use and application logical, sensible, and sound in judgment; rework is avoided, making processes supportive of LEAN concepts.

Rockley, Cooper, and Abel explain how broadly applicable intelligent content is, not only in content marketing, but in other common places: traditional marketing content, product and support content, learning and training content, and employee-focused content. They write in simplistic terms that make the reader want to progress through the chapters learning more with a curiosity to know how the authors will further discuss these concepts.

The authors offer a peak into the futuristic state of intelligent content by briefing the reader on the

“Internet of Things.” They share research on the future state of connectedness and summarize four decades of content development and presentation in a manner that vividly tells the story for change in the status quo. Rockley, Cooper, and Abel also align their concepts with Web Content Accessibility Guidelines (WCAG) that encompass users with disabilities.

Intelligent Content comes full circle with guided steps on Transitioning to Intelligent Content, and finally Getting Started with Intelligent Content. The authors, in these final two chapters, offer practical advice on dealing with key related elements including culture change. They include a checklist to assist in developing an intelligent content strategy that is intuitive and adds a component that takes the audience from acquiring knowledge to moving to the functional. The glossary of terms is a useful quick reference.

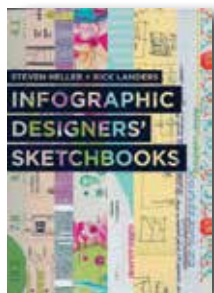
This subject has not yet been exhausted nor is it sufficiently discussed in organizations. Employees are programmed to think they must save or create everything in a standard format. The Content Wrangler’s “Content Strategy Series” should consider including a book in the series on the use of intelligent content in mitigating legal nightmares that might potentially arise during discovery.

Caroline Bruno

Caroline is an STC student member. She handles corporate communications for C-suite executives at a Fortune 50 company in New York. Caroline has a careful eye for editorial detail in text and visual content with a honed eye for audience, context, and purpose issues.

Infographic Designers’ Sketchbooks

Steven Heller and Rick Landers. 2014. New York, NY: Princeton Architectural Press. [ISBN 978-1-61689-286-9. 352 pages, including index. US\$60.00.]



Infographics are now widely available in many capacities, with magazines and news sources in online or print as some of the major communication purveyors. Data visualizations, information design, or information graphics (infographics for short) are on the rise in the information age and, as a

result, we are seeing a surge in this type of publication design. Steven Heller’s and Rick Landers’s *Infographic Designers’ Sketchbooks* is a collection of sketches from designers of data in various forms.

The book contains examples of sketches and final projects from 73 designers. The work comes from designers and teams, those who have been entrenched in the designing of infographics for years, those who have made a name for themselves, those who have successfully dabbled in the field, and those who are primarily masters in fine arts candidates. At least 11 contributors have ties specifically to Heller’s School of Visual Arts. It would be interesting to know the selection process the authors used in determining what work samples to include.

Some designers express their love of working traditionally with pen and pencil, while others claim that data visualization requires precision that is only achievable through the computer and therefore sketching by hand is a waste of time. Despite this, they all feel sketching is necessary; none of the designers achieved the end solution out of the gate; and all required some fine tuning and editing.

Infographic Designers’ Sketchbooks is a great source of inspiration for anyone interested in data visualization, whether merely an admirer or interested in learning or developing this as a skill set. The book is a quick read, since it primarily consists of a collection of images in the form of sketches alongside final infographic designs. It does, however, include a brief narrative for every contributor that provides a great deal of insight into processes, philosophies, and theories on the designs. Despite the book’s brevity, anyone with an interest in information design or beautiful graphics could spend hours poring over the images.

Advancements in technology and the Internet’s proliferation have made data king, what is often described as “Data Glut”; according to Hyei Song “Raw Data has no value in itself . . . only extracted information has value” (p. 294). The solution to this problem seems to be in the form of infographics with the intent being to relate information from raw data in an understandable form to the viewer. We will likely continue to see a rise in the use and interest of information graphics so sources such as *Infographic Designers’ Sketchbooks* will continue to serve those in the various communication fields.

Amanda Horton

Amanda Horton holds an MFA in design and currently teaches graduate and undergraduate courses at the University of Central Oklahoma in the areas of design technology, design studio, and history of graphic design. She serves as a book reviewer for *Technical Communication*.

Digital Cosmopolitans: Why We Think the Internet Connects Us, Why It Doesn't, and How to Rewire It

Ethan Zuckerman. 2015. New York, NY: W. W. Norton & Company. [ISBN 978-0-393-35032-6. 312 pages, including index. US\$15.95 (soft cover).]



