A Cross Section of Technical Communication Tools across Industries in the Upper Midwest

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Abstract

In this brief study, I interviewed practicing technical writers and professional communicators from companies across multiple industries in the Midwest, including manufacturing, consumer products, finance, software, small businesses, and retail to better understand current digital writing tools employed across the Midwest. In what follows, I will discuss the results of my interviews, and the implications of this study in the context of the field of technical writing, and technical writing higher education programs in Minnesota.

Introduction

The field of technical communication is rapidly changing as we dive further into the age of Web 2.0. Audiences expect to create, converse, and interact with the content they consume (Livingstone, 2004). In turn, how authors write and publish content, and how users access and interact with content, is in a constant state of flux as our (American) economy becomes more and more digital (Wladawsky-Berger, 2017). As professional writers and communicators, technical writers need to be equipped to adapt to these changes and provide compelling content to their users when and where they need it.

The role of the technical writer then becomes so much more than writing manuals - we are translators, designers, "desktop publisher[s], electronic graphic artist[s], and webmaster[s]" (O'Hara, 2013, p. 4), and above all else user advocates. We need to use our knowledge and skills to organize and design information that is focused on the user.

The above is of particular interest to me as I am in my final semester of the University of Minnesota's Scientific and Technical Communication MS program, and will be entering the workforce following graduation in December. At this point, I have completed my coursework, and am ostensibly trained to be a fully functioning technical writer. But as many scholars and professionals have lamented, there is a large disconnect between academia's lessons and industry's needs (Poe, 2017).

Along with being a student, I am also a Teaching Assistant for the Writing with Digital Technologies courses (WRIT 4662 and 5662) where we aim to help students develop their digital literacy by teaching common technical writing tools including HTML/CSS, XML and DITA. I am particularly interested in writing tools that employers in the Upper Midwest are using in their technical publications/ communications departments, and what skills that they are looking for in new writers. My interest in current technical writing trends, my position as a Teaching Assistant in a technical writing program, and my personal position as a soon-to-be graduate have lead me to conduct the study that follows. This study is both a selfish move to

better prepare myself for a career in technical communication, as well as a memo for the Writing Studies Department and students of the Department here at the U of M to better align themselves to the needs of the workforce.

In this brief study, I interviewed practicing technical writers and professional communicators from companies across multiple industries in the Midwest, including manufacturing, consumer products, finance, software, and small businesses to better understand current digital writing tools employed across the Midwest. In what follows, I will discuss the results of my interviews, and the implications of this study in the context of the field of technical writing, and technical writing higher education programs in Minnesota.

Methods

Before I began the study, I submitted the study for IRB review as I was interviewing human participants. Due to the target of study for this project (i.e. the writing tools used by the participants rather than personal information about the participants), the study was considered exempt, and did not need any further IRB review or approvals.

Contacting Participants

Finding participants for this project took a snowball approach. I first reached out to contacts recommended to me through my personal network. I informed coworkers and friends of my research, and inquired if they knew technical writers or professional communicators.

If a potential participant was identified, my personal contact would first inquire about their interest in participating in the study based on a brief study summary that I provided:

> "In this project I am interviewing practicing technical writers from companies across multiple industries in the Midwest, including manufacturing, food production, finance, software, medical devices, and retail to gather information on current digital writing tools employed across the Midwest" (Shirk, Personal Correspondence, 2019).

If the person was interested in participating, my personal contact would either inform the participant to expect me to contact them and provide me with the contact information for the interested person so that I could reach out to them directly.

Alternatively, my personal contact would introduce me to the participant via an introductory email. I would then respond to the email with a more elaborate explanation of the study, communication options (in-person, phone, video-chat, email) so we could set up a time for the interview, along with my set of interview questions for their reference.

As I began to conduct interviews, my participants connected me with more communicators who were interested in participating in this study. I would then reach out to these secondary contacts via LinkedIn initially, and then shift the conversation to email to set up a meeting time. It is important to note that this study originally focused on employers in the Twin Cities, but quickly expanded to the Midwest region as a whole as I was connected with communicators in Wisconsin and Illinois as well.

