Reflecting on Information Mapping®:
Does the Method Live Up to the Expectations?

Carel Jansen
Department of Business Communication
University of Nijmegen
Erasmus Building 5.18
P.O. Box 9103
6500 HD Nijmegen
The Netherlands
c.jansen@let.kun.nl

Two empirical studies into the effects of applying the Information Mapping® method (IMAP) were carried out. The first study (65 subjects) compared an existing text with information about a chemical process intended for operators working at a Dutch plan, both with an IMAP version of that text and with a third version, rewritten by an experienced writer not familiar with IMAP. The second study (76 subjects) compared two similar Dutch texts containing instructions for operating a specific machine with IMAP-versions of these texts. Half of the subjects were of Dutch descent, the other subjects were immigrants.

In both studies hardly any statistically significant effects were found. The first study showed no effects at all of text format on reader performance (correctness nor speed). Only with regard to overall reader judgment the IMAP version scored higher than one of the alternatives did, suggesting that at best readers may think that an IMAP text is superior to a more traditional text. In the second study only the origin of the subjects and their educational level proved to affect their performance. The results give no reason to believe that IMAP is specifically helpful to readers facing extra difficulties because of a difference between their mother tongue and the language used in the text.

Keywords: immigrants, Information Mapping®, structured writing, educational level

Introduction

Suppose you are a young technical writer, not too experienced in the field yet, and eager to learn about techniques that might be helpful in rewriting the often complicated documents that your clients confront you with. Suppose also that one of your new colleagues told you something

promising in passing about an approach to structured writing that you never heard of before, an approach called *Information Mapping*®. And finally suppose that you decide to go and find out for yourself what this method is all about: you take a look at the *Information Mapping Inc.* website. What you find there, among other things, is a number of *before and after* examples of documents written in a conventional form and then re-written using the Information Mapping method (further: IMAP). Figure 1 is one of the after-examples.

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 shown on the website of Information Mapping Inc.

Preceding this example and the other ones showing results of the application of IMAP, the IMAP website contains an explicit warning: "What you can't see is the method used to create this format: the analysis, the organization, and the appropriate use of presentation modes." More information about the IMAP method can be found another page on the website, and in a series of paper publications, mainly written by the founder of IMAP, Robert E. Horn himself. These publications make clear that one of the major characteristics for IMAP is the standardization of the writing procedures that must be followed. Seven basic principles, all applying to information elements called maps and blocks are distinguished: the principles of *chunking, hierarchy of chunking and labelling, relevance, consistency, labelling, integrated graphics* and *accessible detail* (for definitions and examples of the application of these principles, see Horn, 1969; 1976; 1985). All in all, visitors of the IMAP website and readers of the IMAP-literature probably get the - correct - impression that IMAP is a strongly prescriptive set of instructions for the analysis, organization, and presentation of information, resulting in a large degree of consistency and in clearly recognizable texts.

But does it work, our unexperienced technical writer might ask himself. Do the time and trouble needed to get familiar with the IMAP method really result in better texts? The IMAP website might provide the answer. It contains an interactive *Show Me Demo* that - according to the accompanying text – "will illustrate how the Information Mapping Method can be used to save time and money". By clicking on stopwatches in this demo, visitors can determine the difference between the reading time necessary to find information in a 'typical business document', a prose text with a rather awkward structure, and the reading time needed for an Information Mapping (further: IMAP) version. If the IMAP version wins, the visitor is shown how much time and money could be saved in your organisation. The site suggests that a one-second gain in reading time of this text translates into $2,000 per year for a company with 100 employees. In the unlikely event that the prose version should win, the visitor is congratulated on his or her special reading skill of a non-IMAP text.

Is this demo meant as scientific proof of the benefits of the IMAP method, or is it just an innocent marketing gimmick presented against the background of serious research into the effects of IMAP? Fortunately, the second option seems to be correct. The IMAP website contains a link to a webpage called *Research*, offering the possibility to download a publication entitled *The Information Mapping® Method. 30 Years of Research* (further: Information Mapping, 1999). In this publication a number of effect studies, mostly carried out between 1975 and 1990, are summarized. The conclusion from these studies is that the results support, among other things, improvements in accuracy, reading speed, time to retrieve information and time-on-task (p. 11). This conclusion is in accordance with a number of statements in a research survey published by Horn (1992), that carries the promising subtitle *Examining the evidence of Information Mapping's method of high-performance communication.*

In the introduction section of his survey, Horn summarizes the findings of the evaluation studies to be discussed, and he states that "the [IMAP] method has stood the test of time under the scrunity of both university and business evaluators". According to the author, results reported in the evaluation studies show "10 to 55% improved retrieval of reference-based tasks, up to 30% decrease in reading time, and overwhelmingly positive user evaluations by managers and technical staff."

