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INTRODUCTION

In a given week, I probably only do about 15 minutes of real, actual work.
—Office Space (1999)

1.1 IN THIS CHAPTER

This chapter discusses the motivation behind the collaborative technical and scientific writing approach presented in this book. We touch upon the history and development of *STREAM Tools* and discuss common problems encountered by technical and scientific writers in order to set the stage for why *STREAM Tools* will help your team write better and more efficiently. In part, this introductory chapter should persuade you of the value that a structured, software-enabled approach to team writing brings to your projects. It should also enable those who already see the value of such an approach to best make a case for such a system to their collaborators.

Overall, this chapter is an elaborate expansion of the notion that as little time as possible should be spent dealing with the more mundane aspects of the writing process—such as formatting and redundant editing—in order to leave more time and resources for creativity and rigor in research and development.

Technical Writing for Teams: The STREAM Tools Handbook, by Alexander Mamishev and Sean Williams

If your team is ready to begin using *STREAM Tools* right away because you already believe in the value of standardizing your group's approach to writing or have experienced the challenges of collaborative authorship without such a system, then reading this chapter is probably unnecessary. Skip directly to Chapter 2 and begin there to initiate your writing project.

1.2 OUR AUDIENCE

Our audience includes scientists, engineers, technical managers, students, professors, grant writers, and administrative assistants—technical professionals who produce complex documents as part of their jobs, especially those who work and write in teams. In principle, any technical professional can utilize *STREAM Tools*, whether working alone or in a team, but since the majority of complex technical work occurs in teams, we emphasize the ways that *STREAM Tools* can help multiple collaborators streamline their writing activities.

Finally, all members of our audience share some characteristics regardless of their position, title, or specialization: they are busy professionals who demand excellence and efficiency and wish to maintain great relationships with their collaborators. *STREAM Tools* enable our audience to meet each of these objectives.

1.2.1 A Few Horror Stories

First, we would like to include several anecdotes about the challenges that led ***us*** to begin thinking about ways that we could improve our own collaborative writing. Some readers will readily identify with our stories and could quickly contribute their own similar accounts. Here are a few stories to set the stage:

Professor Mamishev, University of Washington:
We were submitting a large multi-university proposal to the National Science Foundation. The lead writer was at another institution. I sent my contributions to the proposal and was waiting for the compiled version of the manuscript to review. When the file finally arrived, I realized that some critical figures were taken out during the editing stage. Without these figures, the ideas were not communicated clearly. I wrote a new version, with the figures included and text shortened to keep the total length of this portion unchanged. Even though there were still many days left before the submission, the reply from the lead writer was adamant: "We have already numbered the figures, and at this point it would be too much work to change the structure of the manuscript." Needless to say, we did not get funded at that round.

Professor Mamishev:
Having almost had completed my Ph.D. dissertation at MIT, I had to tie up some loose ends in my graduate education. One of them was submitting a report to the foundation that had sponsored my dissertation research for one year. The requirements from the foundation were very clear, and the foundation officers were adamant—the report should be in Microsoft Word format. This would not have been a big deal, except that I wanted to adapt materials from my dissertation, which was written in LaTeX, a

typesetting system widely used at MIT. More than 700 pages of non-stop entertainment. That is, if you consider design of fringing electric field sensors entertainment. I did … Anyway, I had to bite the bullet and sit in front of the computer screen for two days straight reformatting chapters, sections, figures, and equations, finally producing a document that looked pretty much exactly like a few chapters of my thesis—the content did not change at all. Two days of my life. I felt that they could have been better spent.

Professor Williams, Clemson University:
A few years ago, I was hired as an outside expert to help a large bank organize some of their internal documentation regarding a specific internal product. The team I led, composed of a group of subcontractors and a group from the bank, had a very short timeframe in which to deliver our project since the product was going to be rolled out to the entire company in three months. At that time, the subcontracted technical writers were located in three different states, the client was in another state, and I was in the fifth state—all of which made face-to-face collaboration nearly impossible. To complicate matters, the documents provided by the bank were in "old" word processing formats like Word Perfect; some were handwritten on paper; yet others were in PowerPoint, Microsoft Word, or Adobe PageMaker. Finally, the documents contained large numbers of figures and tables, all of which were numbered inconsistently at best. Combine the complexity of the documents we received with the multitude of formats, plus the challenges of working at distance and the pressures of completing the project under a tight deadline and you can imagine the stress the team felt as we squandered hours debating how we would produce the final document set and in what software package. Let's just say that the result of this chaos was that I have not been invited to bid on another project for this client.

