SPRINGER NATURE

Die Zukunft des Lesens und Schreibens von Büchern: KI und VR

Dr. Niels Peter Thomas

Osnabrück, Oktober 2019

Springer

The Book World: „Plant an Idea – Grow a Book“

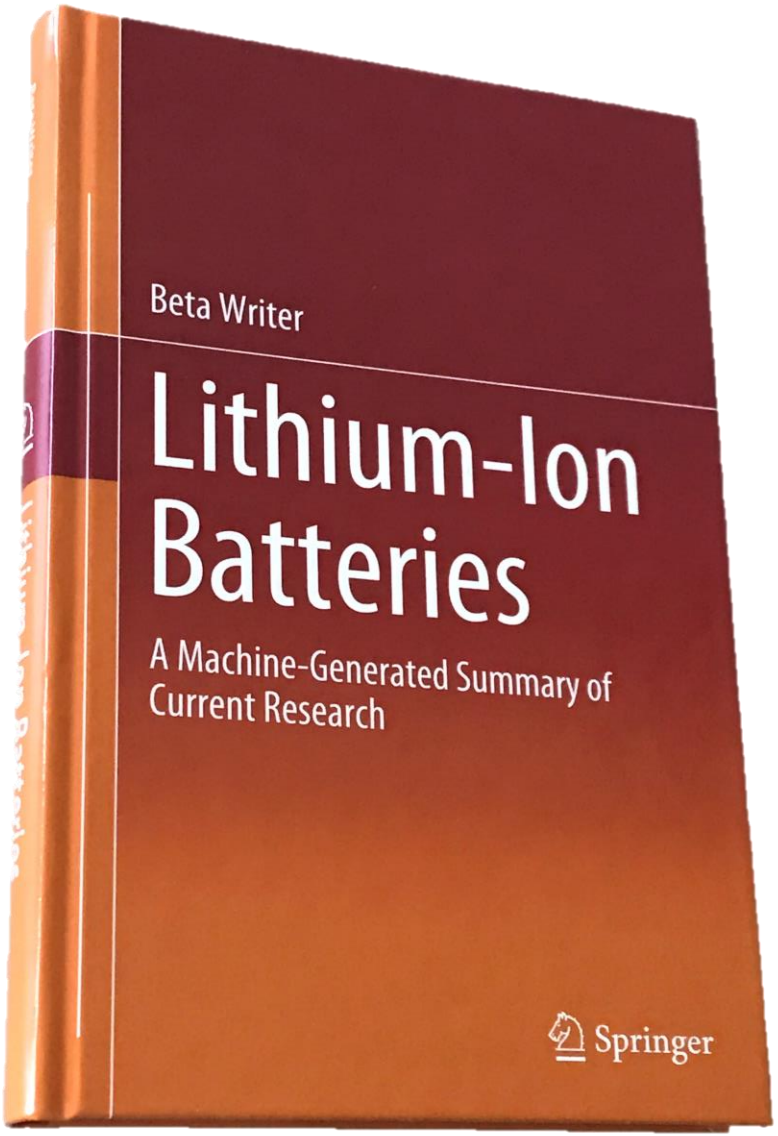
Problem #1: Managing the Information Overload

(1) The Future of Writing Books

How can we make writing books more efficient? A case study in artificial intelligence

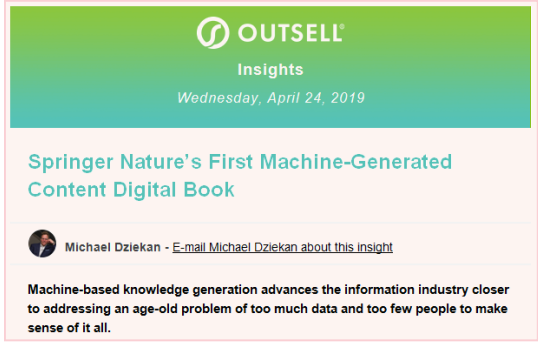
The First Machine-Generated Academic Book Ever

