Writing Backwards: The Use of Visual Models in Writing

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The use of visual models in writing technical material can affect the order of the entire writing process — in effect, reversing it. A single case study is used to explain how a model is developed, what purposes it serves, and how it affects the writing process. A few tips on using visual models in writing are given.

Most people would agree that it's good to amplify a piece of writing with visual devices such as diagrams or illustrations. Usually, the sequence of performing these tasks is to write first, then illustrate. Often this process results in visuals that merely embellish the text. Reversing the sequence of writing and illustrating can significantly improve a writer's ability to communicate concepts effectively, but will also change the writing process. Because using this technique essentially reverses the usual writing process, I call it Writing Backwards. A project completed by our office (Agnew Moyer Smith, Inc.) clearly illustrates the technique of writing backwards. This project dealt with the need to explain how an integrated information system would work and how it could be built.

Planning an office of the future

An integrated information system is sometimes referred to as "the office of the future." It is a system that links together the latest office technologies — word processors, computers, telephone services, video, audio visual, laser printers, intelligent copies, and typesetters. Once linked, the synergism of the total system profoundly changes the way office work is accomplished. Our client, Westinghouse corporate headquarters, was planning to build such a system.

To begin, the company had formed a task force composed of experts in each area of technology. Each member of the group researched available products and techniques within his or her own area and then completed a detailed report explaining a recommended approach. Together, in many meetings, the task force worked out many of the problems of connecting these often disparate technologies. The result of this initial effort was two thick binders full of technical papers, each paper explaining a specific area of technology. The binders were filled with complicated system diagrams and the text was riddled with unexplained technical jargon like asychronous, gateways, and COM.

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The problem

The problem was that, for the most part, these reports were only understandable by a technical person — and this wasn't the audience. The audience was the company's top-level managers who were going to be asked to approve the expenditures for the system, and middle managers whose departments were going to be the system users. For these audiences, it was important to show: How the system would work, what benefits it would offer, how much it would cost, and how it could be built. These questions had to be answered simply but without compromising technical integrity, and in a way which could be easily and quickly comprehended.

Our office was asked to solve this communications problem. The office was founded by graphic designers — visual thinkers, skilled in design, layout, typography, and the visual organization of publications. Yet the office is committed to the idea that designers cannot merely lay out and amplify writers' ideas and text — that visual and verbal thinking cannot be separated. Our goal is to integrate writing and design and to recruit other designers who are interested in dealing with communication problems — designers who are also writers. The make-up and attitudes of our office strongly influenced our approach to explaining the integrated information system. Here's what we did:

A case study

First, we read and reread the technical reports, writing notes, making queries, and checking other references while we tried to understand the system and its components. Next, we talked to selected task force members about their particular technical areas. We clarified misunderstandings and learned about their primary concerns and objectives. We also asked them about their perceptions of the audience's information needs and what areas seemed particularly confusing or unclear. Then, we went away and thought.

Developing a visual model

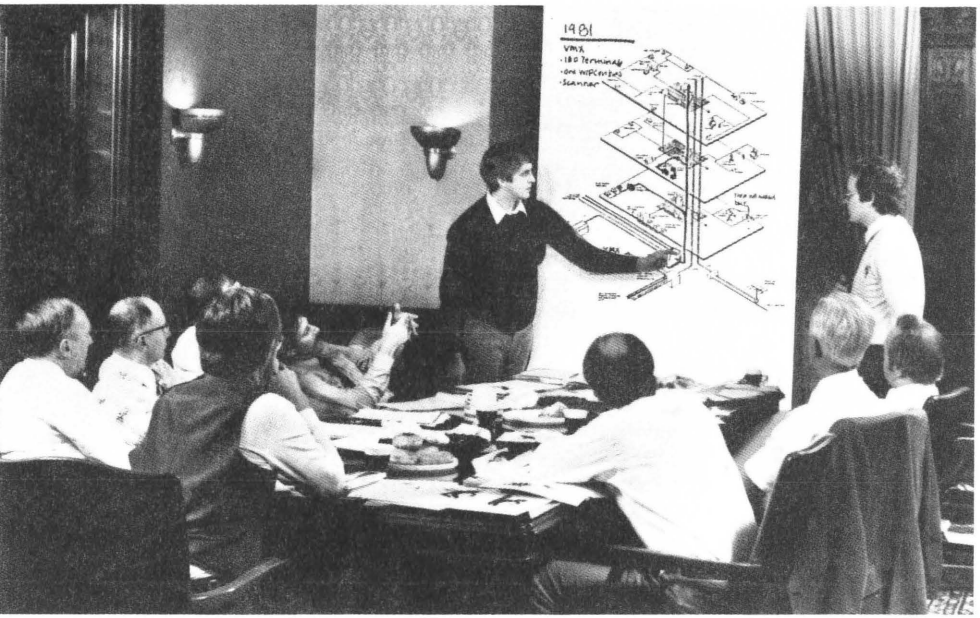
After we felt comfortable with the subject and information needs, our first productive task was to develop a visual model of the integrated system we thought they were trying to build. A visual model is a diagram, chart, illustration, or matrix that shows many parts of the subject simultaneously. Once constructed, a good model enables a viewer to comprehend a complete concept or idea all at once.