I also reached out to members of the TCAB board to participate in this interview via LinkedIn (for the initial communication), and again, shift the conversation to email to set up a meeting time.

In the interest of my participants' privacy, I have redacted participant and company names from this report. Rather, I will refer to the industry and company size where the participant works.

Interviews

The interview component of the study took several different forms, depending on the availability of the participant and myself. I offered the interview via phone call, video call, or email correspondence and let the participant decide which communication method would work best with their schedule.

Each interview was based on the following set of questions. I would provide each interviewee this set of questions for their review prior to the interview.

- What tools does your writing team use?
- How many writing tools does your writing team use?
- Do you have any legacy formats that you no longer use to create new manuals?
- How do you plan to move away from these legacy formats?
- What writing tools have you considered to replace your legacy formats?
- How big is your writing team?
- What skills do you look for in a new writer?
- Do you have a separate illustration team? What tools do they use?
- What are your output formats?
- How do users interact with your documentation?
- Are you happy with your current writing tools?
- Do you have any plans to change how you are writing content in the future?
- Do you have any plans to change what document outputs you produce in the future?
- Are you comfortable with me listing your name and/or company in my final report? Or do you wish to remain anonymous?

For phone and video call interviews, I would set up a meeting time with the participant days in advance. For video calls, I set up meeting spaces using Google Meet or Zoom and sent the

meeting room link to the participant. During the meetings I used the listed interview questions to guide our conversation. I found that these interviews tended to stray from the questions a bit more than the email correspondences as the interviewee and I were conversing. As the participant was speaking, I would take notes of their responses on my laptop in a Google Doc outline that I had prepared for the interview.

For email correspondence I would send a description of the study along with the set of interview questions for the participant to respond to. Participants would copy and paste the questions and provide their responses below the question, much like a worksheet.

Table 1: Participant Information

Participant	Industry	Company Size
Participant 1	Manufacturing	90,000 Employees
Participant 2	Financial IT	5,000 Employees
Participant 3	Manufacturing	6,000 Employees
Participant 4	Manufacturing	90,000 Employees
Participant 5	Software	17,000 Employees
Participant 6	Small Consulting Business	1 Employee
Participant 7	Digital Healthcare Communications Startup	5 Employees
	Consumer Products	41,000 Employees

Participants 1 and 4 were from the same company, in different divisions. I will treat them as two separate entries as their experiences, past and current, are very different and their insights are very informative. Participant 7 holds two communications positions. In our conversation, we discussed their roles separately, so I will report on their responses as two separate entries.

Following completion of my interviews, I compiled my results and notes into a Google Doc and assessed responses. To assess the interview responses, I grouped my questions into topic-based groups including: current writing tools, legacy formats, illustrations, writing teams, outputs, and future plans. I then compared the responses of the different participants to determine common threads and interesting differences, which I will discuss in the Results section below.

Results

Current writing tools

Questions regarding the participant's current writing tools included:

> What tools does your writing team use? How many writing tools does your writing team use?

I asked these questions to get a better understanding of what tools the writers were using in their daily work, and how many different tools they needed to learn and rely on in their work. This information is the central focus of my research, and thus were placed at the top of my interview questions. I wanted these questions to guide the majority of our conversations, and be at the forefront of the participants' minds as they were responding to my questions throughout our discussion.

Structured authoring

Four of the seven participants used structured authoring tools of some sort. Two reported using Adobe FrameMaker (both from manufacturing companies), one reported using PTC Arbortext (from manufacturing) and one reported using oXygen XML editor (from software).

Accompanying their authoring tool, these same four participants reported using CMS/CCMSs in their work for version control and content reuse. Two reported using Adobe Experience Manager, one reported using PTC Windchill, and one reported using IXIASOFT.

Table 2: Structured Authoring Tools and CMSs by Industry

Participant	Authoring Tool	CMS	Industry
Participant 1	Adobe FrameMaker	Adobe Experience Manager	Manufacturing
Participant 4			
Participant 3	PTC Arbortext	PTC Windchill	Manufacturing
Participant 6	oXygen	IXIASOFT	Software

Unstructured authoring

Three of the seven participants reported using unstructured authoring tools including Microsoft Word, Microsoft PowerPoint, Microsoft Visio, Microsoft Publisher, Google Docs, Google Slides, Confluence wikis.

