A Student's Guide to Technical Writing

A Public and Professional Writing Independent Study Project

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# Table of Contents

- **Introduction to Project**: 2
- **Definition and Description of Technical Writing**: 3
- **History and Timeline of Technical Writing**: 4
- **Position Descriptions for Technical Writers**: 5
- **Skills and Processes Used By Technical Writers**: 6
- **Audience Types and Purposes for Technical Writers**: 8
- **Examples of Documents Created by Technical Writers**: 10
- **Employment and Salary Potential for Technical Writers**: 13
- **Interview with a Professional Technical Writer**: 14
- **Resources and Experience to Start as a Technical Writer**: 15
- **Conclusion**: 17
- **Glossary of Technical Writing Terms**: 18
- **Sources**: 19
What Will This Project Discuss: Introduction

With this project, I will examine a type of writing, which many English and/or Liberal Arts students may think remote or obscure to their course(s) of study—technical writing. The word “technical” right before “writing” somehow makes this field, and the entire technical writing industry, seem beyond the expertise of creative writers or anyone who obtains a major, say, in English Literature, like myself. However, as students who study the best approaches to, and the mechanics of, writing, you already have become uniquely acquainted with some of the knowledge needed to enter the technical writing field. From audience analysis to the study of rhetorical purposes, most students who pursue any writing degree will find themselves prepared to begin a career as a technical writer.

To help you become more aware of the experience and knowledge needed for a successful career in technical writing, I provide you with a guide that lists everything from technical writing salary and employment potential to technical writers’ most commonly used computer software to the methods you can use to gain skills or access resources about this field. Hopefully, this guide will aid students who want to learn more about the field of technical writing and also, encourage them to imagine a career as a technical writer.
What Constitutes Technical Writing: Definition and Description

Some people refer to technical writing as technical communication and vice versa. Also, some organizations may designate technical writing as a specific subset or genre of technical communication. Whatever the title used—technical communication or technical writing—they both encompass the same type of work and you will find they pursue the same purposes and audiences with their writing. However, you will find most people who work within the industry identify themselves as technical writers, first and foremost, no matter how varied the tasks they perform on a daily basis.

Definition(s) for Technical Writers

One of the largest professional organizations that supports technical writers, the Society for Technical Communication (STC), describes technical writing as any communication that uses technology to describe technical or specialized topics, usually through a set of instructions. All technical writers, according to the STC, “employ a user-centered approach to providing the right information, in the right way, at the right time to make someone’s life easier and more productive.”

You can find many more descriptions for technical writers and what they do, such as the one provided by Carnegie Mellon University’s Bachelor of Science in Technical Writing and Communication degree (note: a part of the University’s English department), which describes the field in this way: “Technical writers design, write, and edit documents for engineering, scientific, industrial, and governmental organizations. These include technical reports, computer manuals, brochures, proposals, technical specifications, educational and training materials, and marketing or public relations releases.” Some of these documents will sound familiar to students who have completed courses within Pitt’s Public and Professional Writing (PPW) program and for many other English writing students too.

“...a user-centered approach to providing the right information, in the right way, at the right time to make someone’s life easier and more productive...”

Description(s) of Technical Writing

Technical writers span the gap between the subject-matter experts or SMEs (please refer to glossary for definition), and creators of technical products, and the audience who will need to use the product. These products can vary from scientific lab equipment to computers (software and hardware) to the desk that you place your computer upon. Technical writers not only instruct external users or consumers about products and services, they can also inform their fellow employees of any communicative or technical changes within their own organization. A technical writer’s responsibilities, within his or her own company, may include

• The creation of technical presentations for clients
• The visual depiction of the most current company-operation standards for a specific employee process
• The regulation and operation of online-learning tools to keep employees current with industry certifications
As they create these usability materials for technically-driven industries, such as engineering or a myriad of scientific disciplines, tech writers will work with subject-matter experts (see glossary) to complete and/or edit instructions for the users of these technical products/processes. Sometimes these users will include only technical professionals and other times, as a technical writer, you must consider an audience consisting of both the technically savvy and the general public, who may have very little technical knowledge. Writing for a specific audience, similar to any writing field, becomes one of the most critical components to master as a successful technical writer. I will provide an in-depth discussion on audience analysis and purpose in a subsequent section.

