Managing Headings in Print and Online Documents

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Headings are employed in most print documents, in PowerPoint presentations, and on many web pages. A key role of headings is to indicate the logical subordination of the sections of content that make up the print or online document. Although the basic principles of showing subordination with headings are familiar to all, there are some useful techniques that are rarely acknowledged and others that handbooks regularly condemn. These techniques include ways to flatten the document's hierarchical structure and ways to handle introductions and conclusions. PowerPoint presentations pose special problems because this medium calls for relatively flat hierarchies. Websites allow for considerable depth, but designers must recognize that depth arises from both headings on web pages and hyperlinks to the next level down in the hierarchy. Finally, headings and subordination are significant issues in multipurpose publishing—for example, when a print document will be converted to a PowerPoint presentation or moved to a website or when content stored in a database will become both a print manual and an online help system. Of special importance in this regard is the distinction between populated and unpopulated locations in the document's hierarchy.

Keywords: headings, subordination, writing, engineering communication

Every writer knows that organizing one's ideas is a challenging task. As we reconcile the needs of the audience, our own purposes in writing, and the internal logic of our subject matter, we work hard to decide what will be the key ideas and the subordinate ideas and to arrange these ideas in the most meaningful, useful, and engaging way.

The aspect of organization that seems entirely straightforward is applying the general principles of subordination that govern the use of headings. We know that the main sections of a document, which correspond to the general ideas being communicated, are marked with first-level headings and that these sections are subdivided with subordinate headings. Usually we try

not to go below about three heading levels. This is Technical Writing 101—familiar, unchanging, and uncomplicated.

I believe, however, that managing headings, in particular the task of subordination, is surprisingly complex and that expert writers routinely make subtle decisions and employ sophisticated techniques that they rarely articulate, even to themselves. Less expert writers lose out. Either they entirely miss opportunities to refine the structure of their documents, or else they see possibilities but puzzle over what is correct and appropriate and very likely shy away from good choices. In making explicit these complexities and describing a set of techniques for managing headings, I hope to achieve several goals:

1. To contribute in a small way to our general understanding of expository writing and to invite teachers and authors of textbooks to present issues and explain techniques that will benefit students. The discussion of subordination in textbooks is rudimentary indeed. This is true even of the successful advanced textbook, Alred, Oliu, and Brusaw's *The Professional Writer: A Guide for Advanced Technical Writing* (1992).

2. To briefly note how our strategies for managing headings in print must be altered when we write for the computer screen, in particular when we create PowerPoint presentations and websites.

3. To show that we need to understand headings and subordination to succeed in the new era of content management, XML, and multipurpose publishing. In particular, I demonstrate that the way in which we manage headings in print significantly affects our design options when we repurpose the document for an online medium.

The roles of headings

Headings, as we know, serve several important roles in expository documents:

- They preview and succinctly summarize upcoming content.
- They show subordination, making clear that certain sections of a document are subordinate to others.
- They provide a means of access for those who skim or scan for specific information.
- They provide an overview of the document as a whole (e.g., examining the headings of part or all of a document is akin to examining the table of contents).

As they do so, headings contribute in subtle but significant ways to a document's "look and feel" and to the reader's overall experience. When the visual appearance (fonts, blank space, etc.), syntax, and length are appropriate, when readers encounter headings at about the right intervals (not too much text between headings and not too little), and when the level of subordination seems appropriate to the content and purpose, readers are more engaged and the document is perceived as well-crafted.

Managing the levels of a hierarchy

It will be helpful to work from a concrete example. Figure 1 shows the draft of a technical report in MS Word's outline view. All the body text is collapsed. The title of the report, which will appear on the title page, is "Flooding in Western New Jersey." In keeping with standard formatting practice (discussed later), there is no actual "Introduction" heading to mark the introductory section of the report. In the current outline view only the "Flooding at Parsons" branch of the hierarchy is fully expanded, and we can see that it extends to level 5 ("Clear Cutting" and the other causes of flooding). A 5-level hierarchy is deep, but this much depth is found in many large and complex technical documents. The Rowlesburg and Albright branches and the branches pertaining to flooding incidents on the Tug and Gauley rivers also extend to level 5, although this cannot be seen in the figure.