To maintain their documentation, the participants using unstructured authoring tools employed a variety of different storage tools including Office 365, Sharepoint, Google Drive, and Confluence.

Table 3: Unstructured Authoring Tools and Content Storage

Participant	Authoring Tools	Storage Tool	Industry
Participant 7	Microsoft Office (mainly Word, Excel, and Visio)	Sharepoint	Consumer Products
	Google Suite (Docs, Slides, Sheets)	Google Drive	Digital Healthcare Communications Startup
Participant 6	Microsoft Office; Google Suite	Dropbox, Google Drive	Small Consulting Business
Participant 2	Microsoft Office, Confluence	Sharepoint, Intranet, Confluence Wiki Space	Financial IT

Legacy formats

Questions regarding the participant's legacy formats included:

> Do you have any legacy formats that you no longer use to create new manuals? How do you plan to move away from these legacy formats? What writing tools have you considered to replace your legacy formats?

I asked these questions to get a sense of all of the different file formats that a writer has to deal with on a daily basis, and to get a sense of how much of their time is spent on conversion and maintenance versus authoring new content.

Four of the seven participants responded that they encounter old legacy formats in their work, and some are working to migrate this content into their current writing formats. The other three participants did not indicate any issues with legacy content, or any discussion of content conversion.

Participant 1 noted that their company was undergoing a massive conversion process as they transition from content written in Microsoft Word to a DITA solution using Adobe FrameMaker and Adobe Experience Manager. Participant 4, who works in the same company, experienced the same conversion issues.

Participant 5 reported that they run into legacy documentation in Documentum and are working to convert all of their content into their DITA solution using oXygen XML. The participant noted that this conversion process is almost complete after five years of transition.
Participant 2 noted that, while they do not tend to convert their legacy documents, the tools that they use for writing and publishing their content is changing. They noted the desire and potential conversion of the company's intranet tools.

Illustrations

Questions regarding the participant's experience with illustrations included:

> Do you have a separate illustration team? What tools do they use?

I asked these questions to better understand how common a separate illustrations team was in the study area, and what skills a technical writer entering the field today would need to possess in order to succeed. Graphic design and illustration skills are not addressed in the Writing Studies Department at the University of Minnesota, and thus a student would need to look outside the department to gain proficiency in this area.

All seven of the participants indicated that they do not have a separate illustrations team and either create their own illustrations and visual content, or visual content creation is not part of their job.

One participant in manufacturing stated that they have vendors create line drawings, but the technical writers are in charge of photo and video content.

Another participant working for a healthcare communications startup noted that illustrations were not part of their position, but that visual design was a large element of the work they do in creating presentations and data visualizations.

Finally, Participant 6, who runs their own small consulting business did not discuss illustrations.

Table 4: Visual Content Creation Tools by Industry

Participant	Visual Content Creation Tool	Industry
Participant 2	Adobe creative cloud - Illustrator, Photoshop, Adobe Stock, InDesign, Acrobat/Acrobat Pro, SnagIT	Financial IT
Participant 3	PTC Creo	Manufacturing
Participant 1	Adobe Illustrator	Manufacturing
Participant 4		

Participant 5	Visio	Software
Participant 7	Google Slides, Microsoft PowerPoint	Digital Healthcare Communications Startup
	Microsoft PowerPoint	Consumer Products

Writing teams

Questions regarding the participant's writing team included:

How big is your writing team? What skills do you look for in a new writer?

I asked these questions to get a better sense of how many writers are on a typical writing team in the various industries and company-sizes that I interviewed in this project. The number of writers on a team greatly impacts the workload and responsibilities for each writer on a team.

Writing Team Size
Writing team sizes varied greatly from participant to participant, and is largely based on the size of the company. Larger companies tended to have larger writing teams and smaller companies had smaller writing teams. Participants from Global companies noted that they had writing teams across the globe.

As I noted previously in the Illustrations section, no writer from this study was supported by a separate illustration team, and the writers themselves took on the role of illustrator on top of their writing responsibilities. This means that they are in control of the entire document - its look and feel.

