

## Post-digital print: a future scenario

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There is no one-way street from analog to digital; rather, there are transitions between the two, in both directions. Digital is the paradigm for content and quantity of information; analog is the paradigm for usability and interfacing. The recent history of video and music provides a good example, since the use of digital technology for these types of content is much more advanced than it is for publishing. In the case of video, the medium (whether VHS or DVD) is merely a carrier, since the content is always ultimately displayed on screens. The same is true for music, where cassettes, vinyl records, and CDs are only intermediate carriers: the actual listening always happened through speakers (and increasingly through headphones). In both cases, the format changed without dramatically affecting the watching or listening experience. Sometimes the experience was improved by changes in the media technology (with HD video); sometimes it was almost imperceptibly worsened (with the loss of frequencies in MP3s).

Print, however, is a very different case, since the medium—the printed page—is more than just a carrier for things to be shown on some display; it is also the display itself. Changing it consequently changes people's experience, with all the (physical) habits, rituals, and cultural conventions involved. E-publishing therefore still has a long way to go before it reaches the level of sophistication which printed pages have achieved over the course of a few centuries.

But as more and more content moves from print to digital, we seem to be approaching an inevitable turning point, where publishers soon will be releasing more electronic publications than printed materials. A key factor in this development is that e-publishing is gradually becoming just as simple and accessible as traditional publishing—not only for producers, but also, thanks to new interfaces, habits, and conventions, for consumers as well. However, the real power of digital publishing lies not so much in its integration of multiple media, but in its superior networking capabilities. Even if it were possible to write some spectacular software to automatically transform e-books into another media standard (for instance, an animation of book or magazine pages being turned) or vice-versa, this would be far less interesting for users than new and sophisticated forms of connectivity—not only to related content hosted elsewhere, but also to other humans willing to share their knowledge online. To this end, digital publishing will have to establish universal interoperability standards and product identities that don't lock customers into the closed worlds of one particular application or service.

Traditional print publishing, on the other hand, is increasingly presenting its products as valuable objects and collector's items, by exploiting the physical and tactile qualities of paper. It thus acts as a counterpart to the digital world, while looking for ways to cope with a gradually

shrinking customer base—particularly in its traditional sectors such as newspaper production and distribution (where costs are becoming unsustainable) or paper encyclopedias (which have already become vintage status symbols rather than practical information tools). A number of products will thus need to be reinvented in order to still make sense in print.

At the time of writing, the development toward print as a valuable object can best be observed in the contemporary do-it-yourself book and zine scene. Until the late 1990s, this scene was mostly focused on radical politics and social engagement; the contemporary scene however is more fascinated with the collection of visual-symbolic information into carefully crafted paper objects. Despite its loyalty to print, this new generation of DIY publishers has created offline networks for print production and distribution which, in their bottom-up structure and peer-to-peer ethic, very much resemble internet communities. At the same time, the work they create is meant to remain offline and not be digitized, thus requiring a physical exchange between publisher, distributor, and reader. This ethic is squarely opposed to the so-called "go all digital" philosophy which advocates a completely digital life, getting rid of as much physical belongings as possible, and relying only on a laptop and a mobile phone filled with digitized materials.

For sure, the DIY print publishing ethic is closely related to the (often dormant) bottom-up social dynamics of the internet. But as it currently stands, it still lacks one crucial aspect (besides production and sharing): it does not include mechanisms able to initiate social or media processes which could potentially bring the printed content to another level—what I would call the "processual" level. In the past, print activism (using pamphlets, avant-garde magazines, Punk zines, etc.) was deployed for spreading new ideas meant to induce new creative, technological, and—by implication—social and political processes. The future of post-digital print may also involve new processes, such as remote printing, networked real-time distribution, and on-demand customization of printed materials—all processes with (as of yet) unexplored social and political potential.

Conversely, digital networking technologies could make better use of print. Those who advocate and develop these new technologies should perhaps become more aware of print's cultural significance. Many readers will continue to choose print products above electronic publications, possibly leading to a demand for networked (perhaps even portable) printers allowing individuals to print materials at any location, anywhere in the world. Combined with personal binding devices (however primitive), such personal "book machines" would allow readers to "teleport"

print publications to and from any location. Furthermore, resistance to the ubiquitous and nonstop surveillance of the internet may well take a more radical turn: individuals and groups could make a political statement out of going completely offline and working in isolation as neo-analog media practitioners.

