

# Vision for the Future of Academic Libraries

**David W. Lewis**

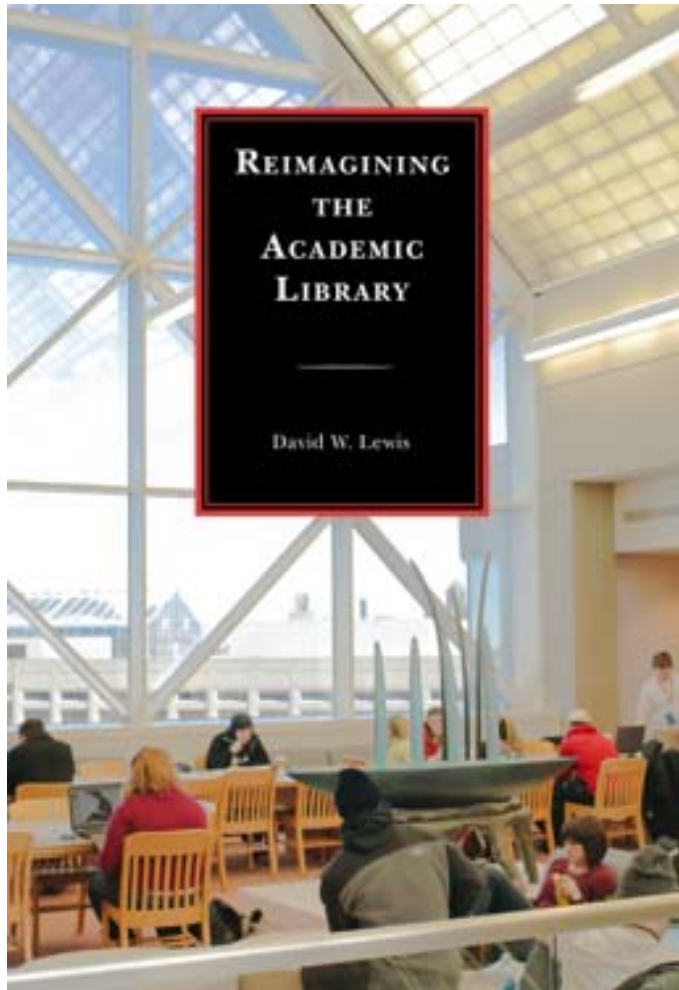
**SCONUL Summer Conference**

**Cardiff**

**June 24, 2016**

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<https://rowman.com/ISBN/9781442238572/Reimagining-the-Academic-Library>







# Agenda

- 1. What has Changed?**
- 2. Steps Down the Road**
- 3. Ten Things to Do Now**

**What Has Changed?**

**“Now, like then, public leaders and public institutions have failed to keep up with rapid change, and popular trust has been deeply eroded.”**

**Now, like then, “this is the best moment in history to be alive” — human health, literacy, aggregate wealth and education are flourishing — and “there are more scientists alive today than in all previous generations.”**

**Now, like then, “sizable parts of the population found their skills were no longer needed, or they lived in places left behind, so inequality grew.”**

**– Ian Goldin as quoted by Thomas Friedman**

**Ian Goldin and Chris Kutarna, *Age of Discovery: Navigating the Risks and Rewards of Our New Renaissance*, St. Martin's Press, 2016.**

Thomas L. Friedman, Another “Age of Discovery,” New York Times, June 22, 2016, <http://www.nytimes.com/2016/06/22/opinion/another-age-of-discovery.html>