“Thanks to new tools, speech need no longer be controlled by those who own the means of publishing and distribution, or by governments that would restrict thought and communication,” (p. 121) states a 2004 manifesto that inspired the creation of Global Voices, an organization co-founded by

Zuckerman that makes international stories overlooked by the mainstream media accessible to a wider public. In this book, he argues that while social media and the Internet let people learn about countries and events they wouldn't know about otherwise, these same tools often limit their exposure to information beyond a narrow sphere of interest even more than, say, a major newspaper would. It's not that the information isn't out there—albeit not necessarily in a language we understand—it's that we don't usually seek it out.

Digital Cosmopolitans: Why We Think the Internet Connects Us, Why It Doesn't, and How to Rewire It documents that stance using Zuckerman's own experience with Global Voices, research by various scholars, activists' reports, and background information. It is a compellingly written account of why many people are now exposed to an even narrower slice of world events than they used to be and what can be done to change that situation. Zuckerman also explains why expanding our horizon in terms of international information will become ever more important in the future. He introduces the concept of “bridge figures” who provide specialized knowledge about a location

to people elsewhere on the globe. Modern migration patterns are producing an increasing number of people capable of becoming bridges between their new homes and the countries they left behind.

Then, of course, there is the question of language. Google Translate and other machine translation tools can provide us with the basic gist of an article in a foreign language, but they can't accurately convey all information in the article, let alone subtle phrasing that may be important for understanding the writer's view of the events. A bridge figure is therefore also important as a translator, not just an explainer. That's why professional translators make excellent bridge figures: they are by definition bilingual (or trilingual) and either come from another country or have lived there for an extended period. Who better to explain current events in Haiti to an American than someone who grew up there but now lives in the US and regularly translates information from Haiti for a US audience?

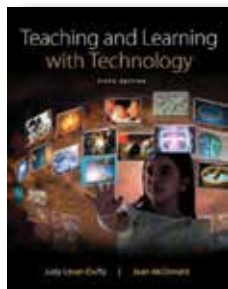
However, to harness the potential of such bridge figures, people must first access the information they can provide. One way to do so is to engineer serendipity online—to build tools that provide blog posts, news, etc. from around the globe related to a user's general interests in a language the user understands. We are not there yet, but as Zuckerman concludes: “If we want a world that values diversity of perspective over the certainty of singular belief, a world where many voices balance a privileged few, where many points of view complicate issues and push us toward novel solutions, we need to build that world” (p. 272).

Barbara Jungwirth

After writing software documentation and managing an IT department, Barbara Jungwirth now translates German technical documents into polished English appropriate for a specific audience. She owns reliable translations llc (www.reliable-translations.com), writes a blog called On Language and Translation (www.reliable-translations.com/blog/), and tweets (@reliabletran). You can also connect with her on LinkedIn (www.linkedin.com/in/BarbaraJungwirth).

Teaching and Learning with Technology

Judy Lever-Duffy and Jean McDonald. 2014. 5th ed. Upper Saddle River, NJ: Pearson. [ISBN 978-0-13-381426-2. 368 pages, including index. US\$74.00 (looseleaf).]



As technology continues to change along with the evolving educational system it serves, textbooks such as Lever-Duffy's and McDonald's *Teaching and Learning with Technology* become more relevant as required reading material for teachers in all subject areas. Overall, this twelve-chapter

textbook describes the changing needs to be served by new technology, methods of evaluating and selecting technology in different situations, implementation and design of such technology, and the emerging technologies to meet the future educational needs.

The book opens with chapters on standards by which to measure technology preparedness in education as well as available certifications and licensures. The authors break down the types of classroom technologies by administrative, presentations, lesson preparation, and communications. The text also makes use of text boxes with anecdotal and situational stories from real classroom experiences, "Tech Tutor" video excerpts from the publisher's website for later watching, and a very detailed glossary for looking up unfamiliar terms introduced.

Chapters two through four cover integrating technology with learning styles, designing instruction around technology, and applying technology for special needs. Chapter five discusses classroom computers from hardware and mouse technology to networking, printers, and data storage. For example, cloud computing has drastically changed available access of educational materials. By chapter six, the text focuses on specific types of classroom technology such as mobile devices, wireless services, video conferencing, and e-book readers.

Chapter seven outlines software tools for educators using a table to list applications for each database feature. These types of tables are present throughout the text and clearly lay out detailed information. The distance learning table in chapter ten is one exception to the usual clarity, as it is confusing in attempting to show course completion and success rates. The large amount of information in the table would be easier to read and digest if it were larger.

The final chapter, and my favorite, was a glimpse of the Jetsons in textbook form. In this chapter, Lever-Duffy and McDonald describe in detail the projected technologies of the future. Most interesting to me was electronic paper, a digital solution to paper handouts. For the cost of around \$100 per page of electronic paper, students can download class handouts onto a rollable, foldable device. This could, feasibly, even eliminate the need for a recycle bin in classrooms of the future!