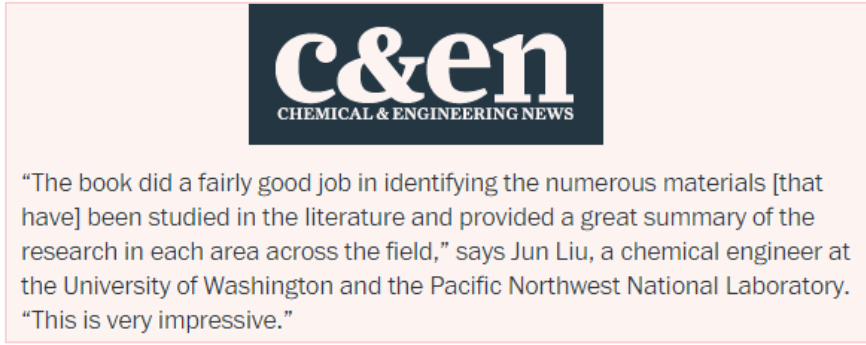
- Published April 1, 2019
- First academic book without an author
- by an algorithm jointly developed by Springer Nature and Goethe Uni Frankfurt, in cooperation with Digital Science
- cross-corpora summarization of existing texts, organized into a coherent similarity-based sequence.
- available for free on SpringerLink
  https://link.springer.com/book/10.1007/978-3-030-16800-1

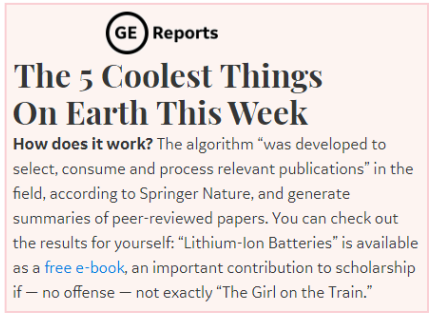


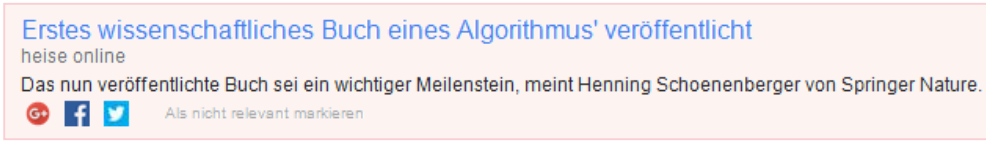
SPRINGER NATURE

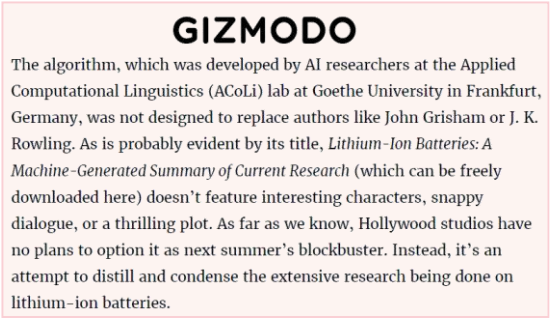
Great Media Coverage: Springer Nature‘s Thought Leadership

