LIBER QUARTERLY, ISSN 1435-5205
© LIBER 2004. All rights reserved
K.G. Saur, Munich, Printed in Germany

The Transitional Period of the Periodicals Format Shift

by EILEEN GIFFORD FENTON, ROGER C. SCHONFELD

INTRODUCTION

One of the more dramatic shifts affecting libraries in the past decade has been the rapid pace of technological change. In particular, the ongoing transition from print to electronic periodicals has challenged librarians to rethink their strategies. While some effects of this change have been immediately apparent - greater breadth of material, easier access for users, exposure to new sources, publisher package deals, and open access - the broader outcomes on library operations remain unclear.

In 2003, with colleagues Donald W. King at the University of Pittsburgh and Ann Okerson at Yale University, we set out to learn how this transition to electronic periodicals is affecting costs to libraries. With the cooperation of 11 academic libraries, [1] we focused specifically on the 'non-subscription' costs, everything from staff time and computer workstations to binding and the maintenance of space. We analyzed this data using a life-cycle approach, which allowed us to project how anticipated costs over time for the two formats - print and electronic - can be expected to compare. Full details about our methodology for data collection and the life-cycle analysis may be found in full report, which was published by the Council on Library and Information Resources (Schonfeld et al, 2004).[2]

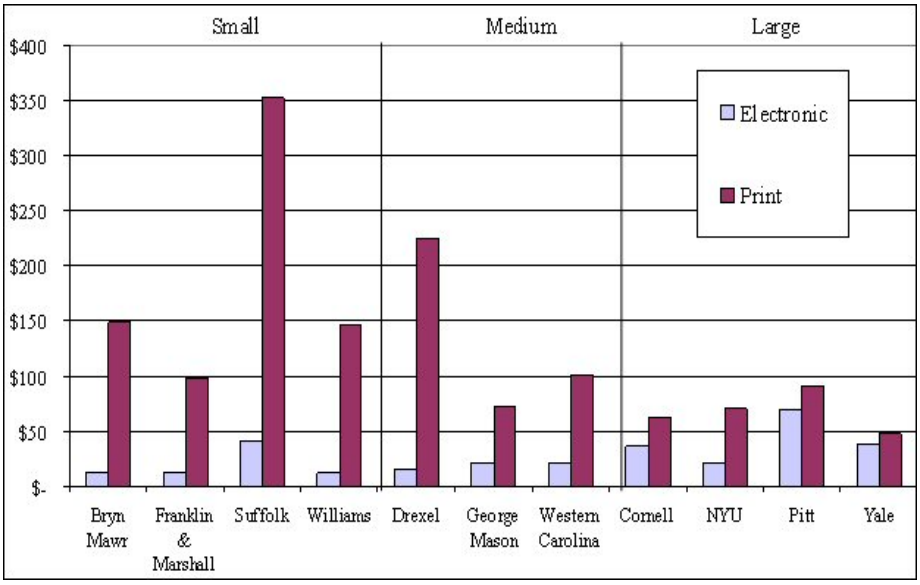
The libraries that were included in our sample represent a range of academic libraries in the United States, from the largest research universities, to medium-sized universities, to small liberal-arts colleges. We sought a group of libraries that was diverse in terms of size, research-intensity, affiliation, and degree of commitment to electronic resources. We hope that many readers will find institutions similar to their own among our study participants, and that this may offer some implications for them of the likely effects of the format transition. We did not, however, build the sample to be 'representative' of American or worldwide libraries, so a degree of caution is recommended in interpreting the implications of our findings system-wide. Because we focused exclusively on US libraries, currency is expressed in US Dollars throughout.

Our findings show that, on a per-title basis, the non-subscription costs of electronic periodicals are consistently and substantially lower than those of print periodicals. After reviewing our findings, we will devote this paper to the topic of the transitional period between an all-print and an all-electronic collection, to focus on this important period in which most libraries now find themselves.