Lever-Duffy and McDonald sum up the value of learning from the text with this: "Teaching in the 21st century will include new pedagogy that uses new technologies. Flipped classrooms and personal learning environments are just the beginning. Creative teachers will develop yet-to-be imagined models for instructional delivery and new ways to use current and emerging technologies. With this change for educators of the 21st century, familiarity and training in new technology are just the beginning of their journey as tech-savvy educators" (p. 297).

Julie Kinyoun

Julie Kinyoun is an on-call community college chemistry instructor in Southern California. As an avid reader, she enjoys reviewing books that can help her and others become better teachers.

Training Design Basics

Saul Carliner. 2015. 2nd ed. Alexandria, VA: ATD Press. [ISBN 978-1-56286-925-0. 220 pages. US\$29.95 (softcover).]



What do you do if you're a technical writer or editor suddenly assigned to training? What about if you are interested in a career change, perhaps involving some travel, and training appeals to you? Or maybe you're a student in a technical communication program looking for your niche. In all these cases, *Training Design Basics* might be the place to start.

This book won't make you a training expert, but you will learn something about the aspects of training from contracts, scheduling, and goal setting to curriculum design, testing, and assessment. You may want to read assertively because the information may not all be relevant. For example, you may want to skip the early chapters on project estimation and contract language if

you plan to work within a corporation's training group. (Your manager will likely handle these jobs.)

Skip to Chapters 5–7 to get the most information because these chapters cover organization, delivery strategies (in person vs computer based, for example), and materials. Chapter 8 covers writing (use “a supportive tone”) and producing documents (fonts, page layout, slide design), which more experienced readers can skim or skip.

Technical communication or UX instructors may like Chapter 9, which covers assessment of the training program and materials. However, don't expect a detailed (or theoretical) approach; the material here is more appropriate for students who are learning such tasks. As the publisher says, the Training Basics series “takes a minimalist approach to your learning curve dilemma,” (p. v), and that's what this book does best.

Training Design Basics contains notes, sidebars, “Basic Rules,” and tables of information. Some chapters contain exercises for practicing the techniques, although most readers will skip these and simply apply the techniques on real training projects. Carliner may want to review the entire text through the eyes of a reader who has their own project and revise accordingly.

Additionally, in places, the language needs flexibility. For example, “the back matter for a self-study training program includes six items” (p. 95) should allow for differing approaches. *Sometimes, usually, often* includes? These types of absolutes, rather than seeming authoritative, come across as restrictive and inflexible.

The biggest oversight with this book? No index. Yes, the text is meant to be read linearly—the first time—but after that, using the text as a reference will be frustrating. Furthermore, Carliner has included a formal reference list and a list of additional references for each chapter, but these are likely to be overlooked. The Table of Contents is sparse and repetitive. Every chapter begins with “The Basics of,” and most chapters end with the exact same headings (one on types of project, another “Getting It Done”). Any third edition should address these issues.

Despite these flaws, *Training Design Basics* does what it promises: You'll get the basics of training.

Kelly A. Harrison

Kelly A. Harrison, MFA, works as a consultant, speaker, and writing instructor in San José, CA. For over 20 years, she has written print and online content for various high-tech computer companies. Currently, she teaches writing at San José State University and Stanford University.

Landmark Essays on Speech and Writing

Peter Elbow, ed. 2015. New York, NY: Routledge. [ISBN: 978-0-415-64169-2. 312 pages, including index. US\$60.00 (soft cover).]



Landmark Essays on Speech and Writing discusses the obvious, hidden relationships between speech and writing. Punctuation is the best way to capture the sound and rhythm of spoken language, yet punctuation doesn't capture everything. Other features like italics, boldface, and word order are

contributors. Still, punctuation is the most important tool with its main function of dividing chunks of meaning to make reading easier. Reading aloud can help decide the best way to punctuate, using a tape recorder, for example. Yet, a tape recording of someone reading aloud is seldom mistaken for speech: “We know written material when we hear it” (p. 209).

Oral culture was the universal medium for thousands of years before the rise and growing influence of print. And with oral culture came the need for building features into language that helped people to better remember things like rhyme, idioms, well-known phrases, and collocations.

Landmark Essays on Speech and Writing highlights some of the fascinating differences between the two modes: Not everyone learns to write, but nearly everyone learns to speak. Speech is for the ear, writing for the eye. Speaking is done with the mouth, writing with the fingers. Speaking exists in time (we speak and it's gone), writing in space (it can be recalled and reexamined endlessly). Speaking tends to be spontaneous; writing tends to be planned. Speaking tends to be more informal, writing, more formal (“tends” to be is crucial here). This book examines these differences and more at great depth.

