

## **E-readers are for reading**

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The e-reader storm is sweeping over the book and library world as a tornado. The end of the publisher, the end of the library, and even the end of the book as such is close. Is this the Doomsday for literacy? Below I will address a series of pertinent questions that have to be tackled before we dress ourselves up for the post funeral party.

### **What is reading?**

The vast literature on the history of writing, reading, publishing and librarianship is grounded on the fundamental notion that human communication by written text is one of the essential ingredients for our present day culture and society. The change from mnemonic icons to versatile alphabets enabled the fixity of well-reasoned thoughts by reading. Progress is not anymore dependent on person-to-person contact as in small clans. Writing and hence reading became a universal memory.

As is well established and subject to in-depth research, reading and hence writing is not a “natural” sense such as speech, smell and touch. This is well illustrated by the fact that we can smell and listen to our earphones while biking, though we cannot read except very short messages, which for that reason are normally displaced in iconic form as traffic signs.

Reading and writing are human capabilities that developed only late in the history of homo sapiens. The history of the book is also social history. For a good overview of all aspects that lead to e-books, see Van der Weel (2011).

The technological developments from clay, via moving type, to unicode is not only an enabling of a stable way of expression, but also an engine in shaping new forms of communications. Elsewhere, I argued more extensively about the mutual interaction of technology and communication (Kircz 2010). Although a message can be represented, or made public in very many media, every medium has its own characteristics which makes it the preferred medium for certain types of reading. If this were not the case, we would not have so much discussion about the transition to electronic media.

Reading is physiologically a unique capacity. Over the last decennia, much work has been performed by neurologists in order to try and understand the human language faculty. Recently brain research furthered our understanding of the faculty of reading (Wolf 2008). But even if we do ever discover the mechanics of reading, understanding and communicating remain a highly social activity. It is in that social process that we have to reconsider our notion of literacy.

Despite the return of the pictograph in our modern world in the form of computer screens filled with icons, almost all content is dissolved in text. Even the most silly computer games need textual help for the uninitiated. This brings us to the old issue of genre and style. The writing of manuals demands a highly structured and in itself coherent approach. Poetry and prose have many diverse, established styles, but the flow of information is always distinctly different than in a manual. In a thriller, the reader must be kept spellbound till the end. In a manual or dictionary, the reading time spend by the reader must be as short as possible. This immediately indicates that the medial presentation will be different.

Thus, if we want to discuss the transition to electronic media, where the memory function is not anymore in the presentation as in books, but in storage, we are confronted with two aspects: the way the authors structure and store the message or story, and subsequently, the way this stored story is represented in a medium, which enables reading by the human eye.

Literacy then becomes the capacity to read and understand very different messages in very different presentations, just as reading a full score during an opera performance.

If we turn to multimedia, we can start with childrens' picture books where small children are taught language using pictures. This is an apple, means that the recognition of the 2D picture of an apple is translated in the abstract word apple. The picture is primary information and the word apple is an explication in language of the very object. Only after a human master reading, do we see a sea change in which the linguistic reasoning becomes primary information and the picture becomes secondary; it becomes an illustration of the text. This becomes even more clear in science. In the mathematical presentation of a hyperbole, it is sufficient to use the formula and mathematical language to develop new ideas and applications, such as space-time physics . However, the picture of a hyperbole has much more explanatory value for non-mathematicians even when they are told that the thickness of this ink line on paper is supposed to be nil. In an electronic environment, we are able not only to draw lines, but to include animations, pictures, sound, video, games and shortly 3D vision and haptic elements. It goes with saying, that this explosion of expressiveness has been and will first commercially exploited by advertising and entertainment. But when the glittering dust settles down and people become used to the new electronic capabilities, we will be confronted with the steep uphill route towards new ways of writing. Writing in which again, as in the early periods of the wood bock, we have to understand the dialectic between abstract text and now plural types of illustrations, helping us to understand the texts as well as primary visual aspects of auditive information that demands linguistic explanation.

And here, we see the great challenge in new multimedia literacy. Novels, text without pictures, are the easiest objects for reading on electronic devices. As long as the type found and face are ergonomically correct, easy reading will be possible. The most important obstacle today is the quality of the screen, as the swift and versatile back-lit LCD screens of laptops and tablets are notorious for tiring the eyes, whilst the stable e-ink readers are still in a first stage of development, allowing beautiful reading but not yet easy manipulation of text. In the case of educational or scientific books, the stakes are higher than with novels, because here we have developed a high- level tradition of lay-out of text and scholarly books. This lay-out can, of course, be copied into an electronic reading device, but it is immediately clear that this is not more than a chimera of what an electronic multimedia book must become.