OVERVIEW OF FINDINGS

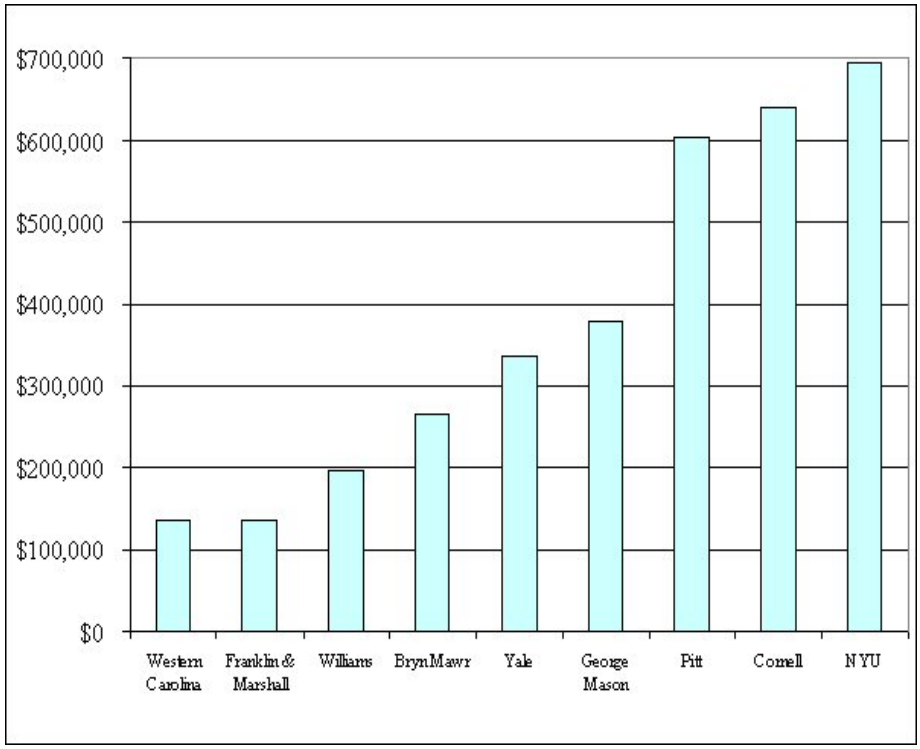
Our methodology allowed us to focus on the implicit long-term cost commitment made by a library at the point of acquisition associated with a given periodical title. This implicit long-term cost commitment is what we refer to as the life-cycle cost. As Figure 1 shows, on a per-title basis, the non-subscription life-cycle costs are consistently and significantly lower in the electronic format than they are in the print format.

Figure 1. Relationship between Print and Electronic 25-Year Life-Cycle Costs



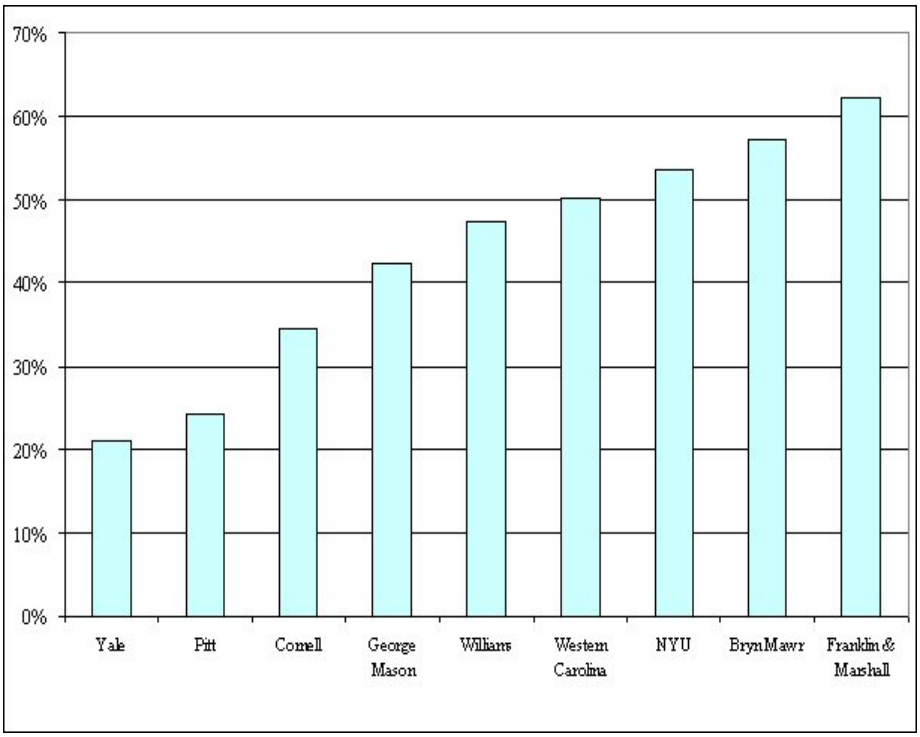
To determine the effects of the life-cycle findings (shown in Figure One) on individual libraries, we considered several potential scenarios. Our ultimate model envisions a complete transition of existing print titles to electronic format. In this case, we project eventual cost reductions of $100,000 to $700,000 annually. [See Figure 2]

