

Editors' Comments

Theoretical relevance

Clearly, life would be much simpler if there was a once-for-all solution for the design of documents. That is, if a relatively simple set of instructions for the design of documents (regardless of their goal or audience) would be sufficient to ensure that the document fulfilled its goal efficiently. Scholars are very doubtful about the possibility that such a set of instructions is indeed uniformly applicable in each and every case. In the article by Jansen, Korzilius, Le Pair, and Roest, a set of design procedures for which a general applicability claim has been put forward is tested. They compare the efficiency of a document designed using these procedures to that of documents written in a more traditional style. At least for this audience and this goal, employing the design procedure did not yield a more effective document.

Practical relevance

Structured writing and *Information Mapping*[®] (IMAP) have been presented as the solution for the design of effective documents. IMAP has become a success story as one can read in the interview with IMAP founder Robert Horn in *Document Design*, Volume 3, Issue 2. Although many claims have been made about the superiority of documents that were designed following IMAP procedures, these claims have been seldom put to the test. Jansen, Korzilius, le Pair, and Roest present an interesting test of the IMAP claimed superiority using real-life documents and real-life users of these documents. Their results may help designers choose whether and when to use the IMAP principles when designing a document.

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Testing an Information Mapping® text

Does the method live up to the expectations?

Keywords: Information Mapping® structured writing, reader performance, reader judgement

A study into the effect the Information Mapping® method compared three text versions. Each version was tested by approximately twenty subjects working for a Dutch company. The study involved a text that had been used in that company for several years, an Information Mapping® version of the same text and a version rewritten by an experienced writer, who did not work with the Information Mapping® method. With regard to effectiveness and efficiency, the results of the various versions did not differ significantly. The judgements that the subjects made were statistically different in one respect: the Information Mapping® text was rated significantly higher than the text rewritten by the experienced writer. However, the subjects did not rate the Information Mapping® text significantly higher than the original text. Subject variables such as age and years of service at the company had no significant effect on the results. All things considered, this study fails to substantiate the claim that the IMAP method results in texts that lead to improved reader performance.

Introduction¹

Without a doubt *Information Mapping*® (from here: IMAP) is the most successful method² for structured writing that is commercially available today. IMAP is distributed in 40

countries, where the method is used by some 150,000 people in some 1,000 organisations³. On the far reaching concept of IMAP a variety of sources can be consulted. One of these is the IMAP web site⁴. Here it is stated that:

Robert E. Horn, Information Mapping's founder, conducted research about how readers deal with large amounts of information. This resulted in a standard approach for communicating information which is based on learning theory, human factors engineering, and cognitive science.

This broad base for IMAP is also referred to in Horn (1985), where the author claims to

[..] have looked everywhere: psychology, general systems theory, computer science, philosophy, advertising, and magazine writing. All these sources have provided us with ideas and methods (p. 185).

In Notten (1996), an article that was published in a Dutch journal on document design, the managing director of *Information Mapping Netherlands* makes an even further reaching claim, stating that:

[..] since the acceptance of a transformational - linguistic [sic] view on language, there is wide recognition that all languages have universal characteristics. Robert Horn takes it a step further. The human brain also shows universal characteristics such as patterns of thinking, classification principles, and processing strategies. Horn has researched universally applicable patterns for dozens of years. His findings are firmly rooted in his *Information Mapping* (IMAP) concept (p. 28).

A recent Dutch publication by a Belgian and a Dutch IMAP exponent (Bouquet & Notten, 1999) again stresses the importance of the IMAP method, now specifically for business documents. During the last ten years, according to the authors, business documents (both on paper and online) have evolved at reader, writer and technology levels. Traditional documents are not always adapted to current technology or to the needs of readers increasingly inundated with information. Bouquet and Notten also note that writers are not fully capable of structuring their texts. Writers are increasingly becoming alienated from the ultimate product, to which they only make partial contributions. Moreover Bouquet & Notten argue that technological developments in business documents, which are often part of complex information architecture via the Internet and Intranet require information constructed and presented hierarchically in modular information building blocks, according to a fixed structure. IMAP seems to offer just the right solution.

How exactly does this method, which is claimed to be successful in so many ways work?⁵ The explanation and the examples on the IMAP web site give a good first impression.⁶ IMAP products can often be recognised immediately by their structure and layout (see Figure 1 for an example).