Gabe Rowe, large semiconductor manufacturing firm:
I often write technical memos for the company I work for, but I am one of the few employees who use autonumbering for figures, tables, and cross-references, or who takes advantage of Styles and Formatting options. I am able to make a small change and quickly shoot out a new version of the memo while other people have to go through and manually update all of the references to figures. It's funny. These Microsoft Word shortcuts are old technology, but very few people know how to use them. It makes me think that there really should be more training on this kind of stuff.

Nels Jewell-Larsen, graduate student, University of Washington:
In my first year of graduate school, I only had to write short conference papers and simple reports, so there were no difficulties putting them together. Once I had to write a thesis, things suddenly changed. For several days, I was struggling with the document formatting, completely abandoning all other aspects of the project. There were so many figures, tables, and references to keep track of. At this point, I had no choice but to learn the document design principles used by more senior graduate students in our lab.

Kishore Sundara-Rajan, graduate student, University of Washington:
During my first year of graduate school, I was required to submit a literature search report for a class. I had written a five-page paper, and during one of the numerous revisions of the paper, I introduced new figures and citations in the middle of the text. This required that I renumber all of the following figures and references in the manuscript, and I was positive that I had managed to do that just fine. I was surprised when the professor gave me a low grade and returned the paper with a note that I hadn't

entirely understood the field. It turned out that I had not changed a few citations and reference to the figures in the body of the text during the changes and as a result, that paper was incomprehensible. I could have saved myself a lot of time and pain had I adopted an auto-numbering system. Needless to say, once I began using the system, my 130-page master's thesis was a breeze to edit and revise.

These situations demonstrate why a system like *STREAM Tools* can be helpful. Yet, on the other hand, some might argue that their experiences with collaborative writing have been more positive and, in fact, we've had good experiences as well. But our purpose in telling these stories is to encourage people to look beyond their personal desktop. Perhaps everything is running smoothly in your office or with your specific team, but is it true for your organization? Perhaps you have mastered the tools of the writing trade, but your students or junior colleagues spend enormous amounts of time preparing their documents and therefore are not as productive as they could be. Maybe you do not worry about writing efficiency because your organization has administrative assistants who pick up the loose ends, but if you looked closely, perhaps the hidden costs are mounting up. In all, this book hopes to outline a process, *STREAM Tools*, that will be useful across your organization, to all those impacted by writing, so that everyone can work more successfully, regardless of their level.

1.2.2 Some History

Most technical writing guides are not tied to any particular software practices. They follow a sensible philosophy: "Here are your audience analysis paradigms, your composition principles, and your grammar rules and you can use your favorite software to put your ideas down on paper." In this book, we depart from those other guides and explicitly recommend that writing teams utilize Microsoft Word. We recommend Microsoft Word primarily for practical reasons: it is simply the easiest to use, the most widely available, and it has enough functionality to meet the needs of nearly every collaborative research team. Why struggle within your team to decide which software packages to use when others have already done it for you? We also recommend Microsoft Word because *STREAM Tools* uses a holistic approach in which considerations of grammar and style are closely linked to other aspects, such as editing, collaborative writing, document design, and document management; Microsoft Word enables each of these aspects with relative ease.

Even with these arguments, some of our more dedicated LaTeX users might require a bit more persuasion, so let's start with a brief history about the evolution of LaTeX and Microsoft Word and then attack a few myths.

Let's start with the 1980s. Early versions of Microsoft Word were running on computers that could not hold a large document in RAM. Writers could only work with small documents with limited graphics, and even then, the operating system crashed frequently and unpredictably. At that time, writers designed a document in a text file using an HTML-like language and then compiled it into a postscript file that would then output to a printer as formatted in the markup. At that time, "serious" academic writers chose LaTeX for their scholarly work and reserved Microsoft Word for letters,

memos, short papers, and other ephemeral communications. As computers became more powerful and software companies eliminated bugs from mainstream typesetting packages, Microsoft Word started gaining ground with writers of large manuscripts.

At the same time, document management systems evolved from passing floppy disks among team members to sending emails, placing files on FTP servers, and using sophisticated collaborative environments like wikis or SharePoint. Today, all these methods coexist in some form (floppy disks have been replaced by USB flash drives). While the myriad of choices available for document management are not bad in themselves, it poses a serious challenge to collaborating groups. Incompatibility of writing processes and document design methods slows down manuscript production enormously.

