Communication Design Quarterly

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Editorial: Design of Communication Open Research Questions .......................................................... 3
Notes from the Chair ......................................................................................................................... 6
Produsers and End Users: How Social Media Impacts Our Students’ Future Research Questions .. 11
A Program of Research for Technical Communication: Adaptive Learning ..................................... 15
Big Data, Big Questions ...................................................................................................................... 18
From Research to Design: Building Knowledge So That We Can Build Experiences ....................... 22
The Invisible Web and The Need for New Research Methodologies ............................................... 26
Identifying Core Principles and Expectations .................................................................................... 29
Navigating increasingly cross-cultural, cross-disciplinary, and cross-organizational contexts to support social justice ............................................................................................................. 31
Chickens, MRIs, and Graphics: Creating Visual Information in Scientific Fields ............................... 36
Writing for Machine Translation ......................................................................................................... 40
Open Research Questions for Academics and Industry Professionals: Results of a Survey ............. 42
Exploring Accessibility as a Potential Area of Research for Technical Communication .................. 50
Poster: Tracing Digital Thyroid Culture ............................................................................................. 61
Communication Design Quarterly

ACM SIGDOC (Special Interest Group Design of Communication) seeks to be the premier information source for industry, management, and academia in the multidisciplinary field of the design and communication of information. It contains a mix of peer-reviewed articles, columns, experience reports, and brief summaries of interesting research results. Communication Design Quarterly (CDQ) is archived in the ACM Digital Library.

We invite you to contribute in any of the following areas:

- Peer-reviewed articles. Articles that cross discipline boundaries as they focus on the effective and efficient methods of designing and communicating information; disciplines will include technical communication, information design, information architecture, interaction design, and human-computer interaction.
- Experience reports. Experience reports present project- or workplace-focused summaries of important technologies, techniques, or product processes.
- Interesting research results. Short reports on interesting research or usability results that lack the rigor for a full article. For example, pilot studies, graduate student projects, or corporate usability studies where full details can’t be released.

We are also interested in proposals for guest editing special issues. As a guest editor, you would be responsible for providing two peer reviewed articles on a specific topic and, potentially, coordinating with the column editors so their columns can complement the issue’s theme.

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Editorial: Design of Communication Open Research Questions

Michael J. Albers
Co-Editor Communication Design Quarterly

This issue considers the question of what are (or should be) the major current research problems that researchers within Design of Communication should be addressing.

We were inspired to ask this question because one of us (Albers) has read multiple times how about the once a decade evaluation in astronomy, where a group determines the big research questions that should be the focus of the next ten plus years (at the same time this group recommends funding of new telescopes and related equipment so their view is farther than just 10 years). For the basic report information see http://sites.nationalacademies.org/bpa/BPA_049810 and http://blog.nss.org/?p=2089 for a basic summary of the report. Many of the STEM disciplines have similar reports. We decided to devote this issue of CDQ to taking a first step and gaining a view of what the field considers important.

The question we posted to various discussion lists was:

Within the STEM disciplines, it is common to have a committee that publishes a list of the major open research questions which the discipline should focus on within the next 5-10 years. For this issue of Communication Design Quarterly (CDQ), we would like input to create a similar list. Thus, we are asking for input to:

What are the major open research questions facing technical communication today and in the near to mid-term future?

The answers to this question can feedback into the profession in many ways.
It can help guide our research academic agendas over the next 5 or so years.

It can provide valuable guidance to graduate students looking for thesis and dissertation projects.

The results of the research will help shape the curriculum.

As a clarification: we are interested in what you see as the major open questions facing the field, not a description of your research agenda. Likewise, we hope your answers define broad research questions, but not so broad as to be less than useful for focusing research. For example, “learn how to better analyze the rhetorical situation” is too broad and “which font is better on a webpage” is too narrow.

The responses divide themselves into four clusters. I admit the data could easily be clustered in different ways and researchers working within each of these clusters will be working on very different things. But then, the ability to form different groupings and manipulate the results differently is a characteristic of complex information. The cluster organization in the figure was driven by fitting it onto the page and does not reflect any hierarchy or relationships between clusters.

In the mid 90s, when I was in graduate school, one course devoted significant time to defining what was a discipline and if/how technical communication was a discipline. We find it interesting (and perhaps somewhat disappointing) that this question still seems to exist. But the responses here show the discussion has shifted from the basic “what is a discipline” to one that assumes technical communication is a discipline, but one which still needs to fully define itself: What should the field be studying, what are its priorities and in what order, how inclusive is the field? At the same time, there is the Anderson et al survey results that address the other discipline level question technical communication must answer: what is the relationship between academic and practitioner technical communication. The two areas have very different priorities and the field’s research agenda should address the needs of the practitioners and not risk getting declared an irrelevant “bunch of ivory tower stuff” by the people who apply it day to day.
Open Research Questions in Technical Communication

We refrain from attempting to provide an integrated summary of these results. The sample size is too small to make any claims about it being representative of the field. In addition, any integration would rapidly expose our own feelings/agendas about what the field should be researching and, thus, compromising the integration. Instead, we provide the full text of the responses in hopes of starting a discussion about the field’s research agenda.
Hi SIGDOC!

I am your new Chair, and I wanted to take a moment of your time to introduce myself to you and tell you about our plans for the upcoming year.

I am an assistant professor in the department of Writing, Rhetoric, and American Cultures at Michigan State University. At MSU, I am a senior researcher at WIDE Research, director of user experience projects at MATRIX, and collaborator at Creativity Exploratory. My research interests include technologically-mediated communication, experience architecture, and participatory culture. I've worked extensively in industry at Microsoft, consultancies, and start-ups as a director, experience architect, and program manager. I am the former Vice Chair of SIGDOC and the former Co-Editor of Communication Design Quarterly. My work has been sponsored by the National Endowment for the Humanities (NEH) and published in Technical Communication Quarterly, Journal of Business and Technical Communication, and Technical Communication. My new book on user experience and disaster is coming out this September. I have a PhD in communication and rhetoric with a graduate certificate in HCI from Rensselaer Polytechnic Institute.

Now, on to the important bits: We are planning to reboot SIGDOC with your help! We recognize that we have a lot of work ahead of us - planning out future conferences, increasing our membership, and getting the word out about our SIG. Part of that work includes bringing in new volunteers. Please allow me to introduce your new board members:

**Daivde Bolchini, Vice Chair**

Davide Bolchini is Assistant Professor and Interim Department Chair of Human-Centered Computing at Indiana University School
of Informatics and Computing at IUPUI, where he teaches and conducts research in human-computer interaction design. Through over 100 scholarly publications, he has made important and broadly-cited research contributions to conceptual design methods, interactive communication design, user experience modelling, and requirements engineering for web and hypermedia systems. He is IEEE Senior Member, a featured IUPUI Translating Research Into Practice (TRIP) Scholar, a co-recipient of the IEEE Requirements Engineering Conference Best Paper nomination, and the ED-MEDIA Outstanding Paper Award. He has been awarded two Swiss National Science Foundation (SNSF) Fellowships, two US National Science Foundation (NSF) research grants, three NSF Research Experience for Undergraduate (REU) supplement grants, the IUPUI School of Informatics Excellence in Instruction award and the Indiana University Trustees' Teaching Award for the School of Informatics. Davide received a Licentiate and a Ph.D. degree in Communication Sciences from the University of Lugano, Switzerland, and held visiting research positions at the Computer Science departments of University of Toronto, Politecnico di Milano, North Carolina State University, and University College London.

**Stewart Whittemore, Treasurer/Secretary**

Stewart Whittemore is an assistant professor of professional and technical communication. His current research interests include rhetorical theory, information management, and methodologies for studying workplace practices. Before pursuing a career in higher education, he worked for 10 years in the Atlanta area as a technical writer and trainer.

**Michael Albers, Editor of Communication Design Quarterly**

Michael Albers is an associate professor at East Carolina University, where he teaches in the professional writing program. In 1999, he completed his PhD in technical communication and rhetoric from Texas Tech University. Before coming to ECU, he taught for 8 years at the University of Memphis. Before earning his PhD, he worked for 10 years as a technical communicator, writing software documentation and performing interface design. His research interests include designing documentation focused on
answering real-world questions and online presentation of complex information.