In this case, the model was an axonometric diagram which represented all the system's components in the context of three typical floors of an office building. We used this type of diagram because both task force members and their audience seemed confused about where equipment would be placed and how much impact the system would have on the physical arrangement of offices. We have also learned that readers naturally respond to and understand axonometric drawings with representations of real equipment more readily than they do to two-dimensional flow diagrams filled with arrows and abstract shapes like boxes and circles.

Our first presentation of this model to the task force was enlightening for everyone. "Yes," they said, "that is pretty close to representing the system we're trying to build." Then the various technical experts began to discuss the details of the model (Figure 1). To everyone's surprise, it became apparent that there were some holes in the system, some incompatibilities, unforeseen links, and unsolved problems. In the next few weeks, there were many meetings and in each one this visual model became the focal point of discussions. Copies of the model were used to collect and consolidate new information, to discuss changes, and to think through the construction sequence. It was the first time members of the task force had a device to communicate among themselves, to relate their separate technologies, and to consolidate their ideas. The result of these sessions was a revised diagram that everyone agreed was an accurate representation of the system. In addition, we color-coded a series of these diagrams to show how components would be added over a five-year period.

Once this task was completed, we were well on our way to developing a simplified report for the intended audience. Now we could explain the system, benefits, costs, and construction sequence in terms of the visual model. In effect our writing task now was to describe how the model worked — not to rewrite and edit the binders full of complex technical papers. Our writing task would be easier and we had a strong organizing principle to follow.

Figure 1. The visual model became the focal point for conducting task force discussions, for collecting new information, and resolving problems in the system design and construction plans.



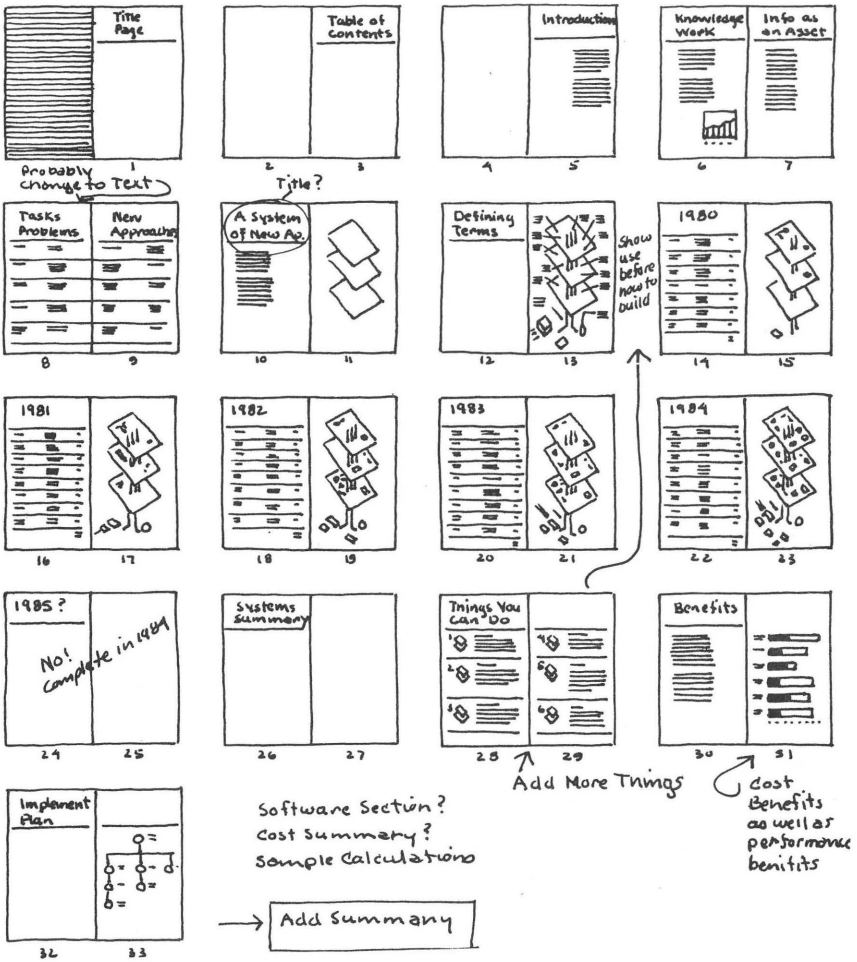


Figure 2. The visual outline was developed to plan the organization and content of the book. It became the guide for detailed writing.