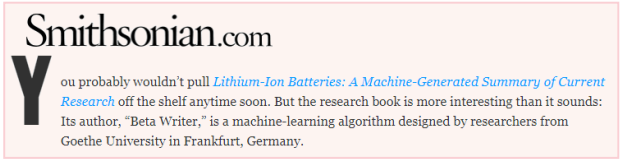












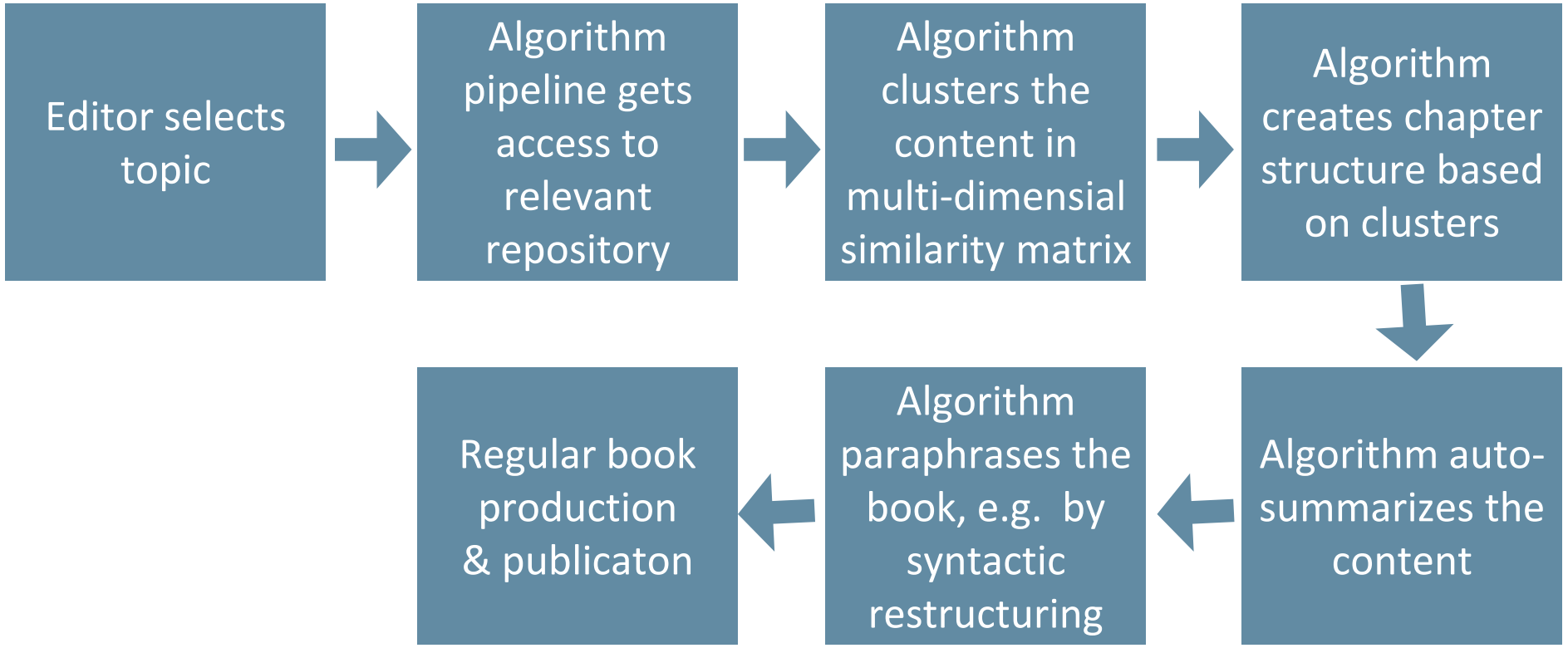
- “Advances the information industry”
- “Coolest things on earth”
- “A real breakthrough”
- “More interesting than it sounds”

Publishers without Authors? Utopia or Dystopia?

- We can create new books automatically, so ….
  - Why pay any royalties?
  - Do we need acquisitioning editors?
  - We can also create journal articles.
  - The role of researchers will change.
  - The role of publishers will change.

- But of course reality is more complicated…

The algorithm, and how it works (in brief)



- **Is this creative?**
  Yes and No: the algorithm produces no new results, but the unbiased summary of literally all known facts provides a new perspective, researchers confirm