Because all of the flooding incidents result from the same four causes (clear cutting, dredging, riverbank development, and dams), the portion of the report dealing with solutions ("Steps to Take") pertains to all the flooding incidents. That is, the writer did not need to discuss solutions for the individual locations or incidents. Although not visible in the figure, the headings in the "Steps to Take" branch of the hierarchy extend to level 4.

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□  FLOODING IN WESTERN NEW JERSEY
✛  Introduction (not a heading)
✛  Flood-Prone Rivers of Western New Jersey
       ✛  The Cheat River
              ✛  Flooding at Parsons
                     ✛  Flooding in 1972
                            ✛  Clear Cutting
                            ✛  Dredging
                            ✛  Riverbank Development
                     ✛  Flooding in 1986
                            ✛  Clear Cutting
                            ✛  Damming
                            ✛  Riverbank Development
                     ✛  Flooding in 1993
                            ✛  Damming
                            ✛  Dredging
                            ✛  Riverbank Development
              ✛  Flooding at Rowlesburg
                     ✛  Flooding in 1972
                     ✛  Flooding in 1974
                     ✛  Flooding in 1986
                     ✛  Flooding in 1993
              ✛  Flooding at Albright
       ✛  The Tug River
       ✛  The Gauley River
✛  Steps to Take
       ✛  Curtail Clear Cutting
       ✛  Limit Dredging
       ✛  Control Riverbank Development
       ✛  Prevent Poorly Planned Dams
✛  Conclusion
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Figure 1. An outline view of a writer's draft of a technical report.

While we will assume that branches extending to five levels are appropriate for this hypothetical report, there are certainly potential problems with deep hierarchies. A profusion of headings may disrupt the continuity of the text (Rude 2002, p. 316) or result in an "airy look" with too much visual separation between sections (Kumpf 2000, p. 410). Deep hierarchies may also cause readers to lose track of the heading level, thus defeating the writer's goal of showing subordination. This is especially likely in the case of deep hierarchies in documents that are not as systematically organized as the flooding report.

Houghton Mifflin's guidelines for authors are typical of many style guides in that they discourage more than three levels (Houghton Mifflin College Division website 2002):

> Headings reflect the logical relation among ideas in the text and help to guide the reader through each chapter, but too many levels, or degrees of subordination, confuse rather than clarify. Most books need no more than two or three levels.

Because a book's chapter-title pages constitute the first level of a book's hierarchy, Houghton Mifflin is actually recognizing the need for three or four levels.

Flattening the hierarchy: Eliminating the bottom level

Let's imagine that the flooding report writer decides to flatten the hierarchy—that is, reduce the number of heading levels. Perhaps the current version seems too choppy. Perhaps this report is being published by a government agency whose house style stipulates only four heading levels.

The most familiar technique for flattening the hierarchy of a print document is to eliminate the bottom level (or levels) of headings. The flooding report writer, for example, might choose to eliminate the headings that state the causes of flooding (clear cutting, etc.) under the sections, such as "Flooding in 1972," that describe particular flooding incidents. Presumably, then, the introductory paragraphs of sections such as "Flooding in 1972" will provide a plan of development statement, very possibly with a bulleted or numbered list, that previews the causes and enables readers to grasp the overall structure of the section. Even so, given the importance of the causes of flooding to the report as a whole, eliminating these cause-of-flooding headings is a questionable strategy.

The need to reduce heading depth is certainly not the only reason why writers eliminate the bottom level (or levels) of a hierarchy. Not every document has, or should have, several levels of crisp structural divisions. I recently eliminated the second-level headings from the draft of a document. As I worked on the draft, something about it seemed wrong. Finally, I realized that my second-level headings implied a more systematically organized document than I was in fact creating.

Flattening the hierarchy: Eliminating the top level

A less familiar way to flatten a hierarchy is to eliminate a level at or near the top. For example, our writer might eliminate the first-level headings "Flood-Prone Rivers of Western New Jersey" and "Steps to Take." Figure 2 shows the revised document with its new set of first-level headings. If this choice is made, the introduction must bear a special burden. In addition to explaining the overall purpose and scope of the report, the introduction will have to provide an overview of the Cheat, Tug, and Gauley river basins and an overview of the four solutions.

Figure 2. Flattening a hierarchy by eliminating the top level.

