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PEER-REVIEWED JOURNAL ON THE INTERNET

**Reading *Books in the Digital Age* subsequent to
Amazon, Google and the long tail**

by Terje Hillesund

Abstract

Presenting a wide range of literature, this article explores the state of art in book research, paying particular attention to John B. Thompson's interpretation of digital transformations within the book industry, as depicted in *Books in the Digital Age* (2005). Claiming that Thompson's analyses are one-sided, the article applies alternative perspectives and a model of a text cycle, contending that the diminishing role of paper in text production and text distribution makes the dominant position of printed books particularly vulnerable to advances in digital reading technologies.

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Introduction

In the last decades, the book industry has changed and is now characterised by two (or three) opposite tendencies: Many publishing firms are united in large multinational corporations, commercialisation has increased and bookstores are concentrated in large chains, marketing the popular. At the same time, the Internet has come to constitute an immense book market, and recently Google Book Search has demonstrated the power of the Web in book content discovery and display. Search engines and online bookstores disclose and make available books no longer in stock in ordinary bookstore chains; as a result, niche markets flourish and the total sales of obscure books have grown considerably. As a binary underflow, the electronic book slowly seems to be gathering new strength. In this article, I will present literature that analyses current transformations, and I will critically examine John B. Thompson's analysis of the digitalisation of the book as presented in *Books in the Digital Age* from 2005. Only two years have passed, yet events already confirm my view that Thompson got most of it wrong.

In his treatment of digitalisation, Thompson claims to be contextual. In this article, I will question this and demonstrate how Thompson ends up in an externalist position, treating technology as an autonomous force that has changed the book industry from the outside. I will contend that Thompson presents a simplified picture. By changing perspective, the article will argue that the book's digital transformation is intricately woven into a technological history in which digitalisation of writing and text has been of critical importance for the development of the computer, and of the Internet and the World Wide Web. Book producers are now in the midst of a situation where digital texts and networks are increasingly characterising more of written communication in society. In the last decade, search engines such as Google and Yahoo! have become central hubs in this new form of text dissemination. The development of electronic books is part of the picture and, until now, actors in the book industry have been able to influence e-book technologies, both reading devices and forms of sale. Many stakeholders are nonetheless at work and, using a text cycle model, this article will describe the continuing digitalisation of the text and the book and maintain that the book industry's relationship to technology is far more complex than Thompson's conclusions would indicate.



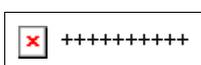
Interest in the book

Internationally, there seems to be growing interest in the book, its digital transformation probably being the most important reason for this increased attention. Around the turn of the century, talk of e-books was extensive, and many predicted the quick demise of the printed book. The hype quickly passed, but new digital technologies are constantly being introduced in the book industry. In December 2004, Google launched The Google Print Library Project, later Google Book Search, in which Google, in collaboration with a number of major institutions — amongst them university libraries at Harvard, Stanford and Oxford — started to scan millions of books, making them searchable on the Web [1]. This so-called "Googlification", or monopolisation of cultural heritage, has provoked many, and in the EU the French Minister of Culture has gathered support for plans for a digital European library (Jeanneney, 2007). In 2005, partly in response to the Google challenge, Yahoo! and the Internet Archive established the Open Content Alliance [2]. In order to generate sales, Amazon has set up "Search Inside", a facility that lets book customers skim parts of books before purchase [3]. In the e-book segment, companies serving library markets, such as ebrary [4], have dramatically increased revenues [5]. In the last couple of years hardware manufacturers have also started offering reading devices based on electronic paper.

These developments are of great concern to publishers, writers and scholars for whom books for millennia have been a core element in the dissemination and accumulation of knowledge. Since 2003, The International Conference of the Book has been arranged annually in Cairns, Beijing, Oxford, Boston and Madrid, where it is being held in October 2007 [6]. The theme of the conference is the past, present and future of the book. The *International Journal of the Book* is published in close connection with the conference. The central questions deal with the position of the book at a time when communication is increasingly based on digital technologies. This is also the topic in a number of scholarly articles in journals such as *Ariadne*, *D-Lib Magazine* and the *Journal of Electronic Publishing*. In 2005, the *Electronic Library* published a theme issue on electronic books with a bibliography that, far from being complete, lists nearly 500 journal articles on e-books alone (Ramaiah, 2005). In a popular article in *Wired*, Chris Anderson (2004) explains the mechanisms behind the stirring increase in niche book sales created by Amazon and online bookstores. These mechanisms are based on huge inventories (3.7 million books in Amazon in 2006), intelligent search functions and recommendations of books similar to the ones that have already caught customers' interest, often leading book buyers to titles they were not aware existed. Based on empirical findings and models presented in the journal *Management Science* by Erik Brynjolfsson, Yu Hu and Michael D. Smith (2003), Anderson started to use the concept of the long tail in order to illustrate how the total online sales of multiple niche books may equal and even surpass the total sales of relatively few bestsellers, in the model labelled as *Head*.



In later writings, Anderson (2006) claims that Google Book Search is contributing to the increased sales of rare and obscure books, while Google (the company) has recently started to use the expression "Serving The Long Tail" [7].

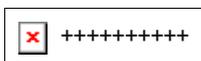


Books on books

In addition to articles, books are written about books, and in 2002 Routledge published the *Book History Reader*, edited by David Finkelstein and Alistair McCleery. With 28 contributions by scholars like Robert Darnton, Elisabeth Eisenstein and Pierre Bourdieu, the book provides a wealth of perspectives on the history of the book: on the transition from orality to writing, the relevance of printing, the history of reading and digital transformations. Finkelstein and McCleery provide a condensed account of the findings in *An Introduction to Book History*, published in 2005. According to the authors, book historians ask questions at three intertwined levels: text, book and medium. A text is a written document that is read, but it has to have some physical form, and this form can be a wide range of media, such as printed books, magazines, newspapers and online Web pages. Finkelstein and McCleery define the book as a medium (bound sheets of written or printed paper), explicitly excluding online versions from the definition of books. This usage is contradicted by publishers, technologists and readers, who do not regard phrases such as “an electronic book” or “digital books” to be contradictory, as Finkelstein and McCleery would do. Nevertheless, there has been terminological confusion in the field of e–books. Around the turn of the century, a dedicated reading device was often called an “e–book” or an “e–book reader”, along the same lines as Finkelstein and McCleery’s definition of a book as a medium. Today, the term “e–book” usually denotes the document containing text and images of a book and “e–book reader” the software application on which an e–book is read. The technical apparatus is called a “reading device”, and much equipment carrying a display, such as stationary computers, laptops and microcomputers, handheld communicators, mobile phones, television screens and posters, do sometimes function as reading devices, also for reading of e–books.