How Did Technical Writing Begin: History and Timeline

You can trace the origins of technical writing back to the middle of the twentieth century. During the time of the Second World War, a need arose for people who could create and demonstrate concise and efficient writing to help soldiers properly operate military weapons. As the Cold War ensued during the 1950s, the need for these technical writers increased. The below historical timeline lists some of the more important moments (though, certainly not an exhaustive depiction) in the progression of technical writing, from the 1940s to the present-day industry we now identify as technical writing.

Timeline of Technical Writing’s Origins

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
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<tbody>
<tr>
<td>1940s</td>
<td>Technological advances in the military equipment of WWII requires tech writing</td>
</tr>
<tr>
<td>1950s</td>
<td>Many organizations are founded, such as the STC, to help support the growing number of tech writers</td>
</tr>
<tr>
<td>1960s</td>
<td>New inventions of the after-war technological boom provide inventions for growth of computer industry and need for technical writers</td>
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Which Technical Writer Positions Will You Encounter: Descriptions and Details

Technical writers may have vastly different duties depending on the company or organization that hires them and you may find this reflected in the wide variety of titles used for technical writers within the field. Below, I list and detail some of the possible job titles/descriptions that you may come across when you search for technical writer positions. While some of these jobs may focus more upon the textual or visual aspects of technical writing, they all incorporate the same essential skills and knowledge vital for the clarity and efficiency of communication.

Possible Technical Writer Job Descriptions

**Technical Editors** review any documentation created to explain technical topics or concepts. A technical editor will edit SME’s writing for accuracy, consistency, grammatical integrity, and for the correct level of complexity according to the intended audience’s knowledge of the subject matter.

**Information Architects** translate user behavior into media structure, craft interactive experiences, produce workflow diagrams and other production materials, as well as organize information into site maps. They also coordinate with their organization’s creative and production departments to implement their strategies.

**Instructional Designers** (Online or E-Instructional Designers) structure content and learning activities for online educational programs according to the objectives developed by SMEs for what students may need to learn. They will often write or create media to support this learning and instructional designers will then adapt instructional materials from one format to work for an online format.

**Documentation Specialists** use writing skills and industry-specific knowledge to maintain, and sometimes produce, product descriptions and user manuals. They also track any changes for their products or services, according to governmental regulations, and documentation specialists often work with their organization’s legal team to create or write the corresponding documents.

<table>
<thead>
<tr>
<th>1970s &amp; 1980s</th>
<th>1990s, 2000s &amp; beyond</th>
</tr>
</thead>
<tbody>
<tr>
<td>An influx of new, electronic consumer products increases tech writing for the general public’s instruction</td>
<td>The unprecedented growth of the Internet and technology provides a tremendous need for technical writing</td>
</tr>
</tbody>
</table>
What Do You Need to Become A Successful Technical Writer: Skills and Processes

It becomes helpful to delineate the necessary skills to enter the technical writing profession, whether you have a background in engineering, or whether you will graduate with an English degree—both courses of study can lead you on the path to becoming a technical writer.

**Skills a Technical Writer Needs**

In their article in the Technical Communication Quarterly entitled, “Influences on Creativity in Technical Communication: Invention, Motivation, and Constraints,” the authors identify some very important ways that an English degree can translate into a technical writing job: “Today’s technical communicators are creative because they have the skills to invent original solutions that address complex communication problems. These invention skills include audience analysis, understanding rhetorical situations, adapting communication to situations, and rhetorical problem solving.” Importantly, you must first have the ability to write well and have creative skills, which will help identify and correctly assess the many rhetorical situations and audiences you may encounter. Above all, as a profession that focuses on communication first and technical subject matter second, technical writers should engage in certain practices for accurate and effective writing, such as

- **Clarity of message**
- **Brevity of phrases/sentences**
- **Simplicity in grammatical/sentence structure**
- **Consistency with active voice and verbs**

In addition to writing efficiently, you will find success with excellence in these skills and/or abilities:

- **Reason and problem solve with minimal guidance**
- **Interact with subject matter experts (often engineers) to ask questions**
- **Analyze multiple steps of documentation without intimate knowledge of product/service**
- **Strategize with a complex team of people**
- **Acquire, quickly, technical content**
- **Complete accuracy and specificity in both text and graphics**
- **Conduct extensive research and planning during writing process**

“Technical Writers are trained to reveal almost nothing about themselves in their writing. This makes them freaks in the world of writers, since almost all of the other ink-stained wretches in that world reveal a lot about themselves to the reader.”

Kurt Vonnegut
I had the opportunity to work with and edit a service manual for the preventive maintenance of a mass spectrometer. During this experience and with all of my research about the technical writing field, I realized that for the successful completion of any technical writing project, you must understand how the process works. For most technical writers, everything begins and ends with the process. I have illustrated, in Figures 1 and 2, how many technical writers approach and complete their process of writing or editing a project.