Figure 2. Cost Reduction Achieved by Converting One Subscription Year to Electronic-Only Format (Total Cost Differential over 25-Year Life Cycle)



When examined against annual non-subscription costs, we expect savings ranging between 20% and 60% [see Figure 3]. While the cost implications will depend on local conditions, initiatives, and management practices, the likely outcome of the transition for the libraries we studied is reduced non-subscription costs for periodicals. Overall cost reductions appear to exist, although they are perhaps not as dramatic as some observers have indicated. Most notably, the cost reductions at the large schools, though large in the absolute, are smaller than many have anticipated when measured relative to annual budget size.

Figure 3. Cost Reduction Achieved by Converting One Subscription Year to Electronic-Only Format as a Percentage of Annual Non-Subscription Costs



Other things being equal, our findings strongly suggest that making the conversion from print to electronic periodicals will be cost-effective for libraries. (Indeed, we believe that our findings underestimate print costs and that the anticipated cost reductions may be higher than our estimates.) In the long run, the benefits to libraries only bolster the case that has been made about the advantages of the electronic format to research.

These conclusions do not, however, consider the transition itself. One of the most notable set of findings from our study is that the transition is more complicated, both from a cost perspective and from a policy perspective, than has generally been realized. We turn now to consider some of these complications and offer options for how some of these might best be resolved.

COST CONSIDERATIONS

The findings presented above assume a complete transition from print to electronic format. It will likely be some time before we find this transition completed. Even the libraries in our study - Drexel and Suffolk - that have, effectively, completed the transition continue to subscribe to some number of print titles (generally popular periodicals) and so non-subscription costs remain in their operations. Furthermore, many individual journal titles do not have a transition plan of their own and may not develop one for years to come. During a gradual transition, print subscriptions would decline but not be eliminated. Because this is the exact position in which many academic libraries now find themselves, our study also considered the implications of this 'middle state.'

The print operations of the libraries we studied achieve significant economies of scale. The libraries with the largest print collections have significantly lower unit costs than smaller libraries because they have been able to develop routines and workflows that are relatively efficient.

As print titles are cancelled and replaced with electronic versions, the efficiencies that have been developed would be expected to decline. This would lead to a reduction in the economies of scale, with per-title print costs being driven up as a result. (Depending on what percentage of the collection transitions, the increased per-title effects may reduce the expected cost advantages dramatically.)

To demonstrate the complications associated with a partial transition, we modeled a 50% transition from print to electronic format. The results of this model are graphed in Figure 4. This figure can be compared with Figure 2 to see the differences between a full and partial transition. In addition, in Figure 5, we express the half-transition shown in Figure 4 as a percentage of annual non-subscription costs; Figure 5 can be compared with Figure 3. The differences are notable.