In any event, the future of the book is discussed in *An Introduction to Book History*, and it seems quite clear that Finkelstein and McCleery see the end of an era for the traditional printed book. In contrast to this rather gloomy prognostication, in 2006 John Anderson published *The Long Tail: How Endless Choice is Creating Unlimited Demand*. In the book, Anderson elaborates on his previous hypotheses, presents new empirical data, expands the analysis of several media (primarily music and film), and repeats his optimistic view on niche and quality cultural production, in many ways challenging a long academic tradition critical to the capitalistic cultural industry. However, in the area of printed books, so far, “The Long Tail” is mostly theory; hypothesis and scenarios based on aggregation of stipulated data from Amazon used to predict consumer behaviour amongst book buyers collectively.

Internally within the publishing industry, writers have also expressed interest in the book, especially the destiny of quality books. In 2001, Jason Epstein published *Book Business: Publishing Past Present and Future*. The same year, André Schiffrin published *The Business of Books: How International Conglomerates Took over Publishing and Changed the Way We Read*. Epstein is an editor and Schiffrin a publisher, and both write primarily from an English–speaking publishing world. Their concern is the commercialisation of the publishing business in the last decades. From within, the authors describe how the focus in book production has turned from quality to marketable books and profits. According to the authors, this development is closely connected to the concentration of publishing firms in large international publishing giants with clear demands for profitability and earnings. In his book, Epstein also discusses digitalisation. He rejects the idea of e–books, but looks at the digital future with optimism. According to Epstein, the publishing industry will be able to maintain a quality production of books by an increased proliferation of print–on–demand. Epstein envisages a future where local booksellers run their own digital print shops, in which the customers virtually stand waiting for the ordered books to be printed and glued.



Books in the Digital Age

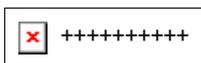
In 2005, John B. Thompson published *Books in the Digital Age: The Transformation of Academic and Higher Education Publishing in Britain and the United States*. According to Thompson, Epstein's vision of a decentralised book printing builds upon wishful thinking. Even if print-on-demand has indeed increased, it has not done so in the decentralised manner Epson imagined, rather the contrary. In his book, after having described general developmental characteristics in the international publishing world, based on extensive studies during the period 2001 to 2003, including numerous interviews, he makes a thorough analysis of academic publishing and publishing for higher education in Great Britain and the U.S. In the last part of the book, he deals with digitalisation.

Previously, John Thompson has written several books about Pierre Bourdieu (Bourdieu and Thompson, 1991), and Bourdieu's concepts of social fields and capital forms make up the theoretical basis in *Books in the Digital Age*. Thompson defines a field as "a structured space of social positions whose properties are defined primarily by the relations between these positions and by the resources attached to them" [8], a definition derived from his earlier book *The Media and Modernity: A Social Theory of the Media* (1995). According to Thompson, every publishing field has its own histories, characteristics and rules. Academic publishing and textbook publishing constitute different fields, fiction yet another. The position of a publishing firm within a publishing field is determined by the volume and composition of the firm's resources: its financial capital (financial situation and earning ability), human capital (competence of the employees), symbolic capital (the publishing firm's recognition) and its intellectual capital (copyright portfolio) [9].

In addition to the field concept, Thompson introduces the concepts of a "publishing cycle" and a "publishing chain." The publishing cycle consists of four stages: acceptance of the book, printing, reprinting, and the point in time when the book goes out of print. The publishing firm is one of many actors in the publishing chain that includes authors, editors, proofreaders, typographers, printers, distributors, booksellers and readers. Interestingly, Thompson's concepts of a cycle and a chain are defined and described from within a paper book paradigm exclusively.

In his analysis, Thompson makes extensive use of Bourdieu, and in a review of Bourdieu, David Hesmondhalgh (2006) points out that Bourdieu's field concept functions well in analyses of media reception, but that Bourdieu's own accounts illustrate that the concept apparatus is insufficient in production analyses. According to Hesmondhalgh, such analyses must be supplemented with insights from political economy theory. John B. Thompson undoubtedly does this in his book. However, it is a problem that Thompson does not discuss the political economy tradition. On the whole, Thompson is frugal with references to other researchers; even his empirical findings are not very well documented, as pointed out by Everett Wiggins (2007). In a preface to his analysis, Thompson reviews four international developmental characteristics that are important for the entire book industry [10]. The characteristics are, not surprisingly:

1. Concentration of the publishing firms in large publishing groups, which in turn are owned by multinational media conglomerates;
2. Concentration of booksellers in large bookseller chains;
3. Globalisation of the markets with an increasing dominance of the English language; and,
4. Introduction of new technologies, particularly digital technologies.



Technology and society

When Thompson deals with the significance of computer technology for the book industry, he is careful to emphasise that technology is not a driving force in itself, and that the influence of digital technology must be considered in a social and cultural context. Nevertheless, Thompson falls into a usage most familiar amongst media technological determinists in the tradition of Marshall McLuhan (1962, 1964) and Walter Ong (1982). These scholars write about revolutions, oral and written ages and about inevitable social and cultural consequences of different media technologies. John B. Thompson writes correspondingly about "the digital revolution", "the digital age" and "the hidden revolution." He writes about the "influence" of digital technology and how computer technology "brings about" changes in the publishing industry. In the Introduction (p. 9), Thompson says, "... the digital revolution represents a major force for change in the publishing industry." Under the title "The impact of new technologies," [11] Thompson writes:

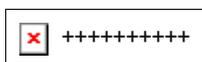
"The rise of the Internet is only one aspect of the digital revolution, a technological transformation which has had, and continues to have, a profound impact on the publishing industry. Since the early 1980s, the publishing industry has been in a state of continuous debate about the impact of new technologies on its working practices, management systems and supply chain. [...] The rise of online retailers like Amazon, and the much publicized debates about e-books, are only the more visible manifestations of a revolution which has affected the publishing industry at every level of the value chain."

