

What Kinds of Writing Have a Future?

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First of all, to answer the question in my title: many kinds of writing have a future. Novels, plays, scripts, poetry, essays, and news reports will not go away any time soon. But as their contexts change, they will also change. Competing forms – as I will explain – have been crowding their ecological niches for some time. The past 40 years have seen a larger number of innovations in writing than perhaps in the entire history of writing. Certainly the spread of the innovations has been orders of magnitude more rapid than in the past. It is these changes and their future that I want to talk about today.

Breaking the rules of writing

When I went to college there was one only kind of writing. It was taught in college composition courses. It consisted of well-crafted three- to five-page essays. We had certain rules to follow. Complete sentences, for instance. Here I am 50 years later receiving a lifetime achievement award from you for having broken a great many of those rules. Not only broken them, but blasted some of them completely out of the water. For example, as you are aware, in some circles, I am known as the guy who kicked the paragraph out of technical writing. So, it's a good time to look at why the kind of writing I was taught in college hasn't had as much of a future as I would have guessed at the time. It's a good time to reflect on the kinds of written communication I've been involved in creating and changing during this period. And to think about what kinds of writing have a future.

Themes I'll examine

In examining this history and suggesting scenarios for the future, I will look at several themes or characteristics of the innovations of the past 50 years. Among these characteristics are (A) what to put in and what to leave out (there are some kinds of writing where you leave out the most important information!); (B) how thoughts stick together (and how to organize this stickiness); (C) what writing should be linear and what should not; (D) when to tightly integrate words and images into visual language; and (E) what in the future may be called metawriting.

What I was taught

What are some of the rules that I was taught in that college course? Make your paragraphs flow one into the other with smooth transitions. Attract your readers and keep the suspense up so they have to read everything you write. Use topic sentences. Put in a subtitle once in awhile, but not very often—the cuter, the better. I followed the rules. I

got pretty good grades. I wrote a column for the student newspaper, did some newspaper reporting.

Rethinking and reinvention

But all that changed with a massive re-thinking and reinvention of writing during my lifetime. It is a revolution that is still going on. My first involvement in this re-thinking was to work on what has come to be called Information Mapping®'s method (1) for which you have given me the award today. At Columbia University, I had two years to do basic research. I decided to look at printed instructional materials. Most of my colleagues were investigating psychomotor skill learning, like typing, where you could measure very precisely the learning taking place. But I was more interested in the kinds of learning that we have to do as adults. I was interested in the high volume of reading we have to do. And I was interested in making a far more systematic approach to helping that learning to take place.

What's wrong with the paragraph

One of the first things I realized was that if we were really going to be systematic, we had to admit we didn't have a good basic unit of meaning. I wanted something that was precise enough that two different writers working on the same document would come up with similar enough chunks to plug into a larger document. The unit had to be flexible, modular, and part of a very good taxonomy. The paragraph did not fit the bill. It was too fuzzily defined; too vague to be a consistent, reliable unit of meaning. Sometimes, for example, it had a topic sentence. Sometimes it only "had" an implied topic sentence, that is, one that was left out. The only thing you could say for sure about a paragraph was that it had a dent at the beginning. (2)

DEFINITION:

Paragraph

The Random House Dictionary defines "paragraph" as: "a distinct portion of written or printed matter dealing with a particular idea, usually beginning with an indentation on a new line..."

I decided to develop a better, more reliable way of identifying basic chunks of thought.

My initial method— cut apart books

The way I did it was to sit down with textbooks and cut them apart into individual sentences. I then asked the question: "What function is this sentence performing?" I soon realized that I could sort the sentences of a subject matter into categories. Definitional sentences were first. They were easy to find.

DEFINITION:
Cash Value

Cash value is the amount of money a life insurance policy is worth at a specified time.