Figure 4. Cost Reduction Achieved by Converting 50% of One Subscription Year to Electronic-Only Format (Total Cost Differential over 25-Year Life Cycle)

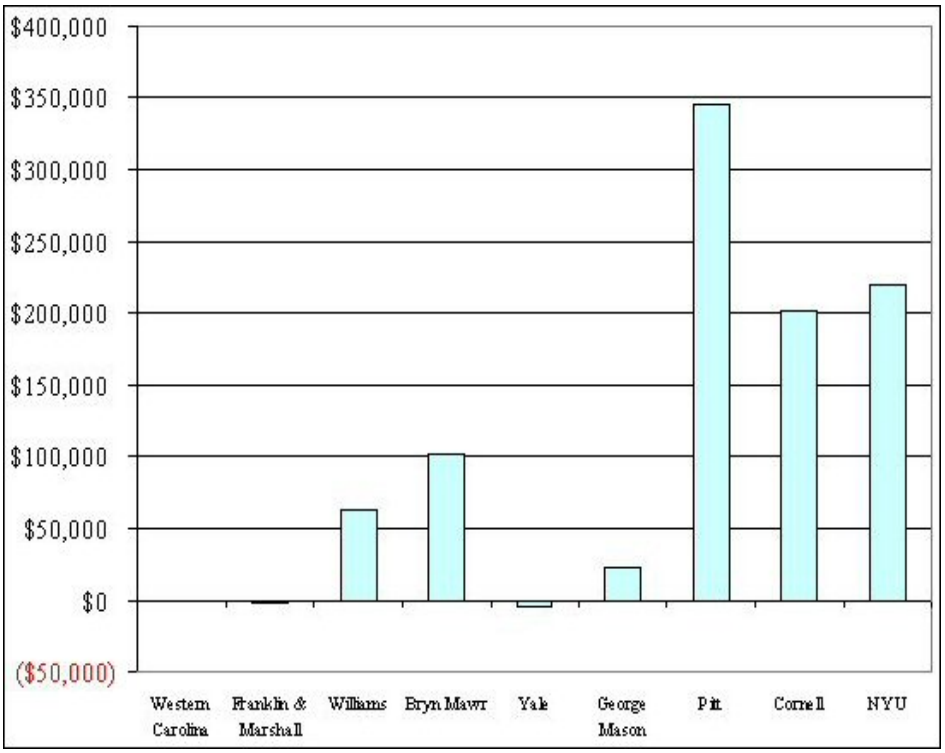
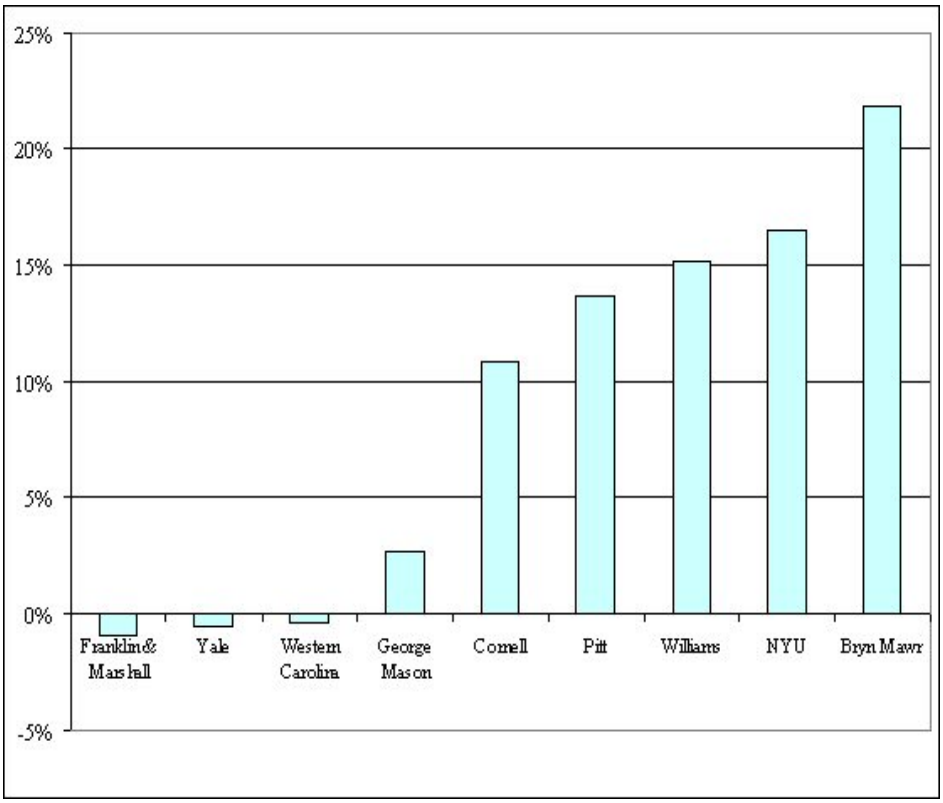