It seems as though Thompson looks at digital technology as an external force, inevitably changing conditions in the book industry. When describing technological influence in isolation, as Thompson eventually does, it is often straightforward to perfunctorily start using this type of language. On the other hand, properly contextualised, writing "the art of printing has influenced Western culture" or "digital technology has influenced book production" is possible without being a hard technological determinist. As is known, hard determinists consider technology as the primary driving force in social development. Usage, however, cannot be combined with the opposite point of view, which considers social conditions to be primary to technology, as with Brian Winston (1998) in *Media Technology and Society*. Unfortunately, Thompson does not discuss his own usage.

According to David E. Nye (2006), most researchers studying the influence of technology apply a contextual point of view in which economical, social and technological conditions are said to work together. Many theoreticians accept a soft determinism that says that (socially formed) technologies with a certain momentum, for example the alphabet, the art of printing or the computer, will have consequences connected to properties of the technology. Contextual perspectives are often supported by "internalist" studies of the prehistory of different technologies, their origin and dissemination (Nye, 2006). Such studies (such as those by Brian Winston) have indicated that most technologies take a long time to develop, that their implementation meets cultural and economic resistance, that use and shaping of inventions is unpredictable, and that all technologies are shaped by the social context, that is, by the general competence in society and by social and cultural needs.

Thompson does not discuss different perspectives on technology or computer technology, and his contextual assertion seems almost ritualistic. He devotes a great deal of space to economic, social and cultural developments in the publishing industry, but relatively little time is spent analysing how these factors interact with technological matters of importance for the industry. On the contrary, he separates digital technology as an individual area for analysis.

Only in the last part of the book [12] does Thompson deal with the influence of digital technology on the book industry, and in so doing he commits the very technological fallacy he himself warns against: He isolates the analysis of computer technology and treats it as a separate driving force. Thompson ends up in what Nye (2006) calls an “externalist” position, where new technology is objectified and treated as an external, autonomous power forcing changes on the book industry.



“The Hidden Revolution”

John Thompson begins his treatment of the digitalisation of the book by establishing that the e–book failed [13], which is partly correct, especially considered in light of the great expectations expressed towards the end of the 1990s. Thompson [14] quotes Robert Darnton (1999) who, in several articles, analyses the e–book and expresses optimistic views on the use of electronic books in research and education. In two chapters [15], Thompson studies a number of projects, including “Gutenberg <e>” which was inspired by Darnton. Thompson concludes that most of the projects struggled (and are struggling) to get professionals to work purely digitally (they wanted their publications printed), that they underestimated the costs of digital productions, and that they overestimated the will of the users to pay for digital text content. Thompson presents an explanation of the reader’s lack of interest in e–books in the following five points [16] (which are exactly the same points formerly described by an Arts Council Norway e–book project):

1. Poor readability (today’s equipment does not provide for good enough reading of long texts);
2. Many incompatible e–book formats;
3. DRM problems (strict copy protection is desired by publishing firms and not desired amongst readers);
4. High price (many publishing firms charge more for an e–book than for the printed pocket version); and,
5. Culture (the paper book is highly valued and interwoven in a number of cultural practices).

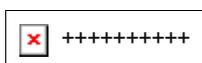
Describing e–book setbacks in the course of nearly 100 pages, as Thompson does, seems a rather circumlocutory way of voicing scepticism towards electronic books. Thompson underlines the lack of interest amongst readers, and pays less attention to the assumption that a functioning e–book market is rendered more or less impossible by consumer–hostile DRM and format chaos, resulting from protective copyright policies amongst publishers (Hillesund and Noring, 2006) and format competition between technology companies (Microsoft, Adobe, Sony, etc.).

Finally, in the very last chapter [17], Thompson describes the technical aspects of book digitalisation. He emphasises changes in book production and describes how computer technology and the Internet have improved efficiency in stock management and sales of printed books. He points out that the book industry, like the music and video industries, is different from many other industries in that the actual product, that is, the content, has been given a digital form. Stored as data files, the literary content is flexible; it can be exchanged amongst computers, and it can be given different forms of representation, on both paper and screen. But while e–book researchers have received a lot of media attention, Thompson [18] contends that a secret revolution has taken place: Digitalisation of production and digital text files has opened the door to digital printing of books, introducing great changes. In revealing

this well-known “secret,” Thompson makes a rather palpable rhetorical turn, redirecting attention to developments in printing and paper book production, thus escaping fundamental questions regarding purely digital books.

This does not mean that advances in digital printing are without significance. Digital printing is done directly from the final edited book file, and in recent years digital printing has been able to compete with offset on price, especially for smaller runs of books printed in black only. Several academic publishers, like Cambridge University Press, use digital printing in the production of monographs when sales are expected to be poor. If a modest first edition sells out, the publisher can supplement the market by print-on-demand. In contrast to the decentralised printing Epstein (2001) envisioned, the present print-on-demand schemes are centrally organised, often with one supplier serving several publishing firms, such as Lightning Source in Great Britain and the U.S. [19] As a result of this digital production flow, what Thompson calls “the life cycle of books” has changed. Books can now be kept on sale much longer, including books that were originally printed in offset. Out-of-print books can be digitised and given new life through digital printing. The old way of calculating a book’s profitability — build on anticipated sales and the size of the first edition — has changed, there is less risk attached to book publication, and the lifetime of a book is longer. Thompson calls these changes a “hidden revolution.”