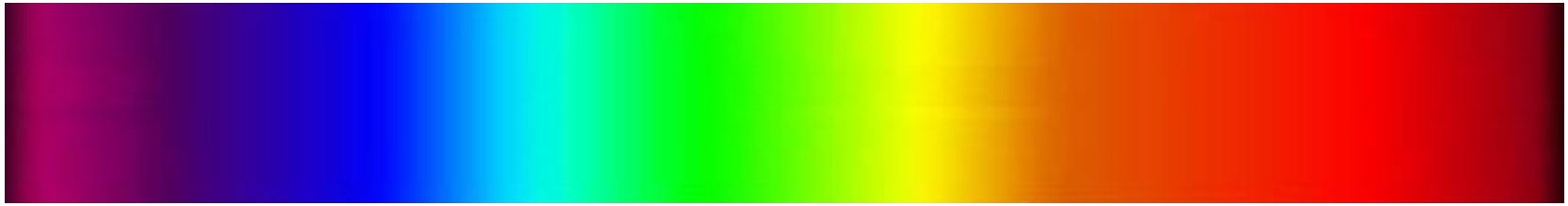
Technological Challenge vs. Publishing Challenge

TECHNOLOGICAL CHALLENGE

- Who is the originator?
- Who is accountable, who is responsible?
- Who owns copyright?
- How to organize „peer review“?
- How to select the topics?
- What is publisher‘s role?

PUBLISHING CHALLENGE

How we are integrating machine-generated content



100% human

100% machine generated

Enrich human written books with auto-summarized meta-data

Provide authors with a machine-generated template for their manuscripts

Create machine-generated books with careful expert editing/correction

Create fully automatic custom reports as a new business model

The future of machine-generated books – no utopia any more

Machine-created new knowledge: The algorithms will combine existing knowledge to form new research hypothesis

Researchers work changes, as they can concentrate on the creative part, and will not waste time on literature search

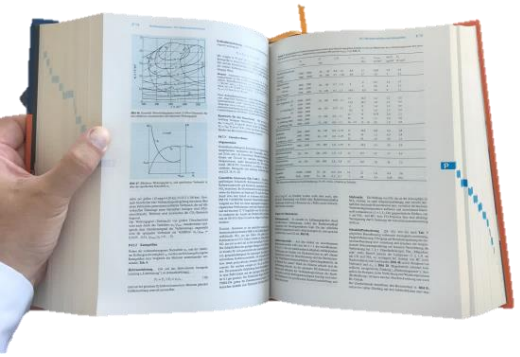
We are in the knowledge creation business and have to rethink our role

(1) The Future of Reading

How can reading a book be more efficient? Experiments with VR & AR

Better Reading: How will we read books in the future?

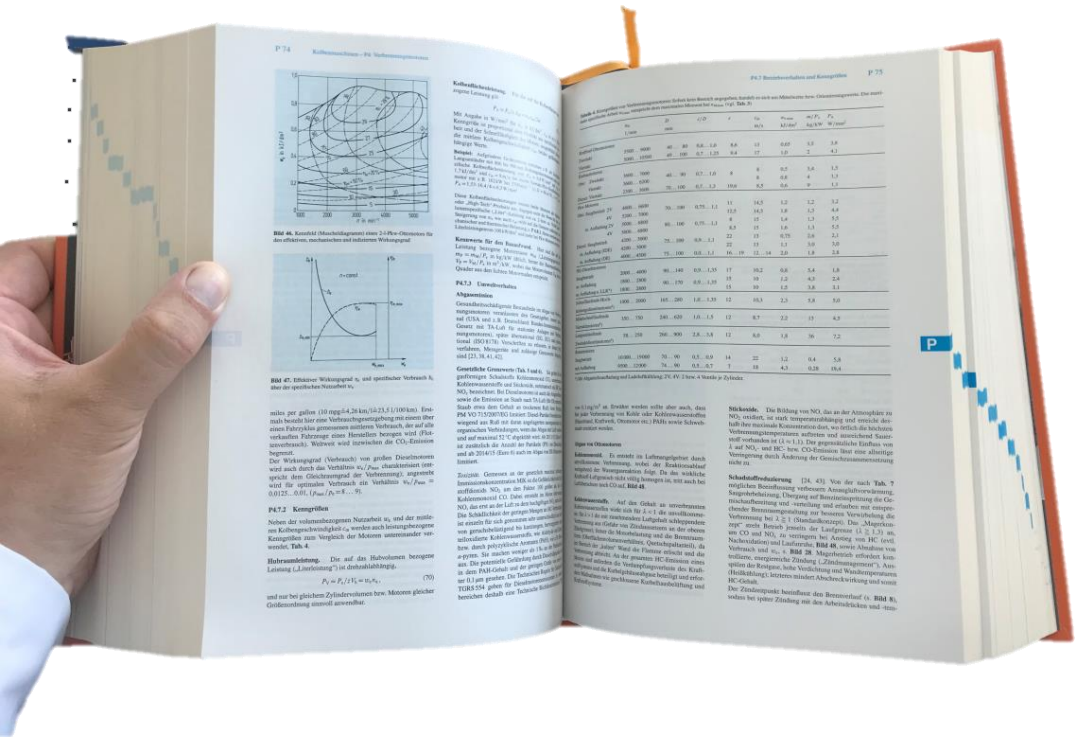
Will we read books in print or in electronic form in the future, or is there a third format?