Unfortunately, not all the studies referred to in Horn (1992) can be regarded as successful attempts to thoroughly investigate the effects of applying IMAP-principles when rewriting a text. As will be illustrated below, a number of these studies seem to have serious methodological flaws. One of the more solid studies is reported by Jonassen & Falk (1980). They compared an IMAP version of a document to a version of that same document in the format of programmed instruction. What they found was that students who worked with the IMAP version were more meticulous, compared to students who worked with other versions. Jonassen & Falk conclude that the structural characteristics of the IMAP version made it easier to find information in text material. Horn (1992) quotes this conclusion, with which he apparently agrees. In another passage in Jonassen & Falk (1980), however, the authors 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 group, 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 & Falk are not mentioned.

Perhaps even more regrettably, the problems referred to by Jonassen & Falk are no exception; there are similar or even more serious objections that can be put forward to many of the other experiments referred to in Horn's research overviews. That is not only our opinion. Other publications where critical remarks on IMAP evaluation studies can be found are Hartley (1982) and Fields (1983). In a response to the criticism in these publications, Horn (1991) points out that he would agree that "there is less research than we would like", and that he regrets that "neither Hartley nor other researchers have attempted to replicate the amazingly simple research that would convince them [..]." Horn also states that he finds research valuable in guiding enhancements in the IMAP method, but "in the absence of adequate research, we have to make informed judgments." Hopefully, the experiments described in section 1 and 2, both performed in the Department of Business Communication of the University of Nijmegen[1], can be regarded as valuable contributions to the research advocated by Horn and his colleagues.

Study 1. Comparing an IMAP version of a document for operators at a chemical plant with two other versions[2]

In our first study we compared an IMAP version of a document with another text that functioned satisfactorily in a business setting and with 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 the 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.

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Design

For our first study, we approached 65 operators working at a Dutch chemical plant (*DSM*). All operators (64 men and one woman; age on average: 42; term of employment on average: 12 years) agreed to cooperate. All participating operators had previous training as process operators at lower or intermediate vocational levels.

Comparisons were made between three text variants of a document which dealt with the same subject: the so-called *regeneration process*.

1. A text currently in use at DSM. This text, which had a total length of three A-4 sheets, was selected by a DSM instructor. According to the instructor, the text was typical of the texts that DSM operators are presented with at the start of their careers, when they have to get acquainted with important technical processes taking place in the plant. Most participants in our study, however, were not familiar with this text.

2. An IMAP variant of the same text, written by one of the researchers 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 that it retained the information from the original text.

3. Another variant of the same text, written by a lecturer in the field of Business Communication who was neither associated with this research, nor familiar with IMAP. The request to this author was to improve the DSM text, while retaining the information expressed.[3]

The subjects were divided into three groups. In each group they were asked to perform the same assignment using one of the three text variants. The assignment consisted of six relatively simple multiple-choice questions, which had been formulated in consultation with a DSM-trainer of new operators. This expert on the subject of the texts also checked the final wording of the questions and answers.

The subjects all worked separately. Following preliminary instructions, which were repeated to each subject word for word, one text variant was presented, along with a flash card showing the first of six multiple-choice questions which had to be answered.[4] At that point, the time check started. When a subject had answered the first question and indicated the place where, in his or her opinion, the answer could be found, the time was stopped. 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. This was done as it was conceivable that subjects would be able to answer questions without having read the text, i.e. solely based on prior knowledge. After all six questions had been answered, the subject gave an overall judgement of the quality of the text he or she had worked with. 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 variants.

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Results and Conclusion

Statistical analysis of the results showed that a mean of 78 percent questions was answered correctly, and that on average, the 65 subjects needed well over three minutes to do the assignment. More important, however, was the finding that there were no statistically significant differences between the three text variants, neither concerning the number of correct answers found, nor concerning the time needed to find these answers.

The only statistically significant effect found of presentation format was on the evaluative report marks given by the subjects for the three variants. The IMAP text (average score 7.71 on a ten-point scale) was assessed as significantly more positive than was the text revised by the lecturer (6.72). The original DSM-text (7.38) was not assessed as significantly more positive or negative than the other texts. To study whether subject variables (age, years of service and cloze scores) had affected the results, multivariate covariance analyses were performed. It turned out that none of the co-variables had a significant effect on the results.