The essay authors explore the relationship between art and writing, pointing out that art—visual meanings scraped on cave walls—preceded writing by some 25,000 years. And it is not until 3500 BC that we get the “rebus:” combining pictures to make sounds, such as a bee plus a leaf to get the word “belief.” A giant step toward writing that took almost 20,000 years! The images have disappeared from our abstract alphabet: “But the pictures once were there” (p. 9).

Fashions play their part. Early 20th century linguists stressed the primacy of speech over writing. In the 60s

and 70s, several scholars suggested that the two modes are fundamentally different: that writing is more explicit. Others, that writing is more structurally complex with longer sentences and more subordination.

The most useful distinction for us: conversation is typically personal rather than informational. So many lexical and syntactic differences flow from this distinction. The article then presents a long list of contrasts between the two. For example: In conversation, roughly 70% of verbs are in the present tense, the progressive is three times as common, and modal verbs (can, will, could) twice as common.

Such a list can be useful for those who feel a conversational tone is more effective in any kind of writing.

Steven Darian

Steven Darian is an STC Fellow, having retired from teaching business and technical writing at Rutgers for 33 years and in eight countries. He was a manager for Raytheon in Saudi Arabia. Steven's next book is "Tools of the Trade: Technique in Nonfiction, 2015."

Information Age: Six Networks that Changed the World

Tilly Blyth, ed. 2014. London, England: Scala Arts Publishers Inc. [ISBN: 978-1-85759-901-5. 224 pages, including index. US\$55.00.]



We live in an age of so many technological wonders that we tend to forget, especially if young, that the world's information—real-time news from distant lands, clips from old movies, our exact location on the face of the earth, the ability to communicate with

both friends and strangers 24/7—was not always available at the swipe of a finger.

For those who want a better understanding of how our modern networked world developed over the past two centuries, *Information Age: Six Networks that Changed the World* is full of riches.

In a handsome "coffee-table" format, it tells the stories of the inventors, entrepreneurs, and early adopters who made the modern world possible. Put together by the

Science Museum in London to showcase its impressive collection of artifacts related to the history of information technology, the book uses beautiful photographs and archival material to trace the history of six networks:

- The hard wiring of the earth, starting with the trans-Atlantic cable, which allowed rapid wired communication across oceans and between distant locations.
- The development of broadcasting, which allowed real-time dissemination of news and entertainment via radio and television.
- The development of the telephone exchange, which allowed real-time, person-to-person communication to be shared over a finite infrastructure.
- The development of satellite communication, which greatly enhanced earlier technologies by freeing them from the need for trunk lines and transmission towers and enabled new technologies such as GPS.
- The development of the Internet, which linked computers, enabled email, enabled instantaneous access to vast quantities of stored information, and revolutionized commerce.
- The development of cell tower technology, which allowed mobile devices to stay connected while roaming freely.

For these networks to come together and change into their present form, many pieces had to fall into place—the telegraph key, Morris code, the carbon (telephone) microphone, the vacuum tube, and hundreds of others. Many developments had humble beginnings: The first computer mouse was carved out of a block of wood. The book describes and pictures many of these developments.

Information Age is also full of interesting stories: how the idea to first deploy computers for routine business tasks came to a forward thinking head of a British catering chain and the key role played by GPS technology—then just coming online—in the Gulf War, literally guiding troops through the blinding dust of desert storms.

Given its source, the book is written from a British perspective, which provides a refreshing reminder that technology is not just the province of the US or Silicon Valley.

Besides the main text, *Information Age* contains essays by James Gleick, David Attenborough, and others focused on how each development stage touched the lives of ordinary people.

For anyone wanting to explore the subject through both words and pictures, this a handsome and valuable book.

Patrick Lufkin

Patrick Lufkin is an STC Associate Fellow with experience in computer documentation, newsletter production, and public relations. He reads widely in science, history, and current affairs, as well as on writing and editing. He chairs the Gordon Scholarship for technical communication and co-chairs the Northern California technical communication competition.

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STC Summit Pre-Conference Courses (full day)	6
STC Summit Pre-Conference Courses (half day)	3
STC Virtual Summit	4
STC Annual Summit	8
Begin and complete a college-accredited course related to the Technical Communication field	8
Published articles that relate to any aspect of Technical Communication (2/article)	2
Published books publicly available on topics related to Technical Communication (5/book)	5
Presentations at conferences related to aspects of Technical Communication (2/presentation)	2
Total needed within 2 years post-certification date	12

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Lyn Gattis, Editor

The following articles on technical communication have appeared recently in other journals. The abstracts are prepared by volunteer journal monitors. If you would like to contribute, contact Lyn Gattis at LynGattis@MissouriState.edu.