A few years ago, many people in publishing would have assumed that soon we will have a clear tendency for eBooks, but this will probably not happen.

We observe our readers and it seems that mot of us are dual mode readers who prefer a certain format according to the specific reading situation we are in.

Benefits of the printed book*

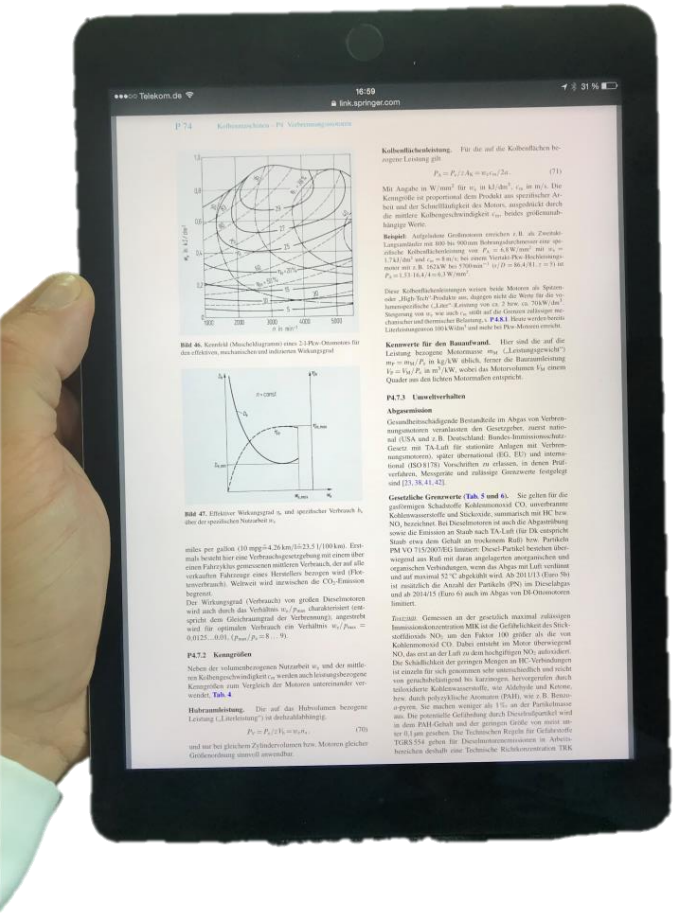


- No device needed
- No electricity/ battery needed
- Open a book and read without delay
- Insensitive
- No technical know-how necessary
- Can be borrowed, sold, passed on
- More pleasant touch and feel
- Orientation within the book easier

SPRINGER NATURE

* Source: Survey among students of business informatics ,May 2018

Benefits of the eBook*



- Search by keyword
- More content immediately available
- Customizeable format (size, layout)
- Saves resources (paper, logistics)
- Fast delivery
- Durability (free from wear and tear)
- Copying is easy
- Multimedia integration possible