So were example sentences. Then I noticed that several example sentences stuck together to form one example. That meant that the individual sentence wasn't the basic unit of meaning—at least not always. Sometimes you had to have several sentences to create a satisfactory, meaningful chunk. This was my first important experience with the stickiness of sentences. I found that some of the sentences stuck together more closely than others and were best dealt with in that closely stuck-together form. However, the lack of strong guidelines, at that time, permitted writers to separate these sticky sentences into different paragraphs.

Taxonomy helps systematic work

Well, I continued to sort sentences into piles that seemed to go together and attempted to create a taxonomy. I knew that in some sciences, especially biology, taxonomy was fundamental. In not too long I had a group of some 40 categories into which I could reliably sort approximately 80 percent of the sentences of a subject matter. That was pretty interesting. It was a lot more than the seven to ten kinds of paragraphs that were usually taught in composition classes.

Completeness of analysis

In coming up with these categories I found that I had achieved something very powerful, especially for technical writers. In principle, you could know what you didn't know in a fairly precise manner. One of the things you would do was to put the topics along the top and the block types along the side to create a matrix. Then you plugged in the sentences. Where there were empty spaces, you had gaps in your knowledge.

	topic A	topic B	topic C	topic D	topic E	topic F	topic G	topic H	topic I	topic J	topic K	topic L
block type 1												
block type 2												
block type 3												
block type 4												
block type 5												
block type 6												
block type 7												
block type 8												
block type 9												
block type 10												
block type 11												
block type 12												

...if block type 1 is "definition" then topics A, D, F, H, I, and L have definitions.

...topic E has block types 4, 7, 9, and 11 associated with it.

This tells you a lot about precisely what the subject matter is, and, when combined with a user analysis, tells you much about what to leave out of a particular document.

Only one kind of functional information in a chunk

Then I got to thinking that one of the precise things that make paragraphs so dysfunctional as a basic unit of writing is that you can put all kinds of stuff into a paragraph. You can put introductory words and phrases, transitional stuff, definitional stuff, example stuff, and irrelevant commentary stuff. I asked myself, what would happen if we introduced a rule or guideline that said: Put only one kind of functional meaning in each chunk you present to the learner. That was a kind of leaving out of information – leaving out what was not relevant to the specific function of the chunk being presented to the reader. To distinguish these chunks of information from paragraphs I began to call them information blocks.

I'm aware that over the past years the teaching and practice of technical writing has changed significantly in this respect. There is now widespread recognition that irrelevant information has no place in our technical and user documents.

The difference that my work introduced is the systematic approach to putting in and leaving out. This has massive effects when you are writing databases of chunks that may be used in many media and many different documents, rather than writing in the context of a single document as I will discuss at the end of this talk.

Leaving out is so much more important these days than it was in the 17th and 18th centuries when many of our ideas about essay composition were formulated.

Scanning and skipping with the use of labels

The “information explosion” was already upon us as I was working on these issues. The problem was that there was too much information. There were things that I didn't want to know. But paragraphs generally did not allow me to scan and skip – at least not easily. One of the things I noticed was that headlines and subheads – if written well -- allowed me to scan more easily and skip what I didn't want to read. So in my evolving system of writing, I introduced another suggested guideline: Put an informative label or subhead on every chunk of information.

Labels show organization

Later I devised a bunch of simple rules for what kinds of labels work best for what kinds of the 40 blocks of information in my taxonomy. This had an interesting effect on writing. If you have to label every chunk, the organization of your material becomes obvious to the reader.

Outlines—key information typically left out

This led me to realize that we had been teaching people to make outlines, but this key structure was then hidden from the reader. It was left out! But the outline is exactly what the reader needs in order to decide whether to read all or part of the piece of writing. It is

also exactly what the reader needs to comprehend the structure of the document. Yet we so often deliberately make readers' jobs harder by concealing the structure from them.

Labels are the transitions

When we started labeling every chunk of information, it made the transition words and phrases somewhat awkward. And when we looked at this phenomenon closely, we found that the transition functions were being performed by the labels, not by the usual words or phrases. After that, we weren't so nervous about leaving transitions out of the blocks.