Computerized offices have also led to the elimination of most secretaries and typists from the workforce. Two decades ago, technical professionals would rely on highly trained secretarial staff to ensure that their writing adhered to proper form. Typed manuscripts would be prepared for offset printing by yet another set of professionals, who possessed a detailed knowledge of fonts, margins, Greek letters, serifs, line widths, etc.—the multitude of details that make up a professional publication. Today, the burden of such knowledge rests squarely on the shoulders of technical and scientific professionals, as in most cases, the professional submits the manuscript directly to an audience without intervening document production experts.

1.3 THE NEED FOR A GOOD "WRITING SYSTEM"

Given the complexities presented by collaborative writing situations, adopting a good writing system will enable your team to work more efficiently and produce higher quality documents. In short, technical and scientific writing teams often struggle to produce their documents because they get wrapped up in debates about details—debates that greatly slow down document production, but in the end, have little impact on the document's final quality. Dozens of methods, tricks, and practices for streamlining the writing process evolve in different research groups as each team seeks to maximize the time they spend on their research and development activities. Each time a member joins a new project team, all of those "rules" must be relearned, slowing down the writing process. In addition, publishers, journal editors, and conference organizers develop sets of rules most suitable for their fields, adding further complications to the strategies that teams create. Adhering to the standards of a particular academic society is important. Your work will not be read—no matter how good it is—unless it meets the requirements of a publisher or a particular society. We'd wager that most teams would prefer to spend time on matters more profound than debating which software package to use or which set of conventions to follow. Unfortunately, in reality, many teams spend inordinate amounts of time on these very tasks they'd like to avoid.

Given the challenges faced by research groups, providing a standardized framework for approaching collaborative writing practices is quite important. For example, the same text and graphical information must often be adapted for research reports, conference papers, theses, proposals, presentations, and internal memos. Additionally, multiple authors, communicating electronically, might contribute to these documents,

making an effective, well-organized writing system essential for creating a successful document.

Check any of these statements that apply to you:

— I spend excessive amounts of time formatting documents.
— I need to write a long manuscript (thesis, book) and I am finding it difficult to keep track of document structure and numbered items, such as figures, tables, and references.
— My boss (advisor, professor) is never happy with my writing.
— I spend excessive amounts of time editing documents written by my subordinates, and yet they never seem to improve.
— Just as soon as my subordinates (graduate students, grant writers) get adequate training, they leave for other jobs and the writing process haunts me again.
— Our collaborators use all kinds of word-processors—LaTex, Microsoft Word, Open Office, plain text, Google Docs, etc.—which makes it rather difficult to merge material from different contributors.
— Our group frequently misses manuscript (paper, report, proposal) submission deadlines.
— Our papers and proposals often get rejected due to low quality of writing, even though the content is quite good.
— Our institutional knowledge (group knowledge, tribal knowledge) gets lost because of high turnover of group members.
— We need an effective process to reuse our existing documents (legacy content).

No matter where you find yourself in your career, developing strategies to manage many of the problems noted above will help propel you to success. The techniques presented in this book will help you overcome the challenges previously noted and enable you to improve both the quantity and quality of the manuscripts generated within your organization. *STREAM Tools* will not only help you to manage your regular workload, but it may also help you advance in your career as those around you begin to see your success at managing complex writing projects.

1.4 INTRODUCING *STREAM TOOLS*

1.4.1 What is *STREAM Tools*?

STREAM Tools is a collection of best practices for use by scientific and technical writers. *STREAM Tools* also utilizes an integrated approach to collaborative writing in which specific software tools are integrated with writing quality and team interaction through a flexible collection of stand-alone modules that enable users to choose elements most relevant to their work. Although many *STREAM Tools* elements are valuable for individual writers, the system is most beneficial when every collaborator in a