Thompson concludes his analysis of the digitalisation of the book with his hidden revolution, which is neither particularly hidden nor revolutionary. Naturally, the well-known proliferation of digital printing is a development involving substantial changes, but no revolution. The digitally printed book has the same properties as other printed books; it is distributed and read in very much the same way. Obviously, book production is somewhat changed, and marketing and acquisition are altered, which is also the point made by Anderson and his associates. In digital form, the content of the book can easily be traced and searched, and in online bookstores and search engines readers track down all kinds of literature, both new and old. According to Anderson (2006), digital printing, and especially print-on-demand, is increasing thanks to Amazon and Google Book Search and other online services. Anderson’s reasoning, however, originated in registering physical limitations in ordinary bookstore distribution (and in traditional music and film distribution) and in recognising the distributional advantages of pure digital content, such as MP3 music, digital videos and digital books. According to Anderson, the size and length of “The Long Tail” is partly due to such digital distribution, which is seriously disturbing the traditional sale systems, particularly in the field of music. As for Thompson, he seems so anxious to prove the e-book dead and to look for “hidden” changes that he fails to see the obvious: that digital book content is constantly being created and extensively distributed in network channels.



Text digitalisation

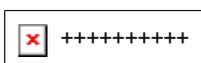
In his study, Thompson’s main concern is how the printed book is affected by digital technologies, in many ways echoing values and view of his interviewees in the publishing industry. However, it is not the case that computers and digital technologies are unilaterally forcing themselves on texts and books. A contrasting view is actually more explanatory, with an internalist perspective revealing that writing and text dissemination have been a core element in the development of computer technology. Analysed historically, taking into account the enduring dominance of writing in human communication, it should be no surprise that writing systems and text exchange have profoundly influenced the development of modern information technologies.

The digitalisation of written language started in the telecom sector long before modern computers were developed. It started with the telegraph. When the Morse alphabet proved difficult to mechanise, Emile Baudot in 1874 developed a five-bit code system for the French telegraphic service based on time intervals in which signals were either on or off. In so doing, he created a binary digital code system with 32 combinations or characters (letters), and the digitalisation of text had begun (Berglund, *et al.*, 2004).

The British Post Office adopted a variation of Baudot's system as its telecommunications standard, other variants also became widespread, especially in teleprinters, and the variation led to a need for standardisation. In 1932, a transindustrial standard called "International Telegraph Alphabet Number 2", or ITA2, was adopted based on Baudot's code system. However, after a long development phase, the typewriter gained ground and a disparity arose amongst the number of characters on typewriter keyboards and the number transmittable via teleprinters. Based on ITA2, the coding standard ASCII (American Standard Code for Information Interchange) was implemented in 1963. This is a seven-bit, 128-character code system including all 96 characters on a standard English language keyboard (Berglund, *et al.*, 2004). The system quickly spread throughout the telesector and was also introduced in the computer world.

Thus, an important element in the development of the computer came in the 1960s when the keyboard started to replace the punch card as input unit, and line-based text editors and teleprinters were developed and used for writing commands and presentation of results. With this change, the digital character coding of telecommunication was decidedly brought into computer technology, and most computer manufacturers started using (variants of) ASCII. The bringing together of teletechnology and computer technology changed programming and hardware, and the convergence greatly influenced information technologies, also within the book industry. From early line-based text editors, word processing systems and layout programmes were developed. Gradually, people started using keyboards and electronic screens for writing of text and layout, and when personal computers were introduced they mostly resembled advanced typewriters. The PC was quickly brought to use by writers, and the computer's efficiency in processing text was an important contributing factor to the proliferation of personal computers in the 1980s.

Another significant consequence of the telecommunication and digital convergence was that from the end of the 1960s computers were connected in networks so that documents could be transferred between different machines. These networks were later interconnected to form the Internet, and applications for text exchange, like e-mail and Usenet, became important for the popularity of the Internet. When the World Wide Web was introduced in 1991, the network in the first years was based on a hypertextual connection of text documents (Berners-Lee and Fischetti, 1999) [20]. With readable screens and the introduction of the Web, the computer developed into a full-fledged text medium, resulting in all kinds of text communication being digital (Bolter and Gremala, 2003). The WWW quickly spread and clearly uncovered a need for a universal character set. In 1991, large actors like Apple, IBM and Microsoft formed "The Unicode Consortium" [21]. Today, Unicode dominates digital text coding, being an interoperable standard with the capacity to represent all characters in all written languages. Analysed in an internalist perspective, step-by-step, digitalisation of text, electronic text production and network-based text dissemination have been vital for the development of computers and modern information technologies.

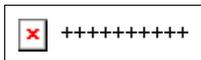


Models in the study of the book

The digitalisation of the book is part of this story, and electronic books have been envisioned since the earliest days of computers. To shed light on the digital transformation of the book, in a project (funded by the Arts Council Norway) [22], a group of researchers developed a model of a text cycle. However, this model is not the first to be applied in the study of books. We have already mentioned Thompson's models of the publishing cycle and the publishing chain (both describing paper book processes) and Anderson's model of "The Long Tail."

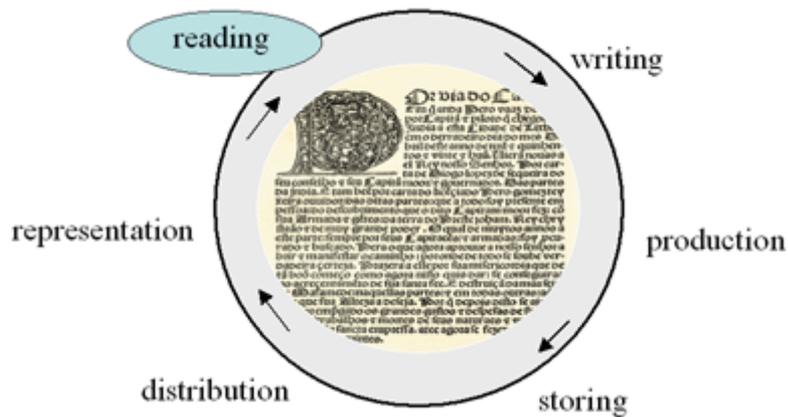
In *The Book History Reader*, a model of a communication circuit formulated by Robert Darnton (1982) shapes the structuring element in the study of the history of the book. Darnton's model describes the production and distribution of books, and is derived from early linear communication models. Bending these models into a circuit, Darnton populates the circuit with authors, publishing firms, printers, colporteurs, booksellers and readers. Even though Finkelstein and McCleery use the model in their books, they point out that Darnton has been criticised for having taken a starting point in the book sales of eighteenth century Europe when formulating his model, and that the model is poorly suited for the study of the book in other periods, particularly for the study of the manuscript tradition (and we could add: for the study of digital books). By choosing the circuit as metaphor, Darnton is also criticised for undercommunicating the intertextuality and extraction of books. Adam and Barker [23] express it as follows: "The text is the reason for the cycle of the book: its transmission depends on its ability to set off new cycles."