**Kathie Gossett, Student Relations**
Kathie Gossett’s research interests include digital humanities, open source design, new media theory & practice, user experience design and medieval rhetoric. She has published in journals such as Kairos: Rhetoric, Technology, & Pedagogy and Computers & Composition as well as several book chapters on born-digital and multimedia writing. Kathie brings over 15 years of project management experience to this project. She planned workshop content, co-led the design and analysis of the workshop, and supervised a graduate student who drafted project documentation.

**Stuart Selber, Member-At-Large**
Stuart Selber is an associate professor of English and an affiliate associate professor of Information Sciences and Technology at Penn State, where he works as Director of Digital Education in English and serves as a Faculty Fellow in Education Technology Services. He also directs the Penn State Digital English Studio. Selber is a past president and Fellow of the Association of Teachers of Technical Writing, a past president of the Council for Programs in Technical and Scientific Communication, and a past chair of the CCCC Committee on Technical Communication. His research focuses on computer literacies, rhetorics of the Internet, and the social and pedagogical dimensions of academic computing. Selber combines qualitative methods with social theories in order to investigate the applications and implications of digital technologies for writing and communication purposes. He is especially interested in the role of human values in technological development and in questions of institutional design and change. Selber teaches courses in technical communication, computers and composition, human-computer interaction, and the digital humanities.

**Christa Teston, Member-At-Large**
Christa Teston received her PhD in Rhetoric and Writing Studies from Kent State University and is an Assistant Professor of English at Ohio State University. She researches how we use texts, visuals, and other embodied sensory input when making decisions about
future action. Specifically, she studies decision-making practices in medical and scientific settings. Her work has been published in Written Communication, Technical Communication Quarterly, and the Journal of Medical Humanities.

**Dave Jones, Member-At-Large**

Dave Jones holds a PhD in Technical Communication and User Experience from Old Dominion University, and he is a Senior User Experience Designer at The Nerdery in Minneapolis. His scholarly work focuses on user experience, participatory cultures, and the design of social ecosystems. As a UX designer, he has worked for startups and now consults for clients ranging from small local businesses to Fortune 500 companies.

**Michael McLeod, Student Representative**

Michael McLeod is a PhD student in the Human Centered Design and Engineering program at the University of Washington. He teaches courses in content management, digital rhetoric, web design, and user experience design. He is the co-founder of the educational technology company Drawbridge and the co-inventor of the instructional writing platform Eli Review. His scholarship has been published in Technical Communication Quarterly, Written Communication, and Computers & Composition.

**Carlos Costa, EuroSIGDOC**

Dr. Carlos J. Costa teaches in the Computer Science Department of the School of Technology and Architecture from the ISCTE-IUL, since 1993. He teaches courses of computer programming and information systems. He also taught in the Portuguese Catholic University, Portuguese Open University. Previously, he worked in an IT consulting firm and in an Investment Bank. He earned a Ph.D. (Doutoramento) in Computer Science – Information Systems and Data Bases, ISCTE (2002), a MSc (Mestrado) in Corporate Strategy, also from the ISCTE and a degree (Licenciatura) from Portuguese Catholic University (1990). He is also researcher in Adetti-IUL. His research interests includes Open Source Software Engineering, Coding/Programming Education, Organizational Systems (ERP, CRM) development, support and usage, and also Collaborative Systems. Carlos is chair of EUROSIGDOC, director of the Master Program Open Source Software and member of the board of Audax (entrepreneurship research center).
We will be adding new board members by region and area of expertise as the year progresses. Let me know if you want to be involved!

I want to encourage you to contribute to our publication, *Communication Design Quarterly*. We have an exciting new issue that will be out soon, and we have plans for more in the future. Please email Mike directly about CDQ contributions: albersm@ecu.edu.

If you ever want to discuss SIGDOC, talk about how you can get involved, or share a suggestion - please feel free to contact me or any of our board members.
Produsers and End Users: How Social Media Impacts Our Students’ Future Research Questions

Lora Arduser
University of Cincinnati

When I bought my first Mac I was frustrated by the lack of instructional documentation in my shiny new box. I found myself regularly going online to look for help in the form of PDFs or videos. A company professionally produced these instructional “texts”. Enter the webcam, the iPhone, and a host of websites to upload user-generated content, and we increasingly see end users becoming produsers, individuals whom produce as well as consume information.

One of the technical communication genres produsers regularly create is instructions. In fact, if you type the phrase “how to” into YouTube, you get the response: “About 101,000,000 results.” Granted, some of these are frivolous, such as “how to get girls to kiss you,” but many sound much more like instructional documentation a technical communicator might produce, such as “how to remove scratches from a DVD,” “how to install a starter button,” or “how to change an insulin pump infusion set.”

The transition to a prosumer culture involves the transition to new types of technologies that facilitate “instantaneous interactions among users and make more “traditional forms of technical support less appealing” (Kimme Hea, 2011). These new types of users and technologies, in turn, require re-assessing the potential research questions our graduate students may ask. As a recent search of the ProQuest Dissertation and Theses database indicates (see the following chart), students are increasingly engaging in research questions that involve social media. And yet, our existing theories and methods do not comfortably accommodate questions that will engage produsers as true collaborators and teammates.
Therefore, one question we should address in the coming years is: How do we guide students in generating research questions that involve social media and other Web 2.0 technologies? In addition, what theories and methods are appropriate for such projects?

Following is an extended example to consider some of the preliminary questions that come to mind in thinking through these needs. I conclude with a possible model to explore.

**Preliminary Questions**

Take as an example the instructions of the aforementioned insulin pump video blogs (vlogs). The pump will come with an extensive print user guide of several hundred pages and patients, also known as “pumpers,” are required to go to a health care provider to initially get the pump programmed and set up. Even with all this technical documentation and personalized assistance, patients can still find and use dozens of vlogs of insulin pump instructions on YouTube. Of the 53 posted as of September 16, 2011, for example, 10 were produced by professional organizations. A total of 43 were created by people using pumps, or what we typically call end users. Such produsers do not need technical communicators to act as advocates, as we often have in our traditional interactions with end users; they are already vested with expertise and agency. This relational shift changes how we need to think through generating questions and conducting research in projects that involves produsers.
Let’s say a graduate student wants to work on a project in which she collaborates with a number of insulin pump vloggers through social media in order to produce technical instructions. Several quandaries come to mind in thinking through how to help her develop her project. First, while technical communicators pay attention to broader rhetorical, social and ethical issues, many research projects are situated workplace exigencies and spaces (for examples see Alexander, 2013; Scott, 2008; and Spinuzzi, 2003). Shifting research practices to social media spaces that are not embedded within a specific organization but in the complex space of the internet requires re-assessing the rhetorical canons of invention and delivery, for example. If our end users are already inventing and delivering content without us, what exactly is our role? Of course, there are also pragmatic issues: Developing team-based work relationships with a geographically dispersed group of people takes time. And how would these types of projects be described to institutional review boards (IRBs)?

**Possible Model**

Studies like the one suggested by this hypothetical student could be a way to open up the documentation process and encourage a type of collaboration that Spinuzzi characterized as a shift from “*consumer model* of documentation-as-product towards a *citizenship model* in which citizens contribute to and collaboratively develop information” (2002). One possible solution/model we might draw on is that of a community of practice, a community in which “members of a community of practice are practitioners. They develop a shared repertoire of resources: experiences, stories, tools, ways of addressing recurring problems—in short a shared practice” (Wenger, 2007). The community itself has an identity defined by a shared interest, and members pursue this interest through joint activities and discussions.

Obviously, a community of practice approach is only one model for working through generating ways to guide students in developing research questions that involve Web 2.0 technologies, but it is, at least, a place to start the conversation.
Works Cited


A Program of Research for Technical Communication: Adaptive Learning

Bernadette Longo,
Nancy Coppola,
Norbert Elliot,
Andrew Klobucar,
Carol Johnson

New Jersey Institute of Technology

Distinct from prose essays as cultural expression, we use technical communication for functional purposes, addressing questions of how people learn as we craft our communications. Aristotle set out psychological principles of how people learn – or are persuaded to change their minds – when he laid down his foundational advice for rhetors to cultivate “the faculty of observing in any given case the available means of persuasion on almost any subject presented to us.” Building on this foundational principle, technical communicators since World War II have studied how to achieve persuasion (or change) by making information accessible, formatting documents, writing at designated reading levels, and setting out instruction steps clearly. Recently, we have also become interested in how, through the concept of rhetoric, oral and written language acquires poignant social, ethical and technical dimensions, situating Aristotle’s “faculties” of persuasion within specific cultural and political contexts.

