

Ball - Goodbye to All That

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Disintermediation, Disruption and the Diminishing Library

David Ball and Chris Spencer

Introduction

History testifies to two ICT revolutions. In our reckoning we are now in the grip of a third.

The first ICT revolution was the development of writing. Beforehand the only vehicle for storing information was the human memory. Transmission relied on speech and signs; if content was not to perish with the individual, replication needed time and personal contact. After the invention of writing, portable storage media decreased the restrictions imposed by time and space. Knowledge became much less vulnerable; more could be stored and passed from generation to generation or carried across long distances; critical thinking was enhanced.

While writing represented a huge advance, scholars in the world of manuscripts knew severe limitations. They tended to travel to manuscripts, which were often in jeopardy: witness the destruction at Alexandria. It was very difficult to determine provenance and authority, and to compare texts. Dissemination by copying tended to corrupt texts.

It is almost impossible for us now to appreciate the scale and impact of the second ICT revolution – printing with movable type – we have spent our lives during its maturity. Scholars in the late 15th and early 16th centuries were however under no illusions about its nature. We hear of Johann Fust having to flee Paris: its inhabitants believed that only someone in league with the devil could produce so many perfect copies of the bible. Later Fust was conflated with Georg (subsequently known as Johann) Faust, who was of course reputed to have sold his soul to the devil in return for knowledge (Eisenstein 1993, pp19-20). Particularly telling is the association of a technology, so marvellous that it could only be achieved through necromancy, with the pursuit of that most dangerous commodity – knowledge.

For the scholar the advances represented by printing were marked. The possibilities of *obtaining* texts were hugely enhanced. By 1503 8 million books had been printed, more, it is estimated, than the number of manuscripts produced between 330AD, the founding of Constantinople, and 1453, when it was captured by the Turks; the cost of copying one manuscript equated to the cost of producing over 300 printed books (Eisenstein 1993, pp13-14). Provenance and authority were enhanced by the use of title pages (appearing from the 1480s onwards, Suarez, Woudhuysen. and Woudhuysen, 2010, p.1208); texts became more organised and exploitable through indexes; tables of contents etc. Later editions *improved* texts through corrections; they did not corrupt them as copying had corrupted manuscript texts.

Looking forward 200 years from the birth of printing, Guédon (2001) discusses one of its major outcomes: the invention of scholarly communication by Oldenburg with the *Philosophical Transactions of the Royal Society of London*. He also notes the fluidity at that time of boundaries between the various players in publishing (writers, printers, book dealers). Under Oldenburg's direction the achievement of the *Philosophical Transactions of the Royal Society of London* was twofold. First they acted as a register of intellectual property: publication there was equivalent to establishing title to that property. Second acceptance by an editor or peer review panel conferred status and credibility through the backing of the journal's name.

As the scope of printed books and journals mushroomed, the role of the librarian grew, as intermediary between user and producer – creating retrieval and descriptive tools such as catalogues and indexes, selecting under scarce budgets, arranging, protecting and providing access.

Today's third ICT revolution brings echoes of the second, particularly in terms of (relative) speed and availability of information. But it will also be a similarly disruptive technology: we cannot yet see in full how it will change scholarly and other communication; we can be sure that its impact will be as great in terms quantity, quality and mode of communication. We can also see that its impact on the role of

the librarian and information professional will be at least as great; we do not know yet exactly how, but we can predict that that role will be severely diminished through disintermediation.

Disruptive technologies

The theory of disruptive technologies was put forward by Christensen in 1997 in a book entitled *The Innovator's Dilemma*. In the introduction, he draws a distinction between sustaining and disruptive technologies. Sustaining technologies generally improve performance of established products, and are pursued by companies that are keenly aware of their existing customer base. Disruptive technologies are generally very different: they underperform existing products, but have different features that are attractive to fringe customers, and are cheaper, simpler, smaller, easier to use.

The famous example given is Honda's penetration of the motor cycle market in the USA. In 1959 Honda began by trying to export large-engined cheap bikes to compete with manufacturers such as Harley Davidson, but could find no dealers to take them on. By chance Honda employees had brought small 50cc bikes with them as run-arounds. These were taken up quite by chance in California largely for leisure use, and sold very well. From the 1970s this foothold in one niche enabled Honda to target the market for larger bikes, supported by excellent engineering and design, and come to dominate it, driving Harley into the very high end of the market.