Frequent labels—the most important change

I have come to think, of all the innovations that I've introduced or strongly advocated, that this one, labeling every chunk, is the single change that would improve written communication to the greatest extent. If all writers would label every chunk of information, our reading lives would be truly easier. We could then skip a lot of reading that we didn't need to do!

Relevancy principle

We suggested one more principle to the cluster of principles governing the construction of information blocks. The relevancy principle states: Include in one chunk only information that relates to one main point based on that information's purpose or function for the reader.

Consistency principle

Finally I suggested that we use the same principles for all blocks of information in the document. This was the consistency principle.

Summary—four main principles

With those four principles—chunking, relevancy, labeling, and consistency—I built the information block as a substitute for the paragraph. And created a fundamental change in how we write technical and business documents.

Summary—leaving things in and out and how sentences stick together

As you can see, what you put in, and especially what you leave out of, a chunk of information is very fundamental to my way of thinking. How sentences stick together is also crucial. Information blocks, as they are usually written, have sentences that stick together functionally.

Stickiness in its various forms

There were other patterns of stickiness that emerged in my investigations. We needed methods and formats to deal with them.

If-then stickiness

There is, for example, if-then stickiness which was formatted into decision tables.

HOW TO APPROVE OR DISAPPROVE AN ORDER

IF credit limit is . . .	and IF pay experience is . . .	and IF special clearance has been obtained . . .	THEN . . .
o. k.	—	—	approve order
questionable	favorable	—	approve order
not favorable	not favorable	yes	approve order
not favorable	not favorable	no	return order to sales dept.

It turns out that formatting this way creates fewer errors and improves speed of decision making. (7) If-then stickiness can amount to as much as five percent of many pieces of technical writing.

Table stickiness

Table stickiness is well known. The columns and rows stick together in a particular way. Comparing is a standard, natural human mental functioning. The table format makes such comparing and contrasting much more efficient.

Create errors and slow people down

If you have the perverse impulse to create more errors and slow people's information processing down, it's very easy to do so. Rewrite decision tables and compare-and-contrast tables as prose paragraphs. That will really slow them down.

Map stickiness

We also found that there was another kind of stickiness usually produced by two to seven information blocks working together. This is both a conceptual stickiness and a convenience formatting for helping humans with their limitation of short-term memory capacity of seven plus or minus two chunks of information. We created a separate unit of document organization called an information map to accommodate this kind of stickiness.

How to Prepare Data for an Audit

Introduction One of the most important procedures in an audit is preparing the data.

Careful preparation ensures that the data is correct and that each step of preparation has been carried out.

Procedure Follow the steps below to prepare for the audit.

Step	Action						
1	For data items selected for the audit, obtain the following: • source document samples, and • data from the computer.						
2	Verify the source documents sample by comparing the samples to the original list.						
3	Record on a worksheet sufficient descriptive information to provide accurate identification for future audits. <table><tr><th>Minimum Information Required</th><th>Examples</th></tr><tr><td>Attributes of the sample</td><td> • Sales territory • Effective data </td></tr><tr><td>Description of each data item</td><td> • Account name • Account number • Type of business </td></tr></table>	Minimum Information Required	Examples	Attributes of the sample	• Sales territory • Effective data	Description of each data item	• Account name • Account number • Type of business
Minimum Information Required	Examples						
Attributes of the sample	• Sales territory • Effective data						
Description of each data item	• Account name • Account number • Type of business						
4	Compare data samples to related documents and record on the worksheet any source of error or difference. <table><tr><th>Compare ...</th><th>To ...</th></tr><tr><td>sample data</td><td> • programming instructions in effect when source document began • company requests • statistical guidelines. </td></tr><tr><td>source data</td><td> • run data printouts. </td></tr></table>	Compare ...	To ...	sample data	• programming instructions in effect when source document began • company requests • statistical guidelines.	source data	• run data printouts.
Compare ...	To ...						
sample data	• programming instructions in effect when source document began • company requests • statistical guidelines.						
source data	• run data printouts.						
5	Prepare a summary sheet that • lists each difference or error found, and • analyzes each data item to compute accuracy ratios for the audit sample data items.						