In the last twenty years or so, we have focused much of our research on tools and how we communicate online, most recently in socially networked forums fueled by advances in digital technology. Our tools may have changed in the last twenty years, but our communication goals are still functional and instructional. Yet as our communications become more integrated with technological devices and sensibilities, questions arise about the relationships of people and machines in rhetorical situations. Although the “traditional” position among information theorists,
following Shannon and Weaver, holds that people are socially and politically disembodied by information technologies, Katherine Hayles reminds us that data sharing has discursive attributes that can be considered embodying to some extent. Language use preserves the body – regardless of medium or format.

Most recently, with the growth of information and communication technologies for data sharing and social networking, technical communicators operate in global forums with iterative exchanges that offer new opportunities for accomplishing our purposes—and also confront us with less control of rhetorical situations. Focusing on questions of instruction and learning in these global and data-rich situations offers new territory for technical communication research.

One area of special research interest is adaptive learning, where technology and instruction meet at a nexus of behavioral psychology, cognitive semantics, design, automated assessment, and big data analysis. (The accompanying figure provides a context for a program of research.) Adaptive learning tools require more than technological or educational know-how; they require technical communication know-how to craft instructional messages that address students/users in ways they understand and want to be addressed. As well, interpretation and adaptation of these tools requires our field’s knowledge of sources of validity evidence and our dedication to understanding specifics in terms of communicative genres. As technical communicators, we have a long history of studying user needs and how to accommodate those needs. We have been concerned with meeting users on their grounds of understanding and moving those users to new understandings and abilities. Following Aristotle’s example, we have studied the available means of persuasion in many given cases. We have learned a great deal about how to translate those means into documents that help people get work done. It is time to make a shift. If we change our language to consider students instead of users—and embrace the metaphors associated with digital communication—we can investigate how the communication principles and strategies we have used in workplaces can translate into digital educational environments.
Such is the transformative work that will allow us to learn more about communicating in digital environments.
Big Data, Big Questions

Ehren Helmut Pflugfelder
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One significant concern I have for the future of technical communication, a concern I often share with my students, involves the impact of “big data.” Though the term is frequently used with a sneer, or at least a slightly unsettled laugh, the methods for retrieving information from large data sets are improving as I write this. One significant question the field faces is: “what new relationships will develop and what new work will technical communicators be responsible for in emergent big data projects, in coming years?”

It is difficult to define precisely what constitutes “big data,” as specific definitions as to how “big” something must be are contextual. When most refer to the concept, they consider (at least) three dimensions of data management –– increasing data volume, velocity, and variety –– features that came from Doug Laney’s 2001 paper describing new application delivery strategies.[1] As Viktor Mayer-Schönberger and Kenneth Cukier explain, the term was coined to represent a situation where “the high volume of information had grown so large that the quantity being examined no longer fit the memory that computers use for processing,” where engineers needed “to revamp the tools the used for analyzing it.”[2] Whether we have trouble defining it or not, big data projects have a fair amount of momentum, as a number of federal agencies (under The Big Data Research and Development Initiative)[3], media organizations, and large corporations (many of whom attain the bulk of their data from online activities) are pursuing such projects. From my perspective, we will face a number of different questions as to how our work will change, including, though certainly not limited to, how technical communicators will support SMEs, understand and develop contextually significant queries of large data sets, create appropriate visualizations of this complex data, and maintain user-oriented ethics as part of the ongoing conversation.
Though a number of technical communicators are already involved in the development and management of big data projects, it is likely that this number will grow along with research funding. The field’s connections to computerized data management professionals will intensify, as will pressure on our ability to communicate with industry experts who work with data warehousing methods and object-oriented and post-relational database systems. As these information technology environments become more complex, we will be likewise relied upon to communicate the value of these activities to others within organizations. While technical communicators may or may not be directly involved with database modeling, software development, or specific forms of information architecture, many will see the impact of this development in their workplaces.

Secondly, technical communicators should be prepared to aid in the analysis of big data through the extension of existing critical thinking and problem-solving skills. At the 2013 ATTW conference, Brenton Faber suggested that “Our technical ability to gather data exceeds our analytical capacity to make meaning from this data,” yet the value of big data sources is necessarily dependent upon our collective ability to understand how to query that data and achieve meaningful answers.[4] To me, technical communicators are especially well situated to tackle such tasks, as much of our work can already be recognized as “symbolic-analytic” work – a term Johndan Johnson-Eilola employs to describe the type of activities accomplished “by a wide range of people in the burgeoning information economy.”[5] In the case of big data inquiries, symbolic-analytic work could take the form of formulating new coding methods, recognizing and understanding variables, making associations, and helping to create relational meanings across seemingly unrelated data.

Being able to see and understand how meaning can be made through and across various data sets also allows technical communicators to employ one of their greatest strengths – their ability to produce coherent and meaningful narratives from data. In some cases, these collaborations may result in infographics, which have exploded in popularity in the last few years, or data visualizations of more traditional forms. With big data, however,
visuals can be produced from real-time information, as data streams emerge from user activity. These kinds of visualizations can be powerful representations, though only if data visualization specialists and technical communicators versed in visual rhetoric are able to understand which relationships benefit users. As the need for this kind of visualization is likely to increase, technical communicators will need to ask which new methodologies will help create visuals designed to help non-experts understand complex information that is also meaningful to their specific circumstances. As Brian McNely argues in the inaugural issue of CDQ, “technical and professional communicators, information architects, and user experience designers must plan humane, human scale approaches to big data, where relevant and meaningful ambient information finds people when they need it, contextualized for local situations.”[6]

Finally, technical communicators will be called upon to represent the needs and rights of users when working within data projects comprised of user information. Some, though not all, big data projects are built from the actions of users, from clicks and buying habits use to site visits and personal metrics. Central to our concerns should be how to protect users’ anonymity, keep users shielded from data mis-management, help users understand when and where they are sharing information, and represent how information is being gathered from them. As specialists in user-centered documentation and practitioners who care about the rights and values of the public, technical communicators will ask how to be the voice of ethical reason within new and emergent information scenarios.

How we response to these questions will affect changes in our classrooms and workplaces. We will need to develop methods for helping students and practitioners understand the implications of big data, especially how these challenges will be coupled with the further complication of how to create useful, training experiences where coding, visualizing, and narrating can be practiced and realized. Big data brings with it big questions for the future of technical communication.
Works Cited


From Research to Design: Building Knowledge So That We Can Build Experiences

Dave Jones

The Nerdery

As a scholarly researcher and architect working in industry, the most critical questions facing communication designers tackle complex ecosystems of people, technologies, and culturally situated practices. The field of Technical Communication is uniquely equipped to tackle these challenges (Hart-Davidson, 2001). Carolyn Rude (2009) states that scholars in the field of Technical Communication must explore how “texts (print, digital, multimedia, visual, verbal) and relative communication practices mediate knowledge, values, and action in a variety of social and professional contexts” (p. 176). She argues that research within the field must be situated at the intersection of creative practices that produce different types of texts, the cultures that provide meaningful context to such activities, and the technologies that support the production of both texts and meaning. But, where does Rude’s call to action point Technical Communication as a field, now? What new research questions have emerged at the intersection that she describes?

These ecosystems often enable (even demand) that people participating within them move across numerous systems and platforms, including desktop and mobile devices, social media platforms, email, or collaborative authoring and document management systems. In doing so, these participants inscribe various texts that can be scattered and dispersed, repurposed within new contexts, and allowed to develop new meaning (Jones, 2012a). My own research explores how gamers in an ecosystem produce game content, discuss their practices within discussion forums, and track down information from game developers across numerous sources (Jones, 2012b). Their research and inscription work spans game levels within Sony’s proprietary networks, Twitter updates, Facebook groups, discussion forums, and fan
blogs. The same is true of other communities who create their own ecosystems from similar tools for their own culturally significant purposes. And Technical Communication scholarship is replete with examples, from discussions about community-based mapping tools (Diehl, et. al., 2008) to examples of text that is recycled and reused across various spaces and contexts (Swarts, 2010).

Three Major Research Questions

With these considerations in mind, at least three major research questions can help scholars and practitioners address the challenges of understanding and designing for these ecosystems. These questions address the culturally situated practices of people and groups in these ecosystems, the design of technologies that support their activities, and the ways people work to understand that design. Collectively, these three areas form a richer picture of complex ecosystems in which technologies mediate the meaningful experiences of people and communities.

