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## **Cost Impact in Managing the Transition to Open Access Model**

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### **Abstract**

Open access to scholarly resources is a growing dimension in the universe of scholarly communication. The impact of open access on the traditional model of acquisition and access is just beginning to surface. In managing the transitioning toward open access, libraries will benefit from the model of use analytics developed by the Collection Development team at HKU to rationalize the value of library investment and to refine collection priorities for the future development of the collections and budget. This paper will discuss the collection building strategies of my university to tackle the major challenges in managing the transition to open access model. In particular, I will focus on the analytics employed to evaluate the use and cost impact of e-journal big deals within an open access environment. The shift to open access of scholarly contents, which is a critical component in the research process, must be prudently managed in keeping down the total costs of ownership. The cost impact of open access must be factored into the big picture in developing new pricing models for greater optimization of resources and budget.

### **Addressing the Challenges**

Today we face a big challenge of sustainability in a world of open knowledge. Decisions on what contents to buy and retain have become highly complex under the constraint of a flat recurrent base budget. The impact of the mass digitized environment and the shift to the open access movement in scholarly communication further exacerbate the complexities in the way libraries develop and acquire collections and knowledge resources. Moreover, there is huge cost impact on scholarly contents and for all stakeholders, researchers, libraries and publishers, in managing the transition to open access.

From the library's perspective, the larger initiatives undertaken at the University of Hong Kong (HKU) include partnering with publishers to further explore and develop

new models of access and acquisitions to support broader research needs. Our libraries have gradually moved from a “just in case” strategy to a “just in time” approach in recent years, toward increasing on-demand purchasing and investments in evidence based model access in order to broaden access limited by ownership and making more effective use of library funds. Aggregated models that incorporate on-demand content licensing and purchasing contents in multiple formats for mobile access to increase use and value are being implemented. Recognizing the limits of ownership, strategies include support to strengthen and enrich the knowledge base of born digital materials such as open access repositories, both institution and discipline based. On a collaborative front, we work with local and international consortiums in purchasing digital resources to leverage our expertise and use of funds. No library can afford to be comprehensive but to embrace a model that ensures broadened access to complement ownership of scholarly materials.

In addressing the challenge to bring the broadest and most current print, digital and media contents to our users under the constraints of a flat recurrent budget and cost increases that outstrip funding, library decisions on what to buy and retain have begun to shift toward evidence based model. Libraries and institutions face additional challenge when the tipping point was reached in open access with over 50% of new research published in 2011 made freely available, either in green or gold (European Commission 2013). Morrison emphasized that “prudent transition of academic library budgets from support for subscriptions journals to support for open access publishing will be key to a successful transition to open access” (Morrison 2013). Libraries as well as stakeholders including funders, universities, researchers, and publishers need to understand the concerns with issues in investment and budget to manage this transition. This paper will discuss the collection building strategies of The University of Hong Kong (HKU) to tackle the major challenges in managing the transition to open access. In particular, I will focus on the analytics employed to evaluate the use and cost impact of e-journal big deals within an open access environment.

## **An Open Access (OA) Research Environment**

The European Commission issued a press release in August 2013 announcing that half of the research published worldwide in 2011 was now available for free after an embargo of a year. The tipping point signifies a point of no return in open access of published research. The study reported that several countries and research areas in the general science and technology, biomedical research, biology, and math and statistics have reached the tipping point, that is, “more than 50% of the papers published 2011 are available for free” (Archambault et al. 2013). The new research published made available free online is a diversified mix of green or self-archiving, and gold and hybrid (pay per article for OA release), subject to publishers’ open access policies. Laakso used the SHERPA RoMEO database to inform that 80% of accepted articles indexed in Scopus are green OA, i.e., allowed to be uploaded in an institutional repository within 12 months’ of publication (Laakso 2014). The OA policies of “the majority of 48 major science funders considered both key forms of OA acceptable, and more than 75% accepted embargo periods of 6 to 12 months.” The European Commission mandates all research supported by funding from Horizon 2020 to be made open access from 2014 (European Commission 2013).

Lewis’s prediction that open access is a disruptive innovation which will replace the established subscription-based journals is informed by the S-curve pattern of growth (Lewis 2012). He projected that the pace of substitution of gold OA for traditional subscription models will accelerate to “50% by 2017-21 and 90% by 2020-25”, thereby suggesting a radical shift in the scholarly publishing in the next decade (Lewis 2013). This development is attributed to the dramatic growth in mega-journals which began with PLOS ONE in 2006. Binfield extrapolated the growth of megajournals to reach 75,000 articles in 2013, which is approximately 8% of all STM article output (Binfield 2013). The Open Access Scholarly Publishers Association (OASPA) concurrently reported that almost 400,000 articles have been published since 2000, and 120,972 of these were published in 2013 (OASPA 2013). It is clear that by 2013 the transition from the journal subscription model to open access model was well underway, with progressively new funding model successfully implemented, such as SCOAP3 and arXiv, which are both supported by crowd funding directly from leading research institutions.

