

## **What is a Book? Past, Present and Future! From the Clay Tablet to the SmartBook**

“Every exit is an entrance to somewhere else.” – Tom Stoppard

### **Introduction**

The book has played a central role in the dissemination of information in human culture from the emergence of writing to the present day. It is only with the emergence of digital information with computing and the Internet that the book has had any competition as the chief medium for the preservation and dissemination of information. We will attempt to answer the question, what is a book? and at the same time discuss where the future of the book is headed and what competition digital forms of information will present and how digital information will reshape the book. All of this will be discussed from a media ecology perspective as developed by Marshall McLuhan. In doing so we will suggest that the book has a long and active life ahead of it and that those suggesting that the book faces imminent obsolescence are greatly mistaken. The book as we will demonstrate shows no sign of giving up the ghost and in fact is thriving as it never has before. So why have some scholars suggested that digital information in the form of personal computers and the Internet threaten to make the codex book of ink on paper obsolete when there is no end in sight for the book? That is a good question.

The reason is that some scholars believe that the Internet, the Web and e-books will spell the end of the medium of the book, a medium that can be traced back to the emergence of writing 5,000 years ago and a medium that has survived the arrival of microfilms, television, personal computers, the Internet and the World Wide Web. The skeptics of the book's survival will not dispute that written text will survive but they think that text written with ink on paper sheets that are bound into a codex format, i.e. what we commonly call a book, will give way to purely electronic forms of text delivered over the Internet and the World Wide Web and read on electronically-configured screens. They further claim that the legibility of text on a screen will steadily improve with time so that it will slowly reach the level of ink on paper, a point that we will dispute below. We intend to show that these prophecies of the book's doom are greatly exaggerated and are due to a lack of a deep understanding of how books and electronically-configured screens work at the neurophysiological level. That is not to say

the book will remain totally unchanged. No, as we will show the book is destined to take on new forms and achieve new levels of functionality.

I believe one of the reasons for the pessimism of some regarding the future of the book comes from their belief that what happened in the recorded music industry where there has been a sharp decline in the sale of recorded music will also happen in the book publishing business. Recorded music industry has been transformed from the producers and distributors of a product in the form of a CD in a jewel box to the providers of a service. Many music stores and chains of music stores have had to close their doors because they could not compete with the likes of iTunes. Because of the downloading of music files recorded music has become a service and not a product. Will the same thing happen to book-length texts?

There is a major difference between the book and music industries. Music is not something that needs to be studied carefully to be fully appreciated. Text, however, requires careful study and that is why the format of access is extremely important. There is a neurophysiological dimension to this problem that entails the fact that the two sides of the bicameral brain processes information differently. The left-brain is involved in the analytic production and interpretation of both spoken language and written text. The right brain, on the other hand, is involved in the synthetic processing of spatial and musical perception. When music is downloaded on to a computer and replayed the acoustic channel of access and the channel of processing both involve right brain processes. Reading a text of ink on paper is strictly a left-brain process. The reading of text on a screen no matter how good the resolution involves both left and right brain processes. When a reader is confronted with text on a screen she must first reassemble the mosaic of pixels that represent the letters of the text to form an image of the letters. This is a right brain process of spatial perception. The reader then must compose the text from the individual letters they have recomposed with their right brain using analytic left-brain processes. This is why reading on a screen no matter how good the resolution is a complicated activity. The right brain converts the pixels into letters and the left-brain converts the letters into words and sentences.

This is why professional writers who produce high quality text will compose their text using word processing, as this does not require using the screen. But when it comes time to edit their manuscript they will print out their word processed text and make their changes and edits on paper and not on

the screen. Also to do structural editing of a book length document it is necessary to be able to take in the whole text at once and nothing beats paper at being able to see one's manuscript all at once. Furthermore scholars who have a long text to study that they can access with their computers will still print out the file so they can do a close reading on paper. It is nearly impossible to do a close reading on a screen for anything more than a short email or a single page of text.

I am sure the book will survive in its traditional codex form and that, at the same time, new forms will emerge like the eBook, which is already available in the market place and in new forms such as the SmartBook, which we will describe later at the end of this chapter. There will also be changes in the institutions that support the book such as publishing houses, bookstores and libraries as well as the institutions that are supported by book such as schools and research institutes. I believe they will undergo changes, which we will briefly describe, as they are the middlemen between authors and their readers and, as we know, the Internet has not been kind to middlemen.