To be able to produce texts such as shown in Figure 1, IMAP sets strict standard writing principles that must be followed. One of the seven basic principles is *chunking*. According to this principle, writers should group information in small, manageable units, mostly referred to as information blocks (*blocks*). Information blocks are combined in seven possible kinds of *information maps*, reflecting the seven *information types* distinguished in IMAP (see below). According to the principle of *hierarchy of chunking and labeling* an information map has to be subdivided into a logical structure of several units (each with its own title) if the limit of nine information blocks in an information map is exceeded.⁷ The *relevance principle* determines the content of an information block. According to this principle no extraneous material is permitted in a block; a definition of a term and an example of a term, for instance, should not be contained in a single

TO: All Department Heads
FROM: Susan Thomson, IT Help Desk
DATE: October 2, 1997

Information on Software Virus

Problem An active PC virus has been identified in certain departments located on various sites. The virus is a new strain and was not detected by existing virus checking software.

Effect The nature of the virus is such that it can prevent sign on and produce unpredictable results causing damage to data.

Possible Solution An "antidote" for the virus has been obtained. It will be used to clean all infected servers.
We need your help in checking all PCs and portables.

Next Steps Could you please complete the following:

Step	Action
1	Warn all staff in your department of the presence of the virus.
2	Confirm to the IT Help Desk that all PCs will be available on Tuesday October 12 for checking and cleansing.
3	Ensure that all field staff bring their portable PCs in on that day.

Deadline Please respond to the Help Desk by Friday October 8.

Figure 1 Example of the IMAP-version of a text, as show on the IMAP web site

Table 1 Information types and key blocks

Information type	contains at least the following key blocks
Procedure	procedure table, decision table or flow chart.
Structure	illustration block and one of the following blocks: description, component table or component-function table.
Classification	classification list, classification table, comparison and contrast table or classification tree.
Process	stage table, decision table / if-then table or block diagram.
Concept	definition (including distinctive features), example, counter example.
Fact	fact block.
Principle	one of the following blocks: rule, policy, standard, law, aim, warning.

block. Consistency of format, sentence titles, labels, and word choice enables readers to use the structure of a text with reliability: the *consistency principle*. Each block is subject to the *labeling principle*: separate from the main text, each block must have a key word (label) that simplifies ‘scanned’, vertical reading. Abstract information must be presented on a location where the reader requires it and must be supplemented by or replaced with, for instance, overviews, illustrations and examples: the *principle of integrated graphics*. The *principle of accessible detail* must ensure that information remains easily accessible, even when there is an increasing degree of detail.

The information type that writers should choose to convey a certain message is determined by the purpose of the writer and the needs of the audience. One or more obligatory key blocks assist a writer in establishing and presenting the relevant information. The seven information types distinguished in IMAP are presented in Table 1, along with the related obligatory (key) blocks.

On the IMAP web site the method is summarized as follows.

The method helps writers analyze, organize, and present information with clarity focus and impact-Information That Works. This table identifies each component and its goal:

Component	Goal
Analysis	Determine the <ul style="list-style-type: none"> – purpose – audience needs, and – information types.
Organization	Create an overall structure for the information, based on the results of your analysis.
Presentation	Format the information to make it clear and accessible to your audience.

All in all, the IMAP method can be regarded as a strongly prescriptive set of recommendations leading to very recognizable, clearly structured texts with a large degree of consistency. However, this does not automatically imply that IMAP is suitable for a large variety of situations in which different types of readers with different reading goals attempt to infer relevant information from texts, a claim that has repeatedly been made by Horn and his colleagues. On the Information Mapping web site, for instance, the following statements can be found:

The method is a basic tool that has been used successfully in a wide variety of documents in every industry. Any business or technical information — whether intended for initial communication, education, training, reference, quick reference, or performance support — will benefit from the method.

and

Information Mapping’s clients represent a wide variety of businesses and industries. They have all recognized the impact that improved communication and performance can have on their bottom line, and have partnered with Information Mapping to improve individual and organizational effectiveness.