The impact of open access is significant when you consider the lowering cost model of open access. The subscription cost model is challenged by the Open Journal Systems ranging from US\$188 up to US\$5000 for hybrid journal article (Morrison 2013). Sutton argues that the “costs associated with online distribution of articles have and will continue to fall to the point that the marginal cost of adding additional

users is practical zero....zero is inevitable” (Sutton 2011). In spite of the lower production and marketing costs, major funders spend significant amounts to support various open access models. In 2012/13 Wellcome Trust spent 6.5M on author publication charges, covering 2127 articles at an average cost of \$3055 per article, in both hybrid and open access journals. The top scholarly publishers benefitting from APC spending were Elsevier, Wiley, Springer and Oxford University Press. What Wellcome bought include many hybrid articles with 12 month embargoes to make them free early. Funders support no doubt boosted the income of publishers of hybrid journals.

### **Rationalizing Budgets and Resources**

The developments in open access, government mandates, lower cost, new cost models and increased access by research communities, raise questions of value for libraries seeking to optimize scholarly resources and budgets. Within an emerging open access environment, it is crucial to examine and recognize the impact on library subscriptions to rationalize investment. Cost and use data of a core publisher’s big deal are analyzed to inform the distribution of use, cost effectiveness, and collection priorities to enable our library to justify and optimize the value of our subscriptions. Data analyzed include the contents of a core publisher’s big deal license, aggregated use, license fee, cost per article download, and the distribution of use. The findings are considered in the context of the changing research environment and the universe of publication to illustrate the ongoing transition toward open access of scholarly resources.

Our study findings show significant increase in the cost of scholarly articles resulting from a marked decline in “bundled” contents and aggregated use of a typical big deal e-journal licensed package. There is evidence to suggest that the decline in use of subscribed e-journal contents may be due to gravitation toward use of similar contents in open access journals. The development of a framework to evaluate the cost impact in an open access environment has enabled our library to rationalize our investment and to make budget decisions in an informed way.

The typical bundle has become something less than the publisher’s complete list. As much as 16% of the titles are excluded, which suggests some inadequacy in our contents acquisition over time (Figure 1). Publisher’s explanation is that certain

society or proprietary titles do not grant the rights for inclusion in a big deal. Incidentally, it is found that this publisher now publishes 9% of its journal output in open access under the APC model. Moreover, the majority of subscription titles are hybrid that charge an optional author fees for immediate open access. It is observed that “big deal” is not everything, excluding niche areas, subject series, proceedings, and emerging research that are not covered, but which compete for funding support.

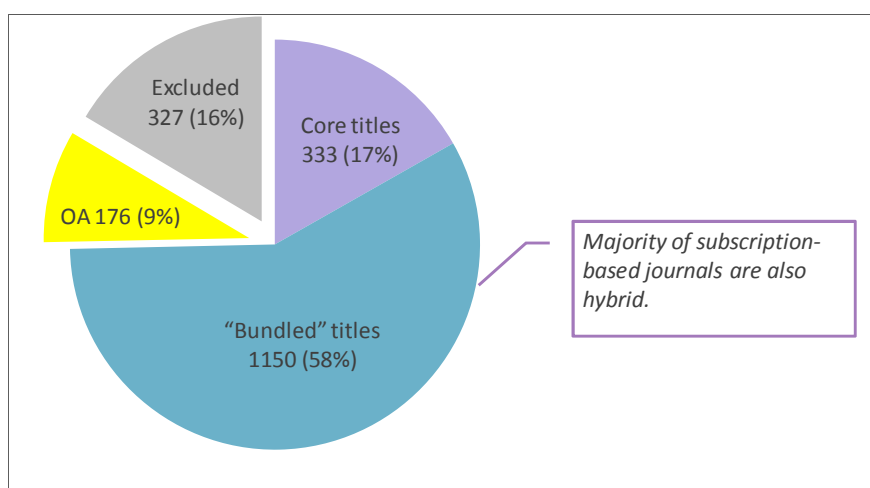


Figure 1 : A “Big deal” as a percent of publisher’s journal output

Our review of aggregated use data reveals a falling trend in 2013 usage compared with 2012. Overall use declined by as much as 19% and 23% respectively according to the latest COUNTER JR1 and JR5 reports for the latest 2 years (Figure 2). Whereas JR1 informs total full-text article requests by use period at the journal level, JR5 reporting by year-of-publication reflects the use of current contents being subscribed that year, and serves better justification for return on investment. The cost per article download derived from JR5 use report against the annual license fee reflects a more realistic costing. For 2013 the cost per use represented 38% increase at the cost of US\$22 per article cost, which is very substantial, despite broader and more diverse access to e-journal contents in the big deal (Figure 3).