Another significant consequence of this decision is that the three headings introducing the rivers and the four headings discussing solutions are no longer grouped separately. With this "mixed category" approach, the main sections of the document are less unified. Readers, therefore, must make larger, more difficult inferences in order to grasp the overall theme of the report from these more diverse headings or from the table of contents. In other words, the reader must figure out that the four headings prior to the conclusion are solutions to the flooding problems on three rivers. Despite these difficulties, I sometimes eliminate the top level of a hierarchy. For example, in an early draft of this paper, the sections "PowerPoint presentations," "The hierarchical structure of web documents," and "Multipurpose publishing" were at the second level, subordinated to a top-level section entitled "Other aspects of managing hierarchical structure."

Flattening the hierarchy: Compound headings

Experienced writers sometimes employ a technique, which I call the "compound heading," to eliminate a physical heading level while maintaining the original logical subordination. Stated differently, two logical levels can be joined as a single physical heading, very often using a colon. Figure 3 shows a version of the flooding report in which the logical first-level heading "Flood-Prone Rivers" is joined three times with headings ("The Cheat," "The Tug," and "The Gauley") that are logically second-level headings but which, as compound headings, are now at the first level. Note how the first half of a compound heading (e.g., "Flood-Prone Rivers") provides explanatory context for the second half.

The writer might have created another set of compound headings by joining "Steps to Take" with the four solution headings (e.g., "Steps to Take: Curtail Clear Cutting"). This proceedings paper demonstrates this technique with the three compound headings that begin with "Flattening the hierarchy." Of course, if phrases such as "Flood-Prone Rivers," "Steps to Take," or "Flattening the hierarchy" need to be followed by some kind of explanatory text, they should not become compound headings.