Christensen's theory is extended by Lucas and Goh (2009). They examined Kodak's response to the development of digital cameras, and introduced the concept of organisational rigidity. From the 1880s, Kodak's business was founded on selling analogue cameras cheaply and making their profits from consumables such as film, paper and chemicals. Even though Kodak spent large sums of money on developing digital technology, they failed to produce and sell digital cameras because of the rigidity of thinking within the company at the middle management level. The five years to 2005 saw sales of digital cameras rise from 4 million to over 20 million, while sales of analogue cameras fell by a similar amount, destroying the demand for Kodak's money-earning consumables.

This disruptiveness does not exactly fit Christensen's theory: what Kodak missed was the realisation that the possibilities of ICT – of the increasing availability of desktops and broadband – would enable a mass market founded on a different, digital technology.

There are lessons in these two examples for the library and information profession today.

The classic version of the theory sees companies that are very adept at reading their customers' demands and at developing existing products. What they miss is the realisation that they are improving their products **beyond** what the customers need. They may well be satisfied with something that is good enough, and in other ways attractive – in terms of price or functionality for instance.

The extension of the theory points to the importance of responding flexibly and quickly to the developing technological environment. The digital camera puts the user in control, in terms of number of images achievable, viewing, printing, editing, distributing, publishing. This pursuit of empowerment is also reflected for instance in the proliferation of web-sites enabling users to build customised holidays – trains, flights, hire cars, accommodation etc. A travel agent could identify a package holiday far more quickly, but the user wants to be in control and have the satisfaction of procuring what s/he wants, when and where s/he wants it, at the price s/he is prepared to pay.

The library and information profession is also prone to offer products developed beyond what the user generally needs. Are our pristine library catalogues and sophisticated search engines necessary (not to mention attractive and welcoming to the user), when a familiar technology such as a Google search produces materials that are **good enough**, and **immediately available** on screen? It can be argued, although there are dissenting views, that *Encyclopaedia Britannica* is more authoritative than *Wikipedia*; but again for most purposes *Wikipedia* is perceived as **good enough**, and is **immediately available**. Also our potential users want to be in control, to decide what they want, where and when they want it. Are our responses to these increasing demands flexible enough?

Libraries are not multinational commercial concerns, and hence are different from the companies cited here, Kodak and Harley. But if we do not learn the lessons from their experience, we may be well on the way to being elbowed out of our traditional place in the information landscape. This paper will chart the implications for the future of the profession of some of the main forces at work on this landscape.

The Big Deal

Organisations such as JISC Collections in the UK and the large regional consortia in the USA have negotiated directly with publishers and obtained large amounts of e-content for prices based on print subscriptions (the so-called Big Deals). These have been welcomed by many: they have delivered large amounts of content for our users. However there are dissenting voices, for instance Ball (2005), holding that too much power has been ceded to the major publishers. Very large proportions of library budgets, especially in the big research libraries, are committed to a small number of publishers, such as Elsevier and Wiley Blackwell, in Big Deals. These agreements typically included punitive no-cancellation clauses. The latter, combined with the length and the all-or-nothing nature of such agreements, severely limit libraries' freedom to make or alter purchasing decisions. The result has been severe reductions in spending on monographs and a squeeze on publishers outside the Big Deals.

With the Big Deals power has shifted considerably in the publishers' favour, and freedom to make collection development decisions has been curtailed. If the trend towards national deals and block payments, seen for instance in the Scottish Higher Education Digital Library (SHEDL; for an initial evaluation see Research Information Network (2010)), continues, these decisions will be relinquished even more. As far as procurement is concerned, the Big Deals have simply exposed a malfunction in the market: all publishers are monopolists, sole suppliers of monograph or journal content. Competition, so central to the procurement process, is severely limited, applying essentially only to intermediaries such as serials agents.

At the time of writing there is a groundswell of opinion in libraries that, mainly because of financial pressures, could see the cancellation of some Big Deals. However, these will be very difficult decisions to make, and subject to pressure from users who have grown used to the availability of huge amounts of material. The publishers will also play their part in trying to influence academics and university decision makers, and in massaging their offers to make them just acceptable. They, it must be remembered, know a great deal about their contributors, buyers and consumers, much more than we know about them. They were able to see the advantages of the Big Deals, and embed them in the market, cutting out the intermediary collection developer.

