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# PLENARY SESSIONS

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## Reimagining the Academic Library

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**ABSTRACT** This paper is a summary with some added thoughts of the closing plenary address at the American Theological Library Association meeting in Indianapolis, Indiana on June 16, 2018. The talk explores issues of productivity in the library context and how libraries need to explore, discover, and invent in order to remain vital. It also considers what has changed, most notably the unrelenting pace of increases in the capacity of computer technology as expressed in Moore's Law. It considers the fundamental shift libraries need to make from an outside-in to an inside-out approach and how this requires investing in open content and infrastructure. Finally, a challenge was issued to the group to create the open scholarly commons for theology and religion.

### INTRODUCTION

“That is what real revolutions are like. The old stuff gets broken faster than the new stuff is put in its place.”<sup>1</sup>

I like to begin with this quote from Clay Shirky because I think it is important to understand that we cannot expect things in our world to go smoothly. We need to understand and accept that there will be broken parts that we have to live with as we search for new solutions. That is just the way it is going to be.

Today I will talk about:

1. Productivity
2. Exploring/Discover/Invent
3. What has Changed?
4. The Fundamental Shift
5. Investing in Open

Finally, I will issue a challenge to you as a community.

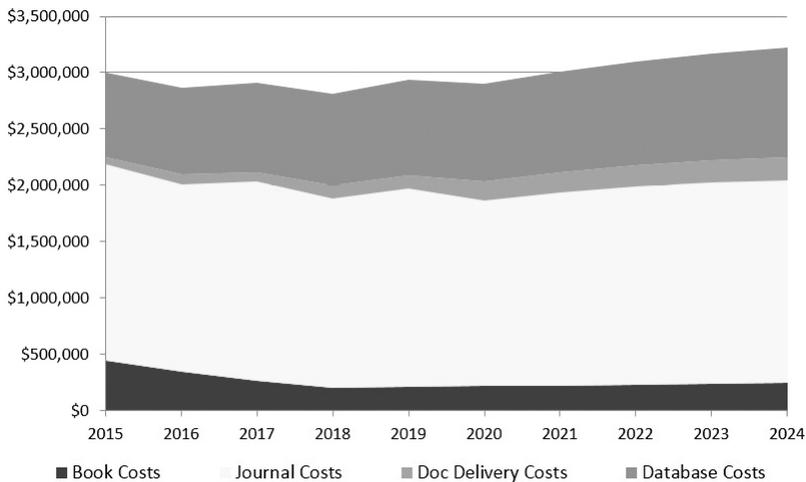
## PRODUCTIVITY

Paul Krugman, the Nobel laureate and *New York Times* columnist, famously said, “Productivity isn’t everything, but in the long run it is almost everything.”<sup>2</sup> I start with productivity because I think that too often librarians, and many others in the academy, think that increasing productivity is not possible. The thinking is that our work, like that of a string quartet, cannot be made more productive. You need four players to have a string quartet; you can’t do it with less. This is not simply a foolish argument, it is wrong. String quartets are now much more productive than they were a century ago before recorded music and more productive than even a decade ago before streaming music services. Libraries can and must become more productive if we are to survive.

Productivity is defined as the units of output divided by the units of input. In the library world this generally means the amount of information that users get divided by the cost of the people and collections that go into providing that information. You get more productive by providing more information, or doing it at a lower cost, or both.

Here is an example that comes from my book, *Reimagining the Academic Library*.<sup>3</sup> In the chart below I propose a materials budget based on changing strategies for providing documents to users: moving from the just-in-case strategy libraries have used in the past to a just-in-time strategy based on patron-driven-acquisitions book

purchasing and the substitution of article purchasing on-demand rather than subscriptions where this is the less expensive option. It also anticipates the growth of open access content and the library's willingness to substitute this access for purchased content. The chart shows that even given conservative assumptions, the library's materials budget can be maintained with only minimal increases even in the face of significant price increases for databases and journals. The library thus is more productive.



If we cannot become more productive, we will not be able to justify increased investments in our libraries, and without that investment our libraries will not be sustainable. So, we need to talk about productivity, and more importantly make our libraries more productive. We do this by acquiring better tools, by hiring and developing more skilled people, and by doing things in new and improved ways.

