

A new paradigm for the scientific article

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Abstract. Information overload is a great problem for the scientific community. To deal with the abundance of new scientific articles there are methods of sophisticated information retrieval tools and text mining tools. Little is known about the relationship between document structure and the structure of thought. This paper describes a project in this matter.

Keywords. scientific article, deconstruction, reading behavior, new writing model

Introduction and Purpose

Considering information overload and the abundance of new scientific articles, which is becoming a greater problem for the scientific community, there had to be a new discourse for finding innovative ways to cope with the growing amount of information. There are different solutions for optimizing the research process and literature review including alerting services, personalization and smart technologies, sophisticated information retrieval and text mining tools.

But is this enough to support the scholars and scientists of the future? There should be a way to go a step further and to find a new approach. It is no longer the search and retrieval process that should be the main focus of interest, but the granularity of the information, the scientific article itself.

A new pattern is emerging... New forms and ideas are being developed to improve and to reorganize the scientific article.

The purpose of this study¹ is to investigate two main questions:

1. Which cognitive processes can be observed while reading hypertexts and hyperlinks?
2. Is there another way to write a scientific article than the IMRD model (Introduction – Method – Results – Discussion)?

Literature review

In the digital age the process of reading and writing has changed; there are just information snippets, fragments, interlinked to each other, thus new forms of texts are created (blogs, microtexts...). New formats are emerging: In 2009, Elsevier launched the “Article of the future”² as a model for embedding source data. On the one hand you

¹ This study is at the same time my doctoral thesis.

² Elsevier Introduces Article of the Future Project. URL: <http://newsbreaks.infoday.com/Digest/Elsevier-Introduces-Article-of-the-Future-Project-55322.asp> (29.01.2014).

see the integration of supplementary materials to enhance and enrich articles [1], on the other hand you will get new methods of construct and deconstruct scientific articles (Nowakowski et al. [2] and Amado Alves [3]). Groth et al. [4] define the future of documents as nanopublications. These scenarios require different distribution models. Priem/Hemminger [5] propose the idea of the „decoupled journal (DcJ)“: „The DcJ brings publishing out of its current seventeenth-century paradigm, and creates a Web-like environment of loosely joined pieces – a marketplace of tools“. Kircz [6] postulates the end of the traditional journal article.

There is very little research on the interaction between document structure and the structure of thought [7]. What effects can hyperlinks have on reading and understanding? Are the cognitive processes changing? According to Nielsen [8]: „Hypertext presents several different options to the readers, and the individual reader determines which of them to follow at the time of reading the text...“.

Method

A suitable method for observing different cognitive processes is eye tracking. Cole et al. [9] show that you can recognize existing domain knowledge of a person with this method. Further they find: „Of particular importance is the fact that eyes fixate until the meaning of the word(s) is acquired.“ [10]. Eye tracking can visualize the different passages of a text already known. In this way it should be possible to delete these passages, to deconstruct and re-construct a text to generate new and shorter versions of it, to fit the right knowledge level of the researcher with the very essence of the content. How small is the smallest unit for understanding?

2.1. Study design

The study design contains determination of the test persons, which means the number of scientists and their reading patterns, and the papers/articles they have read in a defined time scale. Tenopir/Volentine [11] show that there are different reading patterns for each academic discipline and that medical/health scientists have to deal with the largest amount of papers. Therefore this study concentrates on life sciences. The number of scientists and papers is still subject to definition.

3. Conclusion and further research

The results of the eye tracking sample show the scientific article in a different and innovative way: to create an adaptive tool that can recognize a scientist's level of knowledge and to find the smallest unit for writing a scientific article.

Further research is needed concerning the granularity of a text: how far can deconstruction go to write an understandable text, can this go to the word level? Combined with smart technologies there are many possibilities to develop a new and innovative eco system for scientific articles; perhaps to reach the status of Kelly's vision: „In the new world of books, every bit informs another; every page reads all the other pages.“ [12].

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