Social and Creative Practices

What are the social and creative practices of both individuals and groups who participate within these ecosystems? Researchers can describe the activities of participants in these ecosystems, outlining both the processes they use and the inscriptions they produce. At its core, the question seeks to understand what these communities are doing and why such practices are important to them. By tracing both processes and the cultural significance of these processes, researchers and designers can develop a richer understanding of the experiences that participants are seeking within these ecosystems.

Intersection of Practice and Technological Design

How does the design and architecture of technologies intersect with the creative and social practices of individuals and communities who use them? Researchers and designers need to situate the design of technologies—from the interface to the processes represented within the interface to the policies that govern their use—within the practices described by the first research question. This means that we can and should explore how
technological design can impact such practices, or how such practices will impact the ways such technologies are used.

**Strategies for Understanding**

What strategies do people participating in these ecosystems use to trace and understand the ways that technological design and cultural practice intersect with each other? Perhaps the most important of these three considerations, this question is aimed at exploring how participants make the intersections described in the second question meaningful to themselves and their communities. The strategies they employ often turn toward describing how to use such technologies, or how to change them in order to better suit the participatory activities they find important.

**From Research Questions to Design Questions**

Ultimately, these questions are both theoretical and practical. They seek to help better scholarly knowledge of community practice with the purpose of bettering our practices for designing new technologies. Now four years old, Rude’s call to action is still highly relevant to research agendas in both academia and industry. The intersection between people, technologies, and cultures has grown simultaneously more important and exponentially more complex. Now, in 2013, we can begin tailoring Rude’s call to much more specific research questions that address these ecosystems. The use of social media applications has grown exponentially in the intervening years, requiring scholars to account for the user experience (UX) of these technologies (Potts & Jones, 2011). This means not just approaching these technologies as scholarly researchers, but diving into these experiences as participants (Potts, 2010), and assuming a role as designers and architects. We must place ourselves squarely within the social and technological ecosystems we are researching so that we have an impact on their development. We must realize that we can impact how these ecosystems are designed, implemented, and evolve.

The research questions outlined here are a step towards driving research agendas with the aim of designing and developing ecosystems. Our future is not just in understanding these ecosystems and the communities in them. Technical
Communication as a field is well equipped to understand the user experience of these spaces as a matter of culturally situated experiences. Thus, we can drive the design of ecosystems that support communities rather than only interfaces that support behaviors and tasks.

References


The Invisible Web and The Need for New Research Methodologies

James Kalmbach
Illinois State University

A research question that I believe will be important for technical communication practitioners and scholars in the next decade is as follows:

How do we do develop big data methods for locating and studying web-based technical communication artifacts?

The web, for all practical purposes, is an endless sea of artifacts: text, documents, media, code, etc. And most of this limitless sea of data is invisible to us. Tools such as Google or Bing are great when you want to find that the one piece of data on some obscure website that will answer a specific question. These tools are wonderful when you have forgotten the url to a site you have used in the past or a video you heard about at work. Google is becoming (or may have already become) our memory. And there is nothing wrong with that.

But what if instead of asking a specific question, you wish to ask an open-ended question? What if you are interested in a big picture rather than a specific website? What if instead of needing to locate one website, you would like to find a hundred or several hundred that meet a particular criteria: websites that use a particular WordPress theme, a Dreamweaver widget, or that have been built with a particular navigational strategy so you can study how that strategy plays out. I googled the following on June 1, 2013:

websites with top menus

and I got back:

About 1,050,000,000 results (0.46 seconds)
That is one billion hits generated in less than a half second. If you are a big data researcher, where do you go from there?

The answer, of course, is nowhere. Current search tools are simply not for you.

These issues are not new nor are they unique to researchers. The invisible web is the underlying premise of many successful blogging sites and dot.com start-ups. The writers/editors/commenters of these sites do the work of locating and curating information on a particular topic of interest. We in return gift them our attention each day or so. The invisible web is both a problem and an opportunity.

Currently, many big (and not so big) data studies of the web in Technical Communication and Writing Studies constrain data collection via some physical limitation. They may analyze text that is stored in a specific database such as Quinn Warnock’s work, which analyzed texts posted on the Metafilter group blogging site, or they may limit their analysis to webs located on a specific server such as my article analyzing navigation structures in ten years of Kairos essays.

And while it is possible to brainstorm any number of ways of locating large collections of websites, these strategies are all one-off, ad hoc approaches.

The invisible nature of the web suggests that if, as researchers, we want to do more than locate content, if we want to study websites as websites, we will need new tools, methodologies, and systematic strategies for locating data. Since the web isn’t going away any time soon, I predict that answering the question: How do we develop big data methods for locating and studying web-based technical communication artifacts? will be a big deal in the next five to ten years.

And right at this moment, I am imagining Cheryl Ball nodding her head sagely and muttering under her breath: “metadata.” If you are wondering what she means, don’t goggle “Cheryl Ball Metadata,” as all it will yield is 20 million hits. Instead I suggest you ask her.
Works Cited


Identifying Core Principles and Expectations

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I’d like to add my brief response to your discussion about research questions facing our discipline. I can immediately name two.

1. **Identifying core principles (theory and practice) that undergird the broad, multifaceted discipline that is tech comm.**

In my 24 years within the field, our focus has moved...

- from writing itself (traditional issues of sentence structure, grammar & style, organization)
- through design (desktop publishing was a significant change, initiating inquiries into page design, fonts, readability, visual elements, etc.) and bringing emphasis on DTP tools
- through Web design and navigational issues, including all the issues listed above, and finally
- into heavy emphasis on users, usability, and user experience; now followed by content management. I don’t expect it to slow down at this point, but to keep evolving.

It has been a challenge to establish a balance as educators and leaders of programs, but more particularly it has been a challenge to researchers such as young academics who seek topics narrow enough to study, yet "important" enough to win their committee’s approval. Each new wave of interest threatens to pull the discipline out of a mainstream (if there is such a thing) and into tempting eddies and whirlpools.

While some great work has been done on core theory and principles, I’m not certain that academe is particularly focused on transmitting the foundation for advancing our profession and practice. What, for example, can we point to as a handful of common texts we hold to be important? Given the variety in our academic programs, can researchers and employers assume what
might be called a 'common core'? (I do realize, by the way, that even our mother discipline of English & Literature struggles with this same question.)

2. Establishing expectations of graduates and scholars to wed theory with practice.

Ours is, like medicine and engineering, a discipline that must be immersed in solving real-world problems. Even as scholarly professors, we cannot retreat into ivory towers; we must be (I believe) reflective practitioners who understand and demonstrate theory applied in practice. I do not understand how we can pretend to educate young persons to enter the workplace without providing them with internships and real-world assignments that prepare them for meaningful contributions to companies and organizations. In an engineering or medical setting this concept is assumed; is it equally true in tech comm programs? And if not, why not?
Navigating increasingly cross-cultural, cross-disciplinary, and cross-organizational contexts to support social justice

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We believe that one of the major research questions that will drive the field of technical communication during the next 5–10 years is, “How can technical communication scholars navigate increasingly cross-cultural, cross-disciplinary, and cross-organizational contexts to support social justice through better communication?”

Social Justice: Defined as advocating for people who are under-resourced (Frey, Pearce, Pollock, Artz, & Murphy, 1996), social justice can serve as an umbrella term encompassing issues that are of long-standing concern to our field, such as civic engagement (Bowden, 2004), service learning (Crabtree & Sapp, 2005), and social activism (Faber, 2002), as well as more recent focuses of technical communication such as information and communication technology for development (ICTD) (Walton, 2013a) and contemporary activism (Jones, forthcoming). Centrally relevant to social justice is work that examines the importance of the role of technical communication for activist groups and other stakeholders involved in affecting change for disenfranchised and marginalized populations (Scott, 2003). Other research relevant to technical communication and social justice considers how regulations and the creation of public policy documents historically impact underrepresented groups (Williams, 2010). The issue of advocating for under-resourced and marginalized people continues to surface in formal scholarly conversations such as the forthcoming special
issue on technical communication and human rights in the *Journal of Rhetoric, Professional Communication, and Globalization* and in informal professional conversations such as the Diversity and Social Justice in Technical Communication Network, a listserv established in March 2013 that is hosted by the Council for Programs in Technical and Scientific Communication (CPTSC). And while social justice is of central concern to many technical communication scholars in terms of their research, it is also relevant to technical communication pedagogy, for example in preparing students to advocate for marginalized and under-resourced people in a range of contexts from their local communities to their organizations of employment.