Table 5: Writing Team Size by Company Size and Industry

Writing team size	Company Size	Industry
13 writers	6,000 Employees	Manufacturing
* 4 writers	90,000 Employees	Manufacturing
*5 writers		
**19 writers	17,000 Employees	Software
4 writers	41,000 Employees	Consumer Products
1 writer	5 Employees	Healthcare Communications Startup

8 writers	5,000 Employees	Financial IT
1 writer	1 Employee	Small Consulting Business
* Writers from two different writing teams in the same company with 24 writing teams globally		
**140 writers globally		

Desired Writer Skills

All of the participants underscored the importance of "soft skills," explaining that they would be looking for well-rounded candidates who have the ability to learn the tools, but have adaptable people skills. Participant 7 spoke to this point in a particularly poignant manner:

> "It is nice to know the tools, but what's most important is the ability to problem solve, the ability to interview, have empathy, see a deep understanding of your audience and users, curiosity, a lot of those softer skills" ().

In particular, participants noted the following as essential skills:
- Problem solving
- Ability to learn tools
- Have empathy
- Understand users/write for users
- Ability to use a style guide
- Design skills (great but not required)
- Time management
- Communication
- Attention to detail
- Grammar
- Resourcefulness

Outputs

Questions regarding the participant's outputs included:

> What are your output formats? How do users interact with your documentation?

I asked these questions to better understand how writers today are presenting their information to their user, and how these different outputs change how they think about, architect, and create their documentation.

All of the participants noted that their output formats are, in part or fully, digital, and that their users interact with these documents via the company website, intranet, or cloud-sharing tools.

Participants two, six, and seven indicated that they create slide presentations that are presented to a live audience whether internal to a company, in front of a class, or at conferences.

Four participants (one, three, four, and five) indicated that they also create print outputs including product manuals, and books.

Table 6: Document output formats and user interaction

Participant	Output Formats	User Access	Industry
Participant 1	Printed documents, PDF, Videos	With products, on company website	Manufacturing
Participant 2	Wiki articles; PowerPoint Presentations; Email messages; Intranet articles; Word documents	Internal Wiki, Intranet, Sharepoint, Email messages	Financial IT
Participant 3	Printed documents, PDF	With products, on company website	Manufacturing
Participant 4	Printed documents, PDF, HTML	With products, on company website	Manufacturing
Participant 5	oXygen Help Centers, PDF	Online through our company website. Some customer documents are behind a secure portal as part of the licensing agreement.	Software
Participant 6	Word, Presentations, Print books, print teaching materials	In classes, presentations, lectures, email	Small Business
Participant 7	Presentations, Word	Intranet, Cloud storage systems, presentations	Digital Healthcare Communications Startup
	Project management (status reports), Word, Presentations	Intranet, Cloud storage systems, presentations	Consumer Products

Future plans

Questions regarding the participant's future plans included:

> Are you happy with your current writing tools? Do you have any plans to change how you are writing content in the future? Do you have any plans to change what document outputs you produce in the future?

I created the above set of questions to get a sense of the writer's feelings towards their current writing tools, and to get information about potential future directions for writing tools and outputs that could change how the writers work or the content that they create. This information should be of particular interest to new and soon-to-be graduates of tech comm programs looking to enter the professional communication field in the Upper Midwest.

Many participants expressed contentment with their current writing tools. Participant six stated that their organization was at the end of their transition into a DITA authoring environment and expressed great satisfaction with the system and tools. Similarly, Participant three stated that they were working in a structured authoring environment, and were satisfied with the tools and systems that are in place at their organization. Both Participants three and six indicated that there were no future plans to change writing tools or processes any time soon.

Participants one and four indicated that their organization was at the beginning of a conversion into a structured authoring environment. Both participants expressed excitement and satisfaction with their new writing tool, and the potential for more integrated and immersive web-content creation that this new system provides.

Participants two expressed and interest in a structured authoring environment, but indicated that her organization has not considered such a solution and do not intend to change tools any time soon. They did note that, while writing tools were not set to change, that there was the potential for the company's intranet to be upgraded, which would change the way some users interact with content.