As a class apart, we have to mention those books that are in fact not books for reading, such as all kinds of directories. Here, reading is only a simple way of obtaining short chunks of pertinent information such as a telephone number, address, or the translation of a word from one language into another. These publications, for which the book was only a transient state in their way to maturity, cease to be found anymore in book form, but all exist now as mature databases.

The new multimedia literacy will become a mixture of the traditional linguistic capabilities, and visual and auditive forms of communication, which means a new mixture of different neurological and psychological human features. The flipping of newspaper pages is, on the web, already changed into a hopping between textual, spoken and visual information units. The relationship between them is far from seamless. It will take a long time before we reach a reading culture in which all elements find a “natural” place in the narrative.

### **Text and structure**

The abstract equivalence between a notion on the one hand and a sign or word on the other is extended by the equivalence of parts of speech or whole paragraphs with words that are shorthand for complicated notions. This means that the structure of text is very important in understanding text. In earlier work (Kircz 1998, and references therein), it was argued that based on a historical analysis of the various forms of text production, in an electronic medium, the next stage of comprehensive chunks of text will be a module; that is, a self-contained, coherent and comprehensive piece of text, fit for re-use. This idea was worked out for scientific texts in molecular physics by Harmsze (Harmsze 2000, Kircz&Harmsze 2000).

Also in the fields of critical theory and humanities, much work has been done in what Landow (Landow 2006) calls *reconfiguring the text*. In these semantic approaches, whole parts of texts figure as small meaning-objects in comparison with iconic meaning-objects such as a waste bucket on the desktop screen, which means: “*Delete the name of this file from the file allocation table and put it for a while in custody, until you decide to free it back to a directory or kill it forever. Though only the entry is deleted and only after the bits on the disk that contain the file information are overwritten, it is still retrievable with special software*”.

The real challenge in e-reading is not the quality of reading and the ergonomics of the e-reader device, though very important for its acceptance by the public, but the way we structure coherent electronic publications.

I already mentioned the idea of modularity of information. This means that a narrative is structured according to a system that represents the flow of reasoning. Legal judgements are a good example. In all argumentative texts, and most texts are argumentative, we have a clear division between statements, background information, discussions, conclusions, etc. This structure can be very domain- and genre-dependent (see De Waard & Pandermaat (2010) for a model in molecular biology). But having said that, we are immediately confronted with the essence of hypertext, namely the linking of information chunks. It is like chemistry. If we decompose a molecule into its constitutive atoms, we lose the essential features of the molecule. Water is not a pure addition of two hydrogen and one oxygen atoms. The glue, which makes a completely new independent molecule from independent atoms, is called the chemical binding force, of which various

kinds exist. In hypertext, the binding forces are called hyperlinks. However, hyperlinks are a most under-developed field of research. After all these years of web technology, links are still not point-to-point links and are unable to relate unambiguously a piece of text with another piece of text, in another document. Even worse, links are still considered symmetric. However, in real reasoning, links are totally asymmetric. If I refer to another information object, be it a whole document, a paragraph, a picture or a Youtube file, there is a reason. There can be many reasons to add a hyperlink to another person's work, e.g., I agree, I disagree, it proves my point, it is idiotic, it shows my scholarship, etc., etc. But in the reverse direction, the link has a different meaning. If I refer to the work of another author as particularly valuable, then in the reverse direction, this does not mean that the cited author considers my work as valuable. If I point to an explanation elsewhere, the link means 'go to explanation' but the reverse link means 'this text is used elsewhere to explain something'.

Links with meaning are at least as valuable as identifiers for retrieval purposes as nouns (Kircz 1991, Sillence 1992a&b). But links represent activities and activities are not nouns but verbs. Verbs are notoriously difficult to classify (Fellbaum 1998) and so are links.

To make a semantic representation of relationships, necessary for a coherent understanding of a whole collection of works, still demands a lot of hard labour in the field of argumentational structures. For scientific papers, Kircz & Harmsze (2000) have suggested an approach.