The findings in this first experiment reveal a clear picture. The effect that the IMAP text had on the target group differed in no way from the effect of the original text used by the company. Nor were there, in terms of efficacy or efficiency, any differences between the IMAP text and the non-IMAP text variant written by an experienced writer. Only with regard to overall reader judgement, expressed in a report mark, did this variant score lower than the IMAP variant. All in all, this study fails to substantiate the claim that the IMAP method will result in texts that lead to improved reader performance. The outcomes suggest that at best, readers may *think* that an IMAP text is superior.

Earlier Studies into Possible Benefits of IMAP for Special Target Groups

The results found in our first study do not imply, of course, that there could be no benefits associated with the IMAP method. Conceivably, with longer texts, different types of texts, or texts in different media, IMAP could result in greater efficacy or efficiency, therefore increasing the user friendliness of these documents. And perhaps there are specific, less skilled reader groups who profit more from IMAP texts than other readers do. In Horn (1992) two studies are presented where individual skills, measured in SAT scores or in reading test scores, were used as an independent variable: Burrell (1978) and Baker (1988). Below these studies are briefly discussed.

Burrell (1978) divided a group of 39 senior students at a medical college in students with SAT scores above the national mean and students with SAT scores below the national mean. She presented both groups with three chapters of a course on critical nursing care. One of these chapters was accompanied by a self-assessment guide written according to IMAP, the other chapters came without additional instructional material. In a post-test on the chapters studied, it turned out that for the high SAT group the IMAP version produced average scores that were 59% higher than the standard version, and for the low SAT group the IMAP version scored 53% higher than the standard version. Horn (1992) apparently attributes the success of the IMAP version to the method used to develop instructional material. Unfortunately, though, he pays no attention to the obvious alternative explanation that the mere presence of the additional

instructional manual was the cause of the improved test performance and that the format used to present this material hardly mattered. As far as possible interaction effects are concerned of the SAT scores of the students and the text version presented to them, Horn does not present the results of a detailed statistical analysis. However, considering the fairly low number of participants and the small difference between the average scores reported for students with high or low SAT-scores, it is hard to imagine that such an interaction effect did exist.[5]

In Baker (1988) the scores on the Nelson-Denny Reading Test were used to divide subjects (335 junior officers at a basic course at Fort Gordon, USA) into three reading ability groups: high, average and low. Each student read one out of three text variants: (i) a 24 page prose text to train US soldiers in leadership, containing a "liberal application of such aids as the use of major topic headings, the insertion of section summaries, and conclusions, and underlining key words" (cf. Horn 1992: 60), (ii) the same text with an advance organizer, and (iii) an IMAP version containing the same number of pages as the prose version. The tests the students carried out were the same for each group. They had to answer 33 multiple choice questions scored on accuracy, and they had to do an application examination containing multiple choice questions scored on the basis of time. The results showed main effects of reading ability: subjects in the high reading ability group significantly outperformed the lower ability readers in reading time, recall scores, and application time. There was no main effect of text format on the accuracy scores achieved with the multiple choice questions, nor was there a main effect of text format on the time needed for the application examination. In other words: no differences in test scores were found when the IMAP-condition was compared to any of the other conditions, and neither was there a significant difference between the two non-IMAP conditions. With regard to the time needed to read the texts before the tests were performed, however, it turned out that in the IMAP condition subjects in all three reading ability groups used statistically significant less reading time than in the prose condition and in the prose-with-advance-organizer condition. Just as in the Burrell study, there were no interaction effects: nor the IMAP version, nor any other version proved to be specifically helpful to low or to high ability readers.

Nor the Burrell study, nor the Baker study leads to the conclusion that less skilled reader groups profit more (or less) from IMAP texts than other readers do. But that does not imply that other reader characteristics would not play a role in the possible efficacy of IMAP texts. It might be, for instance, that the performance of users of IMAP texts is influenced by their level of command of the language used in the text. Perhaps immigrants with a mother tongue other than the language used in the text benefit more from IMAP texts than other readers do, as they might be particularly helped by the application of the *consistency principle* (use of the same words, labels, formats, structures and sequences) in IMAP documents. The overview of IMAP research presented in Horn (1992) mentions one study where in the testing the effects of IMAP applications, the linguistic background of the readers seems to be taken into consideration.