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□  FLOODING IN WESTERN NEW JERSEY
⬦  Introduction (not a heading)
⬦  Flood-Prone Rivers: The Cheat
⬦  Flood-Prone Rivers: The Tug
⬦  Flood-Prone Rivers: The Gauley
⬦  Steps to Take
        ⬦  Curtail Clear Cutting
        ⬦  Limit Dredging
        ⬦  Control Riverbank Development
        ⬦  Prevent Poorly Planned Dams
⬦  Conclusion
```

Figure 3. Compound headings.

Stacking headings

The practice of stacking headings is routinely condemned by style manuals and other authorities. Here is a typical statement, taken from Houghton Mifflin's guidelines for authors:

> Avoid "stacking" heads, or placing two levels of headings together without intervening text. A heading cannot substitute for the transitional or introductory paragraphs that guide the reader through a chapter. Remember too that a chapter opening looks better in type when one or more paragraphs of text precede the first heading.

Skillful writers, however, will at times choose to stack headings. For example, a graduate student wrote a course paper for me in which the second-level heading "Difficulties with Help Systems" is followed immediately by this third-level heading: "Help disrupts the user's workflow."

Stacking headings is not a means to flatten a hierarchy. Rather, the impulse to stack headings usually arises when we resist writing a "placeholder" introduction that has little value for the reader but exists primarily to avoid stacked headings. The graduate student did not see the need to elaborate on the general idea that help systems present difficulties and did not see the need for an introductory paragraph previewing the difficulties covered in the paper.

In Figure 4 we see a situation that might tempt a writer to delete the introductory sentence and thereby stack two headings. Perhaps there is value in previewing the fact that there will be morning, afternoon, and evening sessions. On the other hand, this fact may have been made amply clear earlier in the document. Note that the use of compound headings (e.g., "Conference Schedule: Morning Sessions") is an alternative to stacked headings.

Figure 4. A situation in which a writer may want to stack headings.

Dividing a section into a single subsection

A frequently encountered prohibition regarding the use of headings is that a section should not be divided into a single subsection. Houghton Mifflin provides a typical formulation of this rule:

> As you set up your heading structure, please keep in mind the logical impossibility of single subdivisions. A section cannot divide into one part: It must divide into two or more parts, each with a separate but equivalent heading, or it divides into no parts at all.

I have puzzled over this "logical impossibility" for many years, and I continue to find occasions when dividing a section into a single subsection seems to work well. In this paper, the section "Populated and unpopulated locations in hierarchies" is the sole subsection of "Multipurpose publishing." (I found this preferable to subdividing "Multipurpose publishing" by types of media.)

There are others as well who are unwilling to completely rule out this technique. A note of hesitancy is expressed in the venerable *Chicago Manual of Style* (1993):

> When a section of text is subdivided, there should ordinarily be at least two subsections. One subhead in a chapter or one B-level subhead under an A-level subhead may be viewed as illogical and asymmetrical" (p. 34).

Likewise, the authors of IBM's thoughtfully written style manual *Designing Quality Technical Information* (Hargis and others 1998, p. 156) refrain from a full prohibition when they say that dividing a section into a single subsection "is a good indication that there is an organization problem." Finally, the technique is endorsed by the iconoclastic authors of the well-known *STOP Report*, who, in fact, mount a broad attack on conventional ideas regarding headings and subordination (Tracey and others 1965, p. 14).

Whatever our opinions on this issue, we can make use of the sidebar (a supplement to a magazine story or other piece of writing that is boxed off from the main flow of text) to divide a section into a single subsection while evading the prohibition. The drawbacks of sidebars, however, are (1) that they make the sidebar content appear more tangential than the writer may wish and (2) that they do not appear in the table of contents.

Introductory and concluding sections

Our documents are full of introductions and conclusions. We introduce and conclude documents as a whole with what we can call a "general introduction" and a "general conclusion." We also introduce and conclude the sections within a document. The subtleties of introductions and conclusions, especially how we do and don't set them off with headings, are another neglected issue in professional writing.

How we write and format introductions

In the case of expository documents, we tend to regard introductory text as logically superordinate to what is introduced. Standard formatting practice reflects this assumption. In most documents (including the flooding report) the general introduction directly follows the title (or title page) and is not introduced by an "Introduction" heading. It is much the same with section introductions. Though this is not shown in Figure 1, we presume that the introductory text describing the flooding problem at Parsons directly follows the "Flooding at Parsons" heading.

Sophisticated writers, however, do at times employ an "Introduction" heading, though doing so results in stacked headings. One concrete benefit of an "Introduction" heading is that the introductory section can be subdivided with subheadings. Furthermore, the writer can employ special introductory headings, for example, "Background" or even "Introduction: The Betrayal of a Public Trust." (Note that this last heading is not a compound heading even though it employs a colon.)

Writers occasionally "tuck" a brief introductory paragraph under a subordinate heading. For example, in Figure 2 the section "Curtail Clear Cutting" would very likely begin with a brief introduction that would preview the four solutions to the flooding problem. This introduction would briefly recapitulate the longer overview that appeared in the general introduction. The use of tucked introductions violates the logic of strict subordination—why should an introduction to multiple sections appear *within* one of these sections? Even so, the tucked introduction can be used with success. You will find a tucked introduction in this paper directly following the heading "PowerPoint presentations." This came about when I eliminated the top-level heading, "Other aspects of managing hierarchical structure."