The cycle metaphor, and especially the image of a life cycle, is frequently used in models describing the production and sale of text documents. Tenopir and King (2000) take a starting point in King, *et al.*'s (1981) model, "The life cycle of scientific information," when studying scientific periodicals. Tenopir and King emphasise the dynamic aspect in the life cycles of scientific articles: Research and scientific articles evolve on the basis of previously published results and articles. The life cycle metaphor implies, however, that books and articles die. And to be sure, many publications are forgotten or disappear, but many texts "live" on (as illustrated by the long tail) and some reappear. Many books are also the starting points for the creation of new books.



Different text cycles

In the Norwegian research project mentioned previously, we chose the cycle — not the life cycle — as a metaphor in formulating our model. So as not to formulate the model specifically after the periodical genre (Tenopir and King) or the eighteenth century book sales (Darnton), we used the terms "text" and "cycle" in coining the generic concept "*text cycle*." We wanted to arrive at a model consisting of the basic phases in the cycles of all written information, independent of genre, medium or era. Our point of departure was that every text is written and produced, that it has a system for storage and representation of verbal content, and that it is distributed and read. All text cycles consist of the phases *writing, production, storage, representation, distribution* and *reading* (Hillesund, 2005).



To illustrate what digitalisation of books involves, we used the model in a comparison of the text cycle's three basic types: written, printed and digital. Script is common for all of these text cycles. With the development of written language, verbal communication was made possible in visual form. By etching characters into smooth surfaces, verbal information could be stored in time and transported geographically. In written text cycles, text was produced by hand, and historically a number of materials, techniques and characters have been used — everything from stylus, clay and cuneiform characters to pen, paper and phonetic alphabets. Finkelstein and McCleery (2005) need not be accused of being determinists when they make reference to Walter Ong (1982) who asserts that the written languages have had great consequences wherever brought to widespread use. One of the ingenious characteristics of written text cycles is that the same physical means are used in all phases of the cycle. With the help of a pen, scribes can write a text by applying ink in a particular pattern on parchment or paper. In this way, with the help of ink and paper, the text is stored, and in the same form distributed and read.

In the very long development of written communication, Roger Chartier (1995, 1997) believes that proliferation of the codex — or the bound book — in the centuries after Christ was crucial, opening up new ways of organising and accessing verbal information, replacing the ancient roll. Others, such as Elisabeth Eisenstein, place more emphasis on the art of printing, first developed in China and then in Europe around 1450 AD. Paper, invented in China, came to Europe by way of Arabs in the thirteenth century and was brought to use by Johan Gutenberg in his printing press.

With the art of book printing, a new phase was introduced in the text cycle. What happened was that the manufacturing of text was divided into two phases: writing and production. The original manuscript now became the starting point for a new process where the text was edited, set up and printed on paper; the same text was thus reproduced in a large number of copies. This was an efficient process, and during the course of a few decades, print shops spread to most large cities in Europe. In her treatment of the art of printing, Elisabeth Eisenstein (1979) has often been misinterpreted as a hard media determinist despite the fact that she underscores it was in interplay with other factors that the art of printing became so important in Europe.

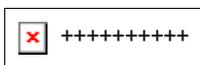
However, comparing basic features of handwritten and printed publications, such as books, scholars such as Chartier (1995) have found that in principal they are very similar. This similarity is most clearly exemplified by the small, one-volume Bible manufactured in vast numbers in the university town of Paris in the thirteenth century. This medieval book was octavo in size and the physical layout of the Bible is the same even today, after more than 700 years, with the same order of books and headings, the same division into chapters written in black ink in two columns, with the same binding, coloured edges and leather jackets in black,

red or blue, the three colours of thirteenth century Parisian painting. The only difference is that the silky–thin uterine vellum has been replaced by tissue–thin paper and the microscopic script by printed characters (De Hamel, 1994). Both types of books are written or produced by applying ink to the vellum or paper in patterns that simultaneously store and represent the text, and in this form the text is distributed and read. Compared to script technologies, the art of printing predominantly involved a dramatic increase in productivity.

In the nineteenth and twentieth centuries, in a process started in the telegraph sector, text was digitised. Viewed in light of the cycle model, this was a great change and substantial differences exist in written and printed text cycles on the one side, and digital text cycles on the other. At the core of these differences are contrasting ways of storing and visually representing text. In written and printed cycles, storage and representation of text is done in a combined process, as we have seen, whereas in digital text cycles storage and visual representation take place in separate processes; text is stored electronically (or otherwise) in a binary system independent of the final representation and reading of the text. In digital environments text is actually represented at several levels: in memory, at machine level, abstractly using the digits 0 and 1, in character codes, as communication signals and as pixel patterns temporarily forming letters on a screen.

The separation of storage and visual representation gives digital texts other properties than those of written and printed texts. While printed text is pressed into the surface of the paper and stored in an unchangeable pattern, digital texts can easily be changed and given new typographical features; where printed texts are fixed, static and permanent, digital texts are manipulable, dynamic and temporal. Printed publications, like books, are physical objects that must be transported from printing shops via distributors to booksellers, libraries and readers, whereas digital texts can be cloned indefinitely and transmitted to other computers via cables and wireless networks.