“Recent & Relevant” does not supply copies of cited articles. However, most publishers supply reprints, tear sheets, or copies at nominal cost. Lists of publishers’ addresses, covering nearly all the articles we have cited, appear in *Ulrich’s international periodicals directory*.

Communication

Good times, bad times: A keyword analysis of letters to shareholders of two Fortune 500 banking institutions

Poole, R. (2016). *International Journal of Business Communication*, 53, 55–73. doi: 10.1177/2329488414525449

“This corpus-based keyword analysis investigates the letters to the shareholders from two commercial banks, Bank of America and Citigroup, over a 3-year period from 2008, 2009, and 2010. The letters were compiled to facilitate a diachronic analysis, an assessment of language change over a specific period, of profit/loss reporting from two prominent financial institutions over a time period in which the recession commenced, peaked, and concluded. To conduct the analysis on the node texts, two sets of reference corpora were compiled. One reference corpus set consists of the letters to shareholders from eight consistently high-performing corporations not within the commercial banking industry for each of the 3 years; the other reference corpus set consists of the letters from the 10 banking institutions that also appeared in the Fortune 500 listings for the 3-year period. The corpus-based analysis revealed that in years of low performance, companies create messages that assert a vision and forward a strategy for ensuring future success while also establishing distance between management and past failures. In contrast, when companies perform well, the keyword lists display a clear tendency of the company/author to accept praise and attribute success to actions of management.”

Katherine Wertz

Design

The idea and image of historical time: Interactions between design and digital humanities

Boyd Davis, S., & Kräutli, F. (2015). *Visible Language*, 49(3). [online] [doi: none]

“The paper addresses the relationship between design and the digital humanities, asking what each can learn from the other and how they may make progress together. The focus is *critical making* in chronographics — the time-wise visualisation of history — based on the authors’ historic research and current practice in visualising collections of cultural objects and events. This is situated in historic and contemporary contexts, arguing that the eighteenth century origins of the modern timeline have useful insights to offer in terms of objectives and rationale. The authors advocate a critical approach to visualisation that requires both design and digital humanities to face up to the problems of uncertainty, imprecision, and curatorial process, including in relation to time itself.”

Lyn Gattis

If it's hard to read, it changes how long you do it: Reading time as an explanation for perceptual fluency effects on judgment

Sanchez, C. A., & Jaeger, A. J. (2015). *Psychonomic Bulletin and Review*, 22, 206–211. doi: 10.3758/s13423-014-0658-6

The research described in this article suggests that readers may perceive text set in a less legible typeface to be more difficult to understand than the identical text set in a more legible typeface. “Perceptual manipulations, such as changes in font type or figure-ground contrast, have been shown to increase judgments of difficulty or effort related to the presented material. Previous theory has suggested that this is the result of changes in online processing or perhaps the post-hoc influence of perceived difficulty recalled at the time of judgment. These two experiments seek to examine by which mechanism (or both) the fluency effect is produced. Results indicate that disfluency does in fact change in situ reading behavior, and this change significantly mediates judgments. Eye movement analyses corroborate this suggestion and observe a difference in how people read a disfluent presentation. These findings support the notion that readers are using perceptual cues in their reading experiences to change how they interact with the material, which in turn produces the observed biases.”

Lyn Gattis

Editing

Editing and proofreading your own work

Gastel, B. (2015). *AMWA Journal*, 30, 147–151. [doi: none]

Gastel, who has written extensively about science writing, provides insight about editing and proofreading in a professional context. While directed toward medical writers, much of the information is usable across genres. Included are numerous checklists, including ones for proofing and for editing for conciseness. Audience considerations and appropriateness of structure are also addressed.

Magdalena Berry

Education

Are we “there” yet? The treatment of gender and feminism in technical, business, and workplace writing studies

White, K., Rumsey, S. K., & Amidon, S. (2016). *Journal of Technical Writing and Communication*, 46, 27–58. doi: 10.1177/0047281615600637

“This article reexamines the treatment of gender and feminism in technical, business, and workplace writing studies—areas in which [the authors] teach. Surprisingly, the published discourse of [the authors’] field seems to implicitly minimize the gendered nature of business and technical writing workplaces and classrooms. To understand this apparent lack of focus, [the authors] review five technical and business communication academic journals and build on previous quantitative evaluations done by Isabelle Thompson in 1999 and by Isabelle Thompson and Elizabeth Overman Smith in 2006. [The authors] also review nine popular textbooks using a content analysis method based on Thompson’s work. Finally, [the authors] discuss current research in feminist pedagogies vis-à-vis these results and [their] own experiences in the professional writing classroom.”