This study, done by Grebow & Horn (n.d.) was carried out at a bank in San Francisco where retail clerks had to be trained in working with a new credit checking service. According to the report presented in Horn (1992: 26-27)[6], the clerks to be trained typically had a sixth-grade education, and half of them spoke English as a second language. Applying the principles of IMAP, a manual was developed. Because many of the intended readers did not speak English well, it was decided to use few words and to rely on pictures and other graphics as much as

possible. In reporting on the way the effects of the manual were tested, Grebow & Horn confine themselves to stating that simulated in-house tests with naive subjects were performed, followed by a full scale field test with actual clerks and managers. No further details on the test procedure are provided. Under the heading *Results of the tests* the information presented is even more scant. It is limited to a number of quotations from a project manager at the bank, stating that "the manual worked perfectly from the beginning", that "the design was distinctive enough that it added to the marketing effort and made the service easier", that "there were very few questions phoned in by the clerks and managers", and that "the result was greater sales and better service". It is hard to take such an elemental report as irrefutable proof of beneficial effects of applying IMAP to a manual. It is even harder to regard it as an instructive study into the influence of reader characteristics on IMAP results.

In our second study, reported below, we tried to use a somewhat more sophisticated approach in searching for possible extra beneficial IMAP effects of on readers with varying levels of command of the language used in a text.

Study 2. Comparing the Effects of an IMAP Text for Readers with Different Linguistic Backgrounds[7]

In this study we wanted to find out if the comparison of an IMAP text with a more traditional text leads to different results when the mother tongue of the subjects is the same as the language used in the texts, versus a situation where the texts are used by immigrants with another linguistic background.

Design

There were 76 subjects involved in this study, all working in the CD Assembly Department of the International Service Center of Sony Music Entertainment in Haarlem (the Netherlands). 44 subjects (further: *employees of Dutch descent*) were born in the Netherlands and had parents who were also born there. The other 32 subjects (further: *immigrants*) were either born themselves outside of the Netherlands, or at least one of their parents was. 23 of the immigrants in this study were of Turkish descent; the others came from Morocco or Gambia. Both the immigrants and the employees of Dutch descent on average had a rather low level of education (measured in years of education: 9.0 respectively 10.6 years). They had worked for Sony for a fairly long period (on average 18.5 respectively 19.9 years), and their average age was 42.0 respectively 42.5 years. There were 69 male and 7 female subjects; 5 female subjects were of Dutch descent, 2 were immigrants.

In this study four texts were used: an original version and an IMAP-version of two one-page documents containing instructions for operating a specific machine used to fill plastic cd boxes with cd's and accompanying booklets. One text (A) told the employees how to fill the machine with booklets; the other text (B) told the employees how to fill the machine with plastic boxes. Structure, style and lay-out of the original versions of text A and text B were quite similar. According to the Sony manager involved in the organization of this experiment, both texts were typical of the instructional texts used at this plant; the manager also stated that none of the subjects were familiar with these texts. According to the manager, some of the subjects might be

familiar with the machine, though. To eliminate possible unwanted effects of prior knowledge of the machine, some minor though decisive changes were made in the scale model of the machine that was used in the experiment, and accordingly in the content of the instructions.

The IMAP versions of texts A and B were written according to the steps of the method as described in the literature. The managing director of *Information Mapping Netherlands* checked both IMAP text versions and confirmed that, in his judgement, they were correct applications of the method, containing the same information as the original texts.

Each subject was presented with two texts: either the original version of A and the IMAP-version of B, or the original version of B and the IMAP-version of A: a mix of a between-subjects and a within-subjects design. The order in which the texts were presented differed systematically: half of the subjects first were presented with text A and then with text B, and for the other subjects the order was reversed (see table 1).

	order in which the texts were presented	
	original text A + IMAP text B	original text B + IMAP text A
first A, then B	11 employees of Dutch descent and 8 immigrants	11 employees of Dutch descent and 8 immigrants
first B, then A	11 employees of Dutch descent and 8 immigrants	11 employees of Dutch descent and 8 immigrants

Table 1. Design of the experiment

Each subject was requested to perform the task described in his or her first text, using a scale model of the cd box filling machine (assignment 1). After that the subject was asked to find information in the text concerning two specific subjects (assignments 2 and 3). Subsequently another task, described in the second text the subject was presented with, had to be performed - again using the scale model of the machine (assignment 4). After that the subject was asked to find information in this second text concerning two specific subjects (assignments 5 and 6).