Participant five runs their own small consulting business and thus has more flexibility in the tools that they use and how often they change writing tools for their work. While participant five did not indicate any plans to change their current set of tools, they did detail how they landed on the set of tools that they use currently. Participant five initially began her business trying to avoid using Microsoft tools and instead opted for open source authoring tools. They quickly found the use of open source authoring tools frustrating as files would not work on client's hardware, and the ability to exchange information and collaborate became difficult. Participant five then switched to the Google suite, which they found to be a more useful option with more of the metaphors of the Microsoft tools, but was not "an end-all-be-all solution." They have since adopted the Microsoft suite, while still using Google tools for cloud-based collaboration.

As a small business owner, Participant five noted that their software budget way less than 0.5 of 1%, which makes maintaining and managing their tools difficult.

Participant seven discussed their varying experiences with tools in their different roles. In both cases, there appears to be no plans to change authoring tools or outputs in the future. In their Healthcare web design startup position, Participant seven discussed their adaptation of Google tools. They indicated that there was a bit of a learning curve in entering an entirely Google environment, and that the tools felt "utilitarian," but indicated that "it gets the job done." Participant five noted that they have "Begrudgingly come to like" using the Google suite in their work at the Healthcare web design startup.

In their Consumer Products role, Participant seven discussed the adoption of collaboration tools such as Microsoft teams, Office 365, and Yammer across the company. They indicated that adoption was slow, that there is little encouragement from the company to use such collaboration tools, but that there was a lot of unrealized potential for collaborative work that they hope gets used in the near future of the company.

Discussion/Conclusions

In the study described above, I was able to speak with professional writers from a wide swath of different roles and industries, giving me an interesting, dynamic look at current technical and professional writing in the Upper Midwest. Overall, the findings of these studies are reflective of Maxwell Hoffman's Top Trends Driving the Technical Communication Industry (2013):

Adoption of Structured Documents and Single Source Publishing
Structured documents and single source publishing reduce errors and costs associated with documentation, and enable an organization to manage and reuse content in a variety of creative applications. Several participants, notably those from large companies, indicated the need for structured documents and single source publishing in their work. This is reflected in the fact that four of the seven participants indicated that they were either in a structured authoring environment, or were transitioning into one.

Movement to Multimedia Communication
Content creators develop multimodal content to aid in user understanding and immersion. Several Participants discussed their current strategies for creating multimedia communication, including the development of instructional videos, and interactive web-based user manuals.

Providing for Mobile Delivery
As of August 2019, mobile devices accounted for over 51% of all internet traffic globally (Statista, 2019). Creating content that is adaptable for mobile delivery is essential in today's mobile technology world. All of the Participants of this study discussed the need for digital content creation to reach users anywhere, at any time. This includes being able to provide content to mobile.

Many of the results and outcomes of this study are reflective of many discussions we have in coursework in the STC program – the need for content reuse and structured authoring skills, the ability to work on virtual teams, strong writing and composition skills, and a user-focused perspective are foundational for creating compelling and useful content. However, I believe this information is locked into an academic framework, and students are missing out on essential professional applications of concepts. I believe the information gleaned from this brief study will be of great use to the Writing Studies Department as they adapt and update their professionally-focused programs.

This study brought to light key findings regarding authoring tool usage in professional writing positions. It appears that tool use depends largely on the size of a company, the amount of content that needs to be generated and maintained, and the industry.

Those in structured authoring environments using a DITA solution or similar were from large companies in manufacturing and software, where there is a large amount of content generated, maintained, and reused across products. Participants used a variety of authoring tools, including Adobe FrameMaker, PTC Arbortext, and oXygen, paired with a CMS including Adobe Experience Manager, PTC Windchill, and IXIASOFT.

Those in unstructured authoring environments tended to be in more non-traditional technical writer positions, working mainly in internal communications or small businesses. They employed a wide variety of tools, most notably Microsoft Office, Sharepoint, and the Google Suite.

