Textbook Publishing — 1990 and Beyond

Mimi L. Lafrenz

Electronic Technical Publishing, 2906 N. E. Glisan St., Portland, Oregon 97232

(503)234-5522

Abstract

Production of college texts and reference books is a natural for TeX, yet the commercial publishers are slow to understand, and therefore accept, the power and versatility of the program. Some book publishers are utilizing authors' TeX files for creation of camera-ready pages, while others will rarely consider the possibility. The resistance of commercial users to divulge macros, tricks, and techniques has impeded the acceptance of TeX by commercial publishers.

We will explore the training and support of authors and publishers, and the impact of openness in the technical realm. Only through shared objectives will we be able to create the best environment for TeX to flourish in this decade.

Introduction

The process of publishing textbooks, especially college-level, scientific, or technical textbooks is rapidly changing. Advances in technology — laser printers, standard page-description languages and available fonts — are largely to thank for the broader use of computing, or electronics, in publishing. With the emergence of computing as an integral part of the production of book pages, broader issues are brought to the surface — issues that will ultimately shape the way book production is handled.

Before looking to the future, we consider the past and present, to see how they determine our perspective. The future of TeX, and all technology, lies in its roots. To understand the differences between scientific and commercial perspectives, is to understand the future of both. The company we are building comes from the scientific side; however, we are convinced of the long-term commercial benefits.

Throughout this paper we have referred to TeX in the general sense, including all derivatives such as $\mathcal{A}_{\mathcal{M}}\mathcal{S}$-TeX, LaTeX, and so on.

History

ETP is a venture that began when a group of key people from a former company launched a typesetting service bureau, exclusively accepting electronic manuscripts. troff was the focus, and the production group consisted of two programmers who spent most of their time cranking out the same UNIX documentation set for many of the large hardware manufacturers across the country.

ETP's entry into textbook composition came when Holt, Rinehart & Winston had an author under contract who was guaranteed that his electronic files, created with UNIX/troff, would be used in the production of the book. That was a difficult guarantee to keep in 1985, since there were few services offering troff programming and page formatting. The people at Holt went straight to the source — AT&T Bell Labs — for the name of a service that could bring this project to completion. We were the leading source for UNIX documentation composition; they called on us. We had no idea how complex good page makeup could be when we agreed to take on our first textbook project.

We had no formal training in the publishing and typesetting conventions related to the proper ways to create a page. Only through the publisher's patience and willingness to work with us were we able to complete the book. They helped us develop our understanding of the numerous details involved in producing high-quality technical type. The project took six months to complete, with much time spent building special characters to match editing marks that we were not familiar with, and similar fiascos. The book was published, and did well. It was in the second printing within one year, and continues to be a popular text.

With each successive textbook and exposure to dozens of publishers, we developed and honed the craft of technical typesetting. More importantly,

we dove deeper into the typesetting languages and programming aspects to harness the inherent power of `troff`.

The Move to TₑX

After a few years of experience with `troff`, an emerging publisher asked us to look at the possibilities of using TₑX. Thanks to good fortune, our technical director had studied under Pierre Mackay at the University of Washington. Dan Olson understood TₑX and gladly accepted the challenge, launching our first TₑX-textbook project in 1987.

Something was very different. Pages were being created faster and more beautifully with TₑX. There was hardly a comparison with `troff` when the hours for page-makeup were tallied. TₑX books went through the plant faster and had fewer mistakes. We were really onto something here, yet at times there were frustrations that made it hard to continue.

Learning without teachers. The first obstacle to overcome was lack of experience with the program and its documentation. Dan's exposure to TₑX made him the sole source in the company for training, which occupied his time for years to follow. As Dan discovered new techniques with TₑX, he shared them with the production group, and vice versa.

There were many times when it seemed impossible to meet the publishers' strict demands for page composition with this program. When hours of programming time were demanded for physically simple tasks, we would resort to the *x-acto macro* and have it done in minutes. Of course there had to be two or three projects with excessive programming hours to lead us to the necessity of a macro made of hardware. Building the company without a role model, and very few mentors in the field, made us resourceful. The addition of TₑX to our service-line could have been fatal, had we not just gone through similar experiences with `troff`. TₑX was a major step forward.