## EXPLORE/DISCOVER/INVENT

Greg Satell has said, “Every business model fails eventually. It’s just a matter of time. Changes in technology, competitive landscape and customer preferences make that a near certainty. . . . Cutting costs, streamlining operations and increasing efficiency will only take it so far. . . . It’s a fairly simple equation. If you don’t explore, you won’t discover. If you don’t discover you won’t invent. And if you don’t invent, you will be disrupted.”<sup>4</sup>

I like this way of thinking for several reasons. First, it doesn't mention committees or task forces. Second, it implies a bias towards action and a freedom for individuals to act on their own. In our libraries, we need to try new things in small ways, fail quickly, and most importantly, learn from our failures. Too often in libraries we behave in exactly the opposite way. We are risk averse and fail to act without extensive conversations.

Let me cite one example of what this might look like. Heather Coates, the data services librarian at the IUPUI University Library, has an interest in research metrics. With some colleagues she created the *Metrics Toolkit*. The toolkit, as its website says, "is a resource for researchers and evaluators that provides guidance for demonstrating and evaluating claims of research impact. With the Toolkit you can quickly understand what a metric means, how it is calculated, and if it's good match for your impact question."<sup>75</sup> As a result of her interest in this topic and her work in it, Heather got a reputation on campus as the person for faculty to talk to to help demonstrate research impact in P&T dossiers. Out of this is growing a new and highly valued library service as she shares her knowledge and approach with her library colleagues.

### WHAT HAS CHANGED?

When we look at the two page images below they look similar.



The one on the left is handwritten manuscript circa 1150.<sup>6</sup> The one on the right is from the Gutenberg Bible.<sup>7</sup> They look very similar, and that is often what big changes look like in the beginning. They are hard to see, as initially the new often mimics the old.

Though if we were actually holding these two pages we would feel that they are quite different. One is vellum and one is paper. The fun fact for the day is that it took 200 to 225 hides from goats or sheep to make a vellum Bible.<sup>8</sup> Without paper, printing would have been much less important.

But over the next 200 years, printing brought changes that could never have been anticipated. Here are some examples:

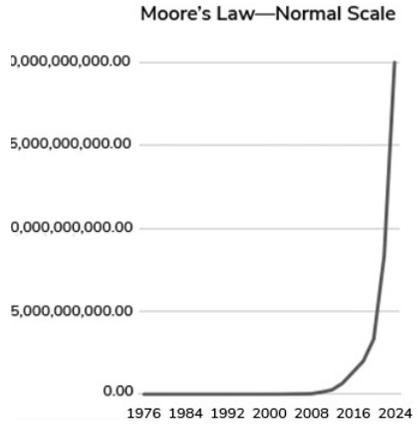
1. In 1494, Fra Luca Bartolomeo de Pacioli published *Summa de Arithmetica, Geometria, Proportioni et Proportionalita* (*Summary of Arithmetic, Geometry, Proportions and Proportionality*), which, among other things, introduced the fundamentals of accounting and bookkeeping. The work was translated and widely distributed across Europe and created a common system that made doing business easier and more efficient across the continent.
2. In 1522, Martin Luther published his German translation of the New Testament and in 1534 his translation of the full Bible. It was followed by translations in many other languages. This broke the Catholic Church's monopoly control of the word of God and resulted in extensive disruption of religion and politics.
3. In 1605, Miguel de Cervantes Saavedra published the first volume of *Don Quixote*. It is generally considered the first novel. This created a greatly expanded popular culture.
4. The first scholarly journal, the *Philosophical Transactions of the Royal Society*, was published in 1665. Without printed journals, science as we know it could not exist.

Of course, the technology that is now driving change is the computer. It might not be true that the first conversation about computers in the library was in the 1957 movie *Desk Set*, but I like to think so, because Katharine Hepburn facing down EMERAC as the feistiest librarian of the twentieth century is a wonderful image. It is probably not true, but that sixty years ago computerizing a library could be the plot driver in a major motion picture tells us how long we have been at this.