To put value into perspective, the publisher has not exactly fulfilled the big deal cost model of the Big Deal by providing access to all of its contents. As we know the big deal is subject to an annual increase locked in by a multi-year license that guarantees the percent of increase in the price model. Continued rising license fee, per article

download at US\$22, and overall lesser contents are causes to raise concerns and questions in the value of big deals. Furthermore, COUNTER JR1 GOA reveals that 4.5% of the aggregated usage comes from gold OA articles for which publication charges have been paid and by authors, funders or institutions.

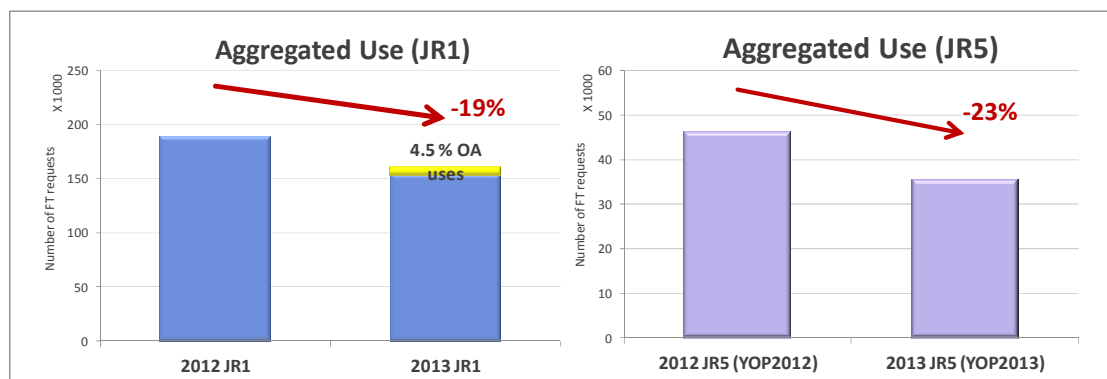


Figure 2 : Aggregated Use – JR1 & JR5

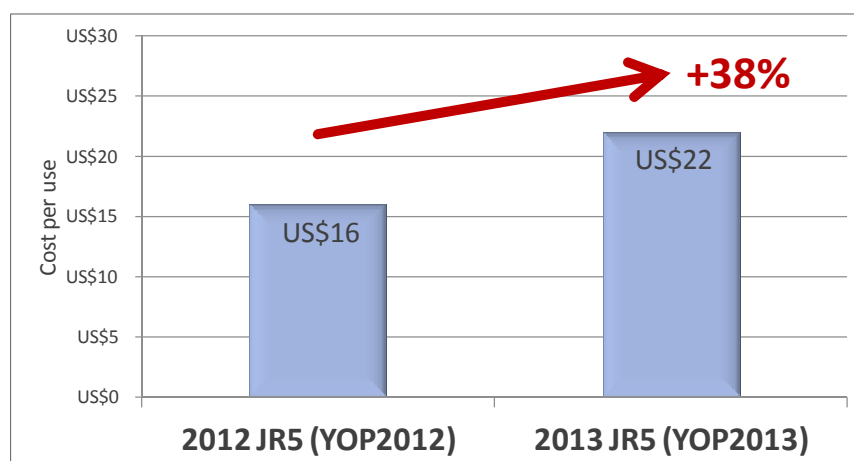


Figure 3 : Increase of cost per use

Changes in academic direction reflect changing needs and collection priorities. Acquisition models should enable the library to develop a robust collection with opportunity to opt out of marginal titles as necessary in times of retrenchment. Distribution curve is useful to measure the level of overall use as well as to identify the high demand areas versus the marginal contents. The core collection no doubt attracts higher average per title than the bundled titles as suggested by the bell shape curve. The majority of core titles attracted medium range use. In contrast,

the bundled collection use results in a sliding curve, with a vast majority of titles in the low use range attracting zero or marginal (Figure 4). The long tail analysis shows the marginal value of niche areas, which the publisher sells more of less (expected use). Study findings show 66% of the core collection titles attracted marginal use at less than once per week or less than 42 uses in a year (Figure 5). To optimize value, a library in consultation with the faculty may target cancellation to channel resources to collection priorities identified. When our library was faced with a flat budget base, the library used the analytics to inform how we might target a reduction of 15% over a 3 year period with annual inflation of 5% to keep the budget flat.