Thus, in digital text cycles, all of the phases are changed: Texts are written and produced in computer programmes, they are stored electronically, texts are distributed with the help of signals, and they are represented and read on screen. By combining digital technology and networks, a number of digital forms of communication have been developed, such as e–mail, discussion groups, Internet pages, search engines, chat, blogs, SMS, digital teaching aids, online newspapers, periodicals — and electronic books. Today most of what has traditionally been printed has got a digital equivalent, including encyclopaedias, dictionaries, law books, handbooks, reports, official propositions, government information, business reports, professional books, religious books, non–fiction and fiction. According to Bolter (2001), some groups, such as scientific researchers and some in business and government, are transferring their allegiance from the printed page to the computer screen, thinking of the computer as their primary medium.



Digital remediation of text

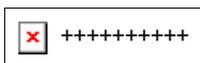
In *Writing Space: Computers, Hypertext and the Remediation of Text*, Jay David Bolter (2001) claims that “digital technology is turning out to be one of the more traumatic remediations in the history of Western writing.” One reason, Bolter says, is that digital technology changes the physical “look and feel” of writing and reading, and in his analyses of the digital remediation of text he quotes Roger Chartier (1995) who argues that the current shift from print to digital technology entails a change greater than the one from manuscript to print:

“Our current revolution is obviously more extensive than Gutenberg’s. It modifies not only the technology for reproduction of the text, but even the materiality of the object that communicates the text to the readers. Until now, the printed book has been heir to the manuscript in its organization of leaves and pages [...] and its aids to reading (concordances, indices, tables). The substitution of screen for codex is a far more radical transformation because it changes methods of organization, structure, consultation, even the appearance of the written word.”

For Bolter, the shifts from papyrus roll to codex to computer all represent “remediations” in the sense that a newer medium takes the place of an older one, borrowing and reorganising the characteristics of writing and text in the older medium, thus involving both homage and rivalry. According to Bolter, our notion of a book as a definite physical object is very closely tied to centuries of experience with the printed book. Bolter, taking an opposite view to Finkelstein and McCleery, suggests that books, regarded as texts, can be represented in a variety of media: written, printed, audio and digital, however not, as Chartier particularly underscores, without varied characteristics and diversified receptions and interpretations.

According to Chartier and Bolter, the essential point is that computers and printed paper are two very different text media with contrasting basic characteristics; opposite features have thus encouraged different kinds of reading and use. The physical nature of printed books makes them tangible, easy to leaf through and highly navigable, an advantage enhanced by use of pagination, chapters and sub-chapters, headers, footers, indices and tables of contents. Locally, physical books are extremely accessible — they stay where last put. Printed books and papers can be piled up and spread out and made available at the length of an arm, in positions from which they can be consulted, underlined and annotated as part of a working process (Sellen and Harper, 2002). Printed books are also highly readable and allow for sophisticated combinations of text, illustrations and graphics; printed books are thus effective reading technologies and often beautifully designed artefacts.

Electronic texts occupy very little space and are globally accessible and searchable. When downloaded (or locally written) e-texts are read on screen, either on desktops or laptops, they are navigated indirectly by use of mouse, keyboard or stylus. In e-books, tables of contents, linking and search functions make navigation relatively easy and personal adjustment of font sizes improves reading. E-texts and e-books can be stored in vast numbers, and entire libraries can be carried about on portable computers. Electronic texts can easily be copied and pasted and reused in other documents and applications. By linking capacities, e-texts point to internal resources such as dictionaries, and to external resources such as remote Web sites and documents, making electronic texts in a sense borderless and part of a global web of texts. Thus, due to different advantages or “affordances” reader usages vary; printed paper is dominating reading of lengthy texts, whereas computers are widely used in finding information and in reading of short texts. A combination of computer and paper is most often employed in the process of creating texts (Sellen and Harper, 2002).



Different book cycles

Even though Thompson’s analysis, like Epson’s visions, builds on a form of wishful thinking (a hope that paper books will survive), his description nevertheless illustrates how the printed book cycle has changed. In turn, writing, layout work and all the work before printing are transferred to a digital platform. In digital form, the book is part of a digital text cycle where it

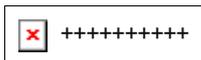
can be stored, distributed and read. The moment the book is printed, however, it enters a paper-based cycle with the traditional sales links — distributors, booksellers and book clubs. The book is eventually read by turning the pages, as always. Today, it may safely be said that the book industry has one foot in a digital cycle and the other in a paper-based cycle.

The efforts of Amazon and Google do not change this situation. The glances provided by Amazon's "Search Inside" are teasers offered to encourage readers to buy the accompanying printed books. Both "Google Book Library Project" and "Google Book Partner Program" (the two parts of "Google Book Search") present low-resolution images of book pages, not at all meant for reading, but for finding relevant books. Google earn their profits in advertising and rerouting of customers to vendors where the proper books can be bought, usually in print editions. The Google scheme, however, also points to the powerful potential of a direct (commercial) download of digital books with no handling of physical objects whatsoever, which of course is the concept of digital libraries such as ebrary. In ebrary, subscribers carry out a full-text search in the book database and choose which books to read in the ebrary Reader, a rather unpretentious reading application. Based on their findings, in addition to reading online, subscribers are allowed to print portions of the books on their local printer. Thus, in most respects, ebrary is not very dissimilar to traditional electronic publishing.

Paradoxically, most electronic publishing also has a foot in a paper-based text cycle. A large number of texts that are published electronically, such as periodical articles, reports and e-books, are originally created to appear on paper. Because they are produced digitally, the texts can be redistributed over the Internet, which is often done in PDF format. PDF documents can of course be read on screen, in applications such as the ebrary Reader and Adobe Reader, but research shows that a majority of users prefer to print out articles (and book portions) and read them on paper (Hillesund and Noring, 2006). This enduring paper influence has deep historical and cultural roots. The entire early text digitalisation was based on paper: the resulting texts were to be printed industrially or locally, including many of the texts that were exchanged on the Internet. In the cycle of electronic publishing what happened was that, in addition to production, distribution also became digital, thus moving the printing of the article or book to the recipients of the text.