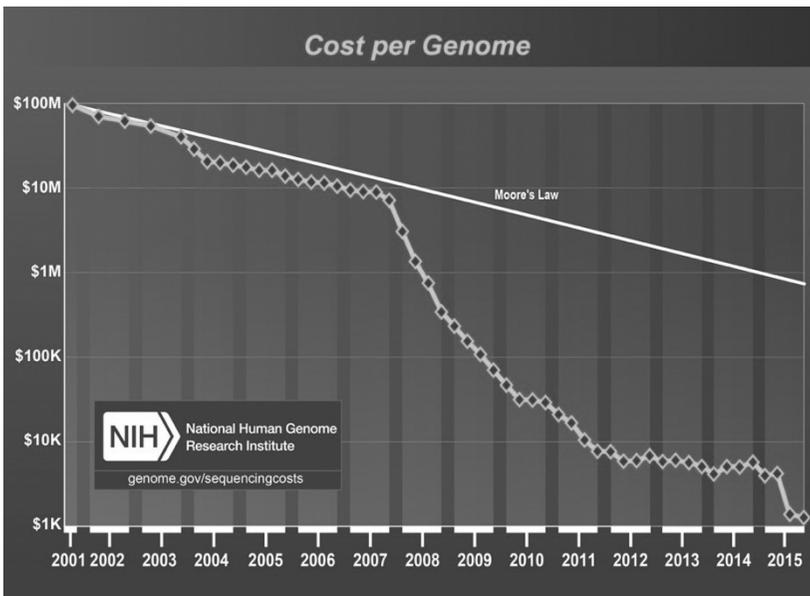


are not overly concerned. It is a nice, gentle 45-degree angle. It is not too scary. What we neglect to notice is that the vertical axis is a log scale. If Moore's Law is plotted on a graph using a normal scale it looks quite different. It looks like the chart to the right.<sup>11</sup>

And the trend line continues to accelerate and go nearly to vertical. The math of Moore's Law is really simple: doubling every eighteen months means that computing capacity increases one hundred times in a decade.



But this might understate the extent of the change. The chart below is from the National Institutes of Health and shows the decrease in the cost of sequencing a human genome.<sup>12</sup> Note that this chart is on a log scale. The white line is the price decrease we would expect from improvements based on Moore's Law. We would have expected a decline in the price of two orders of magnitude. In fact, the change was five orders of magnitude from nearly \$100 million in 2001 to



about \$1,000 in 2015. If we translate this into “library units,” this is the difference between building a university library and purchasing a dozen books.

One of the results of this relentless increase in the capacity of technology is that computers have been able to accomplish things that were once thought to be exclusively human. In 1997, the world’s best chess player, Garry Kasparov, was defeated by IBM’s Deep Blue. In 2011, IBM’s Watson defeated *Jeopardy* champions Brad Rutter and Ken Jennings. In a TED Talk discussing his loss, Jennings said, “I felt like quiz show contestant was now the first job that had become obsolete under the new regime of thinking computers.”<sup>13</sup> In 2016, Go, arguably our most complex game, fell as Lee Se-dol was defeated by AlphaGo.

In the library realm there is Meta, a machine learning system that has ingested all of the biomedical literature on its way to being a new type of search engine. The developers claim that, “Meta estimates the future citation count and impact of a manuscript, with a speed, accuracy, and consistency that far exceed human ability. Large-scale trials conducted by Meta in partnership with industry demonstrated that Bibliometric Intelligence out-performed tens of thousands of human editors by a factor 2.5x at predicting article-level impact for new manuscripts, prior to publication.”<sup>14</sup> This tells us both that the peer review system is not nearly as good as we sometime say it is and that machine systems can have a significant impact when applied to scholarly communication. One can easily imagine Meta providing at least initial screening of manuscripts. I can also see it being used to provide metrics that can’t be worse than journal impact factors. Fortunately for us, Meta was acquired by the Chan Zuckerberg Initiative and not Elsevier.

So, how should we think about this? One way is to ask the economic question posed by Ajay Agrawal, who says, “When looking at artificial intelligence from the perspective of economics, we ask the same, single question that we ask with any technology: What does it reduce the cost of?”<sup>15</sup> Artificial intelligence, says Agrawal, reduces the price of prediction. Computing, Agrawal says, reduces the price of arithmetic. Because the price of arithmetic has decreased at the rate of Moore’s Law, we can now do things with arithmetic that don’t seem at all like arithmetic problems—like music or art. As prediction gets cheap, we can do things with prediction that don’t seem like

prediction problems, like driving. In our world, Google reduces the price of searching, the Web reduces the price of publishing. As Clay Shirky has said, “It makes increasingly less sense even to talk about a publishing industry, because the core problem publishing solves—the incredible difficulty, complexity, and expense of making something available to the public—has stopped being a problem.”<sup>16</sup> Amazon has reduced the cost and time needed to acquire physical objects, most importantly for us, books.

Another way of thinking about the nature of the change is to consider the nature of digital documents on the network. Network-based digital documents have the following characteristics:

1. A copy can be instantaneously delivered anywhere in the world
2. A copy is the same as the original
3. A copy can be made at zero marginal cost

That is to say, as Andrew McAfee and Erik Brynjolfsson do, they should be, “Free, Perfect and Instant.”<sup>17</sup> This is how it should be, but as we all know this is not how it is, at least for scholarly information. For scholarly information, it is none of these things.