This was a peculiar kind of stickiness. It meant that certain kinds of blocks—key blocks, we called them— always appeared on seven kinds of maps. The seven kinds of information came to be called “information types.” (3) They are:

- Structure
- Concept
- Procedure

- Process
- Classification
- Principle
- Fact

Aside—lifecycle methodology and taxonomies of many documents

Many of you have discovered or been taught some of these guidelines quite independently of my work. I think that my research was simply a very early recognition (in 1965) of what we all have to deal with in our writing. The generic name for what I have been doing has come to be “structured writing” (4). My version of structured writing is called the Information Mapping® method which I turned into a life-cycle methodology, applying these guidelines to a whole variety of business documents. Today, how does our work differ from other structured writing? I think it is simply more structured, precise, flexible, and modular along every dimension.

Taxonomies for different business documents

It turns out that there are different taxonomies of block types for different kinds of business documents. We have some twenty or so typical kinds of business documents analyzed into their types of blocks. (Each has “key blocks” that designate and characterize the kinds of information in that document.) These patterns of blocks in particular documents help us manage business and technical knowledge.

Course taught to hundreds of thousands

We have taught the Information Mapping approach to at least 300,000 people in business and industry. That’s a significant fraction of the technical writers writing today. I think that structured writing, and in particular the Information Mapping approach, definitely has a future.

The future of the paragraph

Does the paragraph have a future? In some kinds of writing, yes. In novels, essays, etc. But over the long run, I don’t think it has much of a future in technical writing. I think the information block will be the idea that survives.

Simulation games

There are other problems in writing documents that people are to learn from. One of the problems of our world is how to make decisions in a complex, ambiguous environment with only partial information at hand. Somewhat later in my career I got involved in creating simulation games aimed at creating conditions that helped people learn to operate in complex, ambiguous environments. My principal contribution was as editor-in-chief of a consumer’s report on simulation games. With the personal computer, such simulation games are now everywhere. In the early 1970s they were an innovation. And almost all were non-computerized. They were *not* your fly-around, shoot-em-up, knock-em-down, blow-em-up simulations. Many were social, role-playing simulations.

Leaving out key information

Part of the trick to creating (that is, writing) simulation games was leaving out the key information. The learners were to supply this in the role-playing and decision-making that they did while playing games. One of my simulations called *Participative Decision Making* became the most played and reproduced simulation in those early decades.

What this means is that there are at least two sides to devising learning materials and exercises: (A) providing information (which is what structured writing and Information Mapping does) and (B) providing the opportunity for active participation (which is what simulation and role playing games do). There aren't any really simple rules for what to put in and what to leave out in simulations. But in simulation games you have to leave out the key material and put in enough so that the learner can practice decision making. It's really quite a different set of choices from those in documentation writing. Simulation exercises with much of the important information left out also have an important place in the future.

Writing so they don't have to read what we've written

I've already noted that we need to write so people can scan and skip. That means we need to write so people don't have to read everything we write. This is something of a paradox. We need to make it convenient for people not to read some of our words. Let me repeat—we have to write so people don't have to read what we write.

We know that people have had the freedom not to read everything and probably always have read in a non-linear way. But with hypertext they skip all over the place.

What writing should be linear and what should not

In about 1970, I read an important article-- Doug Englebart's article on the augmentation of human intellect (5). It was my first introduction to hypertext. Englebart was the first person to implement Vannevar Bush's ideas of linked text on a computer. I got to know Doug shortly thereafter, and realized that the kind of writing I had been devising and working on for the previous 5 years was specifically made for a hypertext environment. In my first book on Information Mapping's approach, published in 1976, I put at the bottom of the pages a device I called "related pages."