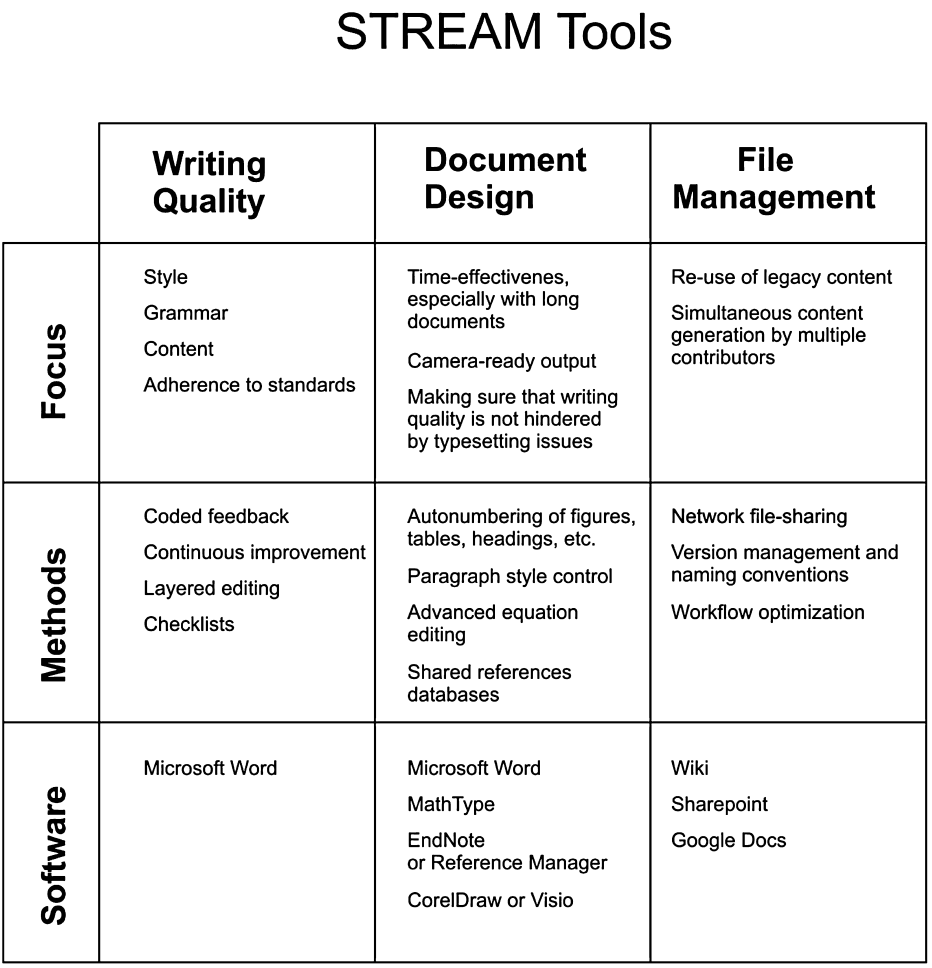

Figure 1.1. Overview of *STREAM Tools*

team adopts it. With *STREAM Tools*, the whole is greater than the sum of the parts. Figure 1.1 shows the overall structure of *STREAM Tools*. The *STREAM Tools* system addresses three areas: Writing Quality, Document Design, and File Management. Within each area, writers are asked to go through an evaluative process, first determining the *focus* of their efforts, in other words, identifying the areas that need most improvement. After that, the writers learn the *methods* most applicable to addressing their specific areas of need. Finally, the writers select the *software* most suitable for the selected methods. Each writing group is unique and will benefit from a unique and custom-tailored combination of tools. *STREAM Tools* is meant to help with the process of choosing the best tools for each specific group.

1.4.2 Why Use *STREAM Tools*?

STREAM Tools enables your team to be more efficient, achieving maximum results with minimum effort. While developing *STREAM Tools*, we observed a number of organizations and found that writers waste a staggering amount of time on tasks that could be streamlined and automated.

Tables 1.1, 1.2, and 1.3 provide specific examples of problems encountered specifically by science and engineering authors and the solutions provided by *STREAM Tools*. While reading this book, you may choose to select the areas of your most pressing need and go directly to the sections indicated in the right column, or you could read the material consecutively and apply these principles to your work more generally. Either way, you will find that utilizing *STREAM Tools* can help free up your time to focus on things that matter.

While teams will ultimately produce manuscripts and push them out the door, the losses due to inefficient organizational practices far exceed the time spent overcoming the challenges listed in these tables. The inefficient practices shown in these tables can cause excellent ideas to be rejected, moved lower in priority in patent filings, or in extreme cases, people could lose their jobs. Conversely, continuous improvements in all areas of one's profession, including writing and publishing, gives individuals and organizations an advantage in a highly competitive world.

1.4.3 The Software of *STREAM Tools*

1.4.3.1 Recommended Packages. *STREAM Tools* integrates closely with specific software packages because these programs are both widely available and easy to use. Microsoft Word is necessary, of course, since the templates used by *STREAM*

TABLE 1.1. Writing Quality Problems

Problem	Solution	Sections	Page Numbers
Senior team members spend too much time correcting grammatical errors instead of focusing on core issues	Coded feedback notes with pointers to reading sections for improvement	2.3; 5.4.5.2	19, 122
"Learning grammar" is a daunting and overwhelming task	Focusing on the most critical areas for improvement hand-picked by an expert	2.3; 5.4.5.2	19, 122
Lack of adherence to organization (company, society) style	Planning and coordination stage among project participants	5.2; 5.3	87, 94
Writer's block	Using structured techniques for overcoming writer's block	5.3.5.1	107
Getting lost in the document complexity	Using template files with auto-numbering features Using Outline view Using color-coding for different types of text	2.4; 3.2; 5.3; 5.4	22, 36, 94, 116

