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Digitally Augmented Books: The sBook Platform for Books that are Smart, Readable, Searchable, Networked, Updatable, and Promote Active Reading

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Abstract: The sBook platform that provides for the convergence of the printed codex book (p-book) and the e-book is described. The sBook platform combines the advantages of both the p-book and the e-book and incorporates some additional features that make the book smart, social and a vehicle for "active reading". We will describe a number of different forms of the sBook that can operate on the sBook platform we are proposing. We will describe the different applications and advantages of each of these forms. The implications for print on demand publishing for the sBook are also examined. The impact of the sBook platform on a number of sectors is identified including authors, readers, publishers, booksellers, libraries and schools. Finally a number of research questions for further study are formulated. This paper is not so much a report of research completed but rather a scoping out of the issues that combining the p-book and the e-book entail. It is a report of work in progress.

Introduction – A History of the Idea

I first hit upon the idea of combining the printed book (p-book) and the e-book back in 2005 when a group of researchers in what evolved into the Strategic Innovation Lab (sLab) at the Ontario College of Art and Design were considering smart tags and the Internet of things. I thought if a building or a product could be smart by embedding a smart tag in it why not a book and voila I conceived of the notion of a SmartBook. My first notion of the SmartBook was a codex book that had been "smart tagged" so that the book directs one's Enabler (a computer or a smart phone) to a Web site that contains the digital form of the text of the codex book. The SmartBook system or platform would be readable, searchable, networkable, updatable, smart and promote "active reading". The book is very readable because the sBook still retains the codex format of ink on paper. Because the "smart tag" directs the reader to a Web site with the digital text and room for comments by readers and updates by the author, the sBook is searchable, networkable and updatable. 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 through a recommender system embedded in the Enabler. The recommender system has a profile of the reader's research needs and information interests and has an internal and an external component. The internal recommender system is able to highlight those portions of the book that will be of particular interest to the reader. The external recommender system would be largely Web based and would bring information external to the book to the attention of the reader. The Enabler and the Web site with the digital text would also

have tools to facilitate active reading consisting of the following activities: "annotating, quoting, comparing, searching, taking notes, sharing" as described in detail by Gene Golovchinsky (www.fxpal.com/publications/FXPAL-PR-08-468.pdf) in his article Reading in The Office. See also www.zenguide.co.uk/2008/05/going-shelfless/ for more on active reading.

This initial notion has been expanded by a group of researchers at the sLab headed by Greg Van Alstyne and myself. Our objective is not to design a device but rather a platform. Our research agenda is to consider all possible configurations of sBooks and match them with possible applications in the future that tap into the needs, desires, expectations, and latent behaviours of potential readers and users. We believe that the following applications are worthy of careful study because of their desirability, viability, and marketability:

• Primary and secondary school books: reading, gathering information from multiple sources, writing, teacher monitoring of work in progress, gathering students' assignments, marking them and commenting on them.
• Post-secondary textbooks: both standard and customized. Exploring the social aspects of schoolwork both secondary and post-secondary, i.e. the social media/collaboration dimension of class work. In particular how to combine reading and writing or producing and consuming at both the individual level and in collaboration between groups. This very broad application is missing in the e-book of today. As McLuhan pointed out the content of a new medium is an older medium. The content of an e-book is just the text that would be published in a printed book, but so much more is possible. The affordances of pen and paper over digital media do not have to be lost. The sBook allows the best of electronic media and pen and paper.
• Research books: article reading and production, peer reviews, references and customized information gathering, the advantages of a recommender system. The social aspects of the sBook described above for schools apply for this category as well.
• Enterprise documents: document sharing in workgroups in both the private and public sectors, communication and collaboration, and the review of documents. The social aspects of the sBook described above for schools apply for this category as well.
• Fiction books: reading, recommendation engine, social reading groups and social recommendations, commenting on content in book clubs and reading-groups, fan fiction or the production of new material based on the content of the sBook.
• Digitally augmented fiction, non-fiction trade books and textbooks: Once we entertain the concept of digitally augmented books we can envision new genres of fiction and non-fiction books in which text is augmented by photos, maps, illustrations, video clips and audio clips.
• Serious games: The sBook becomes an ideal medium for serious games with an educational dimension to them.
• The impact on libraries and bookstores of e-books and sBooks: In fact we need to look at the entire e-book, p-book, sBook ecosystem and consider the possibility of a wholesale move to e-books or sBooks and their impact on authors, publishers, teachers, students, libraries, bookstores, etc.

• The impact of mini-press devices like the Espresso book machine on the sBook idea. The reason to explore this possibility is that an e-book plus a minipress is one way to create an sBook platform. The print-on-demand (POD) dimension of book publishing is extremely important because it saves book publishers the following costs: warehousing, shipping, returns and remaindering excess print runs. Some combination of POD with smaller press runs will probably be ideal for publishers. There is also the dimension of self-publishing that the POD medium affords that needs to be explored.