SPRINGER NATURE

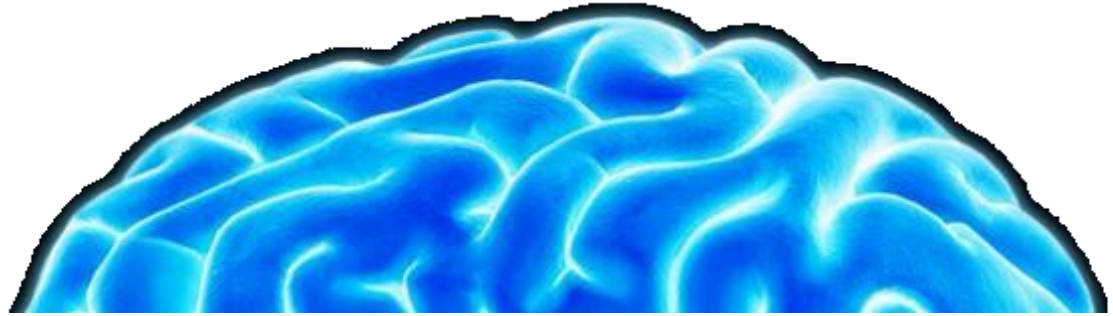
* Source: Survey among students of business informatics ,May 2018

Interesting new empirical research on „reading success“

Reproducible experiments with students show that in some use cases students who read the print version remember better what they have read than those who read an eBook on a flat screen.

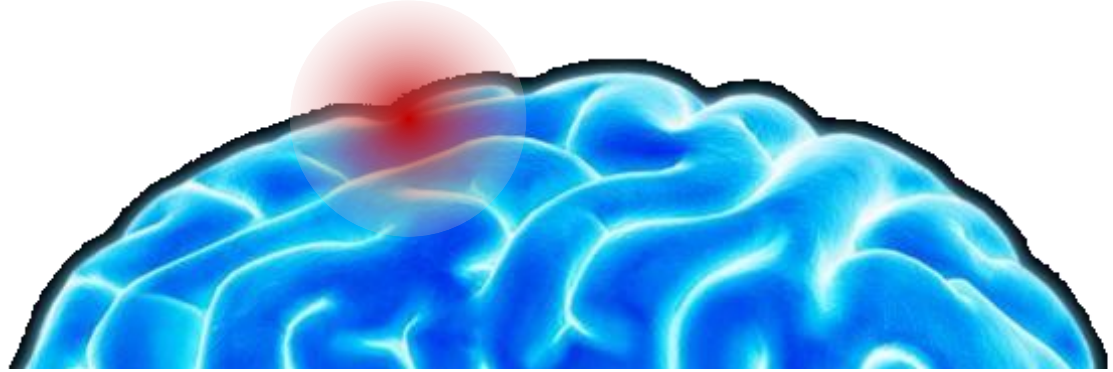
Depending on the specific parameters (how much time, what type of text etc.) the results of these experiments are very different.

Experiments in the neurosciences indicate that this effect can be caused by brain processes during reading!