**Complex Contexts:** With the near-ubiquity of technology-mediated communication and the relevance of field-specific expertise in areas such as healthcare, law, and technology, technical communication research supporting social justice increasingly occurs in cross-cultural, cross-disciplinary, and cross-organizational contexts. For example, ICTD involves using information technology to improve the well-being of people in low-resource environments (Brewer, et. al, 2005). ICTD projects are carried out by cross-disciplinary, cross-cultural, geographically distributed stakeholders: e.g., technologists, social scientists, local beneficiaries, community advocates, and domain experts such as healthcare professionals. These diverse stakeholders contribute to and operate within a complex context for social justice work (Walton, 2013b). Similarly, many social justice and activist organizations engage in distributed work or are considered networked organizations (Jones, 2012). Within these organizations as well, work is often cross-disciplinary and cross-cultural. These complex contexts are not just the “where” of social justice scholarship; they are integral components of the “what.” Context—particularly when comprised of complex connections across cultures, disciplines, and organizations—is a central factor of social justice work.

**Communication:** Communication is an integral part of social justice, broadly defined. Ultimately, the primary objective of social justice causes is change. Faber (2002) notes that change and communication are interconnected, asserting that change is “an inherently discursive project. This means that change is restricted
by the structures of language and conventions of language use. Change will be a product of what can be legitimately said (or written) in a specific context at a specific moment in time” (p. 25). In this sense, communication (written, verbal, visual, and technological) is an inextricable part of social justice because change occurs through communicative practices. The field of technical communication concerns itself with the design of communication for specific purposes and audiences and necessarily considers the writing process; the applications and implications of rhetorical concepts; the use, selection, and design of technology and media; and user experience. As social justice continues to develop as an important line of study in technical communication, research exploring connections between communication and social justice becomes increasingly relevant.

**Future Research:** Looking forward, we see the juncture of social justice, complex contexts, and communication as a promising arena for technical communication research. This research could take a range of forms. For example, it could investigate appropriate research methods: methods that preserve the rights and interests of the full range of research stakeholders, methods that are respectful and meaningful across cultures. For example, action research, in which the researcher actively participates to affect change, has the potential to contribute greatly to investigations of social justice and technical communication (Blythe, Grabill, & Riley, 2008). In addition, methods-focused work could explore how to take into account diverse perspectives and alternate epistemologies to encourage more just and culturally-sensitive ways to understand and promote social justice. Alternatively, future research could focus on pedagogy: e.g., how to scaffold students in critical thinking about their budding professional expertise and its relation to social justice causes. Other important work could involve critical reflection on scholars’ complex roles as researchers and as advocates, exploring issues of identity, values, and research rigor.

In conclusion, we understand that in our work as technical communicators, our audiences, users, and stakeholders are of utmost importance. We design with them in mind. The constituents of these groups belong to and create community. Technical communicators must be focused on and dedicated to promoting
social justice in our communities, both local and at large. The 2012 CPTSC conference theme was “Communities, Workplaces, and Technologies.” Scholars from across the country discussed issues including diversity in our classrooms, multiculturalism, and globalization and localization. One consideration permeating many of the conversations was a genuine concern for how our field could encourage more socially just communities and communication. As Williams (2012) asserted in her keynote address, scholars are “digging for answers related to social justice questions that have been examined by other fields through different lenses” (p. 3). Williams noted that scholars in technical communication are actively searching for ways to make a contribution and “taking the traditional description of technical communication as a field that advocates for the user to a new and exciting level by focusing on historically marginalized groups and issues related to race, class, gender, and sexuality because these identity factors are not mutually exclusive” (p.87). This work investigates how social justice relates to technical communication, leading to a major research question for our field: How can technical communication scholars navigate increasingly cross-cultural, cross-disciplinary, and cross-organizational contexts to support social justice through better communication?

Works Cited


Chickens, MRIs, and Graphics: Creating Visual Information in Scientific Fields

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Last semester I gave a talk to a small group of graduate students and faculty in the Department of Animal and Food Sciences in the College of Agriculture on my campus. As one of several invited speakers for the department’s graduate seminar series, the purpose, I was told, was straightforward: model an effective presentation for the students. I teach courses in technical and professional communication so I imagined it might also be useful to discuss presentation strategies. I concluded by giving an overview of my own research interests—broadly, visual communication—and briefly described a project I am working on related to scientific graphics and historic public health maps.

Afterwards I was chatting with several students and preparing to head back to my office, when a faculty member, Smith, approached me.

“So...”, he began. “I have a question. You mentioned visual communication and scientific graphics and maps.... But what’s a good way to show a picture of a chicken?” he blurted out.

I worked as a technical communicator for years before I became an academic so I’ve had some experience talking to folks in other disciplines about their research. Still, I’d be hard-pressed to recall a conversation with an SME that proved to be as intriguing as this.

“A chicken,” I said, smiling and trying to ignore the image of Foghorn Leghorn that had just appeared in my mind. “Tell me more about this chicken.”

We spent the next half hour discussing scientific graphics and Smith’s area of research focus, essentially selective breeding in chickens. Smith faced an information visualization problem—show
a particular area of the bird, say, the wing, from a broad perspective but while still capturing molecular-level detail. More specifically, he wanted to group genes by function and then show correlations between gene expression and blood supply within specific tissues. A large number of genes were involved but not all gene functions were relevant to his research question so he needed to highlight some functions, but minimize others. The graphic he envisioned would show this ‘big picture’ concept but with appropriately nuanced detail. Most importantly, and the reason Smith had engaged me in conversation, was that he wasn’t aware of a graphical genre, he explained, that would accurately capture both of these perspectives simultaneously.

The above scenario illustrates the kinds of visual communication challenges that technical communicators (and SMEs) may encounter in the twenty-first century. Visual forms of communication such as statistical graphics have, of course, long been used to communicate quantitative information in scientific fields. However, relatively recent advances in computer technology in the latter part of the twentieth century have prompted the development of sophisticated information visualization programs and methods. These developments have lead to the emergence of interactive graphics (also often referred to as infographics) as well as other dynamic forms that communicate spatial and temporal information—mapping systems and 3D modeling, for instance. Many of these dynamic formats might also be thought of as blended genres because they often incorporate both quantitative information (embedded tables and/or charts—i.e., traditional statistical graphical formats) as well as qualitative information such definitions or measurements. Smith essentially needed a blended visual genre to show that could capture several different layers of visual information about his chicken.

Effective visual communication is central in the field of technical communication not just in terms of document design, typography and color choices, and image selection, for instance, but also in visually communicating scientific information. Sorapure (2010)

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1 See Friendly (2008) and Funkhouser (1937) for a history of statistical graphics. See also Tufte (1983).
notes that “Unlike other Web 2.0 applications, the tools and resources that are associated with information visualization have not received much attention from writing teachers or researchers” (61). Thus, understanding the rhetorical scenarios that prompt the creation of new graphical forms as well as exploring how these forms may be shifting and evolving in response to specific communication tasks will be increasingly important in our field. Specifically, the following questions present the opportunity for scholarly inquiry:

- What do technical communicators need to know about information visualization and the conventions of new and emerging graphical genres used to communicate scientific information?

- What conventions are becoming established in these new forms, and what expectations do readers have when they view these forms?

- How is perception influenced by genre, and how does showing information in a non-conventional or blended format (say, showing a map of gene functions in a chicken accompanied by pie charts illustrating details about each function in more detail) change how that information may be perceived?

- Finally, what new genres seem to be emerging, and how do they solve particular communication problems? What forms are beginning to emerge that we have not yet fully envisioned?

Towards the end of our discussion, Smith proposed that an interactive MRI might work for his purposes. However, he was still unsure if this was the best visualization method. He also questioned the feasibility of actually capturing the image (Could an MRI be done on a chicken? And, if so, what organization might have the technology to do the procedure?), as well as the expense involved (I jokingly asked at one point if the grant’s budget would cover an MRI—I assumed the project was grant-funded. He replied, no, unfortunately not). We agreed to talk more at a later

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3 See Kostelnick and Hassert (2003); and Kostelnick and Roberts (2010).
date, but before I left he told me that seeing his research through a different perspective was crucial.

“We need new ways to look at the data,” he said. “If we keep looking in the same way, I’m afraid we’ll miss the opportunity to learn new things.”