The other side of this necessary dissection of wholes into linkable independent coherent entities that are fit for reuse is to get a better notion of what a comprehensive entity is. After all, a narrative, or even a highly hyper textual game is still a singular narrative, just as Danielewski's (2000) *House of leaves* is a novel with a beginning and an end. In the same vein, every single scientific article is a leaf in the broad-leaved forest of a particular scientific field, but is still the unique expression of its author(s). In the intrinsic eclectic world of electronic publications, it becomes more than ever important to grasp what the coherence of a literary work is, and what the essence of a text book is.

Thus, to conclude, the quest of "what is an e-book?" is much more far reaching than the transformation of a traditional paper book into an electronic form. Even that is not so easy, as was already discussed by Clifford Lynch (Lynch 2001) in a way that is still relevant today.

## **Testing understanding**

In a modest attempt to scratch the surface of the issues discussed above, at our institute, we started a research programme on e-books called: Amsterdam E-boekenstad, or Amsterdam E-books city in English (AEBS 2010). In this project, which is supported by the Stichting Innovatie Alliantie (SIA 2010), we collaborate with publishers, distributors and library organisations in order to get some understanding of how the transformation of textbooks into an e-realm will take place. We have four distinct tracks: usability of e-readers, in particular e-ink readers, the business model for educational material including all partners in the value chain, the technological and ergonomical aspects and finally the editorial process of how to transform the production chain from author to reader. Our first results are now reported on our website. In the usability track, we divided a group of 79

second-year marketing students into 3 groups. 30 students got the IREX DR1000 e-ink reader with a 10.2 inch screen, the largest screen on the market. 28 students worked with laptops and 23 students used paper. They all used the same textbook for 10 weeks. Before we started, we had discussion sessions to list the expectations, which were very high. At the end, we again discussed all experiences. In short, paper came through with flying colours. In fact, half of the laptop users changed to paper, while most of the IREX users did so. The main problem with the laptop was that, although you could search easily, browsing was a nuisance. Furthermore, the fact that there were many other applications on the laptop, like chat programmes, e-mail, etc., which distracted the student from conscientious reading, was a big issue. The e-ink reader was mostly dropped because it was too slow in starting-up and browsing and ergonomic not ideal. Apart from that, both non-paper groups were disappointed that the e-version was just a pdf of the paper version and not an enhanced version with extras typical for an electronic environment. This was certainly an enormous drawback, as the expectations of e-reading were unconsciously linked to easy text manipulation together with scribbled notes and annotations. Here, and in a second group of students from our Interactive Media Department, the total “dullness” of the e-reader was a main critique. This, more-or-less, expected results, show that a simple “copy” of a paper book into another medium is not sufficient to establish enthusiasm. This is in concordance with the large success of sales of novels in e-book form, as these electronic copies are for linear reading from beginning to end of a sequential story. When we shared our first result with the manufacturer, the common conclusion was that the actual first generation of e-ink readers is really best for solid reading only. A second test is now underway in which we test the same IREX reader with members of city councils. These people receive piles of documents to read, discuss and make decisions deriving therefrom. Having everything in an e-reader can be an enormous advantage.

Textbooks demand intensive browsing and referring forward and backward in the text. In planned further research, together with Dutch professional textbook publishers, we want to concentrate on the authoring and editorial aspects of e-learning environments in which the book is an integral part.

As discussed in a separate line of research, we look at the business model for electronic textbooks. Here, we again face the discussion of the whole and the part. Financially and pedagogically, we have to consider the opportunities as an integral whole. Only then we will be able to define the technical pre-condition for a paper- poor electronic learning environment, not by following today’s techohype, but by establishing the social and pedagogical tasks which technology has to provide, in order to make an e-book more than a flashy redressing of a printed text. In an institutional educational environment, we have to take the integral cost price into account. This means that on the cost side, we have to incorporate equipment, data infrastructure and storage, helpdesk and website management. On the benefits side, we have the individual buying of books, damaging of books, and tens of millions of photocopies and prints, because in an e-learning environment, student papers and every other document is also supposed to be electronic. In our first workshop of which a report (in Dutch) is given on our website, the issue of aggregators and licensing became prominent. We will try to develop further research on a model in which students find all books they need for one year, in one listing, which also provides the e-books. A practical idea then would be that all books are made available in one licence structure, to be paid for by the student, or as part of the tuition. This way, books that are only partially or temporarily used in a course are also

now in the packages, as it turns out that students show a high resistance against buying books that are not frequently used. This study package might then also become a permanent source for the young professional after leaving school, if such a licence agreement could be extended into a personalised licence for an extended period of time.

As said, the research mentioned is only the beginning of a recent programme. In a year's time, we hope to be able to report more.

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