
The End of the Gutenberg Era

JASON EPSTEIN

ABSTRACT

Digitization has brought the five hundred-year-old Gutenberg era to an end. Gutenberg's press opened the gates to our modern rational, secular world. The cultural impact of today's digital technologies, which will bring multilingual literacy to the far corners of the earth, foreshadows far greater changes. Gutenberg's contemporaries could not begin to imagine the effect of movable type on the centuries to come, nor can we imagine the far greater changes that digitization will bring, but we can see even now that the book publishing industry is in for a radical transformation.

Five hundred and some years ago in the German city of Mainz, Johannes Gutenberg, the son of a goldsmith, who made his own living by selling trinkets at religious fairs, had a scheme for unifying the Catholic Church, which was fractured at the time by many schisms, resulting in a fierce competition for the souls of the faithful and a threat to Gutenberg's religious trinket business. His idea was to print a uniform missal on the book-making machine he had just invented to be distributed to all the churches of Europe, hoping to restore Catholicism at last as the universal church of its fathers' dreams and at the same time secure the market for his mirrors and charms.

Gutenberg's printing press would of course have just the opposite effect. His press would be remembered as the sine qua non of general literacy, the fuse that lit the Protestant Reformation, the Enlightenment, and our modern, secular world. Under the impact of Gutenberg's machine the church would disintegrate in Northern Europe, but Gutenberg would end up bankrupt and a money lender would seize his invention claiming it as his own. Luckily for Gutenberg historians eventually unraveled the actual

story and Gutenberg, not an investor named Futh, was resurrected as the hero who made the machine that changed the world. Otherwise we would be living at the end of the Futhian, not the Gutenberg, era. Anyone interested in this story should read the *Gutenberg Revolution* by Jon Man, now out of print, a wonderful brief account of Gutenberg and the machine that changed the world.

If Gutenberg had not conceived the idea of combining within a single device wine press, metallurgic and metal casting technology with the new oil-based inks to replace the woodblock technology and monastic scriptoria of his day, someone else surely would have done so for the components were readily available in Europe at the time and so, to judge by the results, was the demand for literacy by an emerging middle class. The screw press, as old as Archimedes, was widely in use in Gutenberg's day by winemakers; any goldsmith's apprentice, as Gutenberg had once been, would have known die making and metal casting, and the alphabet gave Europeans a crucial advantage over the Chinese who had often outdistanced the West in inventiveness and might have beaten Gutenberg to the printing press had China not lacked wine-making technology and most important an alphabet. Islam, now well past its golden age, denounced the machine as satanic and banned it as Gutenberg's church itself would probably have done had it not been distracted by its internal difficulties from the threat of widespread literacy. Meanwhile the Chinese ignored an improvised Korean alphabet, perhaps for the same reason that the mandarins chose not to permit the commercial exploitation of such Chinese inventions as gunpowder and the magnetic compass for fear of empowering the very middle class that would hereafter dominate the West and eventually the world, including in our time, China itself—the emerging middle class that a bankrupt seller of religious trinkets also needed for his invention to succeed.

New technologies have now brought within sight an end to the Gutenberg era and the various systems that implement it, including the book publishing industry as it has existed since the fifteenth century, to say nothing of other print-based enterprises. The new technologies of digitization and the Internet foreshadow a time when every book ever printed and in whatever language it happens to reside, will be permanently and cheaply available from the World Wide Web, downloaded from aggregators like the Gutenberg Project, Google, and the Open Content Alliance or from websites of special interest so that readers interested in, for example, brook trout or baseball will go to a brook trout or a baseball website and find there a list of books on the subject to be downloaded wherever in the world Internet connections exist: Sherpa villages halfway up Mount Everest, submarines beneath the Arctic, and high schools in Kampala and Mumbai will soon have the same access to books as you and I and far greater access than you and I have today. The revolutionary possibilities for intellectual life arising from such a radically decentralized marketplace are as

unimaginable today as the possibility of Shakespeare or Diderot or Gibbon or Voltaire were to the fifteenth century, and not only such prophets as these but false prophets as well, for no human invention is an unmixed good.

What will not change—for it never has—is human nature, which is why we read the ancient stories of Troy and the expulsion from Paradise as stories of ourselves, and here is where I take exception to some of the more extravagant prognostications that I hear today about the digital future. History's ash can is piled high with useless gadgets, unlivable cities, deadly cures, unwearable clothes, unreadable books, unworkable laws, deadly ideologies, unrealized futures. Karl Marx believed that new technologies—what he called new forms of production—would change human consciousness: would make new men.

He meant well. He argued his case brilliantly. History in the form of the Soviet Union proved him disastrously wrong. It was not Ronald Reagan who won the Cold War. It was the rejection by human nature of an inhuman system.

