

E-gadget or E-reader?

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Digital technology changes our world and reshapes the scientific, social, political, cultural, commercial—and romantic—relationships between people. A short love letter written on birchbark (a not uncommon carrier of communication in mediaeval Russia (<http://gramoty.ru/>) is intentionally not very much different in content than a modern text message (SMS) or tweet. The differences are mainly the ease and the frequency of exchanges and this certainly influences the subsequent developments and their social consequences. Technology enables communication. Communications between people are manifold and each has its own socially established grammar. The in-depth conveyance of knowledge, for example, demands the publishing of solid ‘volumes’ at a steady pace. The latest gossip which might influence a stock market price on the other hand is short and immediate, as stock market trading is nowadays for more than 50% of cases based on algorithms working on a millisecond scale. Interestingly, the reverse is also true: communication is a driving force within technology. Without the need for fast worldwide communications the technology boost would have never happened. Thus, while communication and technology are tightly interwoven, it is certainly not the case that one size fits all. The opposite is true, as technology enables a more precise and specific means for each different type of inter-human, or nowadays also inter-machine, communications.

In essence, the study of electronic books is the study of the interplay of technology and message. This is exactly the reason why discussions on electronic books and libraries are not always very clear. In this journal Ruediger Wischenbart poses the question ‘has digitization changed what’s really in the book?’ (Wischenbart 2008). This poses an interesting question, as his paper starts with a discussion on the question, What is a book? In general his conclusion, which I share, is that the book is a social invention for an authoritative exchange of ideas. The book embodies a comprehensive story, be it an educational textbook, a scientific treatise or a novel. Essentially a book is a communicative device created for cover-to-cover consumption; it is an object in itself. It goes without saying that having made this declaration, it is crystal clear that at least half the books on the shelves are compendia, collections, haphazard conference proceedings, or anything else that just fits the form of the book, that is to say two covers with paper pages between them, in order to become a commercial product that goes with the flow from author(s) to shop shelves to reader(s). In my opinion the answer to Wischenbart’s question ‘has digitization changed what’s really in the book?’ is a univocal Yes! In the following, I will attack the issue from two sides: firstly from the communication point of view and subsequently from the technological angle. I will discuss the mutual thirst of communication and technology for each other, as both develop in close interdependence. Subsequently, I will deal with the pertinent demands of communications versus the seeming omnipotence of technology.

Communication's thirst for technology

The most characteristic human trait is its capability of linguistic communication. Following the development of writing, from mnemonic devices such as signs on wood or stone, knotted strings, to sign scripts such as Chinese and western alphabets, we see a never-ending experimentation with raw materials: how to engrave or mould them into recognisable shapes and forms in such a way that within a social context a message between people separated by time, space, or both becomes possible (for a good survey see Gaur 1992). In this first phase of written communication, we are immediately confronted with the huge problem of multiple copies of the same message and the integrity of those copies. Scribes copiously copied documents and books with great skill, but the vast literature on this issue shows that not only do we encounter problems of unintentional mistakes but also intentional improvements in order to meet contemporary language. The last practice is still with us. For example, the famous novel *Max Havelaar*, published in 1860 by the Dutch author Multatuli, on the miserable conditions in the former Dutch colony East India (now Indonesia) has just been re-issued in modernised Dutch (Van Es 2009).

The invention of the printing press, together with the ready availability of ample amounts of paper, changed the world (Eisenstein 1979, Febvre 1976). Multiple copies of exactly the same version (which by itself might be full of mistakes), fixed in print, enabled broadcasting in a new way. All readers could share the same word, and Protestantism could flourish.

Another beautiful example of how technology caters for a culture of communication is shown in the Islamic world (Robinson 1993). In the Islamic world, the printing press only became established in the nineteenth century. The deep tradition, was and is, to recite, to read aloud, the Quran. The oral tradition has been the backbone of Muslim education. The person-to-person transmission is the essence of Islamic authority. Hence, videotapes and now all kinds of digital streams of mullahs' teachings are extremely popular. No literacy is needed, for this kind of communication; it can even be skipped completely. Though we do hark back to mnemonic communication: just look at your computer or iPhone screen.