TABLE 1.2. Document Design Problems

Problems	Solutions	Sections	Page Numbers
Difficult to keep track of numbered items Manual re-numbering wastes time	Automatic numbering of headings, equations, figures, tables, and literature citations	2.4, 3.2	22, 36
Conversion from single-column to double-column format	Conscientious use of styles throughout the manuscript	3.3.2	65
Conversion from single numbered equations, figures, and tables to dual-numbered equations, figures, and tables (e.g., Figure 8 becomes Figure 3.2) and vice-versa	Template captions and bookmarks that switch with on a quick selection of options	3.2.2.5	45
Typing complex mathematical equations	Using MathType	2.4.2.2	26
Mouse-free typing of equations	Learning MathType keyboard shortcuts	2.4.2.2, 3.2.2.5	45
Compatibility with TeX and LaTeX users	Entering coded output into TeX and LaTeX documents Generating equations in source LaTeX documents with MathType	3.2.2.5	45

TABLE 1.3. File Management Problems

Problems	Solutions	Sections	Page Numbers
One collaborator blocking others from working across the document	Real-time checking out of documents	5.4.1.3; 6.5	118, 152
Version leapfrogging	File naming conventions Document check-out	5.4.1.3; 6.5	118, 152
Effective use of legacy content	Creating annotated collections of manuscripts	5.4.1.1	116
Incompatible software	Using the same basic set of software tools Teaching everyone on the team basics of *STREAM Tools*	1.4.2; 1.4.3	8, 8
Providing timely feedback to members	Effective use of document-sharing systems	2.5.3; 5.4.5.2; 6.5	34, 122, 138
Circular editing	Layered editing	5.4; 5.5	116, 128

Tools are developed in that environment (for a complete discussion of why *STREAM Tools* uses Microsoft Word and not LaTeX, see section 1.4.3.2). However, writers frequently need equation, graphics, and bibliographic software as well, and since the purpose of *STREAM Tools* is to enable writing teams to get to work quickly and effectively, we recommend software below for each of these purposes.

***STREAM Tools* Commandment #1:**
Team members should use compatible tools.

MathType is an enhanced version of the built-in Equation Editor in Microsoft Word. If you have many equations, it is worth switching to MathType, because it provides better graphics, more options, more streamlined keyboard shortcuts, and an ability to export equations in TeX/LaTeX, should you wish to maintain compatibility with these packages. The website is http://www.dessci.com/en/products/MathType/; a 30-day trial version is available.

CorelDraw is an excellent package for engineering drawings. It has an easy-to-use interface and outputs quality line art. If you do not have any organizational preference for your graphics software, use CorelDraw. The website is www.corel.com; a 30-day trial version is available.

Visio is another frequent choice for line art drawings. It is simpler than CorelDraw, but not as powerful. It is more frequently available in standard computer configurations. Both CorelDraw and Visio are adequate for users with very little experience in graphic design. The website is http://office.microsoft.com/en-us/visio/default.aspx; a 60-day trial version is available.

If, on the other hand, your organization has professional graphics specialists, then you are likely to have various 3D (three-dimensional) CAD (computer-assisted design) packages, Adobe Illustrator, or other programs used by professional graphic designers. These are fine packages, but are less useful to everyone on the writing team, due to the steep learning curve that comes with using them.

An example of the other extreme of graphics packages is the Windows application Paint. While extremely simple to use, it only produces bitmap output, and is not really suitable for formal scientific and engineering documents, such as journal papers or patents.

EndNote is the leading database software for searching and managing literature citations. EndNote allows for quick online searches and subsequent storage of massive numbers of references. With some extra effort, a research group can create and maintain one common database in a particular field of interest, to be used by all members of the group.

EndNote provides essentially the same functions as **Reference Manager**. Just like with the metric and British systems, there is overhead in maintaining compatibility between the two equivalent products. However, since groups of researchers have adopted both technologies, they will probably coexist for the foreseeable future. It would be wise to check whether your potential collaborators are already using one of the two packages. The website for both packages is www.refman.com.