Anita Ford

Improving technical communication group projects: An experimental study of media synchronicity theory training on communication outcomes

Lam, C. (2016). *Journal of Business and Technical Communication*, 30, 85–112. doi: 10.1177/1050651915602293

“This article reports the results of an experiment that was conducted to determine the impact of media synchronicity theory (MST) training on media-fit behavior, communication quantity, communication quality, and group effectiveness. MST training introduces students to a framework for assessing a media’s capabilities and matching those capabilities to a particular task. From three technical communication courses, 80 participants were randomly divided into two groups and compared using a between-subjects design. The MST training group reported significantly higher levels of media-fit behavior, communication quantity, and the communication-performance qualities

of discussion quality, richness, and openness. The article discusses practical ways to implement MST training into technical communication group projects.”

Sean C. Herring

The pedagogy of usability: An analysis of technical communication textbooks, anthologies, and course syllabi and descriptions

Chong, F. (2016). *Technical Communication Quarterly*, 25, 12–28. doi: 10.1080/10572252.2016.1113073

“Usability has been widely implemented in technical communication curricula and workplace practices, but little attention has focused specifically on how usability and its pedagogy are addressed in our literature. This study reviews selected technical communication textbooks, pedagogical and landmark texts, and online course syllabi and descriptions and argues that meager attention is given to usability, thus suggesting the need for more in-depth and productive discussions on usability practices, strategies, and challenges.”

Lyn Gattis

Silent partners: Developing a critical understanding of community partners in technical communication service-learning pedagogies

Kimme Hea, A. C., & Shah, R. W. (2016). *Technical Communication Quarterly*, 25, 48–66. doi: 10.1080/10572252.2016.1113727

“Although many technical communication teachers and programs integrate some form of service-learning pedagogy, there is a dearth of technical communication research on the silent partners of these projects: the community partners. Drawing upon research data from 14 former community partners of professional writing service-learning courses, the authors suggest that understanding community partners’ own self-defined stakes in service-learning projects can challenge hyperpragmatist representations of community partners and aid us in the continued creation, management, and critical evaluation of service-learning pedagogies and curricula.”

Lyn Gattis

Information management

Content management systems, bittorrent trackers, and large-scale rhetorical genres: Analyzing collective activity in participatory digital spaces

Lewis, J. (2016). *Journal of Technical Writing and Communication*, 46, 4–26. doi: 10.1177/0047281615600634

“ . . . [T]he study of meaning-making refuses one-to-one, transparent theories of communication, instead recognizing that there is more to rhetorical action than humans. [Lewis] follows the trail of Haas, Swarts, and others arguing that analyses of mediation uncover much about human motives, digital communities, and rhetorical action.” [The author] argues that “technologies often function as rhetorical genres” . . . and . . . “invisible rhetorical genres operating at macroscopic levels of scale are central to shaping individual and communal activity in sites of distributed social production.” [The author investigates] “two applications—a content management system called Gazelle and a bittorrent tracker called Ocelot—to demonstrate how largely invisible server-side software shapes rhetorical action, circumscribes individual agency, and cultivates community identity in sites of participatory archival curation. By articulating content management systems and other macroscopic software as rhetorical genres, [the author] hope[s] to extend nascent investigations into the medial capacities of digital tools that shape our collective digital experience.”

Anita Ford

Instructions

Technical communication in assembly instructions: An empirical study to bridge the gap between theoretical gender differences and their practical influence

Rohrer-Vanzo, V., Stern, T., Ponocny-Seliger, E., & Schwarzbauer, P. (2016). *Journal of Business and Technical Communication*, 30, 29–58. doi: 10.1177/1050651915602292

“Women decide on about 80% of the goods that their household buys. But marketers often sell products, especially technical ones, that are designed by men and therefore are oriented largely toward their needs. Consequently, assembly instructions for these products are also oriented toward men’s needs. To illustrate the impact of gender orientation in assembly instructions, this study investigates whether theoretical cognitive or psychological gender differences have a practical influence on the usability of assembly instructions. This study has direct implications for technical writers who strive for a more universal design for such instructions.”

Sean C. Herring

Intercultural issues

Cross-cultural cinematic communication: Learning from the information design process for a Sino-American film competition

McDaniel, R., & Kuang, L. (2015). *Communication Design Quarterly Review*, 4, 49–60. doi: 10.1145/2875501.2875505

“This article examines the 2014 Sino-American University Student Digital Micro Film Competition, a collaboration developed and administered between the University of Central Florida in the United States and Shanghai University in the People’s Republic of China (PRC). By using qualitative text analysis and visual content analysis to review key materials and events from this case, the researchers studied information design and cross-cultural communication practices of various aspects of the partnership. The resulting analysis reveals unique information design challenges associated with

cultural differences in communication practices, visual design, and administrative style. The summary of the case and the results of the related research presented here also provide readers with information design strategies that can facilitate design practices—and the associated coordination of event planning—across different cultural groups.”