Documentation. The TₑXbook is a good reference manual, not a good user's guide. There are books and periodicals available, but they require research and reading. The common lack of desire or initiative to research a program has inspired us to build a resource manual, one chapter at a time, to guide the user in understanding TₑX.

Training. The development of internal training programs is an expensive, arduous task. The lack of internal training is even more expensive. As

the old saying goes 'Think education is expensive? Try ignorance.' We spent our energies on a variety of training programs before implementing the current program. The most efficient training methods have been created by production workers who have developed a depth of knowledge in special areas. The use of *A Gentle Introduction to TₑX*, by Michael Doob, has become an integral part of our early training for new users. (Thanks Michael!)

Better, Cheaper, Faster

Better, cheaper, faster. That is all the publishers expect from an electronic manuscript, so what's the problem? Well, let's address these desires individually.

Better. The quality of mathematics set with TₑX is indisputable. The quality of page formatting that can be achieved using TₑX, albeit with effort, is among the best. Dr. Knuth built in many features that are simply unavailable, in their complexity, with any other program or system.

The quality of math set in an Adobe font with TₑX is another story. We have seen the attempts to incorporate other fonts into TₑX files succeed and fail. The advance of composite fonts will change the look of TₑX math. A major development project will eventually be undertaken, fine tuning character widths to automatically give the beautiful spacing inherent in the use of Computer Modern fonts. The accepted approach, in 1990, is the commingling of Times Roman and Computer Modern Math Italic on one page. It does differentiate the math variables from any other italic, but still leaves a lot to be desired in the æsthetic quality of the page.

The basic improvements TₑX has brought to computer-aided publishing should not be overlooked. The final product is better because of features like automated page bottoming, kerning, and the extra care TₑX puts into every paragraph while formatting pages.

Cheaper. The general feeling is that the manuscript must be ready to typeset if the author has input all of the information, so the labor extended to format the pages will be minimal. The main point that the publishers and compositors often miss is the condition of the electronic files prior to the beginning of the composition process.

Quite often in college textbook preparation authors will employ students, clerical staff, even family members, to input the chapters as they are written. It is not unusual to see a 17 chapter book input by 5 or 6 people with different styles, macros,

and contradicting definitions. In fact, we have produced several books in which 3 or 4 programs were used to compose the original files. It was usually easier to strip the word-processing codes and convert the `troff` or other languages into TeX, in order to produce a book consistent through each chapter and section. Reducing expense is difficult in this scenario. The publisher might have done better to send it overseas for keyboarding.

As we look into the future, we will see alternatives to this haphazard system of manuscript preparation.

Faster. In actual production turnaround, faster is relative to company size, skill, seasonality, and organization. The amount of time required to format a book can, in some cases, be significantly greater than the time required to keyboard and traditionally typeset the text depending on the quality of the programs used and on the attention to detail by the author. Publishers who understand the impact of preplanning on the schedule and total expense of a project will recognize the need to negotiate with vendors for better tools and training to simplify and improve the process of book production.

Communication is the Key

The ability to understand and evaluate information and make decisions is the key to a successful project. Developing an understanding between any two parties is the biggest challenge of all, and there are several links in the publishing communication chain.

First, the author and associated support group must set guidelines and procedures for the project which will eliminate waste in the final stages of pagination. For example; coding elements by content (`\example{...}`) rather than by appearance (`\bigskip {\bf...} \medskip`). Next, the author must supply the publisher with complete information about the manuscript, media, and system of creation. The publisher must understand the information being passed on to the compositor and/or artist, since decisions must be made at this crucial step which will affect the results. A progressive publisher, like Addison-Wesley, will research the tools and technicians and have informed individuals guiding authors and preplanning composition. This approach allows growth for all who share the ideas and thereby broaden their own experience. The publisher must then communicate with the compositor, artist, printer, bindery, and distributor. The jargon of book manufacturing has changed

little over recent decades, with the exception of composition, art, and prepress. These are areas of rapid advancement in technology, and only through continuing study can one be up-to-date on all of the current developments. A basic understanding can, however, easily be gained that will allow an individual to converse and make decisions based on the technical information being supplied.

A Fine Line

Quality communication is not the sole responsibility of the publisher or author. The vendors doing the actual production of the book can improve the entire process by accepting the challenge of opening communication channels with clients. There is resistance to openness in the commercial arena, for fear that sharing knowledge will take away a competitive edge.