In a critical appraisal of the IMAP-method Hartley (1982, p. 53) states that people are suspicious of once-for-all solutions that encompass all occasions. Hartley rightfully points out that “there is really very little research which is directly

applicable to designing text, and what research there is often weak, or insufficient to answer all the questions that it raises” (p. 54). He adds that many research workers are critical of the notion that one can provide a set of procedures which will be uniformly applicable (p. 55). We agree with Hartley: general procedures for text writers should be distrusted. Writers are much better off with insights gained in experimental studies into the reading process and into possible effects of all kinds of communication variables on that process and on its outcomes than with general guidelines and requirements, whether or not conveniently arranged in cookbook format.⁸

In a response to the critique as put forward by Hartley, Horn (1991) states that “neither Hartley nor other researchers have attempted to replicate the amazingly simple research that would convince them of these [IMAP’s CJ *et al.*] claims”. Examining the research that Horn bases these claims on (for overviews, see Horn, 1982; 1992 and Information Mapping, 1999) it appears that most studies mentioned show that an IMAP text is both more effective (more correct answers per assignment) and more efficient (works faster). In addition, IMAP texts receive higher ratings than ‘conventional’ texts. Unfortunately, though, the studies referred to by Horn are only rarely described with the level of detail that would be necessary to make them scientifically convincing. Often, little or no specific information is given about the design, implementation and results of the experiments. For example, Horn (1982) points to five published studies (most of which are difficult to trace) and to a larger number of unpublished experiments in which IMAP texts were compared to traditional prose. Apparently, the IMAP documents scored substantially better. “Five recently published studies all comparing structured writing to conventional prose presentations have indicated superiority of structured approaches by ten percent to 50 percent [...]. Numerous unreported industrial evaluations support these findings” (Horn 1982, p. 350). It is not clear, however, what ‘superiority’ exactly means here and how it was measured, nor how the unreported industrial evaluations could be replicated.

The original publications that describe the experiments to which Horn refers in his overviews of IMAP research only rarely provide consolation. Grebow and Horn, for instance, describe a study where a manual used at Wells Fargo Bank was rewritten according to the IMAP method. In this research report the information about the way the IMAP manual was tested is limited to the statement that “simulated in-house tests with naive subjects were performed at Information Mapping and at Wells Fargo. This was followed by a full scale test with actual clerks and managers”. The authors present no data about the subjects, no information about the assignments, and no quantitative results. They only cite the project manager at Wells Fargo, who allegedly stated that “the manual worked perfectly from the beginning. It was an excellent combination of reference and training [...] There were very few questions phoned in by the clerks and managers who use the service all over California. The result was greater sales and better service”. This impressionistic description of the study and its outcomes does not prevent Horn (1992, p. 26–27) from including it in a research overview carrying the promising subtitle ‘Examining the evidence of Information Mapping’s method of high-performance communication’.

As it seems there are only a few studies into the effects of IMAP texts available that can be regarded as thorough. One of these is Jonassen & Falk (1980), who compared an IMAP version of a document to a version of that same document in the format of programmed instruction. They found that students who worked with the IMAP version were more meticulous than students who worked with other versions. Jonassen and Falk conclude that the structural characteristics of the IMAP version provide a clear advantage for retrieving information from textual materials. Horn (1992, p. 63) quotes this conclusion, with which he apparently agrees. Elsewhere, however, Jonassen & Falk (1980) state that:

The potential of information mapping as a technique seems obvious; however, the virtual absence of any research base relegates mapping to the ‘potential status’. While this study was methodologically deficient (absence of control group⁹, study time

factor, prior experience, or concern with relevant learner aptitudes), it was intended only to address the issues and assumptions of mapping globally. (p. 25)

Regrettably, in Horn (1992) these far reaching remarks by Jonassen and Falk are never mentioned. Perhaps even more regrettably, the problems referred to by Jonassen and Falk are no exception. Similar or even more serious objections can be put forward for many of the other experiments referred to in Horn's research overviews.

Other publications where critical remarks on IMAP evaluation studies can be found are Hartley (1982), as mentioned above, and Fields (1983). In his response to the criticism in these publications, Horn (1991) says that he "would agree that there is less research than we would like", and claims that this would partially be the result of the choices of graduate students and their committees as to what to take as a research topic. We trust that the experiment described below, which was performed by the last author as part of her MA program in Business Communication under the supervision of the other authors, can be regarded as a valuable contribution to the research as advocated by Horn and his colleagues.