If print increasingly becomes a valuable or collectible object, and digital publishing indeed continues to grow as expected, the two will nevertheless cross paths frequently, potentially generating new hybrid forms. Currently, the main constraint on the development of such hybrids is the publishing industry's focus on entertainment. What we see, as a result, are up-to-date printable PDF files on one hand, and on the other hand, online news aggregators (such as Flipboard and Pulse) which gather various sources within one application with a slick unified interface and layout. But these are merely the products of "industrial" customization—the consumer product "choice" of combining existing features and extras, where the actual customizing is almost irrelevant. Currently, the industry's main post-digital print entertainment effort is the QR code—those black-and-white pixellated square images which, when read with the proper mobile phone app, give the reader access to some sort of content (almost always a video or web page). This kind of technology could be used much more creatively, as a means of enriching the process of content generation. For example, printed books and magazines could include such codes as a means of providing new updates each time they are scanned—and these updates could in turn be made printable or otherwise preservable. Digital publications might then send customized updates to personal printers, using information from different sources closely related to the publication's content. This could potentially open up new cultural pathways and create unexpected juxtapositions.

Martin Fuchs and Peter Bichsel's book *Written Images* is an example of the first "baby steps" of such a hybrid post-digital print publishing strategy. Though it's still a traditional book, each copy is individually computer-generated, thus disrupting the fixed "serial" nature of print. Furthermore, the project was financed through a networked model (using Kickstarter, a very successful "crowdfunding" platform), speculating on the enthusiasm of its future customers (and in this case, collectors). In other words, this book

is a comprehensive example of post-digital print, through a combination of several elements: print as a limited-edition object; networked crowdfunding; computer-processed information; hybridization of print and digital—all in one single medium, a traditional book. On the other hand, this hybrid is still limited in several respects: its process is complete as soon as it has been acquired by the reader; there is no further community process or networked activity involved; once purchased, it will remain forever a traditional book on a shelf. And so, there is still plenty of room for exploration in developing future hybrid publishing projects.

When we are no longer able to categorize publications as either a "print publication" or an "e-publication" (or a print publication with some electronic enhancement), then the first true hybrids will have arrived. It may be worth envisioning a kind of "print sampling," comparable to sampling in music and video, where customized content (either anthologies or new works) can be created from past works. Such a "remix" publishing strategy could create new cultural opportunities and open up new "processual" publishing practices. We can already see this happening to some extent, in contemporary zine and DIY art book publishing, as well as underground e-book websites.

Since software is a prerequisite for any digital technology (and is also being used for the creation of most analog works today), its "processual" nature should be reflected in the structure and dynamics of future publishing: enabling local and remote participation and also connecting publishing to real-life actions. The younger "digital native" generation has no compunction in irreverently sampling, remixing and "mashing up" traditional and social media (as several adventurous small organizations, born out of the current financial crisis and the "Occupy" movement, have already demonstrated). Print is, unsurprisingly, an important component of this "mashup," because of its acknowledged historical importance as well as its particular material characteristics. And so this new generation of publishers, able to make use of various new and old media without the burden of ideological affiliation to any particular one of them, will surely be in a position to develop new and truly hybrid publications, by creatively combining the best standards and interfaces of both digital and print.

## Appendix

Print vs. electrons

100 differences and similarities between paper and pixel.

### PRODUCTION

1	Screen color consistency	Cross-browser consistency
2	300 dpi	72 dpi
3	A(x), (e.g. A4)	(x)GA (e.g. XGA)
4	Snap to grid	CSS constraints
5	Postscript I/O error	Error 404
6	Ethernet	Wi-Fi
7	Glowing ink	Flash (Adobe)
8	Image not found	Can't connect to server
9	Magnifying glass	Magnifying icon
10	Moiré Excessive	JPEG compression
11	nth color	Custom programming
12	Pantone	Optimised palette
13	Stock photography	Google images
14	Proofreading	Debugging
15	Test print	Draft version
16	Higher resolution	Anti-aliasing
17	Page layout software	Content management system
18	Spines	Partial browser incompatibility
19	Optimizing for print	Optimising for search
20	Cutting	Screen format
21	Recycled paper	White text on black screen
22	Hollow punch	Layers
23	PDF logo	JPEG logo
24	Advertising space	Banner
25	Paid promotional flyer	Pop-up window
26	Ink	Brilliance
27	Full-color insert	Picture gallery
28	Imposition	Sorting with tags
29	Binding	Website structure

