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HOW WILL WE EDIT ELECTRONICALLY TRANSMITTED TEXT?

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ABSTRACT

Editing is an important communication activity that is performed throughout the business and professional world. For generations, publications specialists, managers, and others have annotated paper copies of the drafts they were editing using marginal comments and the traditional set of symbols. Increasingly, however, documents are being edited on computer terminals, and edited texts are being transmitted electronically between the author and editor. This conversion to electronic editing will necessitate new procedures for text annotation. This paper reviews the problem of text annotation in electronic editing, suggests a set of requirements for acceptable annotation procedures, analyzes and assesses the procedures that are evolving, and addresses the need for the standardization of procedures.

INTRODUCTION

Editing can be defined as the act of improving the expression and content of another person's written work. It is performed throughout the professional world by a very broad range of individuals. In organizations of all kinds, superiors regularly edit, in an informal way, the drafts of their subordinates [2;6]. Likewise, peers often collaborate on documents and edit one another's contributions. Finally, business and technical communicators, working in publications departments and elsewhere in organizations, regularly edit, as a formal professional activity, materials being prepared for publication. Clearly, a wide range of professionals are at least part-time editors, and clearly, editing is a prevalent and important activity in the professional world.

For generations editing has been carried out on paper drafts using a set of symbols called "editors'" or "proofreaders'" marks. These symbols, as will be shown, work well. However, with the transition to fully integrated computer systems and the electronic office, editing on hardcopy is becoming obsolete and with it any system of editing that is tied to hardcopy editing.

Organizations can now almost instantly transmit documents between terminals or networked computers located in different office of the same

building or in different countries. Furthermore, work assignments increasingly reflect this capability—individuals at different sites very often **can** and therefore **are** expected to work together efficiently. But traditional "blue pencil" editing hinders professional communication in the electronic age. While most text can be telecommunicated almost instantly, edited text is very often mailed. While most text can be stored magnetically, edited hardcopy is regularly stored in file cabinets.

Many organizations are now recognizing that traditional editing procedures can significantly hinder the power of the computer to automate both publications departments and the entire professional workplace. At The Boeing Company, this problem has been recognized by a number of individuals, including Mr. David Becker, who managers the automation of new-business proposal production for The Boeing Aerospace Company's graphics organization. Becker reports that "The conversion from hardcopy to online editing represents an important factor in improving productivity and throughput, but is a problem that has particularly resisted solution" (personal communication, 8/8/85). Becker also observes that this problem has been recognized by many individuals in other organizations who are concerned with the communication function. In addition, the problem along with some proposed solutions has recently received attention in the technical communication literature [1;3;5;7]. Finally, in the last few years, manufacturers of electronic publishing systems have grappled with the problem and, as will be shown, have implemented solutions that are at least viable and in some cases, highly innovative. The purpose of this study is to provide what is very likely the most broadly based review and analysis of the problem of text annotation in electronic editing and with it an assessment of possible solutions.

PRELIMINARY DISTINCTIONS

It will be good to begin by observing that editors annotate the texts they work on by means of both **marks** and **comments**. The marks, which are generally the traditional set of editors' (or proofreaders') marks, consist largely of nonverbal symbols and are, for the most part, written (or "encoded") within the text, though at times, most notably the marking of a lengthy insertion, the margins or even separate sheets are used. The purpose of these marks is to signify specific changes the editor wishes to make. They are read ("decoded") generally by the author, who accepts or rejects the emendations, and they may be read later by a keyboardist such as a typesetter and by other production personnel.

Comments consist of the questions, explanations, justifications, and other remarks the editor sends to the author and may receive from the author. They are verbal and are normally placed outside the text area. It is possible for editors to use comments to indicate emendations when no accompanying message is called for, as in: "Delete 'electrostatic.'" Or: "The 'F' in 'Federal' should be lowercase." This procedure, however, is considerably less efficient than the use of marks and is therefore seen infrequently in traditional editing.

In traditional editing, the editing marks directly overlay the text, and comments are generally placed in the margins and are often keyed to the corresponding junctures in the text with lines or arrows. It can be said, then, that in traditional editing the decoder enjoys ready "ocular access" from a particular juncture in the original to a corresponding mark or comment. But in many text annotation procedures, comments are used exclusively, and in some of these procedures, ocular access from a juncture in the original to a comment on that juncture is less convenient, reducing the overall efficiency of use for that procedure.