This is the final thing that has changed. This change is not about technology, rather it is about economics. Quite simply, the economics of scholarly communication no longer works. Here are the numbers: “If gasoline had increased in price at the same rate as Chemistry and Physics Journals from 1975 to 2015, it would cost \$30.61 a gallon.”<sup>18</sup> This took place during a period where publication moved from paper to digital, and the cost of paper and postage vanished, and Moore’s Law should have driven down price for technology. The reason this didn’t happen is simple. Scholarly journals are a monopoly good, and publishers, especially the large for-profit publishers, are extracting large monopoly rents. Elsevier’s profit margin has consistently been 35% or a bit more. The five top publishers account for over 50% of the articles in the sciences and over 70% in the social sciences.<sup>20</sup>

Scholarly communication is, like the research it reports, a public good. As such, it requires subsidy to be produced in a way that best serves society at large. When 35% of this subsidy is sucked out of the system to pay dividends to shareholders, it become unsustainable. This is the system we have today.

In addition, the scholarly monograph is in trouble. This is how most scholarly monographs work. First, the author spends two or three years writing the manuscript. Then the scholarly press spends \$15,000 to \$40,000 publishing the book. The book sells five hundred copies. Half of the books are purchased by libraries and only half of the library copies ever circulate. The author is rewarded based on the reputation of the press with whom they published, not on whether the book is ever read. There are a number of efforts to find new ways of supporting the scholarly monograph, but no one has yet found the solution. My guess is that the only solution is a lower quality digital product at a significantly reduced price, covered by the author or her or his institution, that can be made open access. This approach seems unlikely to be attractive to either scholars or the current academic press editors.

## FUNDAMENTAL SHIFT

I want to argue that in the next decade or so there will be a fundamental shift in what libraries do. They will shift from a primary focus on bringing content from the world to their campuses to a focus on capturing the content created on or of interest to their campuses, making it discoverable and accessible, and preserving it. This is a change that Lorcan Dempsey has called moving from an outside-in to an inside-out library.<sup>21</sup> Jean-Claude Guédon very nicely describes it this way:

In the end, libraries can point out the fact that their future role actually points in two, apparently opposite, yet deeply complementary directions: on the one hand, they plunge deeply into the local production scenes since they aim at systematically sweeping, storing, preserving, and curating all that is produced in their hosting institution; at the same time, the libraries, with their sister institutions, are involved in the task of ensuring a vibrant knowledge-nurturing life for their documents: they will circulate, be discoverable, be interoperable, be evaluated, etc. With the first function, each library ensures it safe and strong function within its host institution; with the second function, the libraries connect to bring the knowledge infrastructure that we all really need.<sup>22</sup>

In a print world, the outside-in strategy made sense because, unless content was close at hand, it was expensive and time consuming to get it. This strategy carried over to the early digital era. This was a library that was complicated to use and subject to congestion. The inside-out library takes advantage of the nature of digital content and, by managing and preserving local content for the world, the library serves as a node on the network and part of the open scholarly commons. If implemented at scale across many educational and cultural heritage institutions, scholarly societies, and government agencies, all of whom have as part of their core missions to make knowledge available to their communities, this creates the open scholarly commons, a rich universe of the world's knowledge available to everyone.

## INVESTING IN OPEN

This brings me to my final point. We, as the academic library community, need to invest in open content and the tools to find, use, and preserve it. This needs to become a priority for all of us.

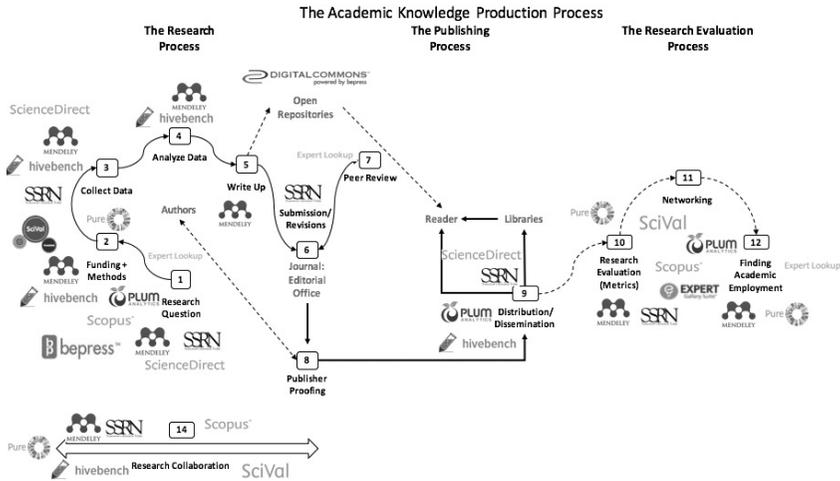
There are three fundamental truths that we need to understand.