How we write and format conclusions

Conclusions serve several functions in expository writing. The general conclusion provides closure for the document as a whole. The various section conclusions provide closure for an individual section and, in some cases, for multiple sections. Section conclusions, furthermore, maintain continuity between sections of a document. That is, as the conclusion provides closure, it very often previews the next section.

Most often the general conclusion (which may or may not be titled "Conclusion") appears as a first-level heading or, in the case of a book, as the title of the concluding chapter. The flooding report (Figure 1) follows this practice. The conventions governing conclusions, however, are

flexible. Especially in the case of shorter documents, writers will tuck the paragraphs that comprise the document's general conclusion into the final section of the document, even though this section may be at level 2 or lower in the hierarchy.

Writers also employ tucked section conclusions. Note that in Figure 1 we might expect the Parsons portion of the document to end with a fourth-level "Conclusion" section (coordinate with "Flooding in 1993"). There is no such section, however, because the writer chose to tuck the concluding paragraphs into the end of the section "Riverbank Development," even though this section is logically at level 5. Decisions of this kind are not trivial—not if we care about quality writing. Tucked introductions, tucked conclusions, and other techniques enable writers to depart from the default procedures for subordinating headings and give documents their own shape, rhythm, and flow.

Here (employing my own tucked section conclusion) I return to a point I raised early on. Because these techniques have not been codified and are not regularly taught, they belong largely to those skillful writers who have taken notice of them and have the confidence to use them. Many writers who might successfully use these techniques never think of them, while other writers recognize such possibilities in their writing but fear they will be following an incorrect or ineffective practice.

PowerPoint presentations

How we manage headings and the structure of document hierarchies are important issues beyond the world of print documents. Indeed, I consider these issues now in three other contexts: PowerPoint presentations, website design, and multipurpose publishing.

Presentations delivered with PowerPoint as well as other presentation graphics applications are ubiquitous in the world of business, government and (increasingly) education. Microsoft recently estimated that at least 30 million PowerPoint presentations are given each day (Parker 2001). An important characteristic of the presentation graphics medium is that it encourages a relatively flat hierarchy. When PowerPoint is used in the conventional manner, each slide has a visually dominant title that corresponds to the first-level heading of a print document. This encourages presenters to promote a great many of their ideas to the first level. Furthermore, due to the limited vertical dimension of the display area, the depth of the hierarchy expressed as bulleted list items (and similar format elements) reaches a practical limit at level 3.

In recent years PowerPoint has come under scrutiny from both lay commentators and researchers (Parker 2001; The Gettysburg PowerPoint Presentation website; Pippert and Moore 1999). Among the questions being asked is whether ideas become oversimplified when communicated as PowerPoint presentations. If this is true—and I suspect it often is—the flat hierarchies are a likely contributor to the problem. A highly organized presenter, of course, can effectively extend the logical structure of the presentation through spoken language, but few speakers, I think, do so.

Fortunately, numerous techniques, such as color coding, can be employed to add more depth to PowerPoint hierarchies. For example, titles in one color can represent the first level and titles in a

different color the second level. Other techniques include judiciously eliminating the top level of the presentation's logical hierarchy and employing compound headings as titles.

The hierarchical structure of web documents

Just as almost all non-fiction print documents are structured as hierarchies, so too are the vast majority of websites. One key difference is that web users are invited to choose which branch of a website hierarchy to descend (and are invited to jump from branch to branch) while in print readers most often move linearly through the document and experience the hierarchy as a succession of headings that mark various levels.

Typically, when we think about website hierarchies, we envision users descending the hierarchy web page by web page. We should remember, however, that when a document with significant depth is presented in a web hierarchy, the levels of the hierarchy are expressed by headings on the web pages as well as by the links that take users to lower-level pages. Thus, in contrast to PowerPoint presentations, websites easily accommodate a relatively deep hierarchy. The issue for the designer, as I explain below, is the great number of design options.

Let's assume that the outline in Figure 1 is an early plan for a website (or a subsite of a larger site). The general introduction is destined to become the home page, and the main branches of the website will probably be these: The Cheat River, The Tug River, The Gauley River, Curtailing Clear Cutting, Limiting Dredging, Controlling Riverbank Development, Preventing Poorly Planned Dams, and Conclusion. The designer, however, has considerable latitude in deciding whether an entry in the outliner will become a link or a heading. For example, if "Flooding in 1972" (on the Parsons branch) is the title of a web page, then "Clear Cutting," "Dredging," and "Riverbank Development" can either be three headings with text directly under them or three links to three deeper level pages that explain these causes of flooding. The broader point here is that on the web as well as in other media subordination and the management of headings are central design tasks.