A final distinction to be made is that between "silent" and "explicit" emendations. In traditional editing all emendations, even the most clear-cut and mechanical ones, must be marked on the original. Even though the author may have no interest in these emendations, they must be marked for the benefit of the typesetter, who rekeyboards the entire text. In this era, however, there is generally no second keyboarding; once emended by the editor, the text can be typeset directly through electronic means. Consequently, it is now feasible for the editor to make silent emendations rather than to call all emendations to the authors' attention.

INADEQUATE PROCEDURES CURRENTLY IN USE

Electronic editing is often performed today using two inadequate procedures for text annotation, procedures that are at best limited only to certain circumstances. The first of these procedures is for the editor to edit "destructively"—simply creating an emended version of the document—and for the author to review the emended version without reference to the original. This procedure, however, has two major drawbacks: (1) there is no provision for editor and author to exchange comments, and (2) the author must rely exclusively on memory and subject matter knowledge to catch any errors that the editor may have unwittingly introduced into the document. This procedure is acceptable to those individuals who are unconcerned about the ways in which their texts may have been altered and who trust themselves to catch errors in content without referring to their original version. But the procedure is almost certainly inadequate for general use in most organizations.

The second inadequate procedure is for the editor to simply create an emended version of the document and for the author to review the emendations by glancing back and forth between the emended version and the original version displayed on a computer screen window, a separate monitor, or even hardcopy. As before, this dual-text procedure includes no provision for the exchange of comments between editor and author. Furthermore, the degree of ocular access between any emendation and the corresponding juncture in the original is very poor. Not only is the process of glancing back and forth tedious and time-consuming, but scrolling and character-string searching may also be necessary to find the corresponding junctures in the original. This procedure may be acceptable where documents receive only light editing or where the

authors only wish to check a few portions of the edited text against the original or among individuals who are rarely edited. But most organizations and certainly all publications units of organizations will need to find a more efficient procedure.

REQUIREMENTS FOR TEXT ADEQUATE ANNOTATION PROCEDURES

In order to determine what procedures for text annotation in electronic editing are viable, it is necessary to establish a set of requirements. Such a set of requirements is offered below. The first two are threshold requirements. The others can be met and exceeded in varying degrees and can therefore prove helpful in choosing among adequate procedures:

1. The procedure must be nondestructive of the original text.

2. The procedure must permit comments between editor and author.

3. The procedure must be efficient in both encoding and decoding modes (including ease of learning as well as efficiency of use by experienced personnel).

4. The procedure must permit the efficient preparation of a final text.

5. The procedure must not be inherently limited to implementation on very expensive or very specialized equipment.

Requirements 1 and 2 were discussed above; requirements 3, 4 and 5 will be discussed below.

Efficiency is the aggregate product of a great many features, many of which pertain only to specific text annotation procedures. Some of the most important generally applicable components of efficiency are these: good ocular access between the original text and comments and/or editing symbols (also discussed above); the use of editing symbols rather than a pure comment system—pure comment systems may be adequate, but they do represent a significant loss of efficiency; the efficiency of the system of editing symbols that may be used.

After the editor has emended a text and the author and editor have agreed upon the emendations, a final, cleaned-up text must be prepared. In traditional editing, of course, the entire text was rekeyboarded, typically by a typesetter; in the age of electronic editing, this rekeyboarding is not acceptable. In some of the newly developed text annotation procedures, there is no alteration of the original text until after the final text has been agreed upon. In others, the editor incorporates some or all of the emendations into the text—though in some nondestructive way—before the author's review. Naturally, it is desirable to have a procedure in which the final text is created in the most efficient, most automated manner possible.

SHOULD THE TRADITIONAL EDITING SYMBOLS BE RETAINED?

The traditional editing symbols are highly efficient when used by experienced personnel and, in addition, are easily learned. They are easily learned because many of the symbols are intuitive and because the symbols can be learned and used in increments. Finally, they already constitute a de facto standard. Might it be desirable, then, to retain these symbols in electronic editing?

Unfortunately, the traditional symbols do not meet two of the requirements specified above for text annotation procedures in electronic editing. Because they were designed to be encoded by hand, these symbols can only be entered on computers or terminals with bit-mapped screens. Given systems with this capability, the most flexible and efficient method for entering the symbols is probably with a mouse (along lines of the "pencil" tool in Apple Computer's MacPaint™). So these symbols require equipment that, if not necessarily expensive, is still relatively specialized. In addition, once the traditional symbols have been entered, there is no easy means of removing them from the text; consequently, preparing a final text becomes unduly difficult. Nevertheless, as will be shown below, it may prove desirable to retain keyboard-character equivalents to these symbols.