1.4.3.2 A Brief Comparison of Microsoft Word vs. LaTeX: History and Myths. The choice of a document design system is a huge decision for any organization. In light of the struggle writers face over which software to pick as they compose their documents, we offer some commentary in this section on the advantages and disadvantages of both Microsoft Word and LaTeX. Our goal is to demonstrate not just

the differences, but also to show why using Microsoft Word will make your writing team more efficient and effective.

Two fundamentally different systems dominate the market for producing research and technical documents: Microsoft Word and LaTeX (or TeX for the most proficient users). Microsoft Word is based on the principle of "What You See Is What You Get" (WYSIWYG); that is, the writer can immediately see where on each page the text, figures, equations, etc., that he or she adds will appear. One can start using Microsoft Word within seconds as it requires little start-up time; most computer users have now become familiar with Microsoft Word due to its overwhelming dominance of the general word processing market.

LaTeX, on the other hand, requires entering the text and the references to all graphical elements into a coded text file, which then is compiled into a final document. The principles of LaTeX are quite close to those of HTML, where the presentation of content and the content itself are separate. The software handles the pagination, spacing, margins, orphan control, figure placement, and many other small details, and so the document looks professional even when prepared by a novice. In addition, LaTeX is greatly suited for writing large manuscripts. Even a thousand-page book full of graphics can be compiled with LaTeX using very modest hardware.

The downside is that many people are not familiar with LaTeX and it is difficult for people to learn the software. In collaborative groups where members belong to different organizations, or in large research groups where members have diverse backgrounds, it is nearly impossible to get everyone to learn LaTeX. Besides, the team's time is best spent on research and innovation, not learning software packages. Because LaTeX has a steep learning curve and because many people simply don't have time to learn yet another software package, *STREAM Tools* employs Microsoft Word as the foundation for collaboration. The methods described in this book rely only on Microsoft Word. You simply cannot get a typical nontechnical person started on LaTeX in 30 minutes, whereas it is entirely feasible to get a typical nontechnical person started on *STREAM Tools* in 30 minutes.

Given this general background, let's examine various issues surrounding the use of Microsoft Word and LaTeX in some detail. First of all, the compatibility between the two systems leaves much to be desired. Although there are software converters that take a Microsoft Word file as an input and then output a LaTeX-compatible file (and vice versa), the formatting of complex documents is not well preserved in the conversion steps. Much like a computer translation from a foreign language, extensive human corrections are necessary in order to guarantee the quality of the final result.

A second issue is that different fields use different tools, and since most research teams now span disciplines, deciding on a single authoring tool becomes critical. For example, in business, law, medicine, and most professional communication, Microsoft Word unquestionably dominates. However, LaTeX is the frequent choice in certain fields of hard sciences, like mathematics, physics, or engineering. Professionals in these fields are comfortable with the technical complexity associated with the text file that looks like a computer program and, more importantly, scientists and engineers frequently need to manipulate large quantities of equations and graphics.

As long these two groups do not need to collaborate, there is no problem. However, most complex research and innovation now requires interdisciplinary teams. For example, a sizeable biomedical instrumentation research project may require input from medical doctors, engineers, statisticians, lawyers, technical writers, and even patients. It is just not realistic to expect all these participants to give up their expectations of WYSIWYG convenience and instead learn to compile their documents using a rather complex set of rules.

In spite of the practical concerns associated with forcing team members to learn LaTeX, one commonly encounters the opinion in many academic settings that LaTeX solves all typesetting problems; some aficionados will not step away from it under any pressure. A fraction of people who hold this position are justified in their view because, indeed, they stand to lose too much by this conversion. For example, a tightly knit team composed of a professor and three graduate students who publish only in specialized journals indeed might be better off with LaTeX. However, in most cases, the decision to use multiple incompatible packages in the same collaborative group is driven by habit rather than a judicious choice: the team leaders choose the system based on tradition, personal preference, local user knowledge, or institutional support rather than what will produce the highest quality product most effectively.

To demonstrate why some authors might prefer LaTeX, and then to demonstrate why we encourage using Microsoft Word, let's examine some of the advantages of each package and then debunk a few myths that arise from the differences.

The Advantages of LaTeX over Microsoft Word

- LaTeX enforces proper typesetting, especially for inexperienced writers. The math symbols are italicized, equations are numbered, and figures are properly captioned because the templates take care of it. By contrast, inexperienced Microsoft Word users have plenty of opportunities to divert from proper typesetting options.
- LaTeX is stable. It does not crash much and has low machine memory requirements. Microsoft Word, especially with large documents, requires both memory and speed.
- LaTeX software packages are forward and backward compatible. LaTeX manuscripts written in 1988 compile in 2008 with few or no problems. In previous years, backward compatibility of Microsoft Word was especially problematic and numerous issues still arise today.
- Automatic figure positioning is far more efficient in LaTeX than in Microsoft Word.