Lyn Gattis

Cultural considerations for communication design: Integrating ideas of culture, communication, and context into user experience design [introduction to special issue]

St.Amant, K. (2015). *Communication Design Quarterly Review*, 4, 6–22. doi: 10.1145/2875501.2875502

“Culture can be difficult to define, yet it is central to almost everything humans do. Culture shapes how individuals view the world—what they consider right and wrong or appropriate and inappropriate—and often provides the lens through which they perceive communication and create messages (Sardi & Flammia, 2011; Varner & Beamer, 2015). As such, culture can be one of the most important aspects communication designers need to consider when developing materials for an audience—any audience. When extended to broader intercultural or international contexts, the need to understand how culture affects expectations and perceptions becomes even more acute. For this reason, the more communication designers know about researching, considering, and addressing cultural communication expectations, the more effectively they can develop materials that meet the information seeking and usage needs of a greater global audience.”

Lyn Gattis

Designing with HDR data: What the Human Development Report can tell us about international users

Sarat-St. Peter, H. (2015). *Communication Design Quarterly Review*, 4, 60–74. doi: 10.1145/2875501.2875506

“Intercultural professional communication (IPC) requires a nuanced understanding of international users’ interactions with technology and information. This requirement poses a distinct challenge to international communication and information designers who must overcome geographic, linguistic, and cultural barriers to understanding users as complex agents. The United Nations Development Program (UNDP) annually publishes a *Human Development Report (HDR)* that contains high-quality international statistics on the regional, national, and transnational contexts in which individuals use technology and information. Thus, the HDR can serve as a resource for communication designers working in international contexts. This article presents strategies for how communication designers might use the HDR when designing materials for users in other cultures as well as use when teaching international aspects of professional writing/communication.”

Lyn Gattis

The digital divide at the margins: Co-designing information solutions to address the needs of indigenous populations of rural India

Dutta, U., & Das, S. (2015). *Communication Design Quarterly Review*, 4, 36–48. doi: 10.1145/2875501.2875504

“This paper presents the results of a case study focusing on information and communication design in indigenous villages of rural India. The villages examined for this study were geographically remote and socio-economically underdeveloped, and their populations represented individuals who possessed low levels of literacy, limited language proficiency in English and mainstream Indic languages (e.g., Hindi and Bengali), and limited familiarity with computer use and computing practices. The authors sought to examine this context by conducting ethnographic field research involving a variety of methods. Through these approaches, the authors found a range of cultural and contextual factors are instrumental in shaping

and co-creating communication design solutions for underserved international audiences. (Such factors include . . . long-term research engagements, in-situ design development, and embracing dialogic and reflexive praxis when designing for local audiences.)”

Lyn Gattis

Professional issues

Freelance forum

Bass, B., Bogen, M. L., Bowen, S., De Milto, L., Evans, C. D., & Vakil, R. (2015). *AMWA Journal*, 30, 180–183. [doi: none]

This article is part of an ongoing series in the *AMWA Journal*, in which numerous members, in a question and answer format, address issues of interest to freelancers. Examples of topics discussed: “Do you use social media to market your freelance medical writing business? Do you always use a written contract when you are working with clients? Is an email message sufficient? Do you have a lawyer review your contract?”

Magdalena Berry

Research

Contemporary research methodologies in technical communication [introduction to special issue]

McNely, B., Spinuzzi, C., & Teston, C. (2015). *Technical Communication Quarterly*, 24, 1–13. doi: 10.1080/10572252.2015.975958

“The 1998 special issue of TCQ on research methodologies established new directions in how technical communication researchers, teachers, and practitioners would understand and explore the field’s objects of study, research ethics, and metrics . . . In this 2015 special issue, each contribution reflects how technical communication’s methods and methodologies have developed further—and along various paths—to better address many new objects of study, new aspects of research ethics, new metrics that have emerged alongside developments in theory, new research opportunities and

modes, and new technologies.” Methodologies explored in this special issue include conducting “a principled network analysis,” developing and enacting “research ethics in community-based, translingual fieldwork,” and piloting “a big data approach to genre analysis.”

Lyn Gattis

Food fights: Cookbook rhetorics, monolithic constructions of womanhood, and field narratives in technical communication

Moeller, M. E., & Frost, E. A. (2016). *Technical Communication Quarterly*, 25, 1–11. doi: 10.1080/10572252.2016.1113025

“Field narratives that (re)classify technical genres as liberating for women risk supporting the notion that feminism is a completed project in technical communication scholarship. This article suggests that technical communicators reexamine the impact of past approaches to critical engagement at the intersections of gender studies and technical communication; cookbooks provide a material example. The authors illustrate how a feminist approach to cookbooks as technical/cultural artifacts can productively revise field narratives in technical communication.”