## STRUCTURE (INTERNAL)

- |    |                             |                          |
|----|-----------------------------|--------------------------|
| 30 | Color addition              | Color subtraction        |
| 31 | Centerfold                  | Background image         |
| 32 | Contrast                    | Brightness               |
| 33 | Dot                         | Pixel                    |
| 34 | TIFF                        | JPEG                     |
| 35 | PDF (fixed layout)          | EPUB (reflowability)     |
| 36 | vector graphics             | Bitmap                   |
| 37 | Front cover                 | Home page                |
| 38 | Externally illuminated      | Backlit                  |
| 39 | Local link                  | Remote link              |
| 40 | paperweight                 | Download time            |
| 41 | Plastification              | Use of 3-D/shadows       |
| 42 | RAM                         | Kbps                     |
| 43 | Best viewed in bright light | Best viewed in dim light |
| 44 | Fire damage                 | File corruption          |
| 45 | Fibers                      | Waves                    |
| 46 | Turns yellow                | Reveals its pixel matrix |
| 47 | Consumed in local time      | Consumed in global time  |
| 48 | Slow replication            | Instant replication      |
| 49 | Hardcover                   | Paid access              |
| 50 | Paperback                   | Free access              |
| 51 | Static                      | Cinematic                |

## STRUCTURE (EXTERNAL)

- |    |                        |                                |
|----|------------------------|--------------------------------|
| 52 | Printer                | Sysadmin                       |
| 53 | Barcode                | WHOIS                          |
| 54 | ISSN Online            | ISSN                           |
| 55 | Local storage backup   | Remote server backup           |
| 56 | Back catalog           | Internal search engines/       |
| 57 | Optimized distribution | Optimised server configuration |
| 58 | Stocks                 | Link on the home page          |
| 59 | Second (nth) edition   | Database rebuilt               |
| 60 | Headquarters           | Hosting                        |
| 61 | Shipping strike        | No connection                  |

## EVALUATION

- |    |                           |                      |
|----|---------------------------|----------------------|
| 62 | Readership                | Unique visits        |
| 63 | Certified distribution    | Guaranteed bandwidth |
| 64 | Distributor list          | Access logs          |
| 65 | Referenced by other media | Incoming links       |
| 66 | Low copy/user ratio       | High copy/user ratio |
| 67 | Promotional copies        | RSS                  |

## REAL AND VIRTUAL SPACE

- |    |             |                        |
|----|-------------|------------------------|
| 68 | Bookshelf   | Database               |
| 69 | Shelf space | Web host storage space |

## CONVENTIONS

- |    |                        |                  |
|----|------------------------|------------------|
| 70 | Table of contents      | Menu             |
| 71 | Promotional T-shirt    | Textual link     |
| 72 | Handwritten font       | Pixel font       |
| 73 | Captions               | Alt text tag     |
| 74 | News department        | Blog             |
| 75 | Page format            | Scrolling        |
| 76 | Print                  | Save             |
| 77 | Bibliography           | Hyperlinks       |
| 78 | Name                   | Domain name      |
| 79 | Paper bookmark         | Browser bookmark |
| 80 | Page numbering         | Posting date     |
| 81 | Clippings              | Cache            |
| 82 | Import dialogue window | Online form      |

## CONSUMPTION

- |    |                         |                           |
|----|-------------------------|---------------------------|
| 83 | Reader                  | User                      |
| 84 | Subscriber              | Registered user           |
| 85 | Subscription            | Push technology           |
| 86 | Reproduction prohibited | Digital rights management |
| 87 | Syndication             | Creative commons          |
| 88 | Freebie                 | Free download             |
| 89 | Shipping                | Spamming                  |
| 90 | Cover price             | Password-protected access |
| 91 | Dust                    | Dust                      |

## GESTURES

- |     |                        |                       |
|-----|------------------------|-----------------------|
| 92  | Flipping through       | Clicking              |
| 93  | Smell of ink           | Sound of mouse clicks |
| 94  | Photocopying           | Copy/paste            |
| 95  | Annotating             | Comments              |
| 96  | Underlining            | Underlining           |
| 97  | Fingerprint on coating | Fingerprint on screen |
| 98  | Folding                | Scaling               |
| 99  | Locally read           | Remotely read         |
| 100 | Handing over           | Forwarding            |