In short, LaTeX does provide some advantages over Microsoft Word, particularly for very long and very complex technical documents. However, Microsoft Word also has advantages.

The Advantages of Microsoft Word over LaTeX

- Microsoft Word is ubiquitous. In most cases, co-writing with groups from different companies or across industry and academia is a lot easier with Microsoft Word than with LaTeX.

- Such features as spell check, grammar check, WYSIWYG, track changes, word count, line numbering, and the manuscript marking system are more powerful and convenient with Microsoft Word.
- Microsoft Word is easier to use for novices.
- Microsoft Word now has many handy multi-authoring tools built in.
- Reuse of figures and text is easier when using Microsoft Word and PowerPoint together (as opposed to LaTeX and PowerPoint).

Naturally, experienced writers tend to prefer one package or the other. Often, these opinions are a result of not being adequately informed about software capabilities. The following section examines some common misconceptions.

Myth: Only LaTeX should be used for scientific writing. Microsoft Word just does not have proper tools to manipulate figures, form equations, etc.

Reality: This might be true for highly specialized areas of mathematics. For most engineering and science disciplines, however, Microsoft Word is adequate, as long as it is used effectively.

Myth: LaTeX is good for writing long manuscripts, whereas Microsoft Word is good for memos and short papers.

Reality: This used to be true when computers crashed frequently and had slow processors. In the last few years, however, creating manuscripts of several hundred pages, filled with figures and equations, became feasible and easily manageable with Microsoft Word.

Myth: In LaTeX, one can write equations without leaving the keyboard, whereas in Microsoft Word, one needs to use the mouse all the time.

Reality: This is not quite true. A handy add-on to Microsoft Word, MathType, provides keyboard shortcuts that allow writing equations with only the keyboard. However, since an option of using the mouse is available, many people never invest their time into learning keyboard shortcuts.

All things considered, we contend that Microsoft Word can now be used in the majority of collaborative writing projects in technical settings because it now has nearly the same capabilities as LaTeX. Most importantly, for getting the team collaborating right away, Microsoft Word requires little training time because it is so ubiquitous. Since a primary goal of this book is to provide tips and techniques for those who want to be efficient and effective in their collaborative work, we focus strictly on how to use Microsoft Word for team collaborations as the core of *STREAM Tools*.

1.5 HOW TO USE THIS BOOK

This book is written primarily for technical professionals who need to create complex documents on a regular basis. The techniques presented here allow technical writers to

focus on developing superior content and meeting the needs of their audiences rather than inventing collaboration strategies or spending extraordinary time formatting documents. The benefits of this streamlined approach to group writing permeate all levels of the organization, saving time, facilitating effective communication, and improving work quality.

Let us have a look at how different groups of readers will benefit from adopting *STREAM Tools*.

If you are an *undergraduate student or novice employee*, you have a lot to learn. Start by experimenting with the Quick Start guide in Chapter 2; get a feel for it. As your writing tasks become increasingly complex, go through material in Chapters 3 and 4, selecting elements of interest from the book's table of contents. As you become more experienced and want to understand how to create more powerful documents, study Chapter 5 to learn about the full system and Chapter 6 to learn about successful collaboration in writing teams. Finally, to refine your writing style and grammar, peruse Chapter 7 initially, and then find a mentor who can identify your writing weaknesses. Return to each chapter's material based on your mentor's feedback, internalizing material in small chunks.

If you are a *graduate student*, a *postdoctoral researcher, bench scientist/engineer*, or the *technical writer on a product team*, you can follow the same pattern as an undergraduate student, except that you may be able to do so with much less guidance. You are likely to be the catalyst for implementing *STREAM Tools* in your organization—undergraduates and novice writers do not yet have to write long and complex formal documents, and executive advisors with many responsibilities tend to be less occupied with this kind of work on a daily basis. So, if you are in this group, we recommend beginning with Chapters 2, 3, and 4 but paying close attention to Chapters 5 and 6 because these chapters are more strategic than the "Quick Start" chapters and position you well to become a manager or group leader.