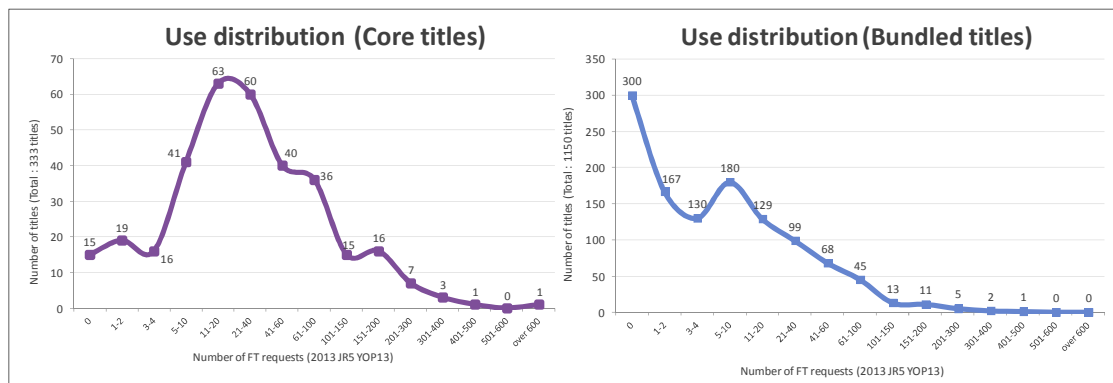


Figure 4 : Use distribution – Core and bundled

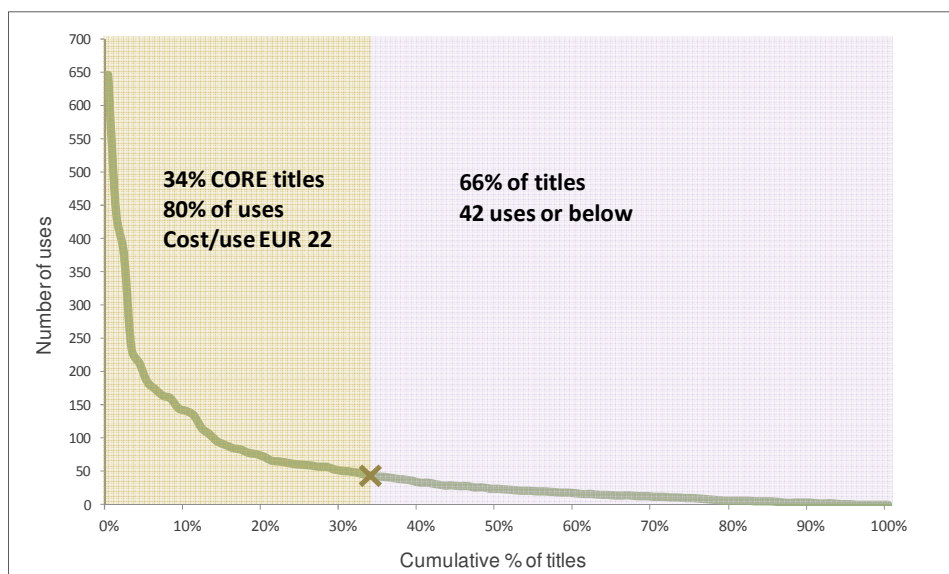


Figure 5 : The long tail analysis shows the marginal value of niche areas



## **Open Access Impacts Use and Cost**

Open access is a growing dimension in the universe of scholarly communication. The impact of open access in the use and cost of traditional model of acquisition and access is just beginning to surface. In managing the transitioning toward open access, libraries will benefit from the model of use analytics developed by the Collection Development team at HKU to rationalize the value of library investment and to refine collection priorities for the future development of the collections and budget. The analytics enable the library to see beyond the aggregated use of subscribed journal contents to recognize the impact of open access.

The most significant finding of the recent study is the evidence of decline in use of core journal titles resulting in substantial increase in cost per article download. This may be evidence that journal usage is gravitating toward high growth open contents that are free and accessible in the research arena. Another significant finding is the use of open access articles within a licensed big deal. Though the total download of open access articles at 4.5% of the total publisher bundled contents is still quite low considering the number of hybrid journals available, publishers are expected to apply appropriate reductions from journal subscriptions in sync with author, funder or institution contributions to avoid “double dipping”. Publisher has yet to rationalize the hybrid income to lower subscription costs. The big deal based on historical print expenditures of past decades is not sustainable or justifiable when use decline and cost per article rises substantially. Unbundling of big deals may not materialize soon due to complex logistics and politics. Libraries and publishers have to work in partnership to find sustainable pricing models that help libraries rationalize the impact of open access.

Libraries and their institutions must recognize that rechanneling of current budgets toward open access APC support is inevitable. HKU currently contributes to several OA programs to support authors who choose the OA route in their field. An overarching aim for academic research library is to strengthen ownership through deeper collaboration while addressing the limits of ownership. The shift to open access of scholarly contents, which is a critical component in the research process, must be prudently managed in keeping down the total costs of ownership and access. The cost impact of open access must be factored into the big picture in developing new pricing models for greater optimization of resources and budget.

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