Creating a visual outline

To begin writing, we created another kind of visual model — a model of the publication we envisioned. This model was much less refined than our system diagram, but was absolutely essential in planning how we would explain the system to our readers. We call this type of model a visual outline (Figure 2). It's simply a small sketch of two-page spreads with indications of what will be explained on each page or spread. It's a combination of an outline and a page

Figure 3. A series of pages similar to this two-page spread use the diagram to show how the system would be built over a 5-year period. The left-hand page of each spread contains a table explaining what new components were added and how much they cost.

1983

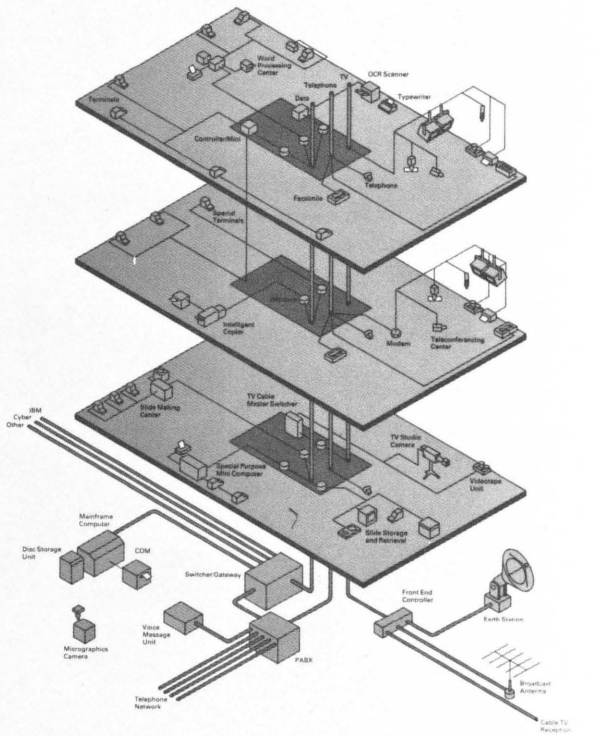
The most significant events in 1983 are the addition of a mainframe computer service to the network and the installation of a Private Automatic Branch Exchange (PABX).

The mainframe computer will provide every terminal with powerful computing ability and access to central data storage. It will drastically reduce outside time-sharing costs.

The PABX will permit the conversion to non-Bell equipment, allowing a reduction of telephone equipment costs.

Although some additional equipment is still being added at this point, most costs reflect a use/maintenance mode of operation.

Item	Description	Cost in Thousands of Dollars
Terminals	· Continue to add terminals at the rate of 15 per month — a total of 600 at the end of 1983 · Maintenance of existing terminals	1,562
Word Processing	· No additional equipment · Lease, operating and maintenance costs for 3 new centers and 15 new people added in 1981 and 1982	600
OCR Scanners	· No additional equipment · Lease, operating and maintenance costs	46
Facsimile	· No additional equipment · Lease, operating and maintenance costs	25
Teleconferencing	· No additional equipment · Provide usage time for 3 existing centers · Maintenance costs	1,346
Intelligent Copiers	· Add two more copiers to the system — total of 5 · Provides copier/printer output for entire network of equipment	103
Slide Storage and Retrieval	· Add an additional terminal and monitor · Operation and maintenance	42
Slide Making	· Add two additional terminals · Maintenance	13
Records Management	· No additional equipment · Operation, maintenance, supplies	45
Voice Message	· No additional equipment · Maintenance	40
Network	· No additional equipment · Maintenance	20
Switcher Gateway Unit	· No additional equipment · Maintenance	50
Mainframe Computer	· Add complete mainframe computer services including Central Processing Unit (CPU) and disc storage · Lease and time costs	621
Computer Output on Microfilm (COM)	· Provide communication link from mainframe computer to COM equipment · Provides computer output directly onto microfilm · Saves space, eliminates paper	This study assumes use of existing facilities
PABX	· Add Private Automatic Branch Exchange (PABX) · Connect to telephone cable · Connect with Switcher Gateway · Provides privately owned connection to Bell System Permits installation of non-Bell equipment · Provides linkage between data and telephone cables	1,500
Planning & Implementation Team	· Project management and direction · Records management · Technical coordination · Training · Systems analysis	785
Total for 1983		6,788



Using
The Office Machine

Things you can do

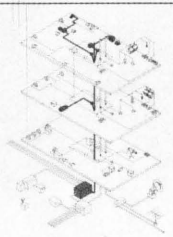
When The Office Machine is completed in 1984, it will be able to help you perform innumerable tasks.