Because I refuse to see an end to the book, some readers might have gathered the impression that I am a dyed in the wool traditionalist and possibly a Luddite that is opposed to the new digital technologies. Let me put that notion to rest right now by revealing that in fact I believe that in addition to the survival of the ink on paper codex book and the increased popularity of the e-book that new hybrid forms of codex and digital books will emerge. In fact I am working with an international team based in Toronto on developing a hybrid medium, the SmartBook, consisting of a codex book, an RFID tag, the Web, a device that can both read the RFID tag and access the Web and a software-based recommender system. The SmartBook to be described below will combine the readability of a codex book, the searchability of an e-book, the networkability of a blog, and the AI capability of a recommender system. So rather than predicting the demise of the book I am suggesting a new era of increased functionality, usability and popularity for the book and the emergence of new forms of the book.

### **Why Books Survived the Threat of Microforms and Why They Will Survive Digital Media**

Microfilms or microforms reduce a whole book to a few small slides that contain the text in miniature that can be enlarged and projected onto a screen with a microfilm reader. They were at one time being touted as a solution to

reduce the burgeoning collection size of a library to a manageable dimension. Unfortunately this technology never realized its promise largely because microforms were not a satisfactory medium for reading. Nothing can beat the format of the codex book for the ease of reading as the following passage so eloquently proclaims:

The book in its traditional form is a memory machine of surprisingly compact and enduring power. It carries in its bindings, its covers and the materials out of which it is made traces of its origin and travels, both as an artifact and as a repository of images and ideas. As a physical object it has what the 20th-century philosopher Walter Benjamin called an "aura," consisting of the host of ritual and metaphysical associations it calls to mind. When some of us recoil from the idea of the digital library, what we mostly fear is the loss of this aura. (Matthews Battles – Boston Globe – Dec. 26, 2004)

I see no conflict between the physical book and its digital incarnation. The book is undoubtedly the best way to read the book especially if one plans to read it from cover to cover. The digital format, however, can be extremely useful, especially if one is using it for reference purposes or one wishes to pull a quote from the material one has already read on paper. I believe that in the not too distant future that scholarly books will be published in both formats.

### **Who Started the Rumor That the End of the Book is Near?**

Where did this notion that the end of the book is near come from and how old is this notion. Some will claim that it was the advocates of the new digital media who first proclaimed that the era of the book was coming to an end. In actuality the first, to my knowledge, to proclaim the obsolescence of the book was Marshall McLuhan (1964) in his book *Understanding Media* published in 1964. What is ironic about this is that McLuhan (1962) who wrote *The Gutenberg Galaxy* was a great champion of the book. In *Understanding Media*, McLuhan documented the radical changes that took place as a result of the transition from the age of literacy and mechanical technologies to the era of electric media. He was alarmed by the trends that he observed particularly the negative effect that television was having on literacy. He sounded a warning: "The electric technology is within the gates, and we are numb, deaf, blind and mute about its encounter with the Gutenberg technology (McLuhan 1964, p. 32)." Actually his concerns for

the threat of electric technology to literacy were expressed eight years earlier, only six years after the introduction of commercial television in North America. In *Explorations*, the famous journal that he co-edited with Ted Carpenter he wrote:

It is the almost total coverage of the globe in time and space that has rendered the book an increasingly obsolete form of communication. The slow movement of the eye along lines of type, the slow procession of items organized by the mind to fit into these endless horizontal columns - these procedures can't stand up to the pressures of instantaneous coverage of the earth (McLuhan 1954).

Unfortunately McLuhan did not live long enough to see the reversal of this trend, which began with the emergence of the digital media of personal computers, the Internet, email, text messaging and the World Wide Web, which unlike television, radio and the movies embrace the Gutenberg technology as its content. McLuhan was the first of many scholars to warn of the dangers that television, an anti-intellectual medium, posed to literacy. He was a crusader who likened himself to Pasteur fighting a pestilence: “I am in the position of Louis Pasteur telling doctors that their greatest enemy was quite invisible, and quite unrecognized by them (McLuhan 1964, p. 32).”

McLuhan was correct to suggest that television posed a threat to literacy during the time he was active as a scholar from 1954 to 1980, the year he passed away. I believe that the threat he identified is not as great today as it was in his time. While TV still poses a threat to literacy and for some children it is having an adverse effect on their ability to read and write digital media has created a new environment, which actually promotes literacy. Since McLuhan first issued his alert over 50 years ago regarding the dangers of television vis-à-vis literacy a new antibiotic has been developed which counteracts the harmful effects of TV and that antibiotic is the emergence of the interactive “new media” of personal computers, the Internet, email, text messaging and the World Wide Web. The content of these media is text, which acts as an antidote to television’s harmful effect on literacy.