1440s







1534



1588



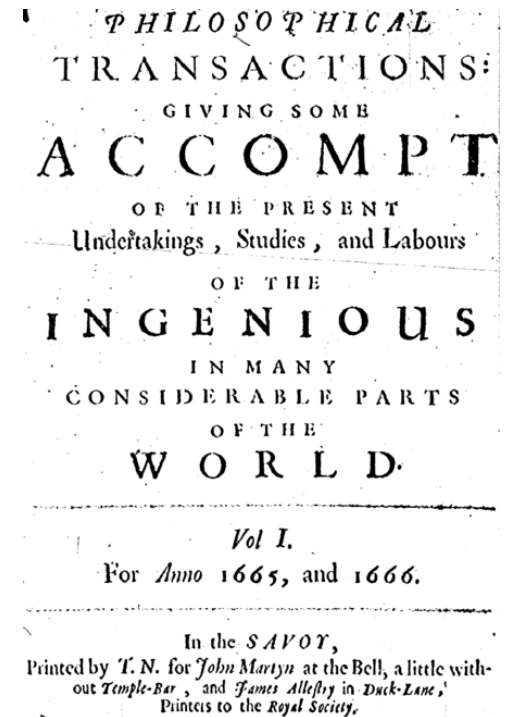
1611

Vernacular Bible



1605

Novel



1665

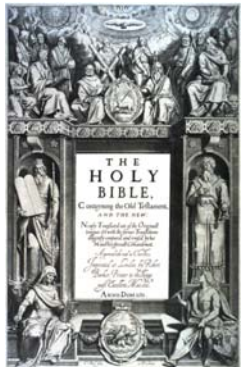
Scholarly Journal



1534



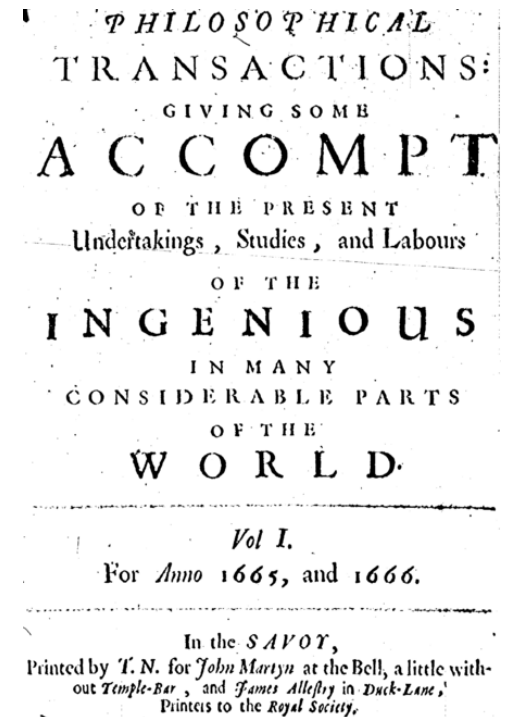
1588



1611



1605



1665

Literacy Became an Amateur Activity



# Encyclopædia Britannica;

OR, A  
DICTIONARY  
OF  
ARTS and SCIENCES,  
COMPILED UPON A NEW PLAN.

IN WHICH  
The different SCIENCES and ARTS are digested into  
distinct Treatises or Systems;  
AND  
The various TECHNICAL TERMS, &c. are explained as they occur  
in the order of the Alphabet.

ILLUSTRATED WITH ONE HUNDRED AND SIXTY COPPERPLATES.

By a SOCIETY of GENTLEMEN in SCOTLAND.

IN THREE VOLUMES.

VOL. III.

EDINBURGH:  
Printed by A. BELL and C. MACFARQUHAR;  
AND SOLD by COLIN MACFARQUHAR, at his Printing-office, Nicolson-street.  
M.DCC.LXXXI.

1768-71

## Alphabetical Order as a Way of Arranging Knowledge

### S U R ( 641 ) S U R

Stories are usually made of soap, sugar, alum, or a piece of tallow-candle, about the length of a man's thumb and the breadth of a finger, though they may be made smaller for children, and sometimes a little thicker for adults.

**SUPPRESSION**, in law, the extinction or annihilating of an office, right, rent, or the like.

**SUPPRESSIONS**, in medicine, is generally used for a retention of urine or the menes. See **MEDICINE**, p. 160, 162.

**SUPPURATION**, the second way wherein an inflammation terminates, being a conversion of the inspissated blood and the left adjacent parts, as the vessels and fat, into pus, or matter: which diffuses, when it has not yet found an opening, is generally called an abscess. See **MEDICINE**, and **SURGERY**.

**SUPPURATIVES**, or **SUPPURATING MEDICINES**, such as promote suppuration. See the preceding article.

**SUPRACOSTALES**, in anatomy. See **ANATOMY**, p. 216.

**SUPRALAPSARY**, in theology, a person who holds that God, without any regard to the good or evil works of men, has resolved, by an eternal decree, to save some and damn others. These are also called antelapsaries, and are opposed to sublapsaries and infralapsaries.

**SUPRASPINATUS**, in anatomy. See **ANATOMY**, p. 196.

**SUPREMACY**, the superiority or sovereignty of the king.

**SURAT**, a city and port-town of Hither India, in the province of Guzarat, or Cambaya, situated on the river

Tapte, ten miles east of the Indian sea: in E. long. 72° 20', N. lat. 21° 30'.

**SURCHARGE**, the fame with overcharge, and whatever is above that which is just and right.

**SURCOAT**, a coat of arms to be worn over the body armour.

The furcoat is properly a loose thin taffety coat, with arms embroidered or painted on it, such as is worn by heralds: anciently also used by military men over their armour, to distinguish themselves by.