The sBook will be a mobile book in the sense that the digital version of the sBook, like the e-book, can be accessed by mobile devices such as e-book readers (smart Phones, Kindles, iPads, etc.). Specifically because of the high increase of social network users and the central role social networks have in behaviour with respect to accessing information and developing relationships across all age segments, it is important to think about features and functionalities of the sBook in these environments. The Web site associated with the sBook would become a 'digital community' with forums, chat rooms, wikis, etc. This would provide another way of viewing and interacting with the content (author and/or user generated) surrounding the main work.

A number of questions arise when considering the role that a recommendation engine could play in the s-book platform?
1. What is the practicality of inserting a recommender system in the sBook platform and what applications could be made of a recommender system?
2. Where does the recommender system provide a benefit? What role could it play?
3. What unmet needs could a recommender system meet? What is the opportunity?

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

Our proposal is not the first example of a system that combines a codex book with a digital form of the text. There are for example many textbooks that come with a CD-ROM containing the digital version of the book. Amazon has an Upgrade features (www.amazon.com/Upgrade-Books/b?ie=UTF8&node=293522011) which allows a reader to access an electronic version of the book they order on the Internet for a selected number of books. It also allows the reader to add highlights, bookmarks, notes or tags to any page in the book. Norton publishers have a series of textbooks that they offer in a standard codex form with access to a digital version of the book and an electronic workbook (SmartWork). They also offer the e-book version of their textbook for approximately half the price of the codex version of the book (www.**nortonebook**s.com). O'Reilly Media offers a number of their books in a print version, an e-book version and a bundled package of the two formats. Their e-book version comes in three digital formats, PDF, ePub and Mobipocket (for Kindle users). What makes our sBook proposal different is that it incorporates so many useful features with the potential to change reading, authoring, publishing, knowledge sharing, elearning, literature research, the updating of a

book and the way readers share their thoughts about a book.

sBook Impacts

If sBooks succeed in penetrating the market they will have an enormous impact of book publishing, booksellers, libraries and schools. Not only will book publisher produce both p-books and e-books but they will together with their authors also have to maintain a Web site for each book they publish.

As the number of sBooks increases there will be an impact on libraries. Imagine a library of sBooks in which a user enters with their recommender system on their Enabler 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 sBook.

sBooks will also impact bookstores. Imagine walking into a bookstore with one's Enabler with an embedded recommender system and being directed to the books one would want to buy. How convenient!

Laws of the Media (LOM)

To gain a deeper insight into the nature of the codex book and the sBook that we are proposing let us apply McLuhan's (McLuhan 1975 & McLuhan and McLuhan 1988) Laws of the Media (LOM) for these two media.

LOM consist of the following four laws:

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

LOM Codex Book

Enhances: the storage of and access to information
Obsolesces: oral tradition or myths
Retrieves: memory
Flips into: e-book

LOM sBook

Enhances: the codex book and hence readability, searchability, relevance, currency, active reading
Obsolesces: the traditional library and the manual search

Retrieves: the reference librarian and the book club
Flips into: the smart library and the online symposium

Protecting Copyright

In order to fulfill all the functions of the sBook that we have identified such as their use in a library or their availability at a bookstore and still protect the copyright of the authors the sBook will have to have three levels of access:

1. The privately owned version - The owner of the book can read the book in the traditional manner and also capture the data in the book electronically and transform it at will. They will be able to create a personal searchable library with a smart catalog from their collection of sBooks.

2. The library version – The library patrons will be able to read the book in hard copy and/or access the entire book electronically, which will allow them to search for and access items of interest in the sBook without having to read the entire book. This will facilitate a great deal of library research as scholars will be able to quickly access the material they need by organizing Google-like searches. They will be restricted, however, from the wholesale copying of the contents of the book onto their Enabler or any third medium. A certain number of lines of text for the purpose of quoting will be allowed depending on the discretion of the publisher and the author.

3. The bookstore version– While the book sits in a bookstore before it is purchased it will be searchable but not copy-able. A collection of sBooks in the bookstore will allow customers to find a book or books that meet their interest and describe to them where in the store they may find them. They will be able to access the book electronically but they will not be able to copy any of the pages of the book except promotional pages at the discretion of the publisher and the author.

Application of the sBook Platform to Other media - The use of the sBook platform does not have to be limited to books as one might wish to consider smart journals, smart magazines, and smart newspapers. Some features of a smart journal already exist as some journals are published in both a print and a digital form with space reserved in the digital form for reader comments. Most online versions of newspapers have a mechanism for reader comments but unfortunately they are too often used for flaming or promoting a particular political point of view rather than being used for entering into constructive serious dialogues.

Smart libraries – Imagine students and research faculty using their Enabler at their library's information commons to find the research material for their various projects.

A Partial Prototype - Two of the features of the sBook will be tested when my book Understanding New Media: Extending Marshall McLuhan, an update of McLuhan's Understanding Media: Extensions of Man is released in the summer of 2010 by Peter Lang Publishing. A Web site will be created that readers of the book will be directed to

so that they can leave comments, which I may choose to respond to in the spirit of a blog. I will also use this Web site to continually update my book.

An Invitation: To conduct our sBook research we have created a Google Group discussion group called Rethinking the Book. Readers of this article interested in joining our Rethinking the Book Google discussion group should email me at logan@physics.utoronto.ca and they will be included in the group.