Children are returning to the Gutenberg galaxy but a digitized Gutenberg galaxy embedded in email, on the Web or in an eBook. The content of the Gutenberg press was the written word assembled by movable type and

printed on paper. The content of the digitized Gutenberg galaxy of the Web, blogs, e-books and email is the word-processed word which still utilizes Gutenberg's mechanism of movable type with recycled and reassembled fonts of the alphabet except in this case the fonts are generated electronically in a wide variety of styles from classical Times Roman to modern sans serif Helvetica instead of being created by pouring hot lead into a mold.

One of the threats to literacy that McLuhan first identified was the speed at which electronically configured information traveled. He spoke of "the electric environment of instant circuitry (ibid., p. x)" and wrote "electric speed is bringing all social and political function together in a sudden implosion that has heightened human awareness of responsibility to an intense degree (ibid., p. 20)." He worried that "the action and the reaction occur almost at the same time" so that we lose the detachment with the information we are dealing with and hence "the power to act without reacting (ibid.)." As a consequence, McLuhan believed that we live mythically with electric media. "Myth is contraction or implosion of any power, and the instant speed of electricity confers the mythic dimension on ordinary industrial and social action today (ibid., p. 38-39)."

I believe that McLuhan's concerns expressed 50 years ago with the speed up of information are no longer a problem because we are now able to slow down the flow of information because of the ease with which we can print out electric information on paper. This gives us the time to reflect on the meaning and significance of a text. McLuhan's thesis was valid at the time he wrote it. He correctly described the information environment he was familiar with. The figure of "the electric speed of information" changes now within the new ground of the widespread access to computing and to cheap and fast printers. In the spirit of McLuhan's emphasis on the figure/ground relationship we must re-evaluate the impact of the electric speed of information. As he pointed out, "No medium has its meaning or existence alone, but only in constant interplay with other media (ibid., p. 39)."

A radical shift in the effects of electrically configured information has occurred since the time McLuhan first predicted the demise of literacy. With the emergence of personal computers, printers, the Net and the Web we have the best of both the Gutenberg galaxy and digital information. Books continue to thrive and we can print out information that comes to us by email or the Web. It is a fact that most people will not read a long text file on the screen of their computer but will print out the text and read it on paper.

Reading text on a screen when reviewing emails or surfing the Web is fine but most people prefer reading ink on paper rather than reading on a screen by reassembling pixels when it comes to a long text especially one of book length. This is why I believe that literary culture is returning to pre-television levels and the book is assured of a long lifetime. That is not to say that the form of the book will not change as it has in the past. In the next section we will describe the evolution of the written word and the variety of the forms of the book in the pre-digital era.

### **The Evolution of Written Material and the Book**

We would like to propose that all forms of written material are a book of one sort or another. The concept of the book then incorporates the following early forms: clay tablets, Egyptian writing on walls, Babylonian stelae, hand written scrolls of ink on parchment like the Torah (the first five books of the Bible) used in Jewish religious services, and hand written codex books of ink on papyrus, vellum and later paper. The modern book emerges with the printing press, which at first is a printed version of the manuscript book. With the innovations of Aldus Manutius, the italic font emerges as well as the portable book that can fit into a saddlebag. With power driven printing presses (first steam and then later electricity) the price of books dropped and allowed the mass distribution of books, magazines, journals and newspapers. There is a wide spectrum of text materials that may be considered as examples of books. The boundary between a book by a single author, a book by multiple authors on a single topic, a journal focusing on a single topic, a journal focusing on a discipline or a general subject, a magazine and a newspaper begin to blur. There is no clear boundary between a book and a journal. One can also ask where is the boundary between a book and a pamphlet for example. We will refer to all printed reading material distributed in multiple numbers as a form of “book” while retaining the term book for the canonical codex format of printed material sold in bookstores and collected in libraries. But now we can generalize written material even more and include into this category of “book” digital books in terms of e-books and actually all forms of print or text files one can access on the Internet since they belong to the set of objects that are mass distributed written text.

Another argument in favor of the folio book is the ease with which one can go back and reread passages to make sense of what one is reading. This is why the folio book won out over the scroll format of the Torah because it is

easier to access information in the folio format compared to the scroll format. Reading a long document on a computer screen is basically using an electronic scroll. Come to think of it we describe reading text on a screen as scrolling.