In the experiment described below we measured the quality of an IMAP text as compared to two serious competitors: a text that already functioned satisfactorily in a business setting and a revision of this same text by an experienced writer, who was not familiar with the IMAP method. This way we tried to exclude the possibility that a positive effect from applying the IMAP-method to an original text could be explained by a mere lack of quality in that original text — like it seems to be the case in a demo shown at the IMAP-website. If a revision according to IMAP-principles would still result in better reading performance than a revision by an experienced writer who is not familiar with IMAP, then it would be clear that following the strict rules of IMAP really has an *added value* when compared to working in accordance with generally accepted principles of clear writing like they can be found in many textbooks.

In assessing the quality of the three text versions we took

the situation in which the original text was normally used as a starting point. All subjects in this study were workers in the plant that the text was written for, and the task the subjects had to perform (locating the spot in the text where the answer to a given question can be found) was in accordance with the genre of the text (reference guide) and with the reading goal that users of such a text would normally try to achieve in this situation (finding the answer to a specific question). The details of the design and the findings of our study are presented below.

Method

Subjects

For our study, we approached 65 operators working at a Dutch chemical plant (DSM). All operators (64 men and one woman; average age: 42; average term of employment: 12 years) agreed to cooperate. Each participating operator had received previous training as a process operator at a lower or intermediate vocational level. The number of subjects was based on a statistical power of .80, a large effect size and an alpha of .05 (see Cohen, 1992).

Text Versions

Comparisons were made with three text versions: an original text in use at DSM, an IMAP version of the same text, and a revised version not based on the IMAP method. Below is a brief description of the three versions. The text fragments shown are translations from the Dutch texts that were used in the experiment.

1.

The original text: an existing DSM text selected by a DSM instructor. According to this instructor, the text was typical of the texts available to operators at this plant, particularly at the start of their careers. The following is an excerpt from the text, which has a total length of three pages A-4.

4.1 Regeneration

[..]

After two hours of regeneration, the flow of methane is stopped and dry nitrogen at 290°C (100 Nm³/h — 125 kg/h) is then blown to the flame through the drier for 30 minutes.

Following this process, the drier is then cooled from 290°C down to 50°C, using dry nitrogen. The dry nitrogen is circulated by a ventilator via a cooler across the drier.

If the temperature in the drier reaches approximately 50°C, the nitrogen cooling will be stopped.

The drier is then filled with fresh isobutane and is ready for reuse.

2.

The *IMAP*-version of this text: a revision of the DSM text by one of the authors of this article, according to the steps of the *IMAP* method. The managing director of *Information Mapping Netherlands* checked the text and confirmed that, in his judgement, it was a correct application of the *IMAP* method and retained the information from the original text. The following is a fragment from this version, concerning the regeneration process.

3. The Regeneration Process

Process Below there is a description of the regeneration

Overview process.

Phase	Who/what	Description
[..]	[..]	[..]
8	Methane flow	Stops after two hours of regeneration
9	Operator	Blows dry nitrogen at 290°C (with 100 Nm ³ /h (125 kg/h) to the flame through the drier for 30 minutes
10	Drier	Cools from 290°C down to 50°C, using dry nitrogen
11	Ventilator	Blows the dry nitrogen via a cooler across the drier
12	Nitrogen cooling	Stops when the temperature of the drier drops to 50°C
13	Operator	Fills the drier with fresh isobutane and the drier is ready for reuse.

3.

The second (non-*IMAP*) revised version of the text: a revision of the DSM text written by a lecturer in Business Communication. A request was made to two lecturers at the University of Nijmegen, both unfamiliar with the *IMAP* method and both not associated with this study, to make the DSM text more readable, following their own intuitions and expertise, while retaining the information expressed. Eight MA students of Business Communication compared the products of the two lecturers to select the text version that could best serve as a serious competitor to the original text and to the *IMAP* version. The text that the students (with one exception) thought was the best was used for this study. The following fragment comes from this text.

3. Purification

[..]

After two hours of regeneration, the methane flow is stopped. Dry nitrogen at 290°C (100 Nm³/h — 125 kg/h) is then blown to the flame through the drier for 30 minutes. The drier is then cooled from 290°C to 50°C, using dry nitrogen. The dry nitrogen is circulated by a ventilator via a cooler across the drier.

When the temperature in the drier reaches approximately 50°C, the nitrogen cooling is stopped. The drier is now ready for reuse and can again be filled with fresh isobutane.

Design of the experiment

The subjects were divided into three groups. In each group the subjects did the assignment using one of the three text versions.