It is only recently, after the proliferation of Web and high-resolution screens, that pure digital text cycles have evolved. In these cycles reading is done directly on digital equipment and no paper is involved. With the spread of the Web and HTML, this form of communication represented a new and flexible way of presenting textual content, as already mentioned. In the Web interface, a number of new genres developed, most of which involve text being read on screen. Also many e-book formats (too many as it were) are made for screen reading and used in specially designed reading applications. Today purely digital e-books are sold in a number of online e-book stores, such as Ebook.com [24] and Fictionwise.com [25], and many digital libraries, such as Electronic Text Center at University of Virginia Library, keep thousands of literary classics for free download [26]. Sales of e-books vary around the world; in the Scandinavian countries of Denmark and Norway e-book markets are practically non-existent, whereas in South Korea e-book sales are relatively high [27]. Even if e-books are a niche product and sales are low in the U.S., e-book sales are growing faster than in any other sector of book publishing [28].

These recent book developments may be considered in light of the text cycle model. In principle (if not in practice), paper is no longer needed in writing, production, storage or distribution of text. What really keeps paper and printed books going is the reading phase and primarily sustained reading of lengthy texts. The part played by paper is dramatically reduced within the text cycle, and its role may be further diminished by new reading technologies, as well as by environmental requirements (saving trees) and changes in social practices and reading habits, especially amongst the young. Thus, taking a long rather than short view, the reduced significance of paper indicates that the future position of the printed book is highly uncertain; a circumstance John B. Thompson seems to be only too unwilling to recognise.



Further digitalisation of the text — and the book

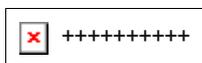
In his book, Thompson stops; he does not describe how the digitalisation of text, after the Web was introduced, has entered a new stage. Today, technological development is concerned not only about improving the efficiency of print production (as within digital printing), but also increasingly more about improving and enlarging digital text cycles and digital reading. This new stage is an integral part of the general developments within communication where most media, like music, videos and TV are transferred to a digital platform.

Part of this overall development has been directed towards improving digital reading (or screen reading). We have already mentioned Unicode, which adopts new code standards every year. Today, all major written languages in the world are digitised. In companies like Microsoft, the typographical development departments have improved font rendering and screen typography for all Western as well as most Asian written languages. Computer screens have also improved. There is a big difference in the readability of today's LCD screens and the low-resolution, black-and-white screens that dominated the market 20 years ago. Screens, however, are yet not optimal for continuous reading, and electronic paper has been researched for many years. Since 2004, Sony has sold reading devices based on electronic paper in Japan, and from 2006 Sony Reader has been on the market in the U.S. [29] In 2006, iRex Technologies from the Netherlands (a spin-off from Philips) started selling Iliad, a reading device based on e-paper [30]. So far, however, electronic paper has not lived up to expectations, but reports have it that the technology company Seiko Epson has developed e-paper with such high contrast and resolution that the readability is better than most printed matter [31].

In addition to resolution and contrast, for continued reading, the size of computer screens has been a technological and commercial challenge. For most people, the minimal screens on PDAs and mobile phones are too small for sustained reading, and the heavy screens on laptops and stationary PCs give a static reading position (Hillesund and Noring, 2006). There have been many attempts to develop lightweight and thin, wirelessly connected PCs with high-resolution screens the size of the pages in a pocket book. At the moment, Microsoft is developing an ultra-mobile PC called Origami [32], and MIT (among others, including Google) a hundred-dollar laptop in the project One Laptop per Child [33]. The e-book readers Sony Reader and Iliad have a screen approximately the size of a large pocketbook. Whether any of these devices proves to be right remains to be seen, but there is little doubt that many people in the computer business are expecting a technological breakthrough, particularly for e-paper, which will make it profitable to produce reading technologies able to replace paper in a growing number of situations.

In addition to hardware, there have also been software developments. Since eXtensible Markup Language was introduced in 1998, digital publishing has been increasingly based on this standard [34]. XML utilises the digital technology's separation of storage and representation of text and makes it easier to publish the same verbal content in several media, for example on the Internet, in e-books, in Braille, in automatic reading programmes and in print. XML also provides a basis for flexible screen presentation (re-flow or adapted setup), and the standard is central in text formats and reading programmes intended for e-books, such as the Microsoft Reader. Many large publishing firms have reorganised production in the direction of XML in order to utilise possibilities in digital text cycles as well as in print-on-demand (Kasdorf, 2003). When Thompson [35] discusses the introduction of XML versus PDF in book production, this is done from the publishing firms' strategic and (often short-term)

economic considerations. An internalist approach would have elaborated on the fact that XML was developed by the World Wide Web Consortium as an open, platform-independent standard designed to improve the production, transfer and viewing of documents — including books — over the Internet and on screen.



The publishing firms' scepticism towards e-books

The last years have seen technological developments within all phases of the text cycle. How this will turn out for the book is for the present uncertain. As Thompson points out, the further development of digital book sales is not only dependent upon technology, but also upon economic, social and cultural conditions, especially in relation to publishing firms and their handling of legal and copyright issues. Thompson's studies from the English-language publishing world show the same result we found in the Norwegian e-book project, that is, that there is a widespread scepticism towards e-books and digital publishing amongst publishers, a scepticism once again evoked by Google Book Search. This scepticism is understandable and can be explained by the forms of capital (economic, human, symbolic and intellectual) Thompson regarded as essential for a publishing firm's position within a publishing field.

Economically, many publishing firms have burnt their fingers on CD-ROM and Web investments and have not been particularly willing to invest heavily in new e-book adventures. There is also a great fear of "cannibalisation": If e-books that are not very profitable draw the economy out of printed books, the publishing firms risk losing money to both.

Further, employees in publishing firms are generally interested in culture and few publishing people have extensive computer competence or insight into digital text cycles. Since human resources are tied to the handling of traditional publishing chains, it has been both individually and collectively convenient to shove the handling of digital publications into a slot of their own alongside the main activity of the publishing firms, which is still to produce paper books. In the literary field, e-books unquestionably have a lower cultural value than printed books.