Also, most industries require technical writers to maintain knowledge in certain softwares, though many companies will train you in the specific computer program(s) that they use. Frequent softwares used by technical writers include:

- Adobe FrameMaker, InDesign, Captivate, Illustrator, RoboHelp, and Acrobat
- Corel DRAW and Paint Shop Pro
- MadCap Flare and Capture
- TechSmith Snagit
- Microsoft Visio, Word, and HTML Help Workshop
- DITA software
- XML/markup software

**Processes Used By Technical Writers**

I had the opportunity to work with and edit a service manual for the preventive maintenance of a mass spectrometer. During this experience and with all of my research about the technical writing field, I realized that for the successful completion of any technical writing project, you must understand how the process works. For most technical writers, everything begins and ends with the process. I have illustrated, in Figures 1 and 2, how many technical writers approach and complete their process of writing or editing a project.

<table>
<thead>
<tr>
<th>Plan</th>
<th>Structure</th>
<th>Write</th>
<th>Review</th>
<th>Publish</th>
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<tbody>
<tr>
<td>Define scope, stakeholders, &amp; process</td>
<td>Check for templates or style guides</td>
<td>Write first draft</td>
<td>Edit &amp; check draft</td>
<td>Finalize document (formatting &amp; proofreading)</td>
</tr>
<tr>
<td>Select tools &amp; techniques</td>
<td>Create table of contents</td>
<td>Review first draft with SME</td>
<td>Conduct stakeholder review</td>
<td>Establish document control</td>
</tr>
<tr>
<td>Gather information</td>
<td>Review table of contents with stakeholders/subject matter experts (SME)</td>
<td>Review &amp; revise draft to final stage</td>
<td>Collate feedback &amp; revise draft</td>
<td>Communicate with stakeholders</td>
</tr>
<tr>
<td>Review document plan with stakeholders</td>
<td></td>
<td>Format/layout draft</td>
<td>Obtain approval to publish</td>
<td>Publish final draft</td>
</tr>
</tbody>
</table>

**Figure 1**
Who Will Your Audience(s) Encompass as a Technical Writer: Types and Purposes

For technical writers who wish to successfully communicate with their readers, they must first know what type of audience will read their document. Here you will notice the similarity between the audience analysis used in technical writing and the awareness of audience needed for all other kinds of writing and rhetorical situations. In the technical writing field, however, you will mainly write for the audience types listed below. Often cited by professional technical writers as the most important aspect of their job, proper audience analysis can also become quite challenging when the technical writer’s document must communicate with a combination of these audiences.

Types and Purposes of Audiences

**Expert audiences** define as high-tech readers who maintain an intimate knowledge of the technical writer’s subject matter. Expert audiences may include the SME or the designer of the product or service you will write about. Other times, you will write for experts, such as service technicians, who will maintain or service the products for your company and they have a different type of expertise than an engineer or a scientist, and you must consider this in your audience analysis. Lastly, you might write for expert audiences comprised of
scientists or engineers that your company wishes to hire or collaborate with so while they have unique knowledge of the industry, they will need more information about specific products.

Technical writers also will encounter specialized audiences, or people who will read their documents with a specific interest in mind. These audiences do not necessarily maintain high-tech expertise but instead, will need your document to make an informed business decision, such as executives within your company. Specialized audiences might also include professionals from economic or governmental agencies that work closely with technologically or scientifically specific industries to make decisions and policies for the general public.

And that brings us to the last main audience type that you will write for as a technical writer—the general public or a lay audience. This audience will almost always have no specialized knowledge about the product or service that technical writers create a document about. Often, this will become an audience for a product manual or user instructions. Technical writers must be very careful with these types of documents because unclear instructions can cause product failure, or even worse—harm to the individual user of the product, which can result in legal ramifications for technical writers and/or for their companies.

For all three of these audiences, technical writers will employ language so as not to alienate any peoples or cultures. They will avoid gendered words and pronouns to remove any sexist biases. Technical writers will provide, in documents, extra space for translations into other languages and will understand that some audiences, regardless of their level of expertise, will misunderstand any pun or slang terms not recognized in their native languages.
What Documents Will You Possibly Create as a Technical Writer: Examples

Technical writers can create quite different documents depending on which industry they work within, which company employs them, and which audience(s) the document will attempt to instruct, inform, or even persuade. It becomes difficult to detail all of the possible documents, which technical writers may create, but you can find some of them listed below.