To avoid the risk that differences in average reading proficiency between the three reader groups would have a confounding effect on the results of the study, the general reading skills of the subjects were assessed in a reading test and the outcomes were used in a matching procedure. As a general reading test the *cloze procedure* was used (Alderson, 1979). All subjects were asked to take this test several weeks before the experiment commenced. The text used for this purpose was a non-DSM fragment from a technical

document. The text conformed to the usual procedure in a cloze test: every fifth word was omitted, except for numbers or highly specific terms. The working experience of the subjects, defined as the number of years of service at DSM was used as the second variable used in the matching procedure.

Table 2 Design of the experiment

Group 1 (22 subjects)	Group 2 (21 subjects)	Group 3 (22 subjects)
Original text	IMAP version	Version revised by communications lecturer

Procedure

The subjects all worked individually. Following preliminary instructions, which were repeated to each subject word for word, the text involved was presented, along with a card showing the first of the six multiple-choice questions that had to be answered. At that point, the time check started. When a subject had answered the first question and had indicated the place where, in his or her opinion, the answer could be found, the time was stopped. To make sure that the answer given was not based on prior knowledge but on the actual consulting of the text, each time the subjects were asked to indicate the precise spot in the text where they had found the answer. The answer and the number of seconds required to find the answer were noted. If the subject gave the correct answer, but did not indicate the correct place in the text, the answer was scored as incorrect. To avoid undesired ordering effects, the questions were presented in a random order.

Assignment

All subjects were presented with six relatively simple multiple-choice questions, which had been formulated in consultation with the trainer of the new operators. This expert also checked the final versions of the questions and answers. By way of illustration, this was question 5:

At which drier temperature is the nitrogen cooling stopped?

- A 290°C
- B 150°C
- C 50°C

After all six questions had been answered, the subject noted his or her evaluation of various aspects of the text on a questionnaire and also gave an overall judgement of its quality. Then the subject was confronted with the other two texts, and was asked to give an overall judgement of the quality of each of these versions. The subject was then given the opportunity to comment on the texts.

Dependent variables

To be able to answer the research questions, the scores of the following three dependent research variables were measured:

- effectiveness
- efficiency
- judgement

Effectiveness referred to the number of correct answers as defined above, that is including a correct reference to the place in the text where the answer could be found. *Efficiency* was determined on the basis of the number of seconds a subject needed to find a correct answer. The *overall judgements* of the subjects were measured through report marks. The evaluation of various text aspects was measured by eliciting statements on five-point scales concerning readability, structure, ease of search for information, and comprehensibility.

Results

Statistical tests used

With the aid of the General Linear Model procedure in SPSS, multivariate analyses of variance were performed to analyse the results. If there was a within-subject factor

in the statistical test, besides the F and p-values, Wilks' lambda (λ) is also mentioned. Where there were significant test results, post-hoc analyses were performed using the Bonferonni method to determine precise group differences. Multivariate covariance analyses were performed to find out whether subject variables such as age and years of service had any effect.

How effective were the texts?

Of the six multiple-choice questions, the 65 subjects gave a minimum of two and a maximum of six correct answers ($M = 4.69$; $SD = 1.00$). Of a total of six questions, a mean of 78 percent was answered correctly (see Table 3).

Table 3 Percentage of correct answers using the three different texts (per question and in total)

Question	Original text (N = 22)	IMAP version (N = 21)	Version revised by communications lecturer (N = 22)	Total (N = 65)	Significant?
Question 1	96%	100%	86%	94%	No
Question 2	91%	95%	96%	94%	No
Question 3	68%	67%	64%	66%	No
Question 4	59%	48%	68%	58%	No
Question 5	68%	67%	86%	74%	No
Question 6	64%	81%	96%	80%	Yes
Mean	74%	76%	67%	78%	No

Table 3 does not show any significant differences between the mean scores on the three text versions ($F(2,62) = 1.16$; $p = .32$). Concerning the scores per question, only question 6 showed a significant difference. The post-hoc analysis revealed that, for this question, the revised text written by the communications lecturer was more effective than the original text. There was no significant difference here between the IMAP text on the one hand and the original text or the lecturer's revised text on the other. Comparison of the relevant fragments in the three text versions did not lead to a solid explanation for this outcome.

How efficient were the texts?