Figure *5*. Cost Reduction Achieved by Converting 50% of One Subscription Year to Electronic-Only Format as a Percentage of Annual Non-Subscription Costs



Many of the libraries might still achieve savings at the 50% point of the transition, although all would see their savings eroded and some might even experience a net cost. Three libraries are projected to experience effectively no cost reductions, or a minor cost increase, during the half-transition. For Franklin & Marshall and Western Carolina, this is because their print periodicals operations are much more efficient than would be expected given the size of their collections; as a result, a reduction in the size of their operations could have disproportionate disadvantages to efficiency. Yale, on the other hand, has the most efficient print periodicals operation in absolute terms, because of the economies of scale it experiences. Consequently, its relative cost reductions were never expected to be dramatic, and in the case of a half-transition, the cost increases as a result of decreasing economies of scale is expected to eat up the otherwise anticipated savings. Although these three cases are the most dramatic, 10 of the eleven libraries would

experience disproportionate decreases in the cost reduction. Pitt is the exception, with the cost reduction expected to be relatively higher in a small transition, although this is a statistical anomaly.[3] The point is that local conditions will play a significant role in the challenges experienced in a partial transition.

The cost effects we have found to be associated with a partial transition deserve careful consideration by any library that is planning a strategy for the transition from print to electronic format. If a full transition is eventually to be achieved, the near-term transitional effects may of course be of only short-term importance. But it cannot be ignored that the transitional period, especially if it is a long one, will result in increased unit costs for print periodicals as the number of print titles is reduced. Many libraries are already along the path of such a partial transition. But the slow ripping of the Band-Aid is always more painful. From this perspective, a faster transition would, other things equal, be preferable. Colleges and universities contemplating the transition from print to electronic format should keep in mind this important cost element, because the speed and comprehensiveness of the transition may affect costs dramatically.

Speeding up the transition would not in itself be a panacea. Having considered why some libraries will find this transitional period more or less challenging, we now examine how the ultimate outcome of a transition might appear. For this, Drexel and Suffolk offer important indications. Each of these libraries has, in effect, completed the conversion of its collection from print to electronic format. And yet, each retains a non-trivial print collection of one hundred or more current titles, in addition to backfiles. As a result, their non-subscription spending devoted to the print format has not fallen nearly as radically as their print subscriptions.

Is this a future that can be expected for other libraries? It is difficult to believe that print subscriptions to popular periodicals such as *The Economist* will be cancelled in the near future. The ways in which readers use such popular periodicals suggests that the print format will remain a popular option. If this proves to be the case at least for some significant amount of time, then the residual print collection may impose disproportionate non-subscription costs on the library. Alternatively, some libraries may conclude that traditional print processing practices are unnecessary simply for popular periodicals. In the absence of significant process redesign, libraries will maintain existing non-subscription practices for the remaining print periodicals. A library whose collection is mostly electronic should, however, consider whether the remaining print collection is being managed in the most efficient way possible.[4]