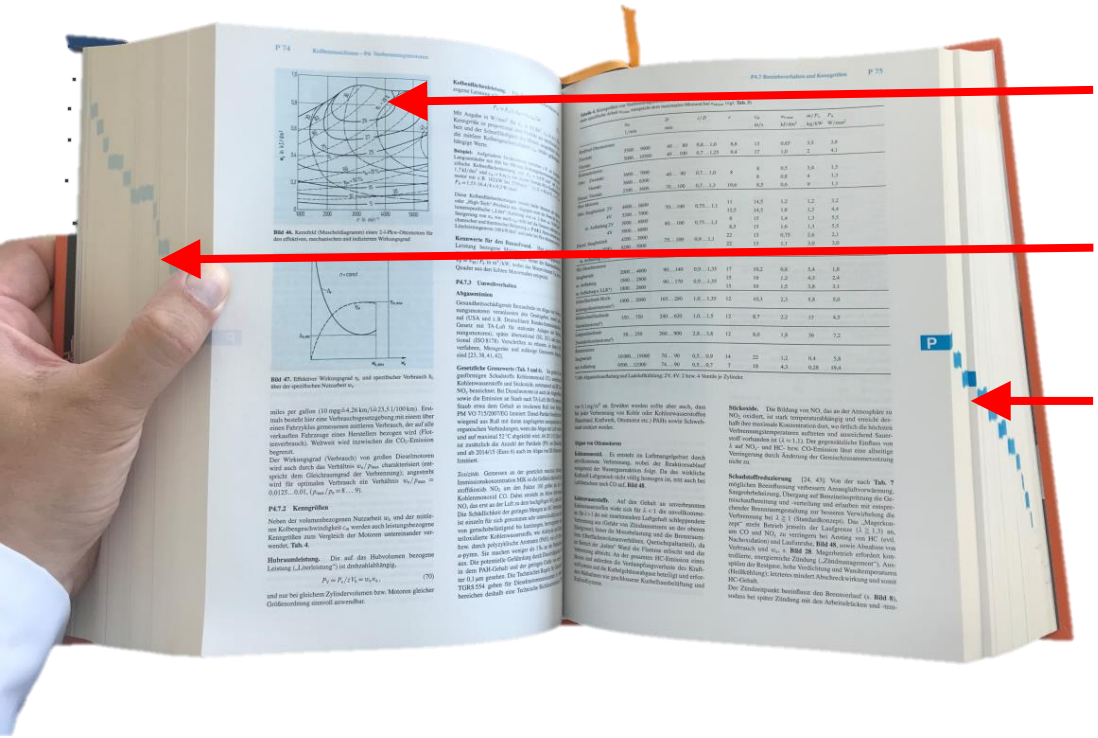


The evolution of the brain and reading

- Our brain has undergone an evolution of several million years.
- However, reading is a revolutionary new skill. The first alphabets are about 6000 years old, and only for less than 1000 years can the majority of mankind read.
- Human brains are not well prepared for reading.
- We do not have a "reading center", but have to re-use the brain center for spatial orientation for reading.



If this hypothesis holds,
what is the neurological advantage of the printed book?



Orientation within the page:
upper left corner is always upper left

Orientation within the book:
depth (3rd dimension) is perceptual

Navigation between pages:
fast turning pages possible.

Two consequences of this insight:

Short term:

- Since this effect is triggered by „hard wired“ brain processes, it will not go away with the next generation.
- Springer Nature will continue to offer both formats, print and e.

Long term:

- When the "codex form" of the book was specified, it was unknown how the brain worked. It is therefore a coincidence that the printed book resonates so well with the brain.
- Maybe there are other formats that fit the brain even better? This would make reading and learning more efficient!
  How would such a “third format” look like?

Requirements for the „third format“

The book presented in the „third format“ must perfectly support the way how the brain works:

1) Texts must be shown in a fixed location.
2) More text should be visible simultaneously.
3) Additional (spatial) structures or colors can support the text (narrative graphs).

Pragmatic constraint: We are looking for a format that is suitable for existing backlist of titles, not only for new books:

4) Keep the concept of pages (for the time being)

Experiments need to prove the benefits of this format over the existing ones.

360°-Reading in virtual reality: the experiment

In the VR headset we can display a complete chapter around the reader at the same time. You read by moving/turning your head or body.

Hypothesis: in complex texts where you need to go back to an earlier page, spatial memory finds orientation much faster than in printed and electronic books.

Next step: experimental verification with three different formats.

Outlook on the future of reading

First internal experiments suggest an interesting project!

The basis of the new format is digital. One day, when we have found a better representation, you can use our eBook collections in the new VR app.

We probably won't all be wearing VR headsets in a few years' time - but these experiments will allow us to gain new insights into reading, which we can translate into our eBooks.

We will share our findings with the academic community and seek to work together - cooperation partners are welcome! (niels.thomas@springer.com)

The Book World: „Plant an Idea – Grow a Book“