Open Access

A notable response to the power of the publishers' monopoly is the open access movement, which aims to make scholarly literature freely available to all.

One route (gold) is through open access publishing, where typically the author, or their institution or research funder, pays the cost of peer review and publishing. The content is then freely available without the need for subscription to the journal. The journals themselves may be completely open access or hybrid, publishing a mixture of subscription-based and open-access content. There are many obstacles and vested interests to overcome if this version of open access is to expand. Perhaps the most intractable is the power of established titles: there are financial and reputational pressures that push academics towards publishing in those with the strongest reputation for peer review; as long as these remain subscription titles, there is little incentive for the researcher to publish elsewhere, and the open access titles are stifled. There is also the problem of cost. While in the longer term there will be savings for most universities in open access (Swan 2010), there remains the awkward period of transition, where subscriptions have to be maintained alongside payments by authors. Also there is evidence to predict that while some, smaller, institutions will benefit financially, others, the largest, will have to pay substantially more.

The other route (green) is the deposit of pre- or post-prints of traditionally published materials in the author's institutional repository. There are also a number of subject repositories, such as Arxiv, which covers physics, mathematics and related disciplines, BioMed Central, Cogprints, a cognitive science archive, and E-LIS for library and information science. A new type of subject repository is represented by Economists Online, which harvests subject-specific content from institutional repositories into one subject collection (Puplett 2010).

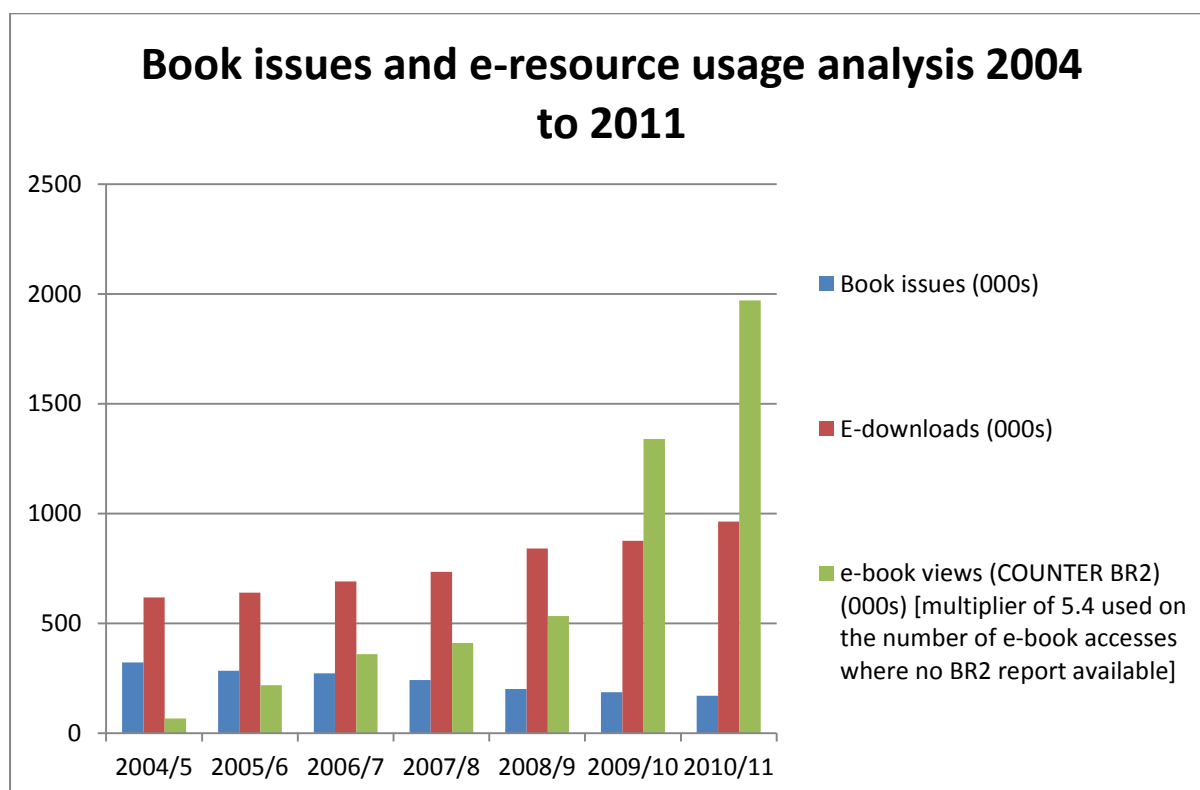
Ironically, in this response to the Big Deals and the power of the publishers, we again see disintermediation at work. Open access journals are freely available to all, without any intervention. Repositories however are rather different, and offer a new avenue for the profession. It has long been recognised (Ball and Spice, 1996) that the electronic age offers the potential to turn academic library