Smith’s last point gets at the heart of the rhetorical purpose of information visualization—to do more than just display data, but rather to improve how we interpret and subsequently make decisions about particular kinds of (often abstract) information—in short, to increase cognition. Smith understood this. And in the field of technical communication, we, too, have the opportunity to join this conversation.

Works Cited


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Computer-assisted translation (aka machine translation) is on the fast track to becoming a utility. Translation will automatically become part of everything we do. Computers, websites, touch screen devices, in-car navigation systems, kiosks in public places, ATMs, airline self-service terminals -- basically any consumer-facing graphic user interface -- will include a "translate" button. In fact, the beta version of the Android operating system includes just that in the latest rendition of the Chrome browser. That's just the start of things to come. Machine translation will soon be ubiquitous!

But, automated translation systems don't produce high quality translations as often as many companies would like it. Accuracy rates depend heavily on the type of machine translation employed (statistical versus rules-based), the language pairs (source language to target language), as well as the quality of the content being translated. Technical communication professionals are part of the problem, especially those who have yet to realize that we write for machines first. Automated translation systems perform best when we provide them with clean, grammatically- and linguistically-correct, highly-structured, semantically-rich content written in clear and concise language free of mumbo jumbo. But, we have a lot to learn as a field of discipline in a new digital, mobile, global era.

Technical communicators have, for the most part, continued to use outdated rules for writing. It's no longer acceptable for us to rely on grammar and writing rules created when devices like the iPhone, iPad and technologies like Bluetooth were science fiction (think Star Trek, the original television series). Today the end game is to write content that machines can process automatically and make available to humans -- the right content, at the right time, in the right format, on the device of their choosing, and in the language they prefer: their own.
Add to the mix voice technologies like speech recognition and the ante rises significantly. Apple's Siri can understand and process human voice commands. How long will it be before she is able to translate those commands into other human languages ("Siri, open my resume and translate it into Spanish. Then, send it to Sally.")?

This is a time of great opportunity for technical communicators who choose to accept the challenge. It's time for educators to recognize that the rules have changed. So, too, must technical communication education.
Open Research Questions for Academics and Industry Professionals: Results of a Survey

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Abstract

To identify some of the research questions and needs of most importance to industry professionals and academics, we conducted a Technical Communication Industry Research Survey that posed a common set of questions about research. Here we report the results, which suggest some differing priorities for academics and industry professionals, but also some shared priorities that might help guide disciplinary research, including content strategy, user behavior, metrics/measurements, and process/practices.
Introduction

Establishing a shared research agenda is a complex task in a field as diverse as technical communication, which includes both academics and industry professionals and an incredibly diverse array of interests, practices, and specialties; we produce a significant amount of work devoted to building bridges between different interest groups (Blakeslee & Spilka, 2004; Faber & Johnson-Eilola, 2002; Rude, 2009; Tebeaux, 2003) and establishing “core” competencies that will help define the field (Albers, 2005; Gu, & Pullman, 2008; Hart-Davidson, 2001; McDaniel, & Steward, 2011; Spilka, R, 2009).

One point of agreement across the field is that we need more and better research, a premise that led JoAnn Hackos to invite four academic researchers to attend the 2012 Best Practices conference sponsored by the Center for Information Development Management (CIDM), a conference attended primarily by managers of information development, training, and support. The subsequent research discussion led to a lively discussion of research needs in industry, an informal survey of those needs, and wide agreement that we need reciprocal relationships in which academics work with industry to define research questions grounded in practice; results of these studies could be beneficial across the field.

The results of the informal survey, taken only by 48 conference attendees, suggested that there are some differing priorities between academics and practitioners, along with some key shared values and goals (Andersen, 2013). We therefore followed up with a more formal Technical Communication Industry Research Survey that posed a common set of questions about research to a large group of academic and industry technical communication specialists. Here, we report the results of that survey.

The Survey

The survey was built from the results of the informal survey at the conference, which asked attendees to respond to one open-ended question: What topics would you appreciate having research data
for? Results broke down into the following eight research categories: user behavior, process/practice, content strategy, metrics/measurement, technical communicator roles, training, value proposition, and tool comparison. In the formal survey, respondents were asked to rank these eight categories from 1-8 with 1 being "most important" and 8 being "least important." Respondents could rank only one topic at each level.

The survey was posted to members of the CIDM via a mailing list and website as well as the group’s LinkedIn page. It was also distributed to the academic listservs including the Association of Teachers of Technical Writing, and the Council for Programs in Technical and Scientific Communication. A total of 261 participants responded to the survey, 190 (73%) of whom are practitioners in technical communication. Fifty-four respondents (21%) identified themselves as academics, and 17 (6%) described themselves as “other,” which included software vendors, academic/practitioners, and project managers. Most (78%) respondents were from the United States, but some global representatives participated, most of whom were from Canada and the UK.

Survey Results

The following tables show the research priorities of the two largest groups of respondents (industry professionals and academics) by totaling the number of responses of 1-3 (most important) for each topic and the number of responses of 6-8 (least important) for the topics.

The tables are read most easily by focusing on the fact that within each of the topic areas (the eight bolded columns), the darkest green at the top of the column indicates the highest number of rankings as "Most Important" whereas the darkest green at the bottom of the column indicates the highest number of rankings as "Least Important." Conversely, the darkest red indicates the lowest number of rankings.
Figure 1. Ranking of Importance of Research Areas: All Participants

As shown in Figure 1, both groups express a need for research in user behavior—third priority for industry professionals, second for academics. Both groups rank processes and practices in the top half of their priorities. Neither group is particularly interested in research on tools.

Key Areas of Agreement and Divergence

Figure 2 helps demonstrate areas in which industry professionals and academics have the most and least agreement. For example, the groups are very close in their assessment of the importance of “process,” but far apart in their relative assessment of “training,” which may of course simply reflect the teaching mission of academics. More intriguing is how far apart academics and practitioners are on “content strategy,” which few academics prioritize (and many felt was least important), but was in the top three for 23% of practitioners.

Figure 2. Most and least divergent categories for academics and practitioners.
If we further account for the number of “top three” and “bottom three” votes assigned to the various categories by practitioners and academics, some additional interesting patterns emerge (see Figure 3), as, for example, we see “strategy” and “metrics” are high priorities for nearly all practitioners, but are middle to low priorities for academics.

![Figure 3. Most and least important categories]

Content strategy and metrics reflect the daily work and needs for decision making by industry professionals, but they affect academics less. This divergence does not mean that academics would not be interested in research in these areas. The survey results help to make them aware of the need.

**Key Questions that Emerge**

In spite of divergent research priorities for practitioners and academics reflected in survey results, there does seem to be some consensus that areas of high priority include content strategy, user behavior, and processes and practices. These topics reflect changes in the field in the production and management of information as a result of cost and time pressures, new technologies, and leaner staffs. They also reflect a changing user who now uses a variety of devices for getting information and learning to use products. In a period of rapid change, industry professionals must invent on the fly. Systematic research could help to determine whether the adaptations and decisions have worked.

In short, the survey suggests that these topics might become priorities for the field’s research insofar as they constitute expressed areas of need for industry practitioners:
Beyond definitional work to flesh out and, if necessary, reconcile the ways academic and professional practitioners may be using these terms, together they speak to a need to deepen understanding of practice with an eye toward developing evidence-based improvements. Content strategy may well be the umbrella term for understanding the ways organizations make choices to suit users’ growing range of needs and choices: should we be designing for mobile first? Should all of our information be localized? Are there data we can generate or access to improve our processes? Are there standards emerging to define and help to place practical limits on costs while ensuring that customer expectations are met?

These specific questions, as representative of the four issues, may or may not be well-represented in the published literature in technical and professional writing, including conference proceedings, journals, and full-length works. A survey of recent work with these in mind, aimed at a practitioner audience, would likely be well-received by the CIDM group members who are eager to develop evidence-based practices within and across their industry and market areas.

Conclusion

We hope this survey data will help open the discipline to more and deeper discussions about the important questions that impact industry professionals, and that in the process we can establish more and better reciprocal research relationships. A research agenda that emphasizes reciprocity between research and practice, where research questions grow out of practice and the results of research are fed back into practice, will not only increase the relevance, value, and reach of scholarship in the field but also help academics better guide students and set new curricular goals. Professional organizations such as the CIDM and the Academic SIG of the Society for Technical Communication have been actively
working to support stronger industry/academic partnerships. The CIDM, for example, soon will have an infrastructure in place to support research projects of value to the industry; the infrastructure includes among other things a funding model and a section on the CIDM website for research project announcements and research proposal submissions.