**SURCULUS**, in the anatomy of plants, a word used to express that part of the branching of the ribs of a leaf, which is of a middle kind between the great middle rib and the smallest reticular ramifications.

**SURD**. See **ALGEBRA**, p. 95.

**SURETY**, in law, generally signifies the fame with bail. See **BAIL**.

**SURFACE**. See **SUPERFICIES**.

**SURFEIT**, in medicine, a sickness proceeding from the fermentation of a food at the stomach, usually attended with erapsions, and sometimes with a fever. See **MEDICINE**.

**SURGE**, in the sea-language, the fame with wave. See **WAVE**.

Also when heaving at the capstan, if the cable royl or messenger slip a little, they call it fudging.

### S U R G E R Y.

**SURGERY**, the art of curing all manner of wounds, and other disorders, where the application of the hand, assisted by proper instruments, is necessary.

#### Of PHLEBOTOMY.

We begin with the operation of phlebotomy: because it is of all the most general, performed in most parts of the body, and by much the most frequent in use at this present day. By phlebotomy, or bleeding, we here intend the opening a vein, by a sharp-edged and pointed instrument of steel, for extracting a proper quantity of blood, either for the preservation or recovery of a person's health.

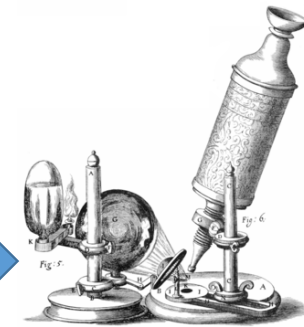
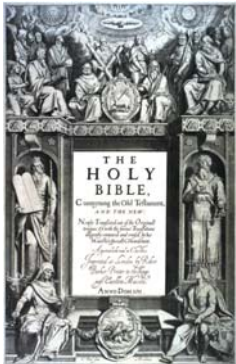
It is commonly enough known, that the operation of bleeding in the arm is performed on the veins that lie on the internal part of the cubit. There are several things worthy the surgeon's notice in this operation, some of which regard the things which are to be done preparatory to bleeding, some in the operation itself, others immediately after the performance of it. Preparatory to bleeding you should have in readiness: (1.) A linen file, about an ell in length, and two fingers in breadth. (2.) Two small square boilers. (3.) Portingers or vessels to receive the blood. (4.) A sponge with warm water. (5.) Some vinegar, wine, or Hungary water, to raise the patient's spirits if he should be inclinable to faint. (6.) Two assistants: one to hold the portinger, the other to reach you anything that you shall want. (7.) You must place your patient upon a couch; or, if he is very fearful of the operation, lay him upon a bed, let his thighs fall into a swoon. Lastly, the operator should be as expert in bleeding with his left hand as with his right: For,

as you are readier at bleeding in the right arm with your right hand, so when you are to open the veins of the left arm, you will find it necessary to use your left hand.

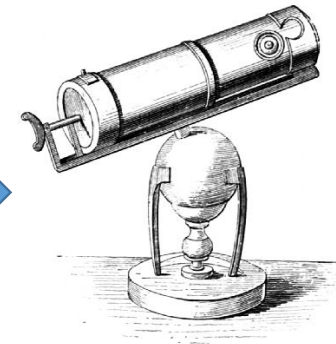
Though the operation is to be performed at once, with one puncture, yet many things are to be observed in order to render it successful. First, it is necessary for the surgeon to inspect his patient's arm diligently, that he may see the course of the veins; he must then take hold of the arm, and extend it towards his breast, tucking up the sleeve about a hand's breadth above the bend of the cubit, where he must make his ligature, rolling the fillet twice round, and fastening it with a knot. The veins being compressed, and the blood being stopped in its return, they will enlarge, and lie later to the eye. When you have bound up the arm in this manner, you let it go for a small time till the veins grow turgid. You are then to lay hold of the arm again in the same manner as we directed before, and extend it to your breast, having an assistant ready with the vessel in his hand, at a convenient distance for receiving the blood.