### **The Possible Decline in the Use of Books**

As we have argued the book is alive and well and will survive the onslaught of digital media. However, we can expect to see a decline in the amount of time spent with traditional books that are ink on paper in the codex format. As McLuhan foresaw, the electrification and then the digitalization of information has resulted in new patterns of information usage. The percentage of time that people spend with books will decline because as new media emerge they invariably crowd out the older media. There is only so much time in a day and time spent with new media will translate into less time for books. The time spent with books might decline but the time spent reading might actually increase because of all the reading involved with “new media” from use of the Web, blogs, email, text messaging, instant messaging and reading the text associated with electronic games. One can expect as a result of these new patterns of usage that books will start to grow shorter in length rather than longer as readers of digital fare become use to smaller hits of information.

### **Digital Media Actually Encourage Book Writing as well as their Distribution and Sale**

Although today’s traditional book looks identical to the books of the past today’s books are actually a hybrid technology in that the information which forms their content has been gathered, written, edited, and typeset using electronic media. Books are easier to write and produce today than they once were because of digital technologies. An index of the health of the book is the sheer number of books that are published each year. In the early 1970s in the United States approximately 40,000 new titles were published each year. That number has more than tripled in recent times indicating that the book is alive and well. I believe that computing and the Internet have done more to encourage the reading and writing of text on paper than it has discouraged. In fact the explosion of academic books and journals have made it difficult for most academic libraries to acquire complete collections of such items. They rely in many instances to electronic versions of journals. As new journals emerge these days they for the most part elect an electronic format

and many journals that were formerly printed have also gone strictly electronic. arXiv is an archive for science and mathematics preprints that can be accessed on the Internet. Some scientists choose to publish only in arXiv and do not bother with submitting their papers to a peer reviewed scientific journal. And you can be sure that the scientists that read these pre-prints on arXiv print them out so they can study them carefully.

Another way in which digital technologies support the book is through their distribution by the on-demand printing of books using multifunction printers that are able to store large amounts of digital information. One way this works is that a publisher can print a small run of books initially and once the initial run is sold out the publisher can then print books on demand as a sale is made. Another way that on-demand printing supports the production and distribution of books is that an author no longer needs a publisher but can turn to a service like lulu.com which will take an electronic file from an author and print copies of their book on demand as orders for the book are received.

Another boost to the marketing and sale of books are Web sites that either allows books to be purchased online and/or the contents of the book to be examined. Two leaders in this field are Amazon.com and Google Book Search both of which allow the visitor to their site to look inside the book. Amazon allows the visitor to purchase the book online and Google Book Search connects the visitor to an online bookseller including Amazon among others to facilitate the sale of the book. All in all I would say that digital technologies do more to promote the use and production of books than to discourage their use.

### **The Future of the Book**

The book continues to evolve as new means to distribute text are developed. Can an archived listserv discussion be considered a book? What about a blog, is it a kind of book that grows with time? The classical codex book and these contemporary forms of text delivery will converge just as television has converged with the Internet as news and public affairs programs request comments and questions from the their listeners via email.

All media have increased variety and choice. When literate society made the transformation from hand written manuscripts to printed books there was an explosion of variety and choice as it was so easy to produce a book in

multiple copies that could be easily transported. A similar explosion is taking place with the “new media” because of the ease with which media products whether they are text, audio or video can be duplicated and transmitted. As a result material for which there is little demand can still be made available by the operator of a Web site and still turn a profit. This phenomenon has been identified by Chris Anderson (Wired, Oct. 2004), who has given it the name of “the long tail.” One can talk of a new class of long tail books that are easily produced and are intended for a small audience as are those published by lulu.com. Dave Gray has published a book, *Marks and Meaning*, as a work in progress using lulu.com asking his readers to help him complete the book. His book is being authored as a wiki. Many books are written by multiple authors who are able to work together because of the ease of digital communication.

### **The SmartBook**

I would like to end this chapter by describing the SmartBook project that Greg Van Alstyne and I are leading at the Strategic Innovation Lab at the Ontario College of Art and Design and will involve an international team of collaborators including Dave Gray, CEO and Founder of XPLANE, the visual thinking company; Peter Jones, CEO and founder of Redesign Research; and Ramon Sangüesa, head of innovation at CitiLab Barcelona. We are proposing a new format for books by embedding a “smart tag” or RFID tag into a standard printed codex or folio book that points one to a Web site that has the text of the book in a digital format. As a consequence the SmartBook is readable, searchable, networkable and smart.