We see the results of the industry research survey described here as a starting point for establishing a research agenda that will put into continual conversation technical communication researchers, practitioners, and educators.

**Works Cited**


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This position paper proposes the undertaking of a systematic research agenda on the tangled questions of accessibility, technology, and disability from the perspective of Technical Communication field. O’Hara (2004), Oswal and Hewett (2013), Palmeri (2006), Porter (1997), Ray and Ray (1999), Salvo (2005), Slatin and Rush (2003), Theofanos and Redish (2003 and 2005), and Walters (2010), have approached accessibility issues in various Technical Communication contexts and have emphasized the need for more attention to accessibility in our research, teaching, and practice. Likewise, the major journals in our field—Technical Communication, Technical Communication Quarterly and the IEEE Transactions in Professional Communication—have also published at least one special issue EACH on the topic of accessibility. While all this sporadic research has appeared on accessibility-related topics in different venues, this research has not yet gained the type of traction one would generally expect from an area with such a growth potential. As a user-centered discipline, we also ought to remember that presently 57.8 million Americans have one or more disabilities. Among the U.S. veteran population alone, 5.5 million are disabled. And, if we consider the reach of our Technical Communication work via the World Wide Web, this planet has 1 billion people with disabilities who can be affected by our accessibility research (National Center for Disability, 2013).

Considering the tight supply of Technical Communication professionals with formal training in accessibility, and the growing pressure from legislative and executive branches of the U.S. Government for compliance with disability laws relating accessibility, it is even more puzzling to see that the work in this
area has not yet found a sturdy footing in our research. Even in the practice arena, we might ask how many Technical Communication companies presently advertise themselves as accessible web design outfits.

As the Technical Communication researchers above have already established that the accessibility as it relates to disability falls well within the scope of the multidisciplinary field of Technical Communication, Information Design, Human-Centered Design, and Human-Computer Interaction. Within this relatively new area of digital accessibility and disability, we can already see several emerging sub-areas, each of which presently pose a set of sometimes well-formulated and sometimes not so well-formulated research questions. While the research in this area has primarily remained practice-centered just as have been most of the publications on accessibility and disability. One of the reasons responsible for this limited focus might have to do with the entrepreneurial nature of web design field where most of the accessibility work has so far taken place in the hands of mostly self-trained programmers and web designers. The second reason for this lack of attention might have something to do with the demand for this accessibility work primarily coming from the industry-side. Another factor contributing to this phenomenon might have to do the relative indifference to accessibility and disability in the academy with the exceptions of some individual academics developing research interest in accessibility here and there.

At the same time, the developments in digital technologies have continued to occur at a breakneck pace with little attention to accessibility. Because the designers and developers continue to exclude the disabled from their conceptualization of the users for these technologies, they also continue to add new accessibility-related problems to the existing ones, not to speak for growing the market for retrofits (Dobransky and Hargittai, 2006).

On the fundamental research side, core questions in the areas of accessibility, technology, and disability have yet not been tackled in any serious manner because most of the professionals addressing these questions at this time are practitioners or trainers, come from fields as apart as Computer Science and disability law, and have mostly wandered into this area to occupy a wide open niche with
unlimited economic opportunities. Howsoever praiseworthy their work might be, the outcome of their efforts has experienced the tensions present in any research where business interests and the search for the best research answers collide. While their work has provided practical solutions for the industry's accessibility problems, in no sense these solutions have always addressed the problems confronted by disabled users to their satisfaction (Moser, 2006). The underlying cause of this dissatisfaction is in industry's focus on meeting regulatory needs than an effort at meeting the user needs. This research also has yet to be validated after having been placed under the microscope for the soundness of its findings. Academic research has also thus far dwelt upon the description of accessibility problems and offering provisional solutions.

The opportunities for expanding the purview of Technical Communication research and practice are vast. The field of technical communication can contribute to most of the aspects of accessibility problems confronting the digital environments. The disability laws and access regulations are complex, expansive, and often contradictory. Someone needs to unpack them for the consumers and citizens, professionals and administrators, designers and developers of technology. If these laws and regulations have to serve their intended purposes, who could be better at it than the language-focused professionals in Technical Communication.

The text of the three titles of the Americans with Disabilities Act, the several revisions of the original Rehabilitation Act of 1973, the various iterations of the Individuals with Disabilities Education Act, the numerous regulations and rulings derived from these statutory laws, the ongoing court decisions and orders, a variety of guidance letters issued by the Departments of Justice and Education, the Office of Civil Rights, the Access Board (executive side of the ADA administration), and the huge library of ongoing Congressional hearings about the aforesaid laws together can keep thousands of Technical Communication researchers busy through their careers to explain, interpret, and even devise instruments to implement the policies derived from these regulations in the areas of technology, information, and communication.
Similarly, the Web Content Accessibility Guidelines 1.0 and 2.0 developed by Web Accessibility Initiative, an arm of the World Wide Web Consortium, are humongous technical documents spanning the vast field of web design, including several areas of off-line digital content and communication, computing, and usability (Stienstra, 2006). All of these documents require expert interpreters and adapters of technical knowledge what three decades ago David Dobrin (1983) described as, accommodating technology to the user. We cannot expect code writers and information technologists to sort out these behemoths; after all they are responsible for producing them in the first place. By simplifying the technical language of the soundest of these guidelines, by testing out the ones with dubious value through our rigorous research, and by integrating the most basic of the tenets of accessibility into the usability literature of our field, we can lift this area of accessibility research from the margins and place it somewhere in the center of Technical Communication—a user-centered discipline in search of a 21st-century identity. By doing so, we can simultaneously render tremendous service to users, government, and industry by constituting the work of accessibility into an organized disciplinary area (Goggin and Newell, 2006).

Considering the number of accessibility-related, large, National Science Foundation (NSF), Department of Labor, Department of Education and other Federal grants claimed by researchers in Computer Science, Human-Computer Design Engineering, Information Science, and Cognitive Psychology fields over the past two decades, it is further difficult to understand why Technical Communication departments have not gone after these grants in these times of fiscal austerity. On the other hand, a good percentage of empirical research conducted in the name of disability and accessibility in the above mentioned fields is quite machine-centered at this time. Even the theoretical work coming from Psychology, Informatics, Computer Science, and Management specialties is rarely human-centered (e.g., see the recent ACM paper from the University of Washington at http://faculty.washington.edu/wobbrock/pubs/chi-11.03.pdf). Since accessibility is about accommodating technical hardware and software, information resources, learning and living venues, citizenship resources, to disabled users’ needs, Technical
Communication can significantly contribute to a human-centered practice of accessibility. Technical Communication field with its origins in the Humanities can also do a much better job at representing "accessibility" both at theoretical and practical levels. Those of us who have an intellectual and professional commitment to direct engagement with technology design can integrate any or all of the accessibility design, problem-solving, and testing-related work in our research agenda.

The professional and research expertise required for accessibility work is closely related to Technical Communication field’s current knowledge base—Psychology, web design, Usability, specification design, and engagement with legal writing. Thus, research and practice in accessibility is well within the scope and purview of Technical Communication because it does not require the acquisition of any extraordinary knowhow in special tool-making or foundational knowledge. The typical research methods, as well as, the more advanced work methodologies, required by accessibility work is training in analytical thinking and discourse analysis, interviewing, document and project design, case history work, ethnographic methods, and usability testing. These training areas are generic in Technical Communication work and expert Technical Communicators are expected to possess knowledge and skills in these areas. On one end of the technical continuum, researchers can be the designers of accessible user experience built from the core at the interface level, and on the other end they can be watch dogs of accessibility in the public digital spaces around the world. In terms of theory, they can arbitrate the guidelines for developing accessible systems, which presently are primarily in the hands of business and industry, so that accessibility standards can become independent of industry control.

In terms of the logistics of implementing an accessibility-centered Technical Communication agenda, we can learn from Computer Science, Information Design, and Human-Center design Engineering about integrating accessibility agenda in our existing programs as extension projects than as a replacement for what we do presently. In many of the aforesaid fields, once a program succeeds in attracting a major grant to establish a research center or testing laboratory, it also begins to attract accessibility work from
business, industry, and governments. Many of the National Science Foundation, National Institutes of Health (NIH), and other Federally-funded projects also offer opportunities for consulting expertise and provides additional revenue to the academic programs.