You are now to examine which vein lies fairest, and is therefore most proper to be opened. For you must observe, that in the arm there usually appear three principal veins. The first is called *Vena Cephalica*, and is found in the external part of the arm. The second is termed *Basilica*, and lies on the internal part of the arm: In the right arm it is also called *Hepatica*; in the left, *Splenica*. The third, which is obliquely situated between the former two, is called *Mediana*. The median and basilic veins, as they are larger than the cephalic, discharge a greater quantity of blood, but are attended with more danger in the operation: For,



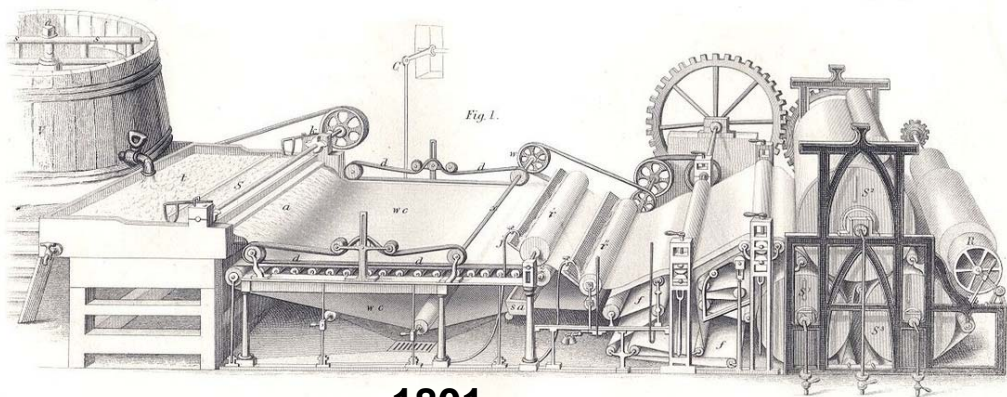


Robert Hook's Microscope  
1660s

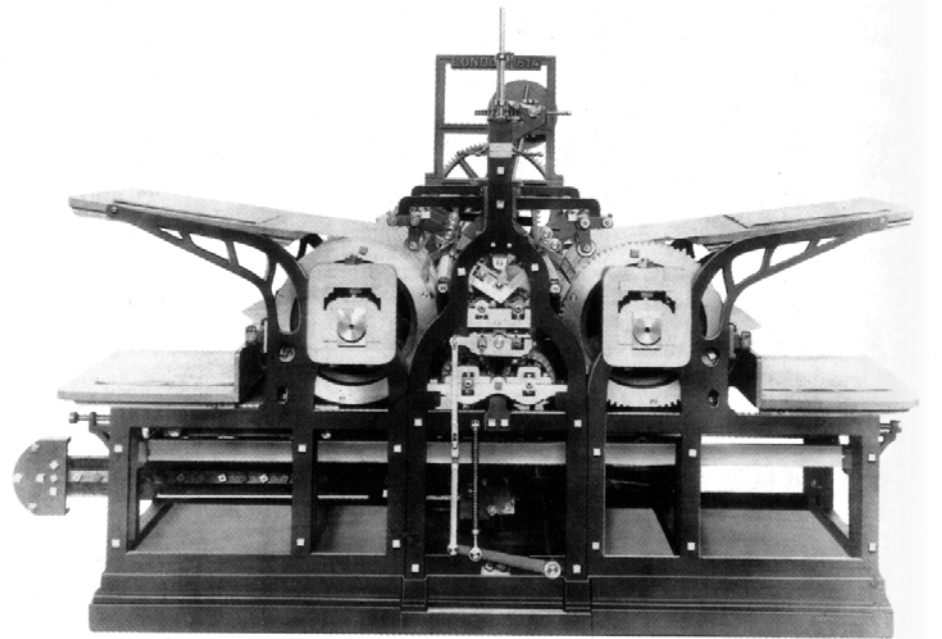


Newton's Reflecting  
Telescope 1670

Steven Johnson, *How We Got to Now: Six Innovations That Made the World Modern*, (New York, NY: Penguin Group, 2014), 20-25.