Comment	A person has to work hard to establish and maintain the picture of being rejected. In fact, he rejects others for not being perfect or living up to some incredibly high standard. Once he has projected the rejection on to someone else, he can then relish the helplessness of his situation. He can enjoy being a powerless victim.
Example Two	A child has difficulty experiencing guilt. He therefore "blames" (i.e. projects on) the table when he has run into it and hurt himself.
Example Three	Frequently, what annoys us in others is a projection of part of our personality. I get annoyed at Jane because she is so often making rules and wanting me to live up to them. In fact, I make a lot of rules for my employees and children; but I don't like to face up to this picture of myself. I prefer to "unconsciously" project it onto Jane.

Related	block, 5	unit, 14	example, 155
Pages	map, 8	definition, 139	comment, 147

This was a deliberate attempt to recognize that if you were going to skip around in a text, it might be a good idea to include specific links. This meant that people were not going to read in a linear fashion.

We had begun to learn that some writing doesn't have to be linear. Hypertextual linking meant that writing had to change. I can't go into all of these changes, but my book *Mapping Hypertext* (6) presents my ideas. With hypertext, many people are still struggling with the chunk-size questions that I think we solved in the 1960s. The book is, by the way, still selling well, even though it was written before the World Wide Web came into existence. Why? Because it focuses exactly on the problems of organizing and structuring text.

Disputed subject matter

Information Mapping, as I had initially devised it, focused mainly on what I've called relatively stable subject matter-- that is, the subject matter you find in introductory textbooks and in declaratory subjects, such a computer documentation or company procedures and policies. When I left being CEO of Information Mapping, Inc., I started to think about another area – disputed subject matter, those areas of disciplines where debates take place, those areas where the content is not stable. What would an analogous approach be like that would “map” argumentation?