Since many of the field conditions in the military resemble the work and living conditions experienced by disabled users—lack of appropriate lighting conditions for the use of vision, loud environments rendered useless for sound communication, or users unable to apply hands, eyes, or ears under certain field environments—various military organizations desire research in this field. For example, close connections can be drawn between the access of devices by users with diverse disabilities and the hands-free use of weapon systems in battle conditions where the pilot or tank operator has to perform multiple tasks at the same time. For this reason, Defense Advanced Research Projects Agency (DARPA) is also beginning to invite proposals for accessibility-related research.

The remainder of this paper presents a tentative agenda, a sort of rough draft for exploring this area of accessibility research.

1. Technical Communicators have the opportunity of becoming accessibility experts in their own backyard. The Composition Studies and Rhetoric, the umbrella field, within which many of us locate the Technical Communication discipline, seeks viable strategies for making its burgeoning enterprise of online instruction accessible to students with differing abilities. Some very basic research questions in this area of online education have yet to be answered with some reliable data (Parker, et al., 2011). On one hand, we are informed that more than 200 fully accredited online higher education institutions presently offer courses in the United States (Radford, 2011) and 2.78 million students were enrolled in fully online programs (Aslanian and Clinefelter, 2012). On the other hand, the only nation-wide survey of online writing instructors by the CCCC Committee for Effective Practices in Online Writing Instruction in 2010 revealed that we knew little about the state of accessibility of our Technical Communication and Composition courses to disabled students. To get research going in this area, we could begin with some exploratory questions from the angle of
accessibility and disability: what does the rapidly changing
technological landscape of online Technical Communication
instruction look like at this time? What do we know about our
disabled students’ accessibility problems with our online courses?
What do Technical Communication instructors know about
accessibility of their online courses? And, what do we know about
the effectiveness of multimodality in Technical Communication
courses in the context of accessibility and disability?

2. Technical Communication field can become the interpreter of
disability and accessibility policies when technological and
linguistic issues are central. Further on, we can argue that we as
professionals have the training for designing, creating, and
organizing information, and possess the crucial knowhow to
interpret the complicated legal and technical literature surrounding
accessibility, disability, and user needs.

3. Technical communicators can become accessible interface
designers because the software developers are too busy designing
software. Web designers are busy designing inaccessible pages, and
the door of opportunity is wide open for us to design accessible
web infrastructure for all. For example, The University of
Washington, which has had an established program in Technical
Communication until recently, reformed and reorganized its
previous program into a Human-Centered Design Engineering
program so that it could not only focus its expertise on general
usability of information but also of design. Ambitious programs
interested in differentiating themselves from the rest have the rare
opportunity to be the first to brand themselves as an accessibility-
centered graduate degree granting department.

4. Researchers in Computer Science, Information Technology,
Information Science and Human-Computer Design Engineering are
conducting both theoretical and applied research in the areas of
technology, accessibility, and design aimed at meeting the needs of
disabled users. Most of this research is experimental or quantitative
aimed at developing prototypes; we can contribute more
meaningful research by combining our expertise in both
quantitative and qualitative methods working with actual users of
accessibility, developing test designs, and creating models for
designing accessibility surveys, studies, and experiments.

5. Likewise, significant ethnographic work is essential for
documenting everyday use of retrofit adaptive technologies both in
the workplace and classroom. Technical Communication can again
transfer its expertise and experience in digital and technical
ethnography to the accessibility work.

6. Technical Communication, with its feet firmly dug in
Humanities, has further opportunities in areas adjacent to disability
and accessibility where questions of social and environmental
justice mingle with the questions of digital divide. Studies of
disabled workers, particularly in higher education where ableism is
obvious in conjunction with many other forms of discrimination—
racism, class, and gender. The only meaningful research in this area
is possible through longitudinal studies where graduate student
could insert herself in an organization with a broader purpose and
yet record in their data collection the particular instances of
everyday, subtle, and highly pervasive instances of discrimination,
exclusion, or plain bullying. Very little work has been done on the
last item although anecdotal information among the individual
disabled groups circulates from time to time. As we know from
studies of other forms of discrimination, such instances can have
devastating effect on her day to day functioning of a disabled
employee in the same workplace. Just as a few decades back a
female employee could be harassed by a male colleague or
supervisor without getting sufficient attention from the
management, discrimination against disabled workers is possible in
today’s organizational mileiu. While female harassment was
possible to document without such close ethnographic work,
because the growing number of women in the workplace were
available as witnesses to such harassment, today’s smattering of
disabled employees in the workplace lack that kind of solid mass of
witnesses because of their small numbers and widespread
ignorance about disability issues among the workforce.

My purpose in outlining the above research paths with many
nested questions is mainly to provide a few quick pointers for the
newcommers to accessibility than to plant some permanent guide
posts for inquiry. As we produce more research in accessibility, we will have other occasions to define this nascent area of research. As more and more scholars get their feet wet in accessibility research, many creative and constructive avenues of inquiry are bound to open for the Technical Communication discipline.

References


National Council on Disability (NCD) June 25, 2013, letter to The Honorable Robert Menendez, Chairman of Committee on Foreign Relations, U.S. Senate.


In this poster presentation, the author traces health communication in online spaces, especially conversations about hypothyroidism on Twitter. Specifically, the author looks at how participants on Twitter use the hashtag #hypothyroidism for patient agency and advocacy. The strength of ties between #hypothyroidism (the Twitter hashtag) and the actors necessary for its existence is also discussed. This poster presentation argues that Twitter can strengthen patient agency and advocacy in both online and offline relationships between hypothyroidism patients and healthcare professionals. Patient agency and advocacy is accomplished because Twitter helps to build communities of support between and among patients and professionals through the immediacy and accessibility of information.

Future Research Trajectory: This pilot study traced digital health communication among patients and professionals in the hypothyroidism community on Twitter. As such, I plan to trace how other communities of support get created and sustained on Twitter. Specifically, I plan to trace how people use Twitter for mentoring in the workplace. Currently, it is my plan to apply the theory and methods used in this pilot study to a dissertation project in the coming two years.
Hypothyroidism, an incurable disease, is a condition in which the thyroid gland produces little or no thyroid-stimulating hormone. Medications, diet/exercise, and family/friend/professional support assist in living with this disease. Hypothyroidism results from autoimmune disorders, thyroiditis, iodine irregularities, stress, and absence of the thyroid gland. Symptoms include anxiety, depression, fatigue, hair loss, goiter, weight gain, and impaired memory among others. Hypothyroidism participants use Twitter as a communication platform to collect/share information, stories, knowledge, and experiences globally. This poster looks at how people use Twitter for patient agency and advocacy.

The strength of ties between hypothyroidism and the actors necessary for its existence is noted. Twitter strengthens patient agency and advocacy in both online/offline relationships between hypothyroidism patients and health care professionals through the immediacy and accessibility of information on Twitter.

**TWITTER: A SPACE FOR COMMUNITY BUILDING**

- Clicking on hashtagged words like #hypothyroidism, for instance, shows other tweets marked with the hashtag #hypothyroidism. Hashtagged words can be organized into an aggregation or stream using a social media dashboard (like Hootsuite or Tweet-deck).
- Twitter publicly states that it “lends itself to cause and action,” and further, that as an organization is “inspired by stories of people using Twitter to help make the world a better place in unexpected ways.”
- Hypothyroidism participants use hashtags on Twitter in order to share stories and generate knowledge about hypothyroidism.

**IMPLICATIONS: PATIENT AGENCY AND ADVOCACY**

- Stories about hypothyroidism primarily come from patients who suffer from the condition.
- Participants use the hashtag #hypothyroidism and interact with others in the Twitter stream by sharing information and knowledge.
- Participants distribute knowledge to others in the network, and thereby build an online community of support.
- Distributed knowledge reinforces patient agency and advocacy.
- The immediacy and accessibility of information on Twitter can provide hypothyroidism participants with a public space to make better their quality of life.

**HYPOTHYROIDISM CULTURE ON TWITTER: HOW COMMUNITY FORMS**

- Actor-network theory (ANT), articulation theory, and activity theory were used as methods in diagramming the figures for this poster.
- Both human and non-human actors were mapped as essential for the hashtag #hypothyroidism to exist on Twitter.
- Data (approximately 2,000 tweets) were sorted and collected for eight weeks during the summer of 2012, as part of a pilot study on tracing digital culture.
- Tweets having the hashtag #hypothyroidism were organized into a Twitter stream using a social media dashboard, so that the author could observe and participate in conversations, and reference tweets at a later time.

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