Because books will now be stored digitally and transmitted electronically it does not follow that human beings will hereafter read Dickens or Proust or Norman Mailer on electronic screens as they now listen to music via iPod. Whoever thinks so can never have read Dickens or Proust or Norman Mailer. Some avid readers on long-distance flights may feel incompletely equipped for travel without a hundred titles loaded onto a handheld reader, but for most travelers facing an eight hour flight a Penguin Emma stuffed into a pocket should be enough for a trip to Paris and back. When I heard that Hewlett-Packard is perfecting a "next generation e-book" whose electronic pages can be turned like those of a real book, I was reminded of Gulliver's visit to Laputa, a land of inventors who live on a cloud in which Gulliver wonders why the projectors (as Swift called them) who inhabit the place wear such ill-fitting coats until he himself has a coat made and finds that the tailors of Laputa are actually geometers who measure him with compass and protractor. Like the tape measure for tailoring, the printed book on paper is exactly adapted ergonomically, economically, and physiologically to the human use for which it has evolved. Digitization and the Internet have made the Gutenberg system obsolete but not the printed book. What Swift meant by Laputa was that cultures and their artifacts must arise organically from the needs and abilities of human beings, not shaped to fit the preconceptions of theorists: in this sense, among others, he was the direct ancestor of the author of 1984 and the Chaplin who created the feeding machine in modern times.

The novels, the established histories, the philosophical and scientific classics that contain the world's cultures—what publishers call permanent backlist—will I believe hereafter be stored and transmitted digitally, readily and always accessible at low cost wherever in the world Internet

connections exist, in a radically decentralized marketplace where readers may order printed copies on demand in traditional formats at a convenient time and place. Because the traditional supply chain will be severely abridged, the cost to the user will be less and the returns to publisher and author will be greater. Most important: no title need ever again be out of print and English will no longer be the imperial language, the sine qua non of literacy. In a moment I will discuss my own part in this transformation, but first I would like to mention vast areas of content that will in fact no longer be printed and bound and which can be accessed most conveniently on digital screens, or as text messages on cell phones, a transformation that is already well advanced.

Most reference and other research materials—encyclopedias, dictionaries, manuals of all kinds, atlases, most if not all textbooks, journals—will be accessed and read digitally and no longer printed on paper and bound. In several lifetimes no one will ever use more than a small fraction of the entries in the *Oxford English Dictionary* or the *Merck Manual* or *Groves Dictionary* or *Fowler's English Usage*, which in printed form are obsolete on the day of publication. These and similar research materials will hereafter be conveniently and cheaply available item-by-item by subscription or for a fee per use or free, accompanied by advertising or otherwise subsidized.

I am delighted to be rid of my multivolume *Oxford English Dictionary*, which for years took up four feet of shelf space above my desk and whose size and weight made it awkward to use. Now I subscribe to the OED, log on, enter the word I want and instantly it appears on my screen, accompanied by its various forms. Eventually the Web will become more useful as a source of rudimentary information while search engines will become increasingly able to sort out complex data. This seems to me only a matter of time. But the World Wide Web is new only by virtue of its electronic form, not its intellectual substance. Humankind has always been surrounded by a web of information, accessed and transmitted long before the electronic age by word of mouth, by drum answering drum, by textile patterns, by mezzuens singing from tower tops, by wandering scholars and balladeers, by farmers telling farmers, by shoemakers and goldsmiths telling their sons, and in the past five thousand or so years by scratches on stone, papyrus, or paper, for how else could the great works of our distant ancestors have been composed, disseminated, and preserved? Search engines in those earlier times were gifted human beings: the authors of Genesis, Ecclesiastes, and the Book of Gilgamesh. In modern times Edward Gibbon compiling his history of Rome was a phenomenal search engine who found and transformed everything he needed for his vast subject to which his successors have added mere footnotes; Diderot compiling his encyclopedia, and Dr. Johnson working alone on his three-legged chair were astonishing search engines whose subtlety no conceivable machine can equal. Data stored and retrieved electronically are a convenience and

eventually will be a greater one: but the searchable Web does not change the fundamental nature of intellectual work or human understanding. Despite the great inventions of the twentieth century—the telephone, the wireless, television, the computer—we still await a second Shakespeare, another Mozart, another Einstein who did his great work in 1905 with nothing more than pencil and paper.

For millenia before the invention of writing, the tales from which our great epics were made—the Homeric epics, the scriptures of ancient religions—were transmitted orally and polished by generation after generation of scribes to evermore regular, concise, and elegant perfection as the collective wisdom of tribes. The great books of the Old Testament were handed down in successive refinements by generations of wise men, the achievement of generations of trial and error until they became an orthodoxy. Then with the invention of the alphabet what had been sung as verse and passed along from parents to children by word of mouth—as the alphabet itself is sung to children and repeated by them today—could now be preserved in written form and codified once and for all. Memorization was no longer essential. The age of prose was at hand. These great works were necessarily collaborative over generations, but unlike the collaborative works envisioned by today's prophets of free for all composition, this tribal wisdom was rigidly governed not only within strict, singable, easily memorized verse forms but by astonishingly high literary standards, refined and burnished by successive generations under what must have been priestly supervision.