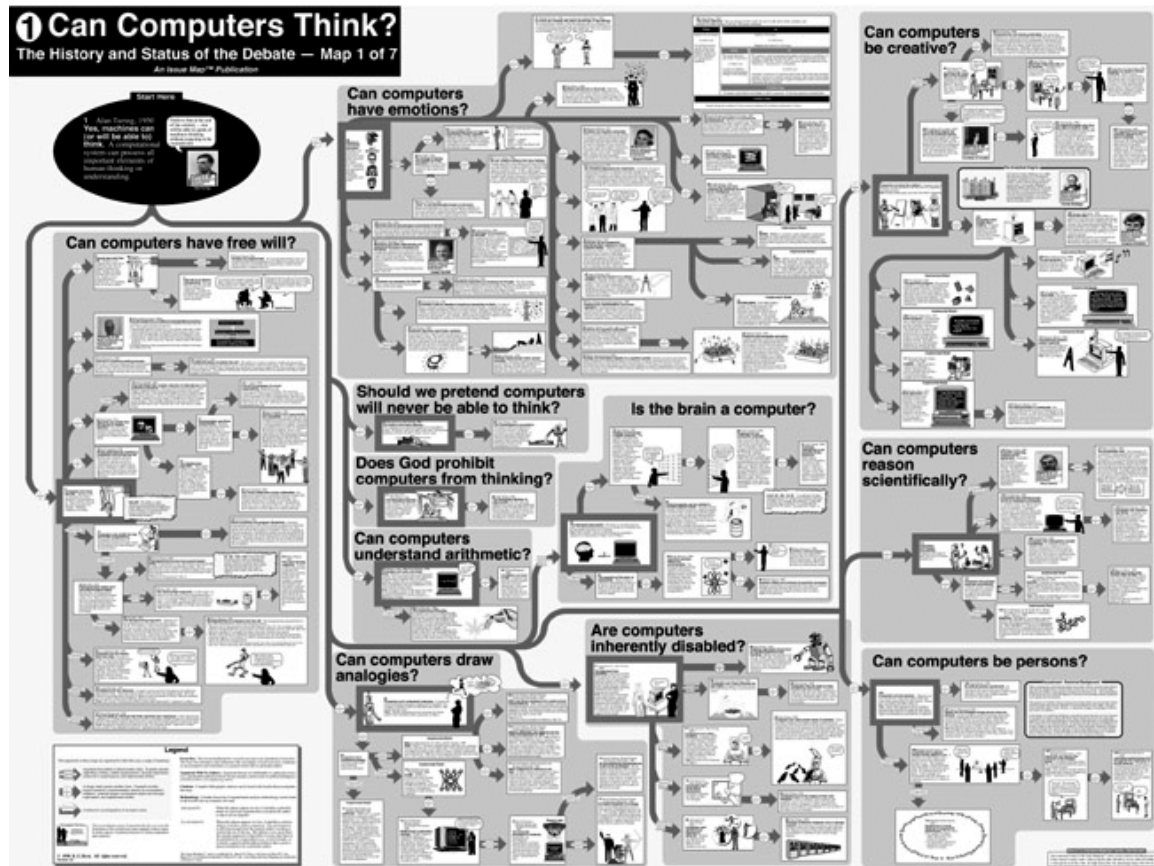
Argumentation mapping

The major problem in understanding arguments is that often we do not find the claims and their rebuttals and the further counter-rebuttals close enough to each other so that we

can easily consider them together. Over the past few years, we've worked out how to create these "argumentation maps." Here the blocks of information are again important. Relevant chunking is important. However, here the chunks are made up of claims and rebuttals and the linkages are different. The links are made up of supports and disputes. And the approach must be diagrammatic. Therefore you can read in all kinds of directions. Diagrams are basically non-linear (as are argument structures). We need boxes and arrows to show the structure of the arguments. (7)

Leaving out information in argumentation maps

In argumentation maps, we put in and leave out different kinds of information from stable subject matter. For example, that which is not disputed does not get into our argumentation maps. That which is disputed must be put in. We have thus created an infrastructure for navigation of huge, sprawling debates that span decades.



This is part of the intellectual history of many academic disciplines. The same maps show what the current status of the argument is.

When to tightly integrate words and images into visual language

The last ten years I've also been very involved in what I think is a major change in how writing will be done in the future. It is called visual language, and this development is noted in your award to me. The critical attribute in visual language is the tight integration of words, images, and shapes. I think it literally is becoming a new

international auxiliary language. Among the problems it helps solve is—how to show big, sprawling, complex phenomena with hundreds of causal elements. Visual language helps us represent common mental models.

The big questions are different in visual language. The big question is: What do words do best and what do visual elements do best when they are working together? I devote two chapters of my recent book, *Visual Language*, to exploring those questions. (8)

How big screens will affect writing

When I started out my career, what we could display on a computer was one line of text. Screen size also affects writing. Screens are going to get bigger. Soon, we will have big wrap-around screens. Already people in my department at Stanford have built a seminar room wall that has the resolution of a computer screen everywhere on it. That means that computer controlled displays can be presented at the resolution of 10 point type. Screens like this will enable us to show visual language infomurals, which I think are the overviews of the future. They will begin to solve the problems of context. They will tell us how to organize our thoughts in time and space, in debates and conceptual ontologies, in documents and groups of documents. They will be visual. Here are some examples.

Metawriting—the challenges

Another trend is also now becoming important. Sometimes, there are many different uses of a single piece of information about a product or service—training manuals, documentation, job aids, reports, change of information instructions, etc. Many software products have versions that are modified for different special customers. If a big company like AT&T likes your software and wants to buy a lot of it, but wants some special features and functions, you are going to make these changes for them. But then you have to document the changes. One company has 17 versions of its premium software. That's just in this one software release. It's on its tenth release. All this means that the documentation has to be in a database.

Write once—use many times

Once you have the systematic Information Mapping way of writing blocks that I spoke of earlier, you can begin to write one block that can appear unchanged in many documents. We call this “write once—use many times” or “single source writing.” I have begun to call it “metawriting.”