If you are a *professor* or a *leader of a technical group*, you stand to benefit from adopting the system perhaps more than anyone else. By adopting *STREAM Tools*, you will be able to process material received from peers and subordinates more effectively, thus producing better papers, proposals, books, and reports. You will also save tremendous amounts of time for yourself by coding and properly directing your feedback during manuscript editing stages. You will be able to avoid excessive coaching on mundane and trivial aspects of professional writing, focusing on content instead of form. You should thoughtfully read Chapter 1 in order to judge the importance of *STREAM Tools* for your group, master Chapter 2, and assign someone in your organization to master the techniques covered in Chapters 3 and 4. You should be aware of the overall process outlined in Chapter 5 as well as the importance of collaboration, as outlined in Chapter 6. Each of these chapters presents concerns that are your responsibility as you ensure the quality not just of the project, but also of the relationships among employees. Finally, become aware of the material presented in Chapter 7, so that you can effectively use the *STREAM Tools* Editorial Mark-up Table (STEM Table).

If you are an *administrative assistant* in charge of composing documents or a *professional grant writer* who uses material from multiple sources, then you should be

TABLE 1.4. Classification of Writers with Respect to *STREAM Tools*

Category	Description
Novice	An inexperienced team member. Does not know how to use *STREAM Tools*, has weaknesses in many areas of technical writing.
Outsider	An expert in his or her field, sometimes the most experienced member of the team; however, not familiar with *STREAM Tools* and therefore has difficulty integrating with the group writing efficiently.
User	User can use *STREAM Tools* methods and templates with some guidance from more experienced team members. User knows what to do and follows the established procedures.
Expert	Expert can teach (and convince) collaborators to use *STREAM Tools* for the benefit of the group. Expert, unlike User, knows not only what to do, but also what NOT to do when using *STREAM Tools*. In other words, an Expert has enough experience to be able to judge which options and techniques will work best for his or her organization.
Wizard	Wizard has a deep understanding of *STREAM Tools* principles and software methods that enables him or her to create new templates and modify basic techniques to meet the needs of his or her organization.

most interested in Chapters 2 through 5, which will enable you to streamline the process of compiling complex documents with input from many parties.

If you are a *course instructor,* you should be able to use this book either as a core text or as a supplement, depending on your audience. Professional audiences may have much less interest in basic grammar discussions and may want to get immediately to the heart of *STREAM Tools*. College students, on the other hand, will benefit from rigorous treatment of traditional technical writing material, and are likely to enjoy *STREAM Tools* as an integral element of group course assignments.

With respect to *STREAM Tools*, we could broadly organize writers into five categories: Novices, Outsiders, Users, Experts, and Wizards, as seen in Table 1.4.

From the perspective of maximizing productivity, most members of a collaborating group should be either Users or Experts, while a small number of Wizards can take care of advanced issues, such as making new templates for everyone to use. In many cases, it may be advisable for an organization to invite an outside Wizard in to streamline a specific process. After that, operations should run smoothly as long as there is at least one Expert in the organization. There should also be a quick and painless process for training Outsiders to the level of Users.

Invariably, the deployment of open-ended systems like *STREAM Tools* leads to unexpected implementations, and so we cannot predict all possible uses of the proposed tools and techniques. However, it is our hope that each reader will take the suggestions we present as a foundation to build upon and expand, developing systems that will help you meet your organization's needs.

EXERCISES

Exercise 1.1. Conduct a critical review of your writing practices. Respond to the following questions:

(A) Do you practice productive and sustainable writing habits? These include knowing your own preferred writing process, writing early and often, and knowing when and where to seek help with your writing or revisions.

(B) What fraction of total writing time do you spend on routine tasks, such as manual numbering and formatting, editing trivial grammatical errors, or converting text from old documents to new ones?

(C) What fraction of your time goes into actual writing—the generation of new text?

(D) How much time do you spend procrastinating or dealing with writer's block?

Exercise 1.2. Conduct informal interviews with your colleagues. Identify their answers to the questions in the previous exercise.

Exercise 1.3. Conduct an informal meeting with your colleagues (co-workers, classmates). Do they have any "horror stories" to share from their own writing experiences? Do you think these stories could have been avoided with proper planning and use of tools?

Exercise 1.4. Review Figure 1.1 either individually or as a group. Based on the problems you identified in previous exercises in this chapter, determine critical focus areas for your writing challenges. Keep this list for the future, so that you can decide whether different tools that you plan to learn are applicable to you.

Note: This exercise is especially valuable for the group. An individual may intuitively decide whether or not a specific tool is useful to him or her, but as a group member, you may simply not be aware of the scope and scale of problems your group members are facing. Therefore, taking time to assess the overall distribution of skills and habits among group members helps tremendously. You may discover in group discussions that some of the problems may be solved with quick fixes using shared knowledge of team members, and yet other problems will require a systematic approach and substantial efforts.