A company works for years at understanding a product or method, and may believe that sharing the technology with the marketplace would be placing the company's future in jeopardy.

The only thing a company has to sell is its technology. Pieces, parts, and production can be copied, but the intangible understanding must be developed. This is the reason private-sector gurus will not divulge macro source code; it is their security. With careful consideration and planning, tools and information can be made available to the marketplace. Tools which enhance the entire process are being released now. Just as Knuth and the AMS developed the most powerful typesetting program and turned it over to the public, we should be open minded about how our technology is used. It is a fine line — between industry for profit and R&D for the advancement of science — the most exciting line to walk.

The Next Generation

Looking to the future, we see trends developing in publishing, technology, and services. Predicting the outcome of developing trends is risky, but this is the approach we have chosen to develop the most efficient and effective publishing system possible. TeX is a good gamble.

Training. The training of authors, editors and publishers is a vital step in fully utilizing the tools and services available. But who is responsible for this training program, and exactly what should it cover? The answer is obvious, we are all responsible to teach each other everything possible. This is the investment required to bring results. Investing time

and materials now is essential to bringing greater understanding and opportunities in the future.

One of the objectives in our program for training authors and publishers has been to foster a basic comprehension of computing. The use of electronics in publishing will continue to grow. Having the users of any product of electronics understand how the product is derived and applied will accelerate the growth. The course needed to gain this grasp takes less than a day.

Technology. The evolution of tools used for publishing will continue. Hardware and software capabilities increase while the prices decrease. Tools are available to a greater number of people, and are easier to use.

The trend we see unfolding in the technology of composition is an increased involvement by the author in the initial formatting and edit updating. Some authors create elementary graphics, some excel in their comprehension of technical illustration and desktop graphics programs. A greater number of authors submit camera-ready pages each year, fully formatted in a variety of ways.

The problem of authors thinking they are designers is common today. With attempts to separate content from appearance, like SGML and ETPtex, authors are less likely to work on the design. Publishers provide macros fully capable of page formatting, when they can. This is a new development, it should have an impact on the way books are produced.

Quality. It is up to the publisher to control the quality, and it is often not easy to persuade the author to conform to editing marks or specifications. Herein lies the frustration most common to those currently involved at this level: What can be sacrificed or improved in maintaining good author relationships, budget, and schedule?

Quality is the only factor left. It suffers in most cases. But college textbook publishing is a market driven, scientifically exact process demanding the highest quality. The ancillary products, guides, manuals, and such, experience an improvement in quality when an author has utilized a desktop or computer aided publishing system, rather than dot matrix or typewriter. Ancillary products have historically been composed by the author.

Preplanning to optimize production. To provide authors with tools capable of meeting publishing specifications, without the burden of years of developing the understanding necessary to produce quality pages, we are developing macro programs for publishers. These are built to common specs, allowing for minimal variation in the design.

In 1988 we first released ETPtex, a macro set designed to produce double spaced manuscript output, with special features like callouts (elemental names) in the margins and floating figures. ETPtex overlays (as a front end), all versions of TeX and is simple to use. Macros are named to match the specifications, and conform to the specs and house standards — when run through the version of the program kept at ETP. Frequently, the design has not been decided during the writing phase of the book. The macros give authors freedom to write without concern for pagination. The involvement of Prentice-Hall was very important in this development project. They have supported our growth in many areas, providing guidance and authors to work with during every stage.

Services like ETP will broaden their range and be available for technical consultation, macro writing, production, and training. The liaison work between the author and publisher is being handled by total concept houses, or services that act in a freelance capacity to bring the editing, design, and production under one roof. A total concept house able to converse technically with the author and publisher, in their respective languages, will bridge the gap until open communication ripples through the industry and training is commonplace. This will happen much sooner than some anticipate.

Summary

The publishing of textbooks, reference books, and periodicals, is transforming into a process of communication. Pioneering companies and individuals realize the benefits of utilizing TeX to improve quality, turnaround, and expense. With rapid advances in so many areas, we must realize that our understanding, support, and use, of these advances will shape the next generations of publishing. The use of TeX will provide freedom not possible with any other platform.

We believe that helping each other will benefit all of us, as we approach a new century of information management.

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