We are now entering a new phase again: a phase where fixity and change can go hand-in-hand. As readers, receivers of a message, enter a mental stage of contemplation, they feel the need for comment. This commenting can be in the form of scribbles in the text, coloured markers highlighting passages or words, notes and quotations in diaries or on scrap paper, excerpts in notebooks, etcetera. Feedback is very often in the form of letters to the author or editor using the same medium as the original.

This urge for digesting and contemplation of messages, be it love letters or scientific reports, demands technologies that allow the reader to mould the original into a personalised shape. My annotated version is distinctly different from that of another person. This brings us to the important distinction of change for private use or change for collaborative use. Scribbles in books by scientists or novelists, which were never meant for broadcasting, can be important input for biographers in an attempt to follow a person's intellectual trajectory or the study on the reception of a particular book (Gingerich 2004). On the other extreme, in the case of the Wiki, or any other collaborative writing tool, such small remarks have a purposeful goal, namely the joint effort to create a superior text.

Digital technology is enabling all kinds of text and picture manipulation. However, as with all technologies, we have to analyse which technology is suitable for what purpose.

If we collaborate in writing a research paper, a manual, or any other co-creation, the Wiki is now one of the most used writing pads. More people can co-author a text and all changes are stored, while comments on each other's contributions are made possible. In that sense Wikis are very open extensions of word processor capabilities such as *track changes* and *comments* in MS Word or *reviewer annotations* in WordPerfect.

All this points to the communicative need to change traditional one-way sending into multiple ways of interactive discourse; *pace* digital preservation.

The most interesting issue here is not what can be done with new digital technology, but what is the human need for certain communicative actions to enhance inter-human discourse and mutual education in a well-defined social setting. The best example is given by the mobile telephone. Less than half a century ago, it was normal that the person who stayed at home was confident that a traveller would send an airmail letter some days after departure to a far-away land. One century ago, a period of weeks or even months was not uncommon. At present, panic strikes if a mobile phone is not picked up immediately, independent of time and location on the planet.

The difference is not only on the level of concern for the other or the fear of abandonment of the self, but also the sharing of experiences. A long letter describing the excitement of passing through the Suez Canal on the way back from Asia is a completely different expression, than a short call, tweet or SMS, that just lets off emotional steam ('I miss U') or mentions a safe arrival.

A different example is reading a non-narrative book, which does communicate important human knowledge, such as the traditional telephone directory. If I lose the telephone number of my friend Jan Visser, one of the most common Dutch names, I refer to the latest directory in book form which lists the name of Visser about 740 times, in alphabetical order according to street name—strangely enough, indicating that the home address has higher priority than the first name. Obviously, this type of book is now completely obsolete as the online directory lists family name first and then alphabetically according to initials. Here I find 38 J.Vissers, with a single initial. This is much easier, although it turns out that almost in the same block there is another person of the same name. [**Note1**].

We see here that non-narrative texts such as a telephone directory were cast in book form, because that was the hegemonic technology when the directory was invented as a textual printed object of communication. These simple examples illustrate that, given a well-understood context; different communicative needs demand very different technologies. Messages such as: "Yes, I'm alive!" and "What is his number?" demands immediately usable database technology. Below I will argue more about the versatility of technology, here, the argument is that every kind of communication demands its own technological environment, even if a lower technological layer maps everything into the monomedium of zeroes and ones. Looking up data or any tabular information is much easier if the data is manipulable and not printed on sheets of paper. This defines demands vis-à-vis technology, on how to store and retrieve such information. Hence,

technology heralds the end of the printed directories. Handling data is the basis of *system requirements*. The same is true for novels, which we want to read at leisure. Only for novels are the requirements distinctly different than for messages. Novels need other reading devices than messages, as reading a novel is a different physical activity than a quick glance at a text message.

Technology's thirst for communication

Technology enables what it can enable. This might sound a bit obvious, but has deeper significance, namely that it does not enable what it cannot do. This seemingly double triviality demands explanation. Contrary to human fantasy and imagination, a device is primarily to be used for what it can do. This does not always dovetail with the original intentions of the inventor (for an elaborate overview of the specific case of the history of text and the computer see Van der Weel, 2011). The most recent example is the incorporation of a camera in a telephone, which the intention that people would feverishly use MMS (multimedia messaging service) to spend lots of telephone time. In practice, the demand for a small camera was a hit, but MMS is hardly used; digital photographs are normally not mailed but put on a dedicated website.