Moreover, one of the publishing firms' most valuable assets is their right to exploit book content: The control over the rights gives the publishing firms power in relation to authors, readers and different actors who want to exploit the content of books. When e-books were introduced at the end of the 1990s, publishing firms quickly discovered that pirate copying and dissemination of unencrypted versions of books could undermine the publishing firms' own sales. Experiences from the music industry did not reduce this fear, and the majority of publishing firms have chosen to introduce a very restrictive digital control of rights on e-book publications (Lynch, 2001). This has greatly influenced the technology. Both the design of reading devices and the formulation of the e-book sales are often built on proprietary, closed and not especially reader-friendly solutions (Hillesund and Noring, 2006).

In the sale of e-books, traditional composers, printers, booksellers and book clubs are replaced with e-book designers, Internet providers, e-booksellers and companies providing systems for digital payment and control of rights. When, in addition, the actual production of books is changed, there is little doubt that e-book distribution constitutes a text cycle very different from the printed book cycle. In this situation, it has been rational for publishing firms to use their control of rights and their role in the publishing chain to control the digital changes such as to retain their central position in the field of publishing (Lynch, 2001) Even though it is difficult to support empirically, much in the publishing firms' acts and statements (in both Thompson's and the Norwegian study) indicates that the publishing firms are satisfied with a

situation in which printed books dominate book sales, and that they make few active attempts to further develop the e-book markets. In fact, most publishing firms want e-books to remain a niche product. Nye (2006) provides many historical examples of actors who worked against the proliferation of new technologies, and Winston (1998) calls the phenomenon “the law of suppression of radical potential.” This suppression is not entirely negative: Through opposition, new technologies are formed by cultural preferences and economical realities.



Summary and conclusion

There is little to indicate that the printed book will soon disappear. Robert Darnton (1999) says that written and printed books have an “extraordinary staying power.” In the article, “The New Age of the Book”, he writes:

“Ever since the invention of the codex in the third or fourth century AD, it has proven to be a marvellous machine — great for packaging information, convenient to thumb through, comfortable to curl up with, superb for storage, and remarkably resistant to damage. It does not need to be upgraded or downloaded, accessed or booted, plugged into circuits or extracted from webs. Its design makes it a delight to the eye. Its shape makes it a pleasure to hold in the hand. And its handiness has made it the basic tool of learning for thousands of years ...”

Robert Darnton is considered a pioneer within the field of book history and has a good eye for the special qualities of written and printed books. Nevertheless, he has an interest in e-books and digital texts, which he believes can supplement and replace printed books in many cases, particularly within research and education.

In this article, we have seen that there is new interest for the study of the book, both historically and contemporarily. The book industry has changed in the last decades. There has been a strong concentration of publishing firms in large publishing groups, which are often owned by multinational media companies. Concentration has led to a more commercial publication policy and an internationalisation of the book markets. Book production has changed in that the workflow, particularly writing and layout work, has been transferred to a digital platform. This has paved the way for new search potentials and marketing strategies, utilised by online companies such as Google and Amazon, resulting in growth of niche book markets, sometimes referred to as the long tail. As digital objects, books also enter purely digital text cycles, and international sales systems have been developed in which digital content and e-books are sold over the Internet and read on digital equipment. Sales of this kind result in a radically changed publishing chain, and publishing firms have until now exploited their control of rights and their position in the chain to steer and control this development.

Publishing firms have great power in the literary field and in the book industry, but they do not operate in a vacuum. The development of digital text cycles, such as those described in this article, is not only directed towards book production, which from an economic point of view is very small, but towards all activities that base parts of their activities on exchange of text documents. Digital text cycles are central in the management of companies, in public administrations and organisations, and they are important in dissemination of news, in scientific discourse and education. Many of these areas of society intervene in the activities of publishing firms. We have mentioned scientific research and sales of periodicals, which have

become increasingly digitised, and university libraries, which have come a long way in offering digital content services, including e–books. A large number of universities have built their own digital libraries, and we have mentioned the European digitalisation initiative, partly a response to Google Book Search. The education sectors, which many publishing firms depend upon, base much of the pedagogy on PCs and digital teaching aids. In many developed countries, it has become a requirement for students in the upper secondary school to have their own laptop computer. A huge amount of free information is available on the Internet, *i.e.* on Wikipedia, and for third world countries, a hundred–dollar laptop is being developed in the One Laptop Per Child project. Ironically (from the cultural capital point of view), fiction or *belles lettres*, with its relatively simple typography, is technologically the easiest type of literature to distribute and present in digital text cycles. Mats Dahlström (2005a, 2005b) points out that an extensive exchange of illegal e–books is taking place in popular file–sharing services on the Internet. Huge amounts of classic literature is also freely available in digital form, and even though it has its weak points, the U.S. and other countries have commercial sales of e–books on the Internet, and sales figures are growing.

This results in a situation that is both complicated and challenging for publishing firms. Several times, they have changed book production by introducing digital writing and layout tools, only to experience that digitalisation of the text and the book continues, and that digital text cycles are characterising more and more of the written language communication in society. What this will lead to for the printed book is not possible to predict, neither for publishers nor for researchers, but certainly the book and the book industry have advanced to be as a very interesting area for scientific enquiry. To understand the scope of the developments, however, it is not sufficient to explore the book industry applying traditional economic and sociological concepts, as John B. Thompson does. In addition, researchers must perform internalist analysis of the technologies that are shaping — and are shaped by — the book and the industry. 

About the author

Terje Hillesund is an Associate Professor at the University of Stavanger, Norway. He has a Masters Degree in Sociology from the University of Oslo and a Ph.D. in Media and Communication Theory from the University of Bergen. His main research interests have been in printed media — newspapers, journals, and books — and their transformation in the age of computers and the Internet. From 2000 to 2002, Dr. Hillesund led a project for Arts Council Norway in which a research team studied the potential impact of e–books on the Norwegian book industry. The results were presented in three reports in 2002. Dr. Hillesund has published scholarly articles on subjects such as e–books, digital reading, XML, digital text editions, and open access.

E–mail: Terje [dot] Hillesund [at] uis [dot] no

Notes

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