- Instruction Manuals
- User Guides
- Quick Start Guides
- White Papers
- Policy Manuals
- Operating Procedures
- Website Tutorials
- Online FAQs

The included examples (Figures 3-6) span a wide range of technically-specific topic and you will notice that each of them attempts to reach a unique audience, which has a different level of interest and expertise concerning the technical material. This greatly affects the technical writer’s overall approach, language and graphic use, and the entire structure of the document.

On the opposite page, Figure 3 shows a quick start guide for a Raspberry Pi, a small computer for the general public, and the lay audience needs only a few, brief text boxes with some illustrative graphics to operate the product and navigate the guide.

In Figures 4 and 5, both depicted on this page, you will notice 2 pages of a technical white paper for a new technology—NVIDIA, a software that uses radio to enable computer modems.

High-tech industries use white papers, which technical writers create, to describe how a product or service can solve a particular problem, usually industry-wide. The audience for these documents often comprise experts, who require an abundance of detail in graphics and well-researched text. Alternatively, technical writers may create white papers for one of the other specialized audiences or stakeholders who will need persuaded to invest in the new product.
In Figure 6, you will find an example of an online document that a technical writer may create for a combination of specialized and lay audiences. This online guide, which shows a collection of screen and printing lessons to further the viewer’s education, provides these specific users with a type of manual for online learning. This electronic and interactive document supplies the student with step by step instructions, using both images and text.

For an interactive document, such as the below educational lesson for the Print Institute, you will create with an awareness of a user instruction/experience that allows every individual to navigate the page in a very specific way. Technical writers try to prepare for all of these navigational possibilities in structure and content.
In Pennsylvania, the average university student will graduate with close to $35,000 in student loan debt. With student loan debt growing at twice the rate of inflation, it becomes increasingly important to obtain a job upon graduation that will pay a highly competitive salary. As of 2014, the median annual salary in the United States of a technical writer paid close to $70,000, with even the lowest 10 percent of technical writers paid over $40,000 in annual salary. As seen in Figure 7, the mean annual salary for technical writers has maintained a stable and consistent growth even with the economic uncertainties of recent years.

Along with a competitive and consistent salary, students who pursue a career in technical writing can expect a positive growth in employment opportunities. As Figure 8 highlights, the technical writing field, according to the Bureau of Labor, will experience a 17% increase in employment for the foreseeable future, which is more than the average of 14% growth for all other occupations in the United States. The increase in the technical writing field reflects the growth market of the technology industry in general, which no expert predicts will slacken anytime soon.
What Advice Can a Veteran of the Technical Writing Industry Give You: An Interview

As I became more interested in exploring the field of technical writing, I was fortunate enough to become acquainted with Karen Riley. Karen, an accomplished technical writer and a veteran of the industry, guided me and allowed me the opportunity to learn more about the technical writing field by sharing some of her expertise. Though she identifies as a technical writer, Karen has much experience working with all facets of technical communication, from user-interface design to software development and vesting to the writing and editing of a wide variety of technically-sophisticated service/instructional manuals. Additionally, Karen provided me with real-world examples of technical documents to explore, edit, and ultimately, gain a better understanding of what I could encounter as a technical writer. Below, you will find an excerpt from an interview with Karen that I conducted during one of our meetings.

How long have you been employed as a technical writer and what is your educational background?

I have worked in the field for close to 25 years now. I went to school at Pitt as well, where I majored in Information Science because I thought it would become a very marketable major to earn, especially at that time. I also completed a WPC [Written Professional Communication] minor, which I think may have changed into the PPW Program.

What type of positions have you had during your career or what were some of the companies that you have worked for?

I began, part-time, at an electromagnetics engineering company and then went onto a company that had only 3 employees, which I really enjoyed, where I helped them develop their user-interface software for this chemical analysis project they hoped to create. They invented a way to analyze chemical molecules that had never been done before. I also worked at an industrial engineering software company, where I worked on printed guides and online help. While I was there, I also wrote their internal newsletter, which I enjoyed immensely. From there, I went on to the Carnegie Group and worked with military types on white papers and prototyping, which I don’t really care for, or don’t feel like that is my strong suit. I worked with a graphic designer too on the Carnegie Group’s “concept of operations” project. Then about 15 years ago, I began with the company that still employs me today—Agilent—as an independent contractor and it has worked really well for me.

“Perseverance will provide you with the knowledge to edit and write...”