Hence the notion that technology is only capable of what it can do intrinsically is not the same as the notion that usage can be different than the inventor had in mind. This means that intrinsic limitations rule, technological as well as social. The research question is to what extent these limitations can be moulded into practical usage. The whole business of digitisation results from the fact that we are able to handle binary data streams better than analogue multiplication methods. Analogue methods are time and material consuming, while digital methods are at present of such quality that digitally recorded text or sound can be reproduced so faithfully that our eyes and ears cannot see or hear the difference from the original (provided that the output device is sufficiently fine grained to match the recording quality). Digital reproduction of digital files is in effect cloning, in contradistinction to the reproduction of, say, an oil painting or a signed certificate. The texture of a painting is still the distinguishing aspect between the real and the representation. The common word *reproduction* needs redefinition in the digital age as real (virtual) sameness becomes possible in some cases [**Note 2**].

Technology is typified by standardisation, scale and uniformity. This means that return on investments demands wholesale usage. The advancing of digital technology increases the transport rate from the telegraph key of a century ago of less than one letter, or 8 bits per second to a million times a million (one Tera) bits now. This capacity cries out for clients. When, in 2000, we were confronted with 'the biggest merger of history', that between the publisher Time-Warner and the internet company America on Line, the whole publishing industry was in a shock. Although, the merger in question did not work out at all, it heralded a completely new business concept in which the channel became the primary vehicle for revenue generation and the data steams, now called *content*, only a means for profit generation. It was as if running trains became the main activity, and conveying travellers a mere spin-off. Apart from interesting sociological aspects of complete alienation between goal (communication) and means (transport), this severely changed the operational models of the publishing houses. The greatest success has been achieved in scientific journal publishing. Scientific articles serve an essential rôle in the fabric of trust in and reliability of scientific results. The article plays various communicative roles (Kircz 1996). We can distinguish various rôles of readers, from the

informed reader who knows what she is looking for and only reads parts, to the non-reader who only wants to be sure that something is properly published (Kircz 1998). Hence, real reading of complete scientific articles is only partially the case. For that reason, putting all scientific articles online is a great thing as it enables hit-and-run reading as well as quick searches for those following adjacent fields and/or competitors. The huge scientific journal repositories are mimicking databases in the sense that they serve primarily a logistical rôle. Only after a certain paper has been identified as relevant, will it normally be printed and read.

The big issue is that the technology solves the memory issue, *pace* digital preservation, and many of the logistical problems. However, contrary to machine grinding of data, such as in genomics, the human digestion of the emotions, knowledge and information remains a physiological process.

Due to a lack of understanding of many aspects of the human–computer interface issue, we witness a tendency that, in order to play safe, all possible technological options are crammed into one device in the hope that the user will find a useful subset.

Most commercial text processing packages have so many possibilities pre-installed by the manufacturer (like getting an indent or start a bulleted lists in MS Word, if you just want an empty line) that people need courseware to return to the simple typewriter. The same is true in mobile phones, which outsmart the user with tens of thousands of applications which demand conscientious choices in order not to be distracted from simple communication. The so-called smart phones are indeed small mobile department stores with a great variety of products waiting to be consumed. In one way this versatility is a great advantage and ‘great fun’, but certainly for dedicated users who want to buy a doll and nothing else in the toy shop, these capabilities are not necessarily desirable. The consumption of a wide-screen film on a smart phone is like reading an abstract. We follow the story line, but miss everything that made it a wide screen film.

Early adopters are an important commercial segment, but they don’t represent the majority of the population, who only use a small fraction of all opportunities and challenges.

The fantastic pace of development in electronic devices leads to overcapacity outflanking dedicated use. The fact that GSM and other wireless channels are becoming overloaded is not an intrinsic technological problem but is the result of an explosion of frivolous messages ranging from 95% of spam in e-mail, via pornography to ill-designed methods so that people send, e.g., 10 megabyte or more per photograph where a fraction of the size will do better. Or is it all a complot to force the end user to higher bandwidths with comparable higher communication bills? The complication is that due to short-term return on investment policies and throat cutting competition, often trivial or even sleazy hypes determine which system or design becomes hegemonic [**note3**]. The embarrassment of richness doesn’t help yet in establishing a healthy diet of information.