On average, the 65 subjects needed more than three minutes to do the complete assignment ($M = 193.92$ seconds, $SD = 70.86$).

Table 4 does not show any significant differences between the mean number of seconds required for answering a question using one of the texts ($F(2,62) = 2.02$; $p = .14$). Only for questions 1 and 4 the texts showed significant differences. For question 1 a post-hoc analysis showed that the version revised according to the IMAP method was more efficient than the text revised by the lecturer. For this question the original DSM text did not differ significantly from the text revised by the lecturer and the IMAP text. For question 4, the original text was more efficient than the text revised by the lecturer. The IMAP text did not differ significantly from the other two texts. Comparison of the relevant fragments in the three text versions did not lead to a solid explanation for these outcomes.

Table 4 Number of seconds per question for the three texts (mean scores; standard deviations in brackets)

Question	Original text (N = 22)	IMAP version (N = 21)	Version revised by communications lecturer (N = 22)	Total (N = 65)	Significant?
Question 1	28.59 (17.11)	23.95 (15.96)	38.23 (21.76)	30.35 (19.16)	Yes
Question 2	27.32 (20.16)	30.95 (28.06)	35.59 (36.24)	31.29 (28.67)	No
Question 3	30.82 (16.54)	34.33 (20.11)	34.86 (19.28)	33.32 (18.48)	No
Question 4	32.82 (19.66)	38.67 (23.32)	50.59 (28.15)	40.72 (24.76)	Yes
Question 5	27.41 (16.29)	21.00 (9.69)	33.41 (36.86)	27.37 (24.25)	No
Question 6	32.73 (25.34)	34.57 (25.02)	25.45 (20.19)	30.86 (23.57)	No
Mean	29.95 (10.36)	30.58 (9.40)	36.36 (14.41)	32.32 (11.81)	No

How were the texts evaluated?

Table 5 shows the report marks the subjects gave for each text version.

Table 5 Report marks per text

Report mark	Original text (N = 65)	IMAP version (N = 65)	Version revised by communications lecturer (N = 65)
Minimum	2	4	4
Maximum	10	10	9
Mean	7.38	7.71	6.72
SD	1.21	1.38	1.19

Presentation format had a statistically significant effect on the report marks given (Wilks' $\lambda = 0.685$, $F(2, 61) = 14.02$; $p < .001$). The post-hoc analysis showed that the IMAP text (7.71) was assessed as significantly more positive than the text revised by the lecturer (6.72). The original text (7.38) was not assessed as significantly more positive or negative than the other texts.

We also examined whether the subjects evaluated the text belonging to their assignments differently from the two texts they did not use to answer the questions. The results are shown in Table 6. The variable 'text that was used' did not have a significant effect on the report marks given (Wilks' $\lambda = 0.89$, $F(4, 122) = 1.83$; $p = .13$).

The subjects were also asked to evaluate the texts that they had used on a five point scale, for readability, structure,

Table 6 Report marks per group (mean scores, standard deviation in brackets)

Group	Original text (N = 22)	IMAP version (N = 21)	Version revised by communications lecturer (N = 22)
Group 1 (worked with the original text)	7.77 (0.92)	7.95 (1.29)	6.68 (1.09)
Group 2 (worked with the IMAP text)	7.19 (0.98)	7.33 (1.28)	6.29 (1.01)
Group 3 (worked with the lecturer's revised text)	7.18 (1.56)	7.82 (1.53)	7.18 (1.33)

ease of search for information, and comprehensibility. The optional answers were: 1 = very poor, 2 = poor, 3 = average, 4 = good and 5 = very good. The results are displayed in Table 7.

Table 7 Judgements on text aspects on a five point scale (mean scores, standard deviation in brackets)

Aspect	Original text (N = 22)	IMAP version (N = 21)	Version revised by communications lecturer (N = 22)
Readability	4.05 (0.49)	3.81 (0.68)	4.00 (0.44)
Structure	3.95 (0.65)	4.00 (0.63)	3.82 (0.73)
Ease of search for information	4.09 (0.75)	3.86 (0.79)	3.86 (0.77)
Comprehensibility	4.14 (0.64)	3.95 (0.59)	4.05 (0.58)

The subjects did not assess the three text versions significantly differently on either of the four text aspects (Wilks' $\lambda = 0.90$, $F(6, 120) = 1.13$; $p = .35$).