1801



1814



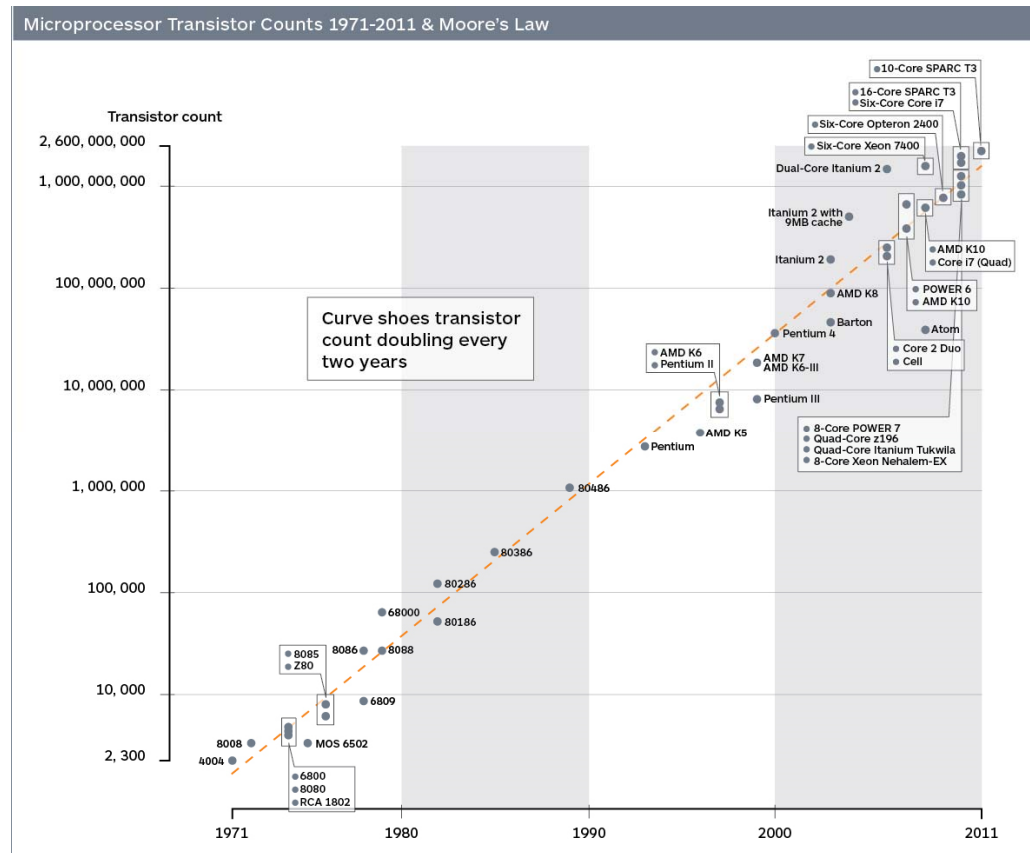






Katherine Hepburn (at right) faces down EMERAC in *Desk Set* (1957).

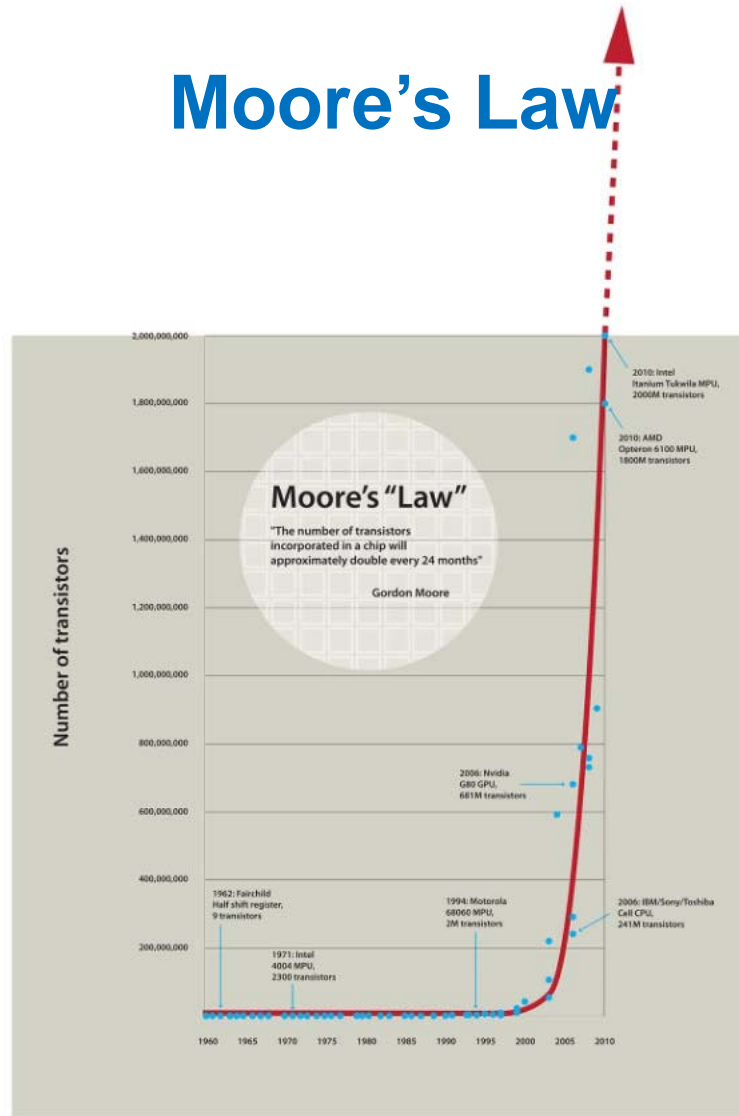
# Moore's Law