Jack of all trades or a dedicated specialist

I mentioned above the co-called smart phone, and today, the tablet computer is back on the playing field. Apart from the cuteness or bloated feature set of many of these devices, the question remains whether this will continue to be a selling point as soon as all these technologies

are well vested in normal social life. After all, almost all laundry machines are simply white and most music and film equipment are black or silver. The cuteness, to a large extent, is a sales argument, in the ideology of selling a fashionable experience and status, instead of being targeted to the primary usefulness. There is nothing wrong with elegance, style and experience, but the question is still what it is that we communicate and in what way technology can help us in accomplishing that. Certainly this does not boil down to the notion that an oil painting has to be seen in oil on canvas and not in print or on a screen.

Here the two lines come together, communication seeking appropriate technology and technology stilling its hunger for payload. On the one hand we deal with the emulation and duplication of existing ways of expressing human emotion, knowledge and information, and on the other hand we deal with the emergence of new forms of the same.

These two different paths are not always properly distinguished. In general we can distinguish between the following:

- The digitisation of known data. This means making a digital representation including all relevant contextual metadata. What does the data mean, who, when, where and how is the data assigned or named? Given completeness, we can, after this conversion, forget about the original, e.g., the telephone directory.
- The digitisation of regular documents. This is the realm of the scientific journal repositories and the massive undertaking of the digitisation of analogue books, with Google in the lead. Here already we see something new. On top of the relevant metadata as mentioned in the first category we have a two-tier approach. The whole page becomes a picture of the original and in a second run the document is converted to raw text, using optical character reading techniques which allow free text searching. The beauty of this approach is that, apart from given metadata and possible index terms, we can now also use advanced search techniques to try and find relevant parts of the text, while skipping a complete reading. The still open question is the readability of the scanned pages. Sometimes, the original print was bad, the book worn and hence the scan unattractive. The question is then: do we want to read the reproduction of the original print, or will OCR develop in such a way that we can use it as source for a completely new edition? At the present state of technology, the last option only pertains to flat text and the development of proper techniques to create from the OCR file a well lay-out new product.
- The digitisation of artwork of all kinds. In the case of books, this is at present not more than a digital two-dimensional representation of the careful lay-out of the bound book. Texture and gloss remain behind, as well as the balance between left and right hand of the open book. But we can mix, overlay, distort and enhance pictures. Therefore we can create comparisons between versions, fakes, and all kinds of completely new works of digital art, that can be printed in two dimensional form. Though three-dimensional printers are coming along, no digital surrogates are using this emerging technology—at least not yet.
- The data capture of new digitally born data. Here the responsibility for the data is shifted from the human capacity of observing to the human capacity of adjusting measurement apparatuses.
- Finally, we deal with new digitally born communicative textual items that include new technological capabilities. This is the most fascinating aspect of book and document studies. The tension between text and non-text, which started with the introduction of the wood block for illustrations, is now extreme. The primacy of the very word is under attack. Text, speech,

pictures, film and, as is already available in some games, haptic communication becomes interwoven. The early experiments with hypertext pale in comparison.

As becomes clear, we have many different threads and very different processes developing, partly in a concerted way, partly totally independently. The key question is then again, what do we want to convey and in which fashion.

Technically we can easily add a camera in the fridge in order to see our stock of yogurt on our mobile phone. Or we can use RFID tags for monitoring the sick or elderly in nursing homes. The question is whether we consider technology as omnipotent helper or as an assistant with its own limitations and idiosyncrasies, however odd they may be.

The e-book as book to read

The above discussion circles around the nagging issue of the mental value of changing communication patterns. Devices can be used for a great variety of applications, but which application is best for what activity? Culturally, a book is developed and shaped into a form that fulfils the physiological pleasure of reading while sitting or lying down. The binding of a cheap book can be abominable for turning pages, but allows cutting the book into parts if reader one is already halfway through and reader two has still to start. Typography and design have a century-long tradition and we know that reading sans serif text is more demanding than a novel set in Bembo. The translation of all that book making knowledge into digital media has just started. Again we are confronted with the two lines mentioned earlier. We are dealing with representations of existing books for with the e-book reader is just a form, and otherwise with the new digitally yet to-be-born books, in which text is one of the ways of expressing the creativity of the author [Note4].

