Information Mapping

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Information mapping is writing without paragraphs. Instead, there is a set format to guide the writer and reader along the easiest pathway to communication.

Who should be interested in this article?
• Training managers with responsibility for producing written training materials.
• Scientists, technologists, engineers who write.
• Training materials writers.
• Educational technologists and other communications innovators.
• Technical manual writers, company procedures writers, technical documentation specialists.

Why should you be interested?
Information mapping offers these advantages:
• Easier and quicker writing of technical materials.
• Easier initial specification of subject matter and job/task analysis.
• Easier management and analysis of writing tasks in large projects.
• Better learning materials and better referencing of technical materials.
All this adds up to more effective and more efficient learning and reference in business communication.

Information mapping is a methodology specifically designed to make technical communication in business and industry easier and quicker. It is currently emerging from a research phase supported by the U.S. Air Force Systems Command. Recently, courses have been given at the Center for Educational Technology at American University, at Great Britain’s Programmed Learning Centre for Industry at Sheffield University, and for the training department of a major multinational firm. Experts attending these workshops agree that Information Mapping simplifies the job of technical documentation and training.

What is Information Mapping?
A method of bringing together current learning research and instructional technology into a comprehensive materials development and presentation technology to improve technical communication.
A system of principles and procedures for
• identifying
• categorizing
• interrelating and sequencing, and
• presenting graphically information required for learning and reference.
More specifically, Information Mapping is a method for written communication as it is currently presented in textbooks, programmed-instruction books, technical manuals, and various kinds of paper documents for complex projects. Information Mapping improves current methods for doing the learning and reference work itself, preparing learning/reference materials, and maintaining/updating such learning/reference materials.

Various experts have estimated an increase in efficiency of from five to 50 percent from Information Mapping in different projects. Most individuals who learn how to use the methodology improve their speed in writing technical materials by five to 20 percent. While these data are based on subjective estimates, almost anyone can use some extra time during his writing labors.

What is new about information mapping?
1. Replaces the paragraph (in prose) or frame (in programmed learning) with
   • information blocks and/or
   • information maps
2. Provides a simple, comprehensive, modular, expandable classification system of
   information maps and blocks.
3. Can be used for different purposes with minimal changes.
4. Provides ready-to-use consistent formats for different types of presentations.

Each of the above features requires additional explanation. The paragraph and the frame have always been loosely defined units of writing. It is difficult—in an engineering sense—to maintain quality control with them. Furthermore, it has been notoriously difficult to teach people to write “good” frames or paragraphs.

To replace them we have introduced a new and very carefully defined—yet easily learned—unit of information called the Information Block, and collections of these blocks called Information Maps. Each Information Block is functionally labeled, and each type of block has specific rules about what types of information belong in it and what information belongs elsewhere.

Every sentence and illustration in a subject matter (book) becomes part of an Information Block. All blocks are assigned to specific maps. All maps are assigned to units which in turn are assigned to courses. Thus the entire organization of a course is hierarchical (yet the method may be interfused with another method of sequencing such as normal job order or prerequisite).

There are six basic types of maps and about 40 types of blocks. However, one need not learn all of them to begin. Some books can be written with only a few types of maps. Reference materials on Information Mapping have been prepared so that one may learn only as much as needed to begin writing Information Mapped books.

Unlike the paragraph, where every paragraph is different, Information Blocks of a particular type are all similar. For example, in an Information Block labeled “Definition” you will find only sentences which define a specified term. No sentences or words
unnecessary to the given definition appear in a Definition Block. Similarly, an Example Block contains only sentences and diagrams which pertain to a specific example (and no other example). There are no mixtures.
All blocks are labeled
All Information Blocks are functionally labeled. No non-functional units are put into an Information Map. Since each block has a name, as does each map, outlines for writers are automatically available. Furthermore, it is easy for a writer or an editor to see whether appropriate material has been included because the functions are clearly labeled. A Definition Block is easily examined by an editor, as is an Example Block. When they are not there, there is a noticeable gap. It is impossible for a writer to gloss over a meaning. The result is clarity in the final product.

Information Blocks are modular. Any block or map can be taken out, improved and replaced at any given time. This permits Information Mapping to be used in a dynamic information environment, such as in a complex design project in which information changes continuously while the design engineers invent the new system.

Mapping clarifies confusion
The following diagram (diagram 2) shows part of the overall map classification chart. (In the training materials for Information Mapping, each type of map or block is individually described and explained.) These classifications of blocks and maps can be added to by companies that have special requirements, although the experiences so far shows that few, in fact, have been added.

Often there is confusion in the production of training materials in industry between reference uses and what we call “initial learning.” Sometimes training materials are prepared in the form of programmed instruction. These materials are great for initial learning but extraordinarily difficult to use later for reference purposes. Yet we know that people are forgetting animals and that they prefer to review what they previously learned in the same text rather than go to another, different reference work. On the other hand, technical manuals which are designed primarily for documentation purposes are often used for initial learning, even though these manuals are usually not organized in an effective learning format or sequence.