practice on its head. University libraries until now have promised to collect or gain access to the research outputs of all other universities and research institutions, a task that is both impossible to accomplish and costly to attempt. With the widespread introduction of institutional repositories, however, it is now feasible for each university or research institution to collect all the research outputs of its own scholars, and make them available to all other universities. This task, by contrast, is finite and achievable; the costs are commensurate with the research standing, and income of the academic institution.

E-Books

In the UK e-book usage began to take off in about 2005, partly as a result of negotiations by the Southern Universities Purchasing Consortium. In the early years, much of the usage was from large packages of e-books offered by various suppliers, such as ebrary. These packages, somewhat reminiscent of the large collections of journal titles offered by aggregators, were largely treated by users as databases: searching was by subject or keyword, rather than by individual title. They played a major role in establishing the e-book as an acceptable medium; students were able to find highly relevant material immediately available in digestible chunks on the desktop. However they were also another example of disintermediation.

The popularity of electronic forms over print can be seen in the graph below, representing usage in Bournemouth University of hard-copy books, e-journals and e-books over the past seven years. The aggregate of e-journal and e-book usage is nearly 3 million downloads, of the size of an article or book chapter. This aggregate is rising sharply, while the total book issues have declined to about 180,000. Applying the Counter multiplier of 5.4 to hard-copy books, in order to arrive at a comparable figure at the article/chapter level, gives just under one million.



There is a mixed message here for the profession. Over the past two years, many more books have become available in electronic form, and libraries are buying more at the title level using traditional selection processes. The selection process seems highly successful, given the mushrooming usage. However, a new form of purchase has been enabled by the new electronic form and is now being trialled by many libraries, known by the unlovely name of patron driven acquisition. While the

business models of the various e-book retailers all differ, the core of the offer is as follows. Libraries are able to select individual titles or authors or subjects for inclusion in the patron plan, and deposit a sum of money with the bookseller. The e-books are freely available to library users, appearing in the library catalogue and search tools. However, when a title is used a certain number of times, it is automatically bought by the library, and the cost is debited from the library's account. Obviously controls can be introduced here – on the range of material available, on the amount of money on deposit. It is also possible to require approval from library staff before the account is debited – but this slows the process and takes away the immediacy and benefit from the user. Again this is a form of disintermediation, where selection is transferred to the end user, whether student or staff, and away from the librarian.

It is too early to tell, anyway in Bournemouth University's case, how successful patron driven acquisition will be. Early indications show that on average in something under a year, e-books selected by library or academic staff during that period are used 22 times, e-books bought as a result of the patron plans are used 7 times, and hard-copy books bought are used twice. It is not possible to draw many conclusions from these figures. They would need to be taken over a longer period of time in order to demonstrate usage over the expected life of a title. Also different types of book, or subject, may be available in the different categories of materials. However, they seem to demonstrate quite clearly that: a) e-books are much more popular than hard copy; b) patron plan acquisitions have the potential for significant usage over time.