Why single source writing is different

This is a different kind of writing. From the beginning of the history of writing, writers have written to the context of the document. We had an idea of what the document was going to look like. We knew where the next sentence fit in to the complete document. But this is not so with single-source metawriting. There, you write the information block and don't know where it is going to appear. The display-event is the context. This has a number of kinds of challenges. It means that the format is completely separate from the content structure. Completely. You can now—with XML—completely ignore the WYSIWYG (what you see is what you get) world. We can tag single sentences, although

as I have explained in talking about stickiness, it is probably better to tag information blocks.

Drop transition words and other habits

This kind of writing involves breaking some of our oldest habits. We have to drop the use of many of the transition words. For example, you can't say "as we've just described" in a sentence in a block if you don't know what has just preceded it. And you don't know what will precede it when you are writing to a database rather than to a context.

This then implies that a separate edit needs to be done to ensure that these kinds of outside-of-the-block references are kept to a minimum, and eliminated wherever possible.

Two kinds of single-source metawriting

We have identified two kinds of single-source writing. One is "on-the-fly" writing where the blocks must be very independent. On-the-fly blocks are completely controlled by the computer display algorithm.

The second kind of single-source block writing is when the writer is writing a library of subcomponents that will be used in different documents in specific places.

Special metawriting stickiness

There are in the Information Mapping system some new kinds of stickiness when you are doing metawriting. For example, we have two kinds of blocks: procedures and warnings. In the context of their use in training manuals and factory-floor job aids, these two must be linked together so that the display algorithm doesn't display the procedure block without the warning block.

How does all this new stickiness become involved with visual language? We're still working on it. Stay tuned.

Summary

1. Pay attention to types of stickiness.
2. Make sure you know what you're putting in and leaving out..
3. Write so people don't have to read what you write (if they don't need to).
4. Label every chunk.
5. Don't always write in a linear fashion.
6. WYSIWYG is not quite dead – but threats to its existence in some parts are looming.
7. Use visual language. Change the ratio of images to words.

Thank you

Again I thank you for the honor you have given me today. I look forward to greeting old friends and colleagues here and to meeting many new ones.

NOTES

1. Information has a topography like geographical terrain. Information has peaks and valleys, cities and countryside, and roads and superhighways that connect them. Like geographical maps, formats should relate to this topology on an point-to-point basis, in so far as possible. Information maps should guide you through the information just like geographical maps do. The ability to show relationships and guide the user quickly to relevant places is a feature of the formats, and the key to the metaphor of Information Mapping's name. (Horn, 1969, 1971, 1992a)

2. For an interesting history of how the paragraph got to be and an important critique of it see Stern, Arthur A. "When is a paragraph?" which is widely reprinted into collections of essays about writing. Stern's article was called to my attention only a couple of years ago.

3. The information types were completed in 1965; first in Horn (1966); incorporated into a research proposal in 1967 and first published in Horn, et. al. 1969.

4. The structured writing approach dates back to 1965 when I was a researcher at Columbia University's Institute for Educational Technology. The earliest publication is Horn, et. al., 1969. Most of the literature on structured writing refers to it by a trademarked name "Information Mapping" which is a registered trademark of Information Mapping, Inc., Waltham, MA. www.infomap.com However the generic term for the approach, which I suggested in the early 1980's, is "structured writing." Often authors of "structured writing" documents use different and more loose standards for analysis, organization and display of information than those who practice Information Mapping's method. The characteristics described in this article refer to those which I first synthesized into Information Mapping's method. Since the name "Information Mapping" is trademarked, we must abide by the requirements of the trademark law and mention that fact. A more complete history of the invention of Information Mapping's method can be found in an article I wrote for *Performance and Instruction* called "Structured Writing at 25" at www.stanford.edu/~rhorn

5. Englebart

6. Horn (1989)

7. Horn (1998a)

8. Horn (1998b)

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