In addition to the challenges this will impose for the current collection, a related question is how libraries will handle their legacy print backfile collections. At many of the libraries in our study, prodigious print backfile collections account for a significant proportion of the non-subscription budgets. It should be underscored that the costs for these legacy backfile collections are not included in the print life-cycle model, because

only future costs for current acquisitions are considered. Legacy backfile collections often represent mission-driven commitments to long-term preservation and bring value to researchers, but their costs, sometimes not well understood, weigh heavily.[5] At large libraries like Cornell, NYU, and Pittsburgh where the number of electronic titles exceeds the number of print titles, the share of annual non-subscription costs remains far higher for print format than for electronic. This is not simply because the electronic life cycle cost is lower; it is also a reflection of the costs of maintaining access to the significant print backfile collections at a research library. And it should be noted that our work estimates the costs of physical space (of which backfiles are the principal consumer) at the rate of a high-efficiency off-campus facility, when backfiles may continue to be held in more costly on-campus space at many libraries, making the value of this space even higher than our figures recognize.

To be sure, high backfile costs reflect the success of a library at acquiring and maintaining collections of significant value to researchers, as well as the commitment to preserve these collections over time. And often, such backfile collections are not available in any other format. But in some cases, such a with the retrospective digitization work of JSTOR, a preservation-quality archive of the backfiles has been created, and in these cases, savings are indicated with the choice to rely on the electronic version alone (Schonfeld, 2003). This opens up numerous questions, including those related to the paper repositories that may ensure that artifacts are not lost as a result of the transition (see Nichols and Smith, 2003). While legacy backfile collections are not an area of focus for our study, they do account for a significant portion of the non-subscription budgets at many libraries, and it is impossible to consider the overall transition without giving some attention to how these collections will be handled after the transition.

All these various cost issues suggest that the transitional period itself is going to open up many interesting and challenging questions for libraries. Will the transitional period result in reduced non-subscription costs and, if not, can and should the transition be accelerated in order to minimize the cost challenges? Will a fully transitioned library nevertheless maintain subscriptions to some number of print periodicals and, if so, can these items be handled more efficiently than our models suggest? And finally, will print backfile collections continue to play an important research role following the transition of current issues and, if so, will they continue to account for a high proportion of library costs? These cost questions represent important uncertainties in how the transition will take place and, most intriguingly, whether near-term concerns may delay its completion.

ARCHIVING CONSIDERATIONS

Just as cost considerations pose challenges for the library community, so archiving considerations pose challenges of their own. There is no solution in place to ensure the long-term availability of electronic periodicals, which becomes more important every day as the library community continues its format transition (Case, 2004). And indeed, the lack of an acceptable archiving solution is unquestionably slowing the transition, thereby delaying the cost reductions that our study finds.

The lack of an acceptable electronic archiving solution is glaring. The costs associated with long-term storage and preservation of print format periodicals appear in our data, while they are altogether absent on the electronic side, accounting for some of the cost differentials we found. An important consideration for librarians and university administrators is whether the cost differentials from the transition will prove to be sufficient to fund a generally acceptable archiving solution and, if not, how that solution might be paid for. The failure to resolve the issue of responsibility for archiving has hindered the transition to electronic journals. If archiving is to be achieved, it must be paid for. While it is unclear whether libraries alone will be able to fund archiving, the cost advantages that this study finds may constitute the most likely source of library funding for this purpose and may therefore present an opportunity for the library community to shape the archiving solutions that eventually emerge. If these cost advantages can be realized by individual libraries and used to stimulate the implementation of archiving solutions, they might expedite electronic access to appropriate resources and the accompanying advantages to scholarship - even if, net of archiving, the format transition were to be cost-neutral.

CONCLUSION

The transition to electronic format for periodicals brings with it numerous advantages. Researchers find an increasing breadth of materials instantly and always available from anywhere, often fully and robustly searchable. Students and scholars are being exposed to sources they might never otherwise have found. And, as our study has shown, academic libraries may experience notable cost reductions in their non-subscription expenditures. It seems undeniable that the transition to the electronic format will not only continue but may even accelerate.