14
What are some of the skills or qualities that you think can help a technical writer to succeed in this industry?

First, always use active voice in your writing. You need to use succinct sentences and your phrases so basically all of your writing should become concise and to the point. Also, you need to learn adeptness at audience analysis—knowing and understanding who you will write for and why you will write for them—becomes incredibly important, especially when you work with multiple teams for multiple projects. And you should know how much your audience knows or needs to know for your audience analysis because sometimes you will write for experts of the material and sometimes for people who will require more information or a different approach. As a technical writer, perseverance will become very important too. You will need to ask and ask and ask again your subject matter expert [SME] to respond to your questions. And you need to understand and identify what questions you will ask your SME to elicit the best responses from them. You don’t need to be an expert in whatever technology that you write about but you should become intuitive and curious enough to know the right questions to ask. That perseverance will provide you with the knowledge to edit and write what is required of you.

How Do You Gain Entry into the Technical Writing Field: Experience and Resources

Since technical writing has become such a lucrative and competitive industry for writers, you may find it difficult to simply apply and obtain a technical writing position without a well-formulated strategy or without some past experience. I list below some different approaches for gaining experience in the technical writing field and some of the resources that may help as you pursue employment as a technical writer.

Academic/Instructional Experience

Many universities, such as CMU, offer a specialized program within the English department for students who want to study technical writing. Other schools offer technical writing in tandem with engineering programs or scientific disciplines. As a Pitt student, most likely in the Arts and Sciences School, neither one of these options is readily available to you. However, the PPW Program offers, as mentioned, many courses that will teach you the knowledge and skills needed to become a successful technical writer. These PPW courses include (though not limited to)

- Introduction to Technical Writing (a brand-new course offering as of Fall 2016)
- Integrating Writing and Design
- Language of Science and Technology
- Language of Business and Industry
**Experience con’t.**

If you have not had the opportunity to enroll in these courses and will graduate before you can, you can explore online courses about technical writing, which some universities offer for free. For example, the New Jersey Institute of Technology posts detailed videos of their lectures, which you can download in a few simple steps and below I provide a link to one of these free courses about technical writing (along with the links to the other two websites referred to in this paragraph.) Or, you can visit the New Jersey Institute of Technology, Open Courseware homepage to view other available videos. Along with these options that universities provide at no cost, you can also enroll in technical writing certificate programs for a fee. One website, Tech Writer-Certification offers online certificates in technical writing and similar topics. With an average of 30 hours of coursework and the option to choose an accredited-university course or a certificate to display your experience on sites such as LinkedIn, you can gain experience in this way too. However you complete your technical writing coursework make sure to list the specific skills learned from these classes prominently on your resume and on any professional, social-media sites—no experience is too trivial to list!

**Links to Online Resources/Courses**


http://ocw.njit.edu/csla/index.php (New Jersey Institute Open Courseware homepage)

http://www.techwriter-certification.com/index.html (Tech-Writer Certification website)

**Other Experience(s) You Can Use**

Alternatively, you can learn, on your own, some of the skills that technical writers use on a daily basis. Technical writers use specific computer software(s) across the industry, even if individual companies may differ slightly, and any software knowledge will increase your employability in the technical writing field. As mentioned in this project’s “Skills” section, you should gain some knowledge in software such as Adobe FrameMaker, Corel DRAW, and/or Microsoft Visio. As a Pitt student, you have access to free, online Lynda Tutorials that will teach you these software. To access Lynda’s informative videos, simply click on the Lynda link at the right of your Pitt homepage, login with your Pitt credentials, then use the search box on Lynda’s homepage to type in the software you wish to learn about—a very easy process to gain this vital knowledge.

Once you have achieved some familiarity with technical writing, the creation of some documents, for your portfolio, will greatly highlight and prove to future employers you can succeed as a technical writer. You can refer to the examples provided in this project as potential pieces to construct or come up with your own. If you have ever encountered a poorly written, or designed, set of instructions, you could edit those instructions. Include a before and after of both sets of directions in your portfolio, along with a brief report or memo describing the changes you made and why—this will definitely showcase your technical writing skills. Or, if you maintain a digital portfolio, you could complete technical writing work by editing a mock webpage (providing before and after scenarios), similar to how a user-interface designer would approach a user’s experience to best guide them through an online document.
As a student, you can easily locate these online tools and college courses, which will aid you in becoming a technical writer but often the best resource for you is the same one used by every other profession—networking! For technical writers, and especially anyone who wishes to break into the field, the STC (Society for Technical Communication) will become your greatest resource and an asset for networking with other technical writers. STC allows students to join their organization, for a small fee of around $60. With the student membership, you will gain entry into one professional and one student chapter, which will provide you with numerous opportunities to network with technical writers and share ideas with students like yourself. You may even find a STC member willing to become a mentor to you and share advice they have honed during their years as a professional technical writer.