Although the web can readily accommodate hierarchical depth, the web medium certainly makes it own special demands, including those pertaining to writing. Because web users are encouraged to descend any branch, the writer must make the branches as modular (free standing) as possible. A user, for example, should be able to read the home page and then make reasonable sense out of, say, the "Controlling Riverbank Development" branch prior to reading about particular rivers and flooding incidents. If such modularity cannot be achieved, the designer would do well to put the report on the web in a linear form, very possibly as a PDF
(Adobe Acrobat) file.

Multipurpose publishing

Increasingly documents are created with the expectation that the content will serve as the basis for new documents in different media. Headings and subordination are significant considerations in multipurpose publishing.

For example, consider an organization that routinely converts print reports to PowerPoint. The organization might encourage or require report writers to keep their print hierarchies relatively flat and might devise a repertoire of PowerPoint techniques for handling several levels of subordination. Careful planning on both ends of the conversion will smooth the task of multipurpose publishing.

In many instances a central issue for multipurpose publishing is the distinction between populated and unpopulated locations of a document's hierarchy. We examine this below in regard to print, the web, and online help.

Populated and unpopulated locations in hierarchies

In "classic" web design, every location on the website hierarchy is a web page containing content and (in most cases) links to the next level down in the hierarchy. But consider the two-level tab system on the home page of Fidelity.com, shown in Figure 5. The "Planning and Retirement" tab, like the other tabs, has no content associated with it. Rather, it is an unpopulated location at level 2 of the hierarchy, merely a "container" for five links ("Planning Center," "Retirement Investing Center," etc.) that, when clicked, display content-rich level-3 pages. Unpopulated locations are, in fact, quite prevalent on the web and are integral to the many websites that employ pop-up menus (Farkas and Farkas 2002, Chapter 8). Online shoppers, for example, may click a "Jewelry" link on a website's navigation column, and the website will display a pop-up menu listing several categories of jewelry. The jewelry link is a container for links, unpopulated with any content of its own.
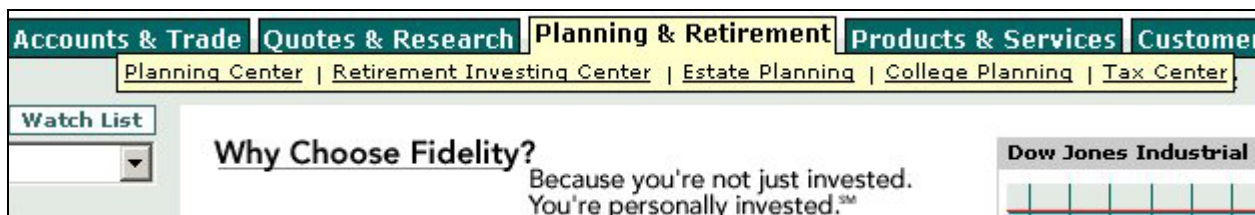

Figure 5. A two-level tab system with unpopulated locations in the hierarchy.

Let's assume that a marketing manager decides that the content of a successful brochure should become key content on the company's website—a website that employs a two-level tab system in the manner of Fidelity.com. When the marketing manager considers moving the brochure content to the web, she may wish that the website had been designed differently. The brochure's title will readily become a tab, and the brochure's section headings will readily become links on the bottom portion of the tab. But the manager will soon discover that this website does not permit the brochure's general introduction, a paragraph that previews each section of the brochure, to appear directly below the title. Rather, this introductory paragraph will have to be implemented as a page accessed by the first of the links on the bottom portion of the tab. One significant difference between the brochure and the website is that web users will encounter the set of links before reading the introductory paragraph. The manager, then, may need to re-phrase the links so that they make sense in this context.

If the manager anticipates moving future versions of this brochure or other company brochures to this website, she may specify that the title of these brochures be followed directly by a heading. Why stack headings in this way? Because stacked headings, being a print instance of unpopulated hierarchies, are more compatible with a two-level web tab system than the standard formatting practice in which introductory text directly follows the title.

A similar issue arises if a software vendor wishes to create both an online help system and a print manual from content stored in a database. In many contemporary help systems, the book icons on the help table of contents are directly associated with overview help topic. Click the book and read the overview. In other help designs (notably the original WinHelp 4.0), the book is a container, an unpopulated location, not directly associated with any content. Click the book, and it expands to show page icons and other book icons. If the manual will be formatted conventionally with the introductory text for each chapter directly following the chapter title and the introductory text for each section directly following the section title, publishing from a database will be easier if the help system's book icons are directly associated with content. In other words, the designer should match the populated hierarchies of the manual with a help system design that also employs populated hierarchies.

Conclusion

Headings, hyperlinks, and the titles on PowerPoint slides are among the key elements for revealing the structure—almost always a hierarchy—of the documents we create. There is, however, much leeway in how this is done. Just as skillful dancers devise subtle variations on the steps of a dance and may time their movements to fall just a bit ahead of or behind the beat of the music, skillful writers and designers work variations on the default principles of subordination. This paper explains some of the techniques they use. In addition, it shows why an understanding of subordination is necessary for achieving efficiency and quality in multipurpose publishing.

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Note on the text:

This document is identical to the document in the published conference proceedings except that the proceedings contains some minor formatting glitches. Therefore, I like this version better and prefer that it be read. The page numbers are the same as the proceedings paper.