Literary skill is a gift not granted indiscriminately to anyone with a pencil or a keyboard. What is unreadable cannot and will not be read whether composed on stone tablets or an IMac. This is not to say that community-based composition of reference works will not flourish in the digital age as in the past. Wikipedia is an example of a dispersed human community collaborating responsibly to create a complex work in progress, but dictionaries, encyclopedias, and similar reference works, except for the very earliest examples, have always been collaborative efforts and there is no reason that they should not continue to be in the digital age. What is impressive about Wikipedia is the strict, unspoken discipline that makes the project possible if not yet perfect, but this is nothing new in the history of encyclopedia making. Plays, novels, histories too have occasionally been written collaboratively and may be in the future as well, but the major works of our literary tradition, those works in which whole cultures are embedded—were composed usually in deep solitude by women and men of genius, not by undisciplined committees at remote keyboards. Digitization will make it possible for literary works to be works in progress permanently, a boon to future Walt Whitmans, but long before the physical limitations of the printed book dictated a formal literary structure, human nature dictated that stories have beginnings, middles, and ends. Narrative

form, like the word *Why?* and the need for an ending, is deeply embedded in human nature.

Digitization does not foreshadow a break with the human past but an extension of it, as the alphabet and later the invention of movable type extended, but did not recreate human nature, the same human nature that links us to Achilles and King David, Medea and Astarte. Google has simplified routine research tasks but it cannot replace the hard, solitary, intellectual work of literary composition. The Melvilles, Prousts, and Faulkners of the future will still have to rely upon their own wisdom and genius, as such writers have always done and are judged accordingly. Nor will an electronic book that actually turns the page enhance the experience and certainly not the convenience of reading *Pride and Prejudice*, or digital distribution alter the fact that intellectual property belongs to its creator under any conceivable copyright law or definition of equity. The fact that children are now spending more time on the Internet means only that children have found a new way to pass the time until they are ready to confront the world. The proportion of young people who become lifetime readers has never been great but there is no reason to assume that it will decline in a digital future that offers readers everywhere unprecedented access to books in their own languages. In fact worldwide literacy will flourish thanks to these new technologies as European literacy expanded by order of magnitude after the fifteenth century.

Let me explain my own interest in these matters. Since the 1950s I have been involved in the book publishing business, for much of this time as the editorial director of Random House in which capacity I oversaw all aspects of the publishing process. Under an unusual arrangement with Random House I was also free to start my own businesses, as long as they were not competitive. At my previous employer, Doubleday, I had been responsible for creating the so-called trade paperback, that is paperback books of permanent—as opposed to transient—interest to be stocked permanently in bookstores rather than displayed briefly at newsstands where last month's inventory was taken away with last month's magazines and replaced each month by new titles, mainly thrillers, romances, and mysteries. This innovation proved a great success and came to be called the paperback revolution. Suddenly I was transformed from a neophyte junior editor to a prophet. I say this not to boast but to explain my subsequent career. By the 1970s I became aware of a structural crisis in our industry. The great postwar demographic shift from city to suburb had transformed the retail market for books from one based on thousands of downtown independent bookstores, many of which carried extensive backlists—what are today called the long tail—to mall-based book chains paying the same rent as the shoe store next door and depending upon the same rates of turnover. This meant radically truncated inventories of fast-moving titles at the expense of the long, slow-moving tail.

This created two problems: first, it turned the book business upside down: where traditionally firms could depend upon their backlists—titles that sold year after year—for their survival, now they were hostage to ephemeral bestsellers that provided the turnover and reduced the inventory expense of the mall stores, but placed an enormous burden on publishers to provide these bestsellers month after month, which involved ever greater, ever more precarious financial risk. It was this burden that led smaller firms to merge with larger ones and for larger firms eventually to be subsumed into today's conglomerates, raising the question for this ancient industry of what happens next in this devolution.

The second problem of course was that the cumulative backlists of all publishers embodied the self-correcting wisdom of our civilization without which we would no longer know who we were or where we came from or where we might be going. The nurturing of backlist was more than simply a financial necessity for publishers, it was our *raison d'être* as members of a civilization. And now that *raison d'être* was vanishing at an alarming rate.