At present we see that almost all new books have a print and a digital version. This is an extremely obvious result of the fact that typesetting is now computerised. One master file allows for a variety of *output device* formats. The SGML revolution, started in 1986, finally proves its value of making a distinction between content and form. But this is not all there is. In the past, we have also seen many versions, in various types and in various formats, of the same novel or poetry collection. Now, in principle, every user must be able to decide in which font and which point size she wants to read a book; there are style sheets galore and maybe they will become as popular as ring tones. But there is more, and that is the intrinsic physiological and mental process of reading, a process that demanded clear typography and lay-out. That process has its specific demands and these demands have to be catered for by e-book readers. Twenty odd years ago, so-called camera-ready books appeared with high-level publishers that often looked worse than the original typescript. There was a market and a profit, but these books did not fulfil the intrinsic demands for an easy reading of a whole story. The same is true if we compare LCD screens and e-ink. Back-lighted computer screens are all around us, and we are accustomed to them. However, it is well-known and experienced daily by all that these kinds of screens are not ideal for the eyes. This is independent of whether they are mounted on PCs, laptops, tablets or telephones. Good e-ink now has 16 gray tones and reads just as well as paper. The disadvantages are still on the technical side. The ink technology allows refreshing rates of about half a second, which is just faster than turning a paper page. The technical bottle neck is still in the size, the screen driver and the related CPU–software combination.

Interestingly, we immediately see how a new technique induces new user demands. Again, it is the logistics that function as the driving force. Uploading new books is considered to be a bit like receiving an email, hence WIFI is becoming imperative for e-ink readers. The same is true for text manipulating such as point size, scribbles, highlighting and tabs. But there is no need to introduce a photo camera or a mobile telephone. The same is true for tablets.

The only real extension to e-ink readers that would go beyond bridging the gap between a digitalised book and a digitally born book is an mp3 player. With the advance of audio books, it would be nice to have the voice of the author and the text available. Many poets read their own works and often this is less eloquent than by a professional voice actor, despite lacking authenticity. Like listening to an orchestra with the score on your lap, reading poetry and hearing a strange voice is a new experience. Another enormous advantage would be if an e-reader could be used as a scanner and would be able to make analogue copies of pages to be loaded for reading into the reader's memory. That way, the reader would also act as a mobile copier of texts that can be incorporated in the user's private library

Books are objects for reading, and the e-book is similarly an object for reading. Just like their paper only-ancestors, the e-book demands at least the same reading quality as the paper version. Printing e-books on paper is an anachronism, but present technology still forces us to do so. Only the increase in electronic substitutes of analogue reading, like page tags, annotations plus the new features of re-use of text will relieve us from paper. The crucial issue is that e-books must be considered as books per se, and e-readers as vehicles for reading, and not as applications of digital Swiss army knives.

Notes

1) A fascinating example of digital data management is the family name bank of the Dutch Meertens Institute for study on diversity in language and culture in the Netherlands. Here we find a complete list of the number of people bearing all Dutch family names in 1947 and 2007 presented onto a geographical map of the country <http://www.meertens.knaw.nl/nfb/>.

2) The whole discussion started with Walter Benjamin in 1936, discussing in particular photography and film. This discussion has become even more important in our digital world (Benjamin 2007).

3) An old example is the hegemonic position of the qwert keyboard invented by Sholes as a result of the claim that it was scientific and subsequently the fact that teachers of typing opposed attempts to change to a better lay-out (see Wilfred A. Beeching 1974, pp. 40-41). A more recent example is the demise of the superior Philips Video 2000 system, where the rumour goes that this was due to the fact that the Philips Company didn't allow licensing for pornography. A juicy idea running on internet and in print without a pertinent source.

4) A funny paper version of what could be a digital abstract of a literary work, is given in a series of 140 character lines in: *Twitterature* by Aciman and Rensin (Aciman 2009).

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Key Phrases

- 1) In essence the study of electronic books is the study of the interplay of technology and message.
- 2) The most interesting issue here is not what can be done with new digital technology, but what is the human need for certain communicative actions to enhance inter-human discourse and mutual education in a well-defined social setting.
- 3) The argument is that every kind of communication demands its own technological environment.
- 4) Communication seeking appropriate technology and technology stilling its hunger for payload.
- 5) The translation of all that book making knowledge into digital media has just started.