Lyn Gattis

Statistical genre analysis: Toward big data methodologies in technical communication

Graham, S. S., Kim, S.-Y., DeVasto, D. M., & Keith, W. (2015). *Technical Communication Quarterly*, 24, 70–104. doi: 10.1080/10572252.2015.975955

“This article pilots a study in statistical genre analysis, a mixed-method approach for (a) identifying conventional responses as a statistical distribution within a big data set and (b) assessing which deviations from the conventional might be more effective for changes in audience, purpose, or context. The study assesses pharmaceutical sponsor presentations at the Food and Drug Administration (FDA) drug advisory committee meetings. Preliminary findings indicate the need for changes to FDA conflict-of-interest policies.”

Lyn Gattis

Values and validity: Navigating messiness in a community-based research project in Rwanda

Walton, R., Zrally, M., & Mugengana, J. P. (2015). *Technical Communication Quarterly*, 24, 45–69. doi: 10.1080/10572252.2015.975962

“Community-based research in technical communication is well suited to supporting empowerment and developing contextualized understandings, but this research is messy. Presenting fieldwork examples from an interdisciplinary technical communication/medical anthropology study in Rwanda, this article conveys challenges that the authors encountered during fieldwork and their efforts to turn the messy constraints of community-based research into openings. Explicitly considering values and validity provided a strategy for our efforts to democratically share power, maximize rigor, and navigate uncertainty.”

Lyn Gattis

Visualizing and tracing: Research methodologies for the study of networked, sociotechnical activity, otherwise known as knowledge work

Read, S., & Swarts, J. (2015). *Technical Communication Quarterly*, 24, 14–44. doi: 10.1080/10572252.2015.975961

“This article demonstrates, by example, 2 approaches to the analysis of knowledge work. Both methods draw on network as a framework: a Latourian actor–network theory analysis and a network analysis. The shared object of analysis is a digital humanities and digital media research lab that is the outcome of the collective and coordinated efforts of researchers and other stakeholders at North Carolina State University. The authors show how the two methods are drawn to different objects of study, different data sources, and different assumptions about how data can be reduced and made understandable. The authors conclude by arguing that although these methods yield different outlooks on the same object, their findings are mutually informing.”

Lyn Gattis

Technology

The communication design of WeChat: Ideological as well as technical aspects of social media

Wang, X., & Gu, B. (2015). *Communication Design Quarterly Review*, 4, 23–35. doi: 10.1145/2875501.2875503

“In this paper, the authors discuss how the technical and ideological design of WeChat, a social media platform, enables the free flow of information within the context of heavy Internet policing and surveillance in the People’s Republic of China. Through a case study of two instances of grassroots and social activism, the authors highlight how three unique features of WeChat—Moments, Friends’ Circle, and Share to—enhance privacy and security issues related to information dissemination. In both cases examined here, the unique design of certain WeChat features enhanced privacy and security in ways that allowed for the free dissemination of information and public involvement through social media. In examining these cases, this study represents one of the first attempts to use a Chinese social media app to examine technology design within a particular political and social context. The authors hope the results of this study will further our understanding of the reciprocal relationship between technology, design, and the social context in which technologies are used.”

Lyn Gattis

Usability

Evaluation of a game used to teach usability to undergraduate students in computer science

Benitti, F., & Sommariva, L. (2015). *Journal of Usability Studies*, 11, 21–39. [doi: none]

“There is a growing recognition of the importance of teaching usability, which has been discussed in various forms in undergraduate courses in areas related to Information Technology. Usability is an essential concept that professionals need to learn as they produce artifacts for different types of users and contexts. After

a systematic mapping of the literature in this field, the authors found that the techniques currently used to teach concepts related to usability mostly involve the development of projects and case studies or the application of heuristic evaluations. Although the use of serious games has been used in different areas, [the authors’] research exposed that serious games are not used to teach usability. Therefore, [the authors] propose in this paper the development of a simulator game that exposes the player to a corporate environment by simulating real situations in the projects of a fictitious company. The objective of the game, called the UsabilityGame, is to support the teaching of usability by addressing the usability engineering life cycle, requirements analysis, and prototyping and heuristic evaluation. [The authors] conducted four experiments to evaluate the effectiveness of using the UsabilityGame as a tool to teach usability concepts to students. [The authors] concluded that the game promotes the learning of usability in general, and heuristic evaluation and requirements analysis in particular.”

Ginnifer Mastarone

Writing

Passive voice and expletive constructions

Thomas, L. E. (2015). *AMWA Journal*, 30, 188–189. [doi: none]

Thomas, in this article, which is part of an ongoing series entitled “In the Service of Good Writing,” provides definitions and examples of passive voice and expletives, differentiating them from each other and using passages from George Orwell as illustration.

Magdalena Berry