ANNOTATION PROCEDURES IMPLEMENTED ON ELECTRONIC PUBLISHING SYSTEMS

Not surprisingly, vendors of electronic publishing systems have devised procedures that at least meet the requirements presented above. Several representative procedures are described and assessed below.

Mentor Graphics offers electronic publications software for Apollo workstations. In this system the decoder, by clicking a mouse pointer, opens markers that become numbered symbols which are keyed to comments the encoder has placed in a special workspace at the top of the page. By clicking the numbered symbol, the decoder rolls down the comments. The ocular access provided in this system results in a level of efficiency of us that is only minimally adequate. Mr. Paul Needham, Mentor's Marketing Manager for Electronic Technical Publication, notes that this is "not an ideal system for editing" but that it works well for technical review and for editing in which the editor makes many silent emendation (personal communication, 5/26/85). He also notes that editing will probably be better supported by Mentor in the future.

Xyvision's electronic publishing system permits comments to be placed between lines in the text area. This method provides excellent ocular access. When no longer needed, the comments can be removed and the extra spacing collapses. In the ViewTech system, comments, which are removable, are introduced within the lines of text. This method also results in excellent ocular access. Mr. Dee Hester, an account manager for ViewTech, indicated that View Tech chose to place comments within

rather than between the lines of text as a means of conserving computer power (personal communication, 5/24/85).

As noted earlier, for greatest efficiency of use, annotation procedures should include both comments and editing marks. The systems described here are comment based, but the excellent correspondence of the Xyvision and ViewTech systems will permit the use of some sort of editing symbols. For instance, a delete symbol, instead of a comment, could be placed directly above or alongside a particular word or phrase.

These procedures permit the preparation of a final test: presumably the editor will go back and keyboard in the emendations and remove the comment areas once the author has approved the editor's work. The manual aspect of this procedure, however, is not ideal and, in fact, is less than might be hoped for in the computer age. A possible means of facilitating the preparation of the final text in these procedures is for the editor to create a new text and to use comments and symbols that indicate how the original text has been emended. Except at the places where the author rejects the editor's emendations, the removal of the comment areas would yield a final text.

A truly innovative procedure for text annotation has very recently been developed independently by Penta Systems and Xerox. In this procedure, the editor works destructively and simply creates a new text. But while the editor works destructively, the system itself records the editor's insertions and deletions and enables the author (and editor) to view a special file in which the insertions are highlighted and the deletions are struck through. Here is procedure for text annotation that is clearly more than a substitute for traditional hardcopy editing: it uses the resources of the computer to provide some distinctly new capabilities. Editors will presumably be more than willing to work destructively. Preparation of the final text is automatic. A question that should still be answered is whether decoding can be performed efficiently, especially in the case of heavily edited text, using a procedure that represents only insertions and deletions rather than the full range of operations represented by the traditional editing symbols. But this procedure, used in conjunction with a comment facility, may well prove very significant in the future of electronic editing.

In the Penta system, this procedure is known as the capability for "edit trace." Mr. Mark O'Connell, Penta's Coordinator for Marketing Services, reports that edit trace is working well in a demonstration project that is currently underway (personal communication, 5/25/85). Xerox's version is a separate software application written in Xerox's dialect of the Lisp language. It was developed and is used internally by researchers at Xerox's Palo Alto Research Center (PARC). PARC researchers have also developed an excellent annotation facility (also written in Lisp) known as Annoland. Annoland permits an encoder to write comments and to place special markers at the appropriate junctures in the text. The decoder clicks the mouse pointer over this mark and a workspace appears with the encoder's comment. According to PARC's Mr. Richard Burton, who has been centrally involved in both projects, ShowEdit will

be included in the next release of Xerox's Lisp editor and will run on their 8000 and 1100 series workstations (personal communication, 5/24/85). Xerox, however, does not now have plans to release Annoland or to transport either ShowEdit or Annoland to their regular office and publications software.

It is evident, then, that a number of adequate and more than adequate procedures have been developed by vendors of electronic publishing systems. But the equipment—networked publications workstations—on which these procedures have for the most part been implemented is expensive and highly specialized. A great many professionals who edit and are edited do not use and will not be using this kind of equipment. Consequently, different procedures have come from other quarters.