Along with the chance to meet people in the technical writing field, an STC membership can supply you with many other benefits to help you become a successful technical writer, which I list some below, and you can view the rest at STC’s website, http://www.stc.org/membership/join-or-renew-now.

• Enjoy member-only discounts on live webinars, courses, and the STC annual conference
• View STC’s over 140 free, on-demand seminars
• Receive continuing education units (CEUs, or initial certifications of technical writing for students) through STC’s educational programs
• Preview STC’s Job Bank with 14-day advance access (before the general public) to the newest employment opportunities
• Access the technical writing industry-leading publications such as Techcomm Today Intercom, and many other technical writing journals, blogs, and newsletters
• Visit the STC Mentor Board where members connect with other members to form relationships that foster professional development
• Use STC’s Affinity Program to receive discounts on software, products, and services

What Did This Project Complete: Conclusion

This project informed, instructed, and even persuaded you that technical writing could provide a possible career path for you. As a technical writer, you could have a variety of titles, write a wide range of documents for numerous audiences, which makes technical writing seem pretty similar to any other type of writing. With only small additions of knowledge and/or skills, a user-centered approach, some research into technical topics, and by asking the right questions of your subject matter experts, you can easily become a technical writer. This guide showed you some ways you can gain experience, with specific resources to use, along with what a profession in the technical writing field can encompass.
What Do These Words Mean: A Glossary for the Jargon

**Active Voice**—a structure of English grammar in which the grammatical subject does the action represented by the verb. For example: The technician opened the door (grammatical subject—technician, verb—opened). Technical documents should always use the active voice and avoid other verb forms (like verbs ending in -ing or phrasal verbs such as “looked after” or “ran into”).

**Stakeholders**—a group of people who technical writers can affect with their designed and written content. In technical writing, stakeholders most often consist of the multiple audiences, along with the creators (SMEs-see below) of products or services that the technical writer will produce documents for.

**Style Guide**—a set of rules and guidelines that tell authors how to write documents. A style guide usually contains information about the sentence style, layout, typefaces, captions, headers, and other parts of a document. Many organizations have company-specific style guides but most technical writers use the Microsoft Manual of Style for any organizational/design decisions not mandated by a company guide.

**Subject-Matter Expert (SME)**—a person who maintains specific knowledge in a specialized field and becomes an authority on that specific subject or topic. Technical writers work closely with SMEs, often engineers, since they create the processes or products that require documentation for proper operation or use. Technical writers will collaborate with SMEs to write the needed documentation for various audiences and will consult with SMEs throughout the writing process to verify technical accuracy.

**Template**—a document used as a model by technical writers to ensure consistency in updates and maintenance of materials, often to ensure documents adhere to company, industry, or federal regulations. Technical writers will also use templates to help in the consistency of instruction for repeat audiences, like service technicians, who expect consistency of structure in similar or updated documents.
Where Did I Find This Information: Sources

**Books**

*How to Get Started as a TECHNICAL WRITER* by James Gill

*The Insider’s Guide to Technical Writing* by Krista Van Laan

*Technical Communication* (7th and 10th editions) by Mike Markel

**Journal Articles**

“The Continuing Evolution of a Profession…and My Role in It” by Roger A. Grice  *Journal of Technical Writing and Communication*

“Elsie Ray and the Founding of STC” by Edward A. Malone  *Journal of Technical Writing and Communication*

“Professional and Technical Communication in a Web 2.0 World” by Stuart Blythe, Claire Lauer, and Paul G. Curran  *Technical Communication Quarterly*

“Influences on Creativity in Technical Communication: Invention, Motivation, and Constraints” by Yuejiao Zhang and Karla Saari Kitalong  *Technical Communication Quarterly*

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CMU website, definition of technical writing
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http://study.com/articles/Documentation_Specialist_Job_Description_and_Requirements_for_Becoming_a_Documentation_Specialist.html

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https://techwritingjcc.wikispaces.com/Chapter+4+Questions
https://www.prismnet.com/~hcexres/textbook/aud.html

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http://www.techscribe.co.uk/techw/glossary.htm

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Images

Information to model self-created bar chart of growth potential for tech writing
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Image of median technical writing salary bar graph
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