In some cases, it will help you perform tasks differently and save time. In other cases, it will enable you to do things which you could not do before.

As users become accustomed to the system, they will invent new uses. We expect the demand for special application packages to increase. The system's use is limited only by the imagination and creativity of the users.

The following five pages contain descriptions of office functions which this new system will help you with. They also indicate which system components are used to perform each function. There are many others, however, we hope this sampling will give you a better understanding of The Office Machine.

Regular Typing and Copying

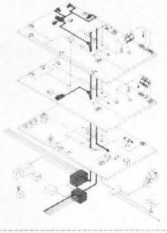


1 Prepare a draft report on a conventional typewriter using an OCR element.

2 Feed the draft into an OCR Scanner and send it to a word processing station for final editing and formatting.

3 Route the finished information to an intelligent copier for printing of finished copies.

Dictation/Word Processing



1 Call central dictation facility from office or remote phone.

2 Dictate message, letter, etc. and provide typing instructions.

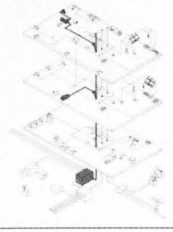
3 Dictation as translated into hard-copy draft at word processing center and sent to your office for review.

4 Mark up draft copy and return to word processing.

5 Word processing makes corrections and completes final draft.

6 Final draft can be sent to intelligent copier for multiple copies if necessary.

Distribution List Mailings



1 Prepare a letter on a word processing terminal.

2 Using the terminal, review the mailing list index and select an appropriate mailing list for distributing the letter.

3 Route the letter to an intelligent copier.

4 Instruct the word processor computer to route the mailing list to the intelligent copier.

5 Instruct the copier to make a copy of the letter for each person on the list.

6 The intelligent copier will print individual personalized letters (with address printed on back for self mailing, if desirable).

plan. We have found that outlining in this way helps to ensure proper page breaks, aids in planning the inclusion of visual material, allows us to assess space problems early, and ensures proper pacing of the presentation. We've found visual outlines to be much more useful than the traditional hierarchical outlining technique we all learned in school. In addition, visual outlines help the clients "see" their publication, and approve the concept and organization before detailed writing begins. In this project, the visual outline helped us plan how we would integrate text with our axonometric diagram. It showed where writing was needed to fully explain an idea and where the diagram could carry the full burden of communication.

Writing the text

At this point, we began writing the text. And it was easy because, for the most part, the text was interpreting and amplifying the visual model. It's much easier to write about a subject when you have a coherent, visible conception of it in front of you. The publication explained the complete system in only 32 pages. The amount of text was limited; information was often organized into matrices or tables instead of text to make it more accessible and inviting (Figures 3 and 4). The system diagram was easy to understand as well as visually engaging. Today, our client is using an integrated information system like the one described in this book.

Writing the usual way

The typical approach to most writing assignments usually follows this pattern: (1) *Interview and set criteria.* The writer interviews the client and establishes basic criteria about the purpose, audience, schedule, cost, and general approach to the assignment. (2) *Research and collect information.* A reference file will begin to develop. (3) *Organize and categorize.* Already some basic decisions which will affect writing are beginning to be made as information is sorted and eliminated. (4) *Outline.* The writer orders the information into a basic hierarchy using words and phrases to describe the content of each category. (5) *Write.* Now the writer "fleshes out" the outline and writes text supporting the order that has been established. (6) *Illustrate and visualize.* The writer reads through to see what points could be illustrated or where tables, graphs, or charts could be included to offer the reader some visual relief. (7) *Lay out.* Finally, the writer decides how the text and illustrations can be organized and arranged in pages.

Writing backwards

Agnew Moyer Smith, Inc. does not follow the traditional approach to writing. The first three steps are the same, but we reverse the last four steps. We begin

Figure 4. User scenarios were developed which describe step by step how 15 office tasks such as filing, document sharing, video conferencing, or electronic mail would be performed using the new system. Small diagrams use color to indicate which system components are used in each scenario.

with visualization, then we simultaneously complete layout and outlining (our visual outline), and finally we write. Our process is backwards.