But while the cost considerations that we discussed seem to pull us towards as fast and comprehensive a transition as possible, archiving considerations mediate in just the opposite direction. This suggests that savings, archiving, and strategy for the transition be considered as one interrelated problem, and from a system-wide perspective. Any potential cost reductions should be carefully considered in the light of the absent

archiving solution for the electronic format because, if this function is valued, it will somehow have to be paid for, and any non-subscription cost reductions may offer one of the few obvious sources of library funding. Without consideration of these interrelated implications of the transition, it is possible for negative unexpected consequences to arise. But, with foresight and planning, we believe libraries can achieve a transitional period that will be both efficient and effective, to the great benefit of the system that will be in place on the other side.

NOTES

1. Grouped roughly by size, the libraries were: Bryn Mawr College, Franklin & Marshall College, Suffolk University, and Williams College (small); Drexel University, George Mason University, Western Carolina University (medium); and Cornell University, New York University, University of Pittsburgh, and Yale University (large).

2. Full details about data collection and the life-cycle analysis may be found in the chapters entitled 'Study Design' and 'Data Analysis.'

3. Because Pitt has multiple libraries spread across several campuses, its print costs are higher than would otherwise be anticipated. Our projection for its 'higher' print costs at the half-transition is, consequently, approximately the same as these costs already, in fact, are. Since print costs appear (incorrectly) not to increase, cost reductions from moving to electronic dominate the picture. This is, however, a statistical anomaly. Unless Pitt were to significantly alter its multi-campus library service, it is unlikely that the half-transition would be any less challenging there than it is projected to be at the other participating libraries.

4. It is no coincidence that, in the past few years, a number of libraries have redesigned some of their print periodicals processes. See, for example: McHugo et al, 2004; Streatfield & King, 2003; Anderson & Zink, 2003.

5. Our data suggest that many of the libraries that participated in the study devote significant resources to these print backfile collections. A good examination of print backfiles in the context of the transition to the electronic format can be found in Chrzastowski, 2003.

REFERENCES

Anderson, Rick and Steven D. Zink: 'Implementing the Unthinkable: The Demise of Periodical Check-in at the University of Nevada'. Library Collections, Acquisitions, & Technical Services, 27(2003), 61-71.

Case, Mary M.: 'A Snapshot in Time: ARL Libraries and Electronic Journal Resources'. ARL Bimonthly, no. 235 (August 2004), 1-10. http://www.arl.org/newsltr/235/snapshot.html.

Chrzastowski, Tina E.: 'Making the Transition from Print to Electronic Serials: A New Model for Academic Chemistry Libraries'. Journal of the American Society for Information Science and Technology, 54(2003)12..

McHugo, Ann, Caroline Magenau and Jeanne M. Langendorfer: 'Reinventing Acquisitions with a ‘Forget-to-Do’ List'. The Serials Librarian, 46(2004)3/4, 269-273.

Nichols, Stephen G., and Abby Smith: The Evidence in Hand: Report of the Task Force on the Artifact in Library Collections. Washington : Council on Library and Information Resources, 2001.

Schonfeld, Roger C., Donald W. King, Ann Okerson and Eileen Gifford Fenton: The Nonsubscription Side of Periodicals: Changes in Library Operations and Costs between Print and Electronic Formats. Washington : Council on Library and Information Resources, 2004. http://www.clir.org/pubs/abstract/pub127abst.html.

Schonfeld, Roger C.: JSTOR: A History. Princeton, NJ : Princeton University Press, 2003.

Streatfield, Rosemary and Cindy Stewart King: 'It’s a Wrap (Part I): Coping with a Binding Budget Cut by Using Shrinkwrap as a Storage Alternative for Serials'. The Serials Librarian, 43(2003)3, 59-70.

WEB SITES REFERRED TO IN THE TEXT

Ithaka. http://www.ithaka.org/

JSTOR. http://www.jstor.org/