*Fundamental Truth #1:* There is no sustainable path to an open scholarly commons without sustained and substantial investment from academic libraries. We need to invest in both infrastructure and content.

*Fundamental Truth #2:* Much of this investment will need to be made collectively. The library community will have to create new capacities and new institutions. The library community is not good at this. We have a collective action problem. John Wenzler puts the problem this way: “Although it is likely that university libraries could develop a more efficient system of scholarly communication if they were to redeploy their collective subscription budgets, each individual library—when it decides how to spend its own little piece of that huge pie—has little incentive to redirect its own expenditures. . . . Unfortunately, if every librarian waits for every other librarian to make the investments necessary to develop a sustainable system of Gold OA publishing, it may never happen.”<sup>23</sup>

*Fundamental Truth #3:* If we do not create the open scholarly commons, Elsevier, Springer, and Wiley will own the scholarly

record and continue to exploit the academy. What should be a public good will be used for private gain. If you doubt that this is the case, consider the illustration below. It shows all of the companies Elsevier has acquired that manage different parts of the research process.<sup>24</sup>



In response to the Elsevier acquisition of Bepress last summer, I suggested that all academic libraries need to contribute 2.5% of their total budgets to support the common infrastructure that is needed to support the open scholarly commons.<sup>25</sup> I arrived at this number by estimating what it would take for U.S. academic libraries to annually raise that amount of money Elsevier reportedly paid for Bepress, which the Financial Times said was \$115 million.<sup>26</sup> I assumed that since the budgets of U.S. academic libraries total about \$7 billion<sup>27</sup>, 2.5% would be \$175 million and if 60% of it could be collected that would be \$105 million, which was close enough.

With several colleagues, I have begun investigating whether my proposal might actually be possible. It turns out that many, but not nearly all, large libraries already invest 2.5% in open projects, but most smaller institutions do not. It also turns out, unsurprisingly, that there is much complexity. Nonetheless, I have been encouraged by the conversation and am optimistic. Organizing investment on the scale required will be difficult, but I believe our community can invest at the level that is required.

## CHALLENGE

This leads to my challenge to you. You need to create the open scholarly commons for theology and religion.

In doing so, I think you have some clear advantages.

First, the American Theological Library Association, your professional society, already has stated core values and strategic goals in line with this. The ATLA Strategic Plan's second core value is, "Widest possible access to relevant information and ideas," and the second strategic goal is, "ATLA has a solid reputation as a facilitator of open access publishing in the study of religion and theology."<sup>28</sup> As a community, you have already declared that open access to the work produced at your institutions is part of your core mission. Importantly, you serve a large practice community, both clergy and laity. This work also has a large audience in countries without well-resourced educational institutions. Arguing for the resources to make this work available to these currently unserved groups might not be a stretch. The leaders of your institutions are likely to espouse goals that would be consistent with an open scholarly commons, though they are unlikely to have thought about the problem and the solutions in quite this way.

Second, most of the money that supports the theological and religious studies literature and its discovery is already in your budgets, and you already pay to support access to this literature and its preservation. As a community, you have today enough money to create the infrastructure necessary. You just have to decide to spend in differently.

Third, ATLA is a significant player in publication and indexing for the discipline. The various databases created by ATLA are the core resources for the field. For the fiscal year 2016-17, the income ATLA generated from these subscription databases was about \$6.5 million or about 94% of the association's revenue.<sup>29</sup> The association's primary business relationship is with EBSCO, which is a much better place to be than if this relationship were with Elsevier. Consistent with its stated values, ATLA has made some beginnings in open access publishing. While remaking ATLA's economic model and business strategy from one based on subscription income to one that supports the open scholarly commons will undoubtedly be very challenging, the fact that so much of the content and infrastructure runs through ATLA, which is ultimately a community-controlled organization, puts you in a better position than most other fields.

Fourth, the large commercial publishers probably don't care about your field. They are after the big bucks, and you are small potatoes. This means that you can create without interference in a way that most other fields cannot. It is often the case that change comes from the periphery. Your field is a niche at the periphery; in this case, this is a good thing. You should use your position to your advantage, and create a model for the rest of us.

Finally, since we are in Indiana, home of the Lilly Endowment, I would suggest you might have access to resources that are not available to every field.

I would suggest when you leave today that you take the following to-do list with you:

1. Imagine the open scholarly commons for theology and religion.
2. Make a plan.
3. Create the incentives and the organizational capacity to solve the collective action problem.
4. Make the collective investments to build the common infrastructure that is required.

When you get back home, begin to work the list.

As a community, you should say to yourselves, "Let's DO This."

## NOTES

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