We have found this to be an extremely useful technique — particularly with technical subjects or with subjects that are organizationally complex. Again and again, visual models have proven to be the bridge between our clients' inability to communicate knowledge clearly and our own ability to understand the ideas and concepts they want to convey. Discussion, change, and modification of models seems to be much easier and less threatening than rewriting or editing textual explanations. And once agreed to, models and visual outlines can readily become a strong organizing principle which the text can easily support.

Our office has used this process on a number of projects — each one requiring a different type of model. One project used a timeline model to unravel, organize, and explain the complex task of relocating families transferred from one company location to another. A well-structured, engaging, and easily read book organized around the timeline made a complex and potentially disruptive task easy. Other projects have used visual models to explain how animals behave, how inventory financing works, what components a manufacturer supplies to the mass transit market, how a project is structured within a matrix organization, and how an automated information retrieval system works. In all these examples, the model was created first. And in all cases, the existence of a model helped our clients clarify fuzzy ideas, eliminated the need for a lot of words, and provided a strong organizing principle for writing.

Integrating text with visual models

Although well-conceived visual models can assume a good share of the communications burden, it is still important to work hard on the clarity of the text, captions, and call-outs that accompany the model. We have found that the existence of a strong model affects writing style. Projects with strong visual models have less main text, and rely more on the supporting layers of text such as call-outs and captions. In addition, these supporting levels of text tend to be written in a terse, telegraphic style. Finally, incorporating visual models changes the traditional structure of pages. No longer will a page contain long columns of text which makes occasional references to remote supporting figures. Text and visuals must be fully integrated.

Although developing visual models early in the writing process is a useful and challenging approach to writing, it's not for everyone. Some people cannot think visually; they cannot represent a concept with even the crudest sketch. Still, many writers are perfectly capable of developing conceptual visual models. One does not have to have a background in illustrationor graphic design to use this approach.

Tips on using visual models

To conclude, I can offer a few tips on using visual models. The following techniques have proven useful in most of the projects we have completed.

Don't discard or put aside explanatory sketches. Rough diagrams drawn on the back of an envelope or a napkin during a discussion may contain the beginnings of a good idea for a visual model.

Look for metaphors and comparisons as clients explain ideas or concepts. These casual comparisons can lead to a strikingly clear visual concept.

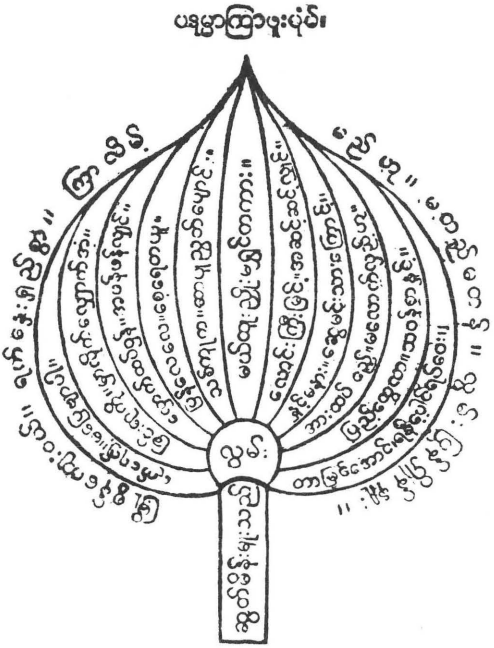
Don't worry about the artistic quality of your first sketches. If you have a good idea that truly helps explain a concept, you can find a designer or illustrator to work out the details later.

Remember your audience. Be sure your model is not too complex or technical for a lay audience, but don't oversimplify or talk down to a more knowledgeable reader.

Create models early in the process. That's when they do the most good for you and your client. They can be a valuable tool in learning a subject and resolving misunderstandings. Don't use models to simply embellish your text after it is completed.

Don't expect the model to replace clearly written, well-organized text. Models do not excuse poor writing.

The next time you're trying to explain something, don't plunge right into outlines, text and words. Pause for a while and think about how you might approach a visual explanation. It could be a rewarding experience.



CORRECTIONS

Our last issue (volume XX number 1) contained several unfortunate errors in arrangement of illustrations:

Page 78. The captions for Figures 7 and 8 should be transposed.

Page 90. The captions for Figures 17 and 18 should be transposed.

Page 91. The illustration shown for Figure 19 is not Seiichi Niikuni, "River/Sand/Bank," as indicated. It is: Emmett Williams, "Mediation No. 2" (ca. 1958).

Page 120. The missing palm-leaf fan illustration for Figure 6 is shown at left.