Information Mapping clarifies this confusion by specifying particular types of uses for a given document. One of the earliest and most useful things we did was to design a document type that could be used for both initial learning and reference, taking advantages of the best of programmed instruction and reference materials. This then led to the development of other levels, such as:
• Documentation (enough text so that a person who is knowledgeable in the general field will be able to grasp it)
• Reference only
• Initial learning only
• Computer-assisted instruction (CAI)
• Adjunct programming
### Extract of information map classification chart

<table>
<thead>
<tr>
<th>Types of maps</th>
<th>Descriptions</th>
<th>Information blocks*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concepts</td>
<td>A concept may be a: technical term, generalization sentence, property sentence, rule sentence, relationship sentence</td>
<td>Name of the concept, Definition or description, Theorem (or generalization), Formula, Use, Rule, Example, Non-example, Introduction, Synonym, Notation, Diagram, Comment, Analogy, Related maps</td>
</tr>
<tr>
<td>Structures</td>
<td>A structure is: a physical thing, or something which can be divided into parts which have boundaries.</td>
<td>Name of structure, Meaning, Function, /All of the concept blocks/ Parts and subparts</td>
</tr>
<tr>
<td>Processes</td>
<td>A process is some structure changing throughout time. The description of a process involves writing about what happens during successive stages of time.</td>
<td>Name of process, /All of concept blocks/, /All of structure blocks/, Stage table, Parts-function table, Cycle chart, Input-output table, Cause-effect table</td>
</tr>
</tbody>
</table>

* A single information map will contain only those blocks which are needed. Not all types of information blocks will be present on a single page.

### Format of map tells you what type of learning you face

- **Concept maps**
  - Name
  - Definition
  - Block
  - Example
  - Other
  - Blocks

- **Procedure maps**
  - Step 1
  - Step 2
  - Step 3
  - Step 4
  - Step 5
  - Step 6
  - Step 7

- **Process maps**
  - If...
  - Then...

- **States**
  - 1
  - 2
  - ... N

- **States (Changes)**
  - 1
  - 2
  - ... N

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**Diagram 2**
For each of these levels, specific types of maps, blocks, and questions were specified. This meant that portions of the same material could be used for different final documents. For example, in a computer design and production project, the documentation specialists could use the documentation level of Information Mapping for the early stages of the project as the engineers are designing the machine and software. Then, these same blocks with additions and reorganization could be used for preparing training and operating manuals. And perhaps later, with the addition of still more blocks, the software for a CAI program could be made.

**Each map has specific format**

It should also be mentioned that each type of Information Map has a specified format. These graphic formats bring together for the first time a technology which has been slowly developing over the last 25 years by graphic illustrators. Because many maps have specific forms, one can tell at a glance what type of learning task one is facing. Furthermore, these formats permit the writer who is not good at visualization or designing formats to plough ahead without worrying. They give him the benefit of much of the display technology developed to date.

Along with these new features, we have kept all that was good and proven in educational technology and good writing practice. That is, we have systematically combined these aspects of current state-of-the-art:

- Careful specification of behavioral outcomes of instruction
- Validation of instructional materials
- Criterion-referenced, competency-based testing
- Frequent chances for the student to obtain feedback on how well he has learned
- Provision of review and practice
- Careful testing and revision of materials until they meet objectives.

In addition, Information Mapping pulls together and rationalizes the use of such new procedural aids as algorithms, decision tables, and WHIF (When and If) charts.

Information Mapping was developed for use in that part of science, technology, and business which represents the largest amount of human information processing. It is, in fact, aimed at the very center of the paperwork mountain in business and government.

Actual applications in government and industry to date include company policy book, temporary typists training manual, computer program documentation, accounting procedures book, sales handbook, and teacher’s manual.

The costs to produce Information Mapped materials are no more than those for any other written product and can frequently run less in larger projects in which coordination and uniformity of product are important.

Currently, it is possible to train writers in about a week, especially if they have been doing technical writing or program writing for a period of time. We are just now testing
Information Mapped training materials on Information Mapping. They should be available in the near future.

WHEN SHOULD ONE CONSIDER USING INFORMATION MAPPING?
1. When there is a need to prepare new written learning or reference materials. (Revision, unless major, is usually not a good place to start.)
2. When the subject/job is basically one or more of these:
   • Conceptual (What is it? Generalizations, discriminations.)
   • Procedural (How to do it? In what order to do it?)
   • Process (How does it function?)
   • Classification (How is it organized?)
   • Structural (What are its parts?)
   • Decision (Which should I do?)

WHAT SHOULD ONE NOT USE INFORMATION MAPPING FOR?
Information mapping does not presently cover material designed to:
• Report on some specific event that has happened (as in case histories).
• Propose or plan to do some particular projects.
• Simulate transactions or events.
• Aid physical skill learning.
• Help live, interpersonal learning.
• Improve motivation in work and learning tasks (although its features do not discourage learning and work as some written materials do.)

APPLICATIONS OF INFORMATION MAPPING FOR BUSINESS

<table>
<thead>
<tr>
<th>LEVEL OF INFORMATION MAPPING</th>
<th>TYPE OF COMPANY APPLICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Documentation</td>
<td>Computer program documentation. Early specification of equipment. Project records.</td>
</tr>
<tr>
<td>Initial learning and reference</td>
<td>Technical training materials Operator training materials Maintenance training Functional (sales, finance, etc.) training</td>
</tr>
<tr>
<td>Adjunct programming</td>
<td>To guide learning from already extant company materials, including reference and documentation-level information mapping.</td>
</tr>
</tbody>
</table>
Summary
The difficulties in technical communication grow with the increasing complexity of equipment and size of human organizations. Information mapping is a response to these problems of complexity and size. Information mapping brings together current learning research and instructional technology in a comprehensive design and presentation methodology which makes communication easier and quicker. A major contribution of information mapping lies in its emphasis on more systematic planning and organization of the writing tasks: it virtually provides an outline as soon as a training activity or documentation effort has been started. Its other significant contribution is in the compression of the analysis-writing-graphic-presentation stages of technical writing. It enables technical specialists to work much more closely with writers in industrial training and documentation.