Google Books

As Dougherty (2010) notes, Google has begun nothing new with its project: JSTOR, Project Muse and the Internet Archive have been in existence longer, using the same or similar technologies, and these projects may well also outlive Google. Compared to Google however their size, though significant, is small. The Internet Archive for instance has over 1.6 million texts, JSTOR over 1000 academic journals, while to date Google has digitised over 13 million books in over 400 languages (Barron 2011). The project is encountering legal problems, but there are strong economic and societal drivers to move it ahead. Barron (2011) notes that more than 90% of books in Europe's national libraries are no longer commercially available. He also estimates that about 75% of the world's printed books are out of print but still in copyright. They lie fallow, having the potential and right to make money for their authors and publishers, but not doing so because the printed form makes it uneconomic. This could be a sizeable income stream for commercial organisations (publishers) generally unlikely to turn such an opportunity down, and authors, who will both make money and get their books read by a wider public.

Turning to out of copyright works, a recent survey (Jones 2009, p.86) demonstrates that 'the pre-1872 content in Google Books approximates that content available via the online catalog of a generic major American research library, and indeed is probably superior for post-1800 imprints... It seems likely that Google Books will eventually (perhaps very soon) become the single largest source for this content'. To be clear, Jones is saying here that perhaps very soon there will be more (pre-1872) content available through Google than in any one major American research library. That content will be available online, free at the desktop of any scholar. The full text will also be indexed and searchable.

There are problems, arising from the process of digitisation; pages may be missed or illegible or folded. However Jones foresees a time when Google Books rather than the library is primary. In a reminder of another disruptive technology, the digital camera example above, the advantages of full-text searching and immediate accessibility are huge: researchers will use Google first and a library only when the Google version is unsatisfactory. If the legal knot preventing the availability of copyright works is finally dissolved, the massive availability and utility of Google Books will have far-reaching effects on the library and information profession. Even in such a specialised field as music, Google Books is seen to have its applications (Dougan 2010).

Disintermediation

As Sandler (2005) notes, 'there are no entitlements in the world today – libraries and librarians have to prove their worth like everyone else'. He takes the example of Main Street America and its specialist shops – these had a belief in themselves as having 'better taste than their customers and a higher knowledge of merchandising, value and quality'. They did not however pay attention to their customers' wants and desires, and have been elbowed out by the out of town malls. The independent bookshop is a good example. The proprietors would pride themselves on knowing their customers and selecting interesting stock, not simply the best-seller lists and publishers' promotions.

Their competitor however is not just the bookshop or supermarket chain, it is Amazon, which provides its users with the opportunity to buy not only everything in print but also the stock of a large part of the second-hand trade. To return to the language of disruptive technologies, the independent bookshop has taken quality beyond what its customer needs; and has been trumped by the accessibility, variety and empowerment of the new technology.

This paper has looked in some detail at the main forces pushing towards disintermediation in the library and information profession. The Big (and national) Deals have removed selection decisions from librarians. The trend to open access publishing, although a counterweight to the power of the subscription-based journals, has and will continue to have the same effect. The free availability of huge amounts of what was formerly known as grey literature (reports, working papers etc.) from organisations' websites is another factor. The e-book is immensely popular; it too has the capability to remove selection decisions from the librarian and transfer them to the end user. Finally the massive digitisation programme of Google Books and others will create a *de facto* research collection far more comprehensive and infinitely more accessible and searchable than anything the profession has been able to create in the print world.

Librarians and other information professionals are facing a huge challenge. Melchionda (2007) puts it well: 'in the internet age [they] need to come to terms with their patrons' new information habits first, and then with a working environment always more dematerialised'. Horava (2010) notes the power of disruptive technologies, but also sees that 'the flip side of disruption is opportunity, and we need to see the enormous opportunities afforded by a disruptive landscape in reconnecting with our patrons in new and effective ways'. Library collections in the electronic age are becoming more and more homogenous – we only need think of the Big and national Deals. The opportunity here is for librarians to concentrate on the special collections of local and primary material. We are already seeing the new role for librarians, as collectors and curators for the institutional repository, becoming well established. Here is a niche, but one that, as noted above, turns traditional library practice on its head: we collect and make available to the world the research outputs of our won institutions, instead of collecting the research of the scholarly world to make it available within our institution.

But in our disrupted professional world the niche, the unorthodox is the space we should be occupying. The established practices of research and scholarly communication will change under the impact of the new technologies, in exactly the same way that the print revolution affected and created the current Oldenburg model. Our challenge is to be open minded and agile enough to predict and respond to these changes, to support our users in their rapidly changing endeavours, and not to remain wedded to the old disrupted models.

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