Several participants discussed the dynamic of working with more traditional business tools like Microsoft Office, and their experiences the adoption of Google tools in the workplace. This presents an interesting intersection of tool use as companies change and modernize. Participants who spoke on this dynamic in our interviews discussed the usefulness and comfort of the familiar metaphors of content development with the Microsoft suite. They noted the disorientation that came with switching to the Google tools – how they are the cloud-based utilitarian of the Microsoft products. The participants spoke to the collaborative power of the Google tools, and other cloud-based tools. Moving forward, collaborative work will be essential for success in the workplace, especially for professional communicators. Being able to use collaboration tools effectively for remote teams work is an essential skill that needs to be emphasized in professional training.

Further, in discussing the roles of writers and their teams, it became clear that the writers I spoke to were functioning as much more than just writers. Indeed, the participants all spoke to their experiences as multifaceted communicators who functioned as a writer, illustrator, designer, information architect, presenter.

These observations underscore the importance of adaptability and building a digital literacy for new and training technical communicators. Technical and professional communicators need to be able to use a multitude of tools and think creatively about the kinds of outputs that we can and need to create with the tools available to us.

Technical communication is a dynamic field that is constantly changing. As demonstrated in this study, writers need to keep up with changing technologies and be flexible enough to adapt to work with novel tools. In her webinar, "Best Practices in Technical Communication," Dr. Joann Hackos (2017) encourages technical communicators to create content in formats that can easily transition from one medium to another, which is especially important to consider with the evolution of technology and the rise of more interactive mediums like VR and AR. It is essential that your content can easily flow from one medium to the other so it does not get boxed into one format or one technology.

Additionally, the surveys in "Professional and Technical communication in a web 2.0 world" prove that technical writers must adapt to writing in multiple disciplines, using various tools, and collaborating on diverse teams. Their results show that "no single technology dominates any one type of writing," and that technical writers are often "required to complete visual work without the help of a design specialist and thus they need specific training with the concepts and technologies in this area," effectively blurring "the lines between technical documentation and technical training, and between print and video" (Blythe et. al., 2014, p. 275).

To meet the needs of an ever-complex and creative field, the Writing Studies Department needs to emphasize the need to learn how to learn new technologies and not be overwhelmed by ever-accelerating technological change, as well as provide opportunities for students to engage with users, writing teams, and SMEs through professional practice. Students need to be able to adapt to emerging writing styles and output. They need to be able to create web-content, and consider how their work plays into a larger interconnected network of an entire organization.

Because technical communication is subject to the shifting sands of technology, it is imperative that technical writers continuously improve their professional skills. In "How can technical communicators develop both as students and professionals," Cargile Cooke (2013) posits that, because the definition of technical communication as a profession is wavering, one's strength as a technical communicator will grow "by learning everything you can about technical communication, by engaging with others who do work similar to yours, and by leading if you are called upon to do so" (p. 106).

Cooke uses case studies to demonstrate that successful technical communicators must challenge themselves to become a dynamic professional who is an expert/very comfortable in several fields related to your work. As a student, take on experiences in a real-life workplace to apply your education in a real setting; as a young professional, network and get engaged in the technical communication community; and as an established expert/professional, give back to the community by providing opportunities for the next generation of technical communicators.

Moreover, in "Blurring Boundaries between Technical Communication and Engineering: Challenges of a Multidisciplinary, Client-Based Pedagogy," Wojahn et. al. (2009) discuss the value of client-based, multidisciplinary projects throughout a writer's development. The authors explain that in a real-world setting, "most technical communicators reported difficulty in helping engineers to see value in interim products and processes and in the role that writing and communication could play throughout the project" (p. 140-141). To prepare students to navigate challenge, the authors posit that "multidisciplinary collaboration can provide students an enriched, challenging learning experience similar to situations they face outside of school… strengthen skills they do not consider "their job"… and serve as a bridge between the academic and workplace worlds" (Wojahn et. al., 2009, p. 132).

To prepare for post-graduation professional life, students need to take it upon themselves to develop a multitude of skills - most importantly, the ability to learn new technologies. From the insight of the study participants above, it is clear that students should also work to develop basic skills of professionalism such as working with others, communicating effectively (verbally and textually), presenting, time management, project management. These seem like skills that everyone should have implicitly, but these are actually learned skills that take time to develop and require practice.

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