Finally the subject was asked to give report marks (on a scale from 1 to 10) for both texts he or she had worked with, expressing an overall judgement of each text.

Results andCconclusion

We were primarily interested in the main effects and the interaction effects of the independent variables *text format* (traditional or IMAP), and *origin of the subjects* (from Dutch descent or immigrant) on the performance (correctness and speed) and on the judgments of the subjects. As for the influence of our covariables, we were especially interested in a possible effect of the educational level of the subjects, defined here as *years of education*.

The analysis of our data revealed only a few statistically significant outcomes. When taking both independent variables *text format* and *origin of the subjects* into account as well as the covariable *years of education*, the statistical analysis of the data revealed no main effects of text format on

the performance of the subjects, measured in number of correct actions and number of correct answers. The origin of the subjects and the number of years of their education, however, did have a main effect on their performance. Employees from Dutch descent performed significantly better than immigrants, and employees with a relatively large number of years of education performed significantly better than employees with a only a few years of education. Looking at the total time needed to carry out the assignments, the only main effect found concerns the origin of the subjects. Employees from Dutch descent proved to be significantly faster than immigrants. Analysis of the judgement data, expressed in report marks for the texts that were used, revealed no significant main effects at all. Of course we were particularly interested in possible interaction effects of *text format* and *origin of the subjects* on their accuracy scores, on the time they needed and on their judgment of the texts: we wanted to know if immigrants would profit more or less from the IMAP format other than employees of Dutch descent would. The statistical analysis revealed no such interaction effects, neither on accuracy and time needed nor on report marks for the text.

All in all this second study confirms what was to be expected regarding main effects of the subject variables involved: readers with a low level of education are at a disadvantage, and even more so are readers with a different mother tongue. Regarding the format chosen for the organization and presentation of the text (IMAP or traditional), there were no significant effects on accuracy, speed or evaluation scores at all, neither apart from nor in interaction with the subject variables measured.

The picture emerging from the Burrell study and the Baker study is confirmed here. Although some of the studies into the effects of IMAP suggest that in some circumstances using an IMAP version of a text may have a positive effect when it comes to, for instance, reading time or perhaps appreciation of a text (as proved to be the case to some extent in our first study), there is no reason to assume that IMAP would be specifically helpful to readers who are disadvantaged because of a low level of education or a mother tongue differing from the language used in the text.

Does that imply that IMAP should be disregarded in future research into possibilities for systematically improving the quality of technical documents? Do our results suggest that young technical writers, eager to learn about writing techniques, 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 like, for instance, the high predictability of locations in a professional text where certain types of information can be found. But we would like to encourage new, serious research into the situations where IMAP can be expected to be most successful, and 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 technical writers considering whether or not to follow the IMAP method, this type of research would also be a contribution to the knowledge base of document design.

Notes

1. The first study was carried out by a team consisting of MA student Miranda Roest and staff members Carel Jansen, Hubert Korzilius and Rob le Pair. The second study was done by MA

student Rentia Visser and staff members Carel Jansen and Hubert Korzilius. We thank Anne Mieke Janssen, our colleague from the department of Applied Linguistics of the University of Nijmegen, for her advice in this second study.

2. An extensive report of this study has been published (in Dutch) in Jansen et al. (2001). An English version has been submitted for publication in *Document Design, Journal of Research and Problem Solving in Organizational Communication.*

3. Two lecturers at the University of Nijmegen, both unfamiliar with IMAP, were asked to rewrite the original text. Eight students of Business Communications compared the text versions written by these two lecturers. The text that the students (with one exception) thought was the best was used for this study.

4. To avoid undesired ordering effects, the questions were asked in an arbitrary sequence.

5. We were not able to consult the original report of this study (Burrell, 1978), an unpublished PhD. dissertation written at the University of Georgia.

6. The report in Horn (1992a) in is an almost literal copy from Grebow & Horn (n.d.).

7. An extensive report of this study is to be submitted for publication in *Document Design, Journal of Research and Problem Solving in Organizational Communication.*

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About the Author

Dr Carel Jansen (www.careljansen.nl) has extensive experience in teaching and researching subjects in the field of document design. He has published books and papers on various aspects of language and communication and on the design of instructional documents. Since 1998 Carel Jansen holds the chair of Business Communication in the Faculty of Arts at Nijmegen University in the Netherlands. Since January 2002 he is also affiliated with the University of Stellenbosch (South Africa), as extraordinary professor in the Department of Afrikaans and Nederlands.