Subject variable effects

Multivariate covariance analyses were performed to examine whether subject variables (age, years of service and cloze scores) affected the results. The analyses showed that none of these subject variables had a significant effect on the results. The findings are shown in Table 8.

Table 8 Results of multivariate covariance analyses

Subject variable	Wilks' λ	df: F	P
Years of service	0.97	(2, 60): 0.80	.46
Age	0.98	(2, 60): 0.53	.59
Cloze score	0.93	(2, 57): 2.27	.11

Discussion

Our findings reveal a clear picture. The effect that the tested IMAP text had on the target group differed in no way from the effect of the original text. In terms of effectiveness or effi-

ciency there were also no statistically significant differences between the original text and the non-IMAP text version written by a communications lecturer. Taking into regard the mostly small differences between the original text and the text revised by the lecturer, this last result does not seem too surprising. What does seem striking, though, in view of the claims made by Horn and his colleagues that were discussed above, is that the IMAP version — different as it was especially in structure and layout — did not outperform the two other versions.

An explanation of these results may be that, contrary to some of the experiments Horn (1982; 1992) refers to, the IMAP text used in our study did have serious competition. Both the original text and the version by the communication lecturer may be characterized as reasonably well structured and articulated. At least in this study, following the IMAP method apparently did not have an added value when compared to following generally accepted principles of clear writing like both the authors of the original text and the communications lecturer have done. Only with regard to overall reader judgement as expressed in a report mark did the IMAP version text score higher than the version revised by the lecturer, but it did not score higher than the original

text. All in all, this study fails to substantiate the claim that the IMAP method produces texts that lead to improved reader performance. It only shows that readers may believe that an IMAP text is superior to a more traditional text.

Does this imply that IMAP should be disregarded in future research into possibilities for systematically improving the quality of technical documents? Do our results suggest that writers should not be advised to take a serious look at IMAP-publications? That is not what we would like to argue. We think that IMAP is too interesting to ignore its strong points such as, for instance, the relative ease with which writers apparently can be trained to produce texts with an acceptable quality. However, we would like to encourage new, serious research into the communication situations (defined in terms of text genres, audience characteristics and specific reading goals) where IMAP can be expected to be most successful, and, perhaps even more important, into the specific role played by each of the seven principles the method is based on. The results of such studies would not only be useful for writers considering whether or not to follow the IMAP method; this type of research could also provide a valuable contribution to the knowledge base of document design.¹⁰

Notes

1. Another report of this study (in Dutch) was published in Jansen et al. (2002).
2. Horn, cited in Hunter (2002), also uses the term *methodology*. Bouquet & Notten (1999) refer to a *paradigm*.
3. Cf. the course material of *Information Mapping Inc. Nederland* (1998)
4. <http://www.infomap.com> (visited in August 2002).
5. In a recent interview published in this journal (Hunter, 2002) Horn states that “the method remains the best approach to capturing subject matter before beginning to organize and write documents. When you are analyzing, organizing and sequencing information for particular kinds

- of documents, that method still has no competition. We have always recognized that the results of an Information Mapping analysis can be presented in a variety of formats.” (p. 138).
6. For an extensive overview in English of the IMAP method, see Horn (1969; 1976; 1985); information in Dutch is offered in Notten (1996) and in the (unpublished) course material of *Information Mapping Inc. Netherland* (1998).
 7. The list of ‘seven basic principles’ seems somewhat inordinate; apparently the principle of *hierarchy of chunking and labeling* comprises at least two other principles, those of *chunking and labeling* (for an explanation, see the FAQ-section on the IMAP web site: <http://www.infomap.com/resources/faqprinciples.htm>).
 8. To clarify this need for studies into the effects of specific text variables in specific circum-

- stances Wright (1987) introduced the analogy of a nautical chart. Just like experienced seamen on the ocean, document designers have to find their way with the use of nautical charts of their ‘design space’ indicating some safe routes as well as a number of shipwrecks and sandbanks, but document designers also need to make their own decisions. Researchers in our field may be expected to contribute to the precision and the quality of the nautical charts for the designers, for instance by studying the effects of manipulating text variables in carefully described communication situations.
9. This refers to the absence of a *flowing prose* condition (Jonassen & Falk, 1980, p. 24).
 10. The authors thank the anonymous reviewers of an earlier version of this article for their valuable and constructive comments.

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