The SmartBook is readable because of its codex format and the fact that ink on paper is the best way to read text. It is searchable because the smart tag points to a digital form of the book’s content on a Web site. It is networkable because the Web site containing the digital form of the book can be used for readers to share ideas about the book with each other and the author as is done on a blog. The author can comment on the readers’ remarks and also update her book either on the basis of readers’ comments or because of new developments in the field of study that the book addresses. Finally, the book is smart because it knows what the reader wants to know and it can recommend what parts of the book are of particular interest to the reader. It achieves these smarts because the device used to access the Web site can incorporate a recommender system that has a profile of the reader’s research needs and information interests. The recommender system is therefore able

to highlight those portions of the book that will be of particular interest to the reader.

The SmartBook system also allows a codex book to incorporate the advantages of hypertext through the Web interface. One would read the codex book with a Web access device close at hand. The author could indicate places in both the printed and the digital form of the text where one could jump to another part of the book or to another source of information on the Web, which the reader could access through the Web and thereby enrich their reading experience.

The SmartBook represents a third option for book publishers in addition to the standard printed codex book (option 1), and to the various digital formats such as an e-book or a book on a CD-ROM (option 2). Options 1 and 2 have their unique advantages. The chief advantage of the printed codex or folio book is that it is the best form yet devised for readability. The codex format is also better suited for quickly browsing the book to get the feel for it especially if the book has a detailed table of contents and index and is written so that the contents of the book are summarized in the first few pages of the book. The advantage of the digital book, on the other hand, is that it is the format of choice for searching and researching. The e-book has the additional advantage that for a complex subject one can easily search the content of the book for topics of particular interest to the reader and thereby tie together related themes. This is particularly true if the e-book is written taking advantage of hypertext.

The SmartBook has all the advantages of both options 1 and 2 and in addition it can customize the content of the book for the specific use of the reader and it can create a forum for the discussion of the book. This feature is particularly useful for books that are written and used for research. There is less of a need for the SmartBook format for a novel or a book of poetry unless that book is a classic that is frequently studied by scholars and students. But even for books that are purely literary the ability of readers to network with each other and possibly the author would be a distinct advantage.

If SmartBooks succeed in penetrating the market they will have an enormous impact of book publishing, booksellers, libraries and schools. Book publisher will not only have to print and distribute codex books they will also have to maintain a Web site for each book they publish. As the number

of SmartBooks increases there will be an impact on libraries. Imagine a library of SmartBooks in which a user enters with their recommender system on their notebook or PDA and are directed to those volumes that are of most interest to them. Part of the function of the reference librarian will be taken over by the SmartBook system. The library edition of the SmartBook will have to have a Smart Tag or RFID tag that can transmit a radio signal over a long distance. SmartBooks will also impact bookstores. Imagine walking into a bookstore with one's recommender system and being directed to the books one would want to buy. How convenient!

The use of books in schools will not change much at the early grades. I cannot imagine young children learning how to read with an e-book. The need for textbooks in schools is one certain application that will prevent the disappearance of books no matter what developments take place in the world of digital text. Because of the neurophysiological effect of reading from a pixilated screen the codex book is sure to survive in the school system. The use of e-book and the SmartBook in high schools and universities is another matter. One can well imagine that they will find many different applications in these institutions.

### **Laws of the Media (LOM)**

McLuhan developed a set of rules, which he called the Laws of the Media (LOM) (McLuhan 1975 & McLuhan and McLuhan 1988) for studying the effects of media or technologies, which specifically illustrate their counterintuitive nature. A LOM consists of the following four laws:

1. Enhances: Every medium or technology enhances some human function.
2. Obsolesces: In doing so, it obsolesces some former medium or technology, which was used to achieve the function earlier.
3. Retrieves: In achieving its function, the new medium or technology retrieves some older form from the past.
4. Flips into: When pushed far enough, the new medium or technology reverses or flips into a complementary form.

To gain a deeper insight into the nature of the codex book and the SmartBook we are proposing let us consider the LOM for these two media.

## **LOM for the Codex Book**

Enhances: the storage of and access to information

Obsolesces: oral tradition and myths

Retrieves: – memory

Flips into: e-books

## **LOM for the SmartBook**

Enhances: codex book

Obsolesces: traditional library

Retrieves: reference librarian

Flips into: SmartLibrary

## **Conclusion**

Rather than the book coming to an end or being obsolesced I believe the book is about to enter a new chapter in its history that combines the advantages of the codex book and the digital or e-book.