To confront this systemic threat to our industry and our civilization I did several things: With my late wife Barbara and a group of like-minded friends I created the *New York Review of Books*, and with the great critic Edmund Wilson I created, as a nonprofit enterprise, The Library of America to publish in permanent editions the collected or in some cases the complete works of American writers, now in its twenty-fifth year and a staple of our culture, and I also created the Readers Catalog, a catalog the size of the Manhattan phonebook from which readers could order over an 800 number forty thousand backlist titles: in effect a traditional, independent bookstore in the form of a catalog and the precursor to online bookselling. This was before the Internet was commercialized. The results were encouraging. We sold hundreds of thousands of catalogs and many times that number of books but after a year I discovered we were losing money on nearly every sale. The average revenue per order was thirty-two dollars but the cost of handling, storing, packing, and shipping physical books for individual customers rather than in bulk to retailers was prohibitive. By this time the Internet had become commercialized and first Amazon and then Barnes and Noble were now selling backlist titles online. I had decided not to pursue this risky course and auctioned the catalog off to the two online companies that proceeded to lose tens of millions of dollars before Amazon finally found its way as a broker of general merchandise. Meanwhile I wondered how to carry on an extensive backlist operation over the Internet to individual customers without the cost of handling physical inventory, which had made my catalog unprofitable and was causing serious losses at Amazon and B&N.

Digitization was of course the obvious answer. Digitization, which had emerged by the late eighties, meant that it would be possible to replace the five hundred-year-old Gutenberg system with its reliance on physical

inventory and its costly infrastructure with a decentralized marketplace served worldwide and in many languages by a practically limitless digital inventory, stored and delivered at little cost wherever Internet connections existed. The catchphrase at the time was disintermediation, but all this meant was that you could now, with a single click, e-mail an entire book with all necessary metadata as easily as a letter. This prefigured a vast paradigm change, but it required a further component for the kinds of indispensable books in which I was mainly interested: a device like an ATM that could quickly produce at point of delivery a high quality paperback book at low cost. Print on demand technology had already been introduced but the machinery was cumbersome, expensive, required full-time operators and functioned within the existing supply chain. It was designed to print small quantities in a factory or workshop setting for university presses and similar specialized publishers that could not afford to maintain inventories of slow-moving titles. What I envisioned was the next generation of p.o.d. technology: a fully automatic, low cost device that could be placed in a neighborhood bookshop or Kinkos or library or Starbucks or cruise ship or space station—in effect an ATM for books—so that readers at their computers could order a title as if they were buying a book from Amazon but instead of receiving a book days later by UPS the reader would order a digital file and fifteen minutes later collect the finished book, indistinguishable from a library quality paperback and at less cost, from a nearby machine. In other words, digitization would abolish Gutenberg's increasingly dysfunctional supply chain if it could be combined with a compact, fully integrated, and automatic bookmaking machine that required no more human intervention than a typical office copier and cost about as much.

That machine in prototype now exists and is printing books at the World Bank Infoshop in Washington, DC; the SIBL Branch of the New York Public Library; and the Alexandrina in Alexandria Egypt. A more compact, faster commercial version is now being developed by On Demand Books, a company I helped found. When this relatively inexpensive machine is distributed worldwide the post-Gutenberg world will have begun, a world in which all the world's books in all the world's languages will be cheaply and easily available in a radically decentralized marketplace wherever Internet connections and electricity exist.

An essential component of this technology is a universal catalog of print-ready digital files, a major collaborative task already begun by the Open Content Alliance but which will eventually require the cooperation of publishers and other content providers including, for example, Google, under worldwide international sponsorship. The advantages to publishers of replacing physical inventories and their costly infrastructure with print-ready deep virtual inventory are obvious. This transformation will not occur overnight but will I believe occur spontaneously as entrepreneurs

discover profitable ways to exploit the new technologies and markets. Thirty-two years after Gutenberg's death, printing presses were established in more than two hundred European cities from Oxford to Salamanca and from Barcelona to Brno. Venice alone had 150 presses. This dispersion was not the result of a master plan but of individual printers pursuing their interests. Gutenberg's technology, like the great libraries it helped create, could function only in fixed locations within large population centers. The new technologies will now serve the world as a whole in a multitude of languages with consequences no more imaginable today than the printers of Oxford and Venice could have imagined for their own technology five hundred years ago.

Jason Epstein worked in book publishing for more than 40 years. He was editorial director of Random House and founded Anchor Books, the *New York Review of Books*, the Library of America, and the Readers Catalog. Now in retirement, he wants to digitally reconstruct publishing, as digitization is recreating the music industry. He has been the recipient of the first National Book Award for Distinguished Service to American Letters, the Curtis Benjamin Award of the Association of American Publishers, and the Lifetime Achievement Award of the National Book Critic's Circle. His most recent endeavor is On Demand Books, the company that markets the Espresso Book Machine, which he cofounded in 2004. In 2007 he received the Philolexian Award for Distinguished Literary Achievement.