ANNOTATION PROCEDURES FOR INEXPENSIVE AND NONSPECIALIZED SYSTEMS

Various individuals have developed text annotation procedures for use at their own jobsites on relatively unspecialized and inexpensive systems. Several of these procedures, moreover, do not require homogeneous equipment but can be used with any terminals or computers that can exchange regular (ASCII character) text. Consequently, these procedures—along with those like them—are for many the only available option over the near term. But some of these procedures many also prove significant in the future of electronic editing.

Mr. Jim Morgan uses a procedure that consists of comments enclosed by brackets located in the text [4]. It is, in fact, quite similar to the editing facility on the ViewTech system. Like some of the other comment-based procedures, this procedure could—and probably should—be enriched by a set of editing symbols that would be placed in the comment areas.

Mr. Randy Taylor, who edits for a group of city planners in the Salt Lake City Planning Department, has devised a simple but functional system for use on the eight terminals that run on the office's Convergent Systems minicomputer (personal communication, 6/23/85). He uses the text editor's strike-through mode to show deletions, its highlighting capability to show insertions, and all uppercase letters to convey his comments to the authors. Taylor's authors generally prepare the final text as they decode his emendations.

Mr. Kenneth M. Gordon, of the Lawrence Livermore National Laboratory, edits on a terminal and exchanges hardcopy versions with his authors [3]. But, as Gordon himself suggests, his general approach can be readily adapted for total electronic editing. Gordon makes minor emendations silently. He indicates more significant emendations not with editing marks but by placing both the original and revised passages next to one another in the text, so that the author enjoys good ocular access while comparing them. Gordon's authors cross out either their original or Gordon's revised version of the passage from their paper copies, and

Gordon then prepares the final text on his terminal. Gordon uses comments such as: "You said ' . . . '" and "You could say ' . . .'" to help alert the authors to these emendations. Often Gordon uses a typesetter to generate his hardcopy drafts, and in those cases, he also uses bold italics to help highlight his emendations.

Another procedure has been devised and used internally (swapping disks rather than through networked computers) by the author and his colleagues at the University of Washington. It consists of a reasonably intuitive and efficient set of editing symbols that are roughly equivalent to the traditional marks but which are generated by means of standard ASCII-keyboard characters. These symbols can be entered on any text editor that encompasses the standard ASCII character set and can be electronically transmitted between any computers or terminals that can exchange ASCII chacters. This procedure provides for comments as well as symbols. Preparation of the final text must be performed manually, but the symbols have been designed to be "read" by a computer so that the final text could be prepared automatically. Testing of this procedure is continuing, and a description of the symbols and the operations they represent are available from the author upon request.

CONCLUSION: THE NEED FOR A STANDARD

It is certain that a great deal of editing, both formal and informal, will be performed electronically. No one knows what procedure or procedures for text annotation will be developed or accepted. But it is highly desirable to achieve agreement on a standard text annotation procedure or, at least, to prevent the proliferation of procedures.

For one thing, a standard would simplify the worklife of all those who edit or are edited, for without a standard these individuals might well have to learn new procedures and switch among procedures many times during a career.

For another thing, standardization of a text annotation procedure will help contribute to hardware and software compatability, both in regard to the text annotation function and to total compatability among systems. Ideally, various electronic publishing systems, microcomputers, and mainframe systems should all be able to work together with full functionality and with a common annotation procedure.

From a technological point of view, there appears to be little in the procedures described here, including those that have been implemented on electronic publishing systems, that could not be added to general purpose text editors, particularly so if comment spaces are placed within lins of text rather than between lines or in special pop-up comment areas. All of these procedures, then, are long-term options for a standard that would extend from the publications department into every department of complex organizations.

But achieving a standard among a wide range of possible procedures will be no easy task. The universe of concerned parties whose needs must be considered is very wide, wider even than what has thus far been suggested in this paper. It extends, for instance, to an experimental project in Great Britain to develop a wholly electronic scholarly journal. For this project, a text annotation procedure has been devised to permit electronic refereeing of submitted manuscripts [4]. Using this procedure, which consists of a comment facility similar to those described above, manuscript reviewers perform what is, at least in part, an editing function and telecommunicate their work to the journal editor.

It is important, therefore, for information to be exchanged and research to be conducted on the needs of various professional communities, the adequacy and applicability of the procedures that are being developed, and the degree to which any procedure is emerging or might emerge as a standard. It is also important to work with a standards organization, such as ANSI, to help bring about a standard and the best possible standard. In this way, as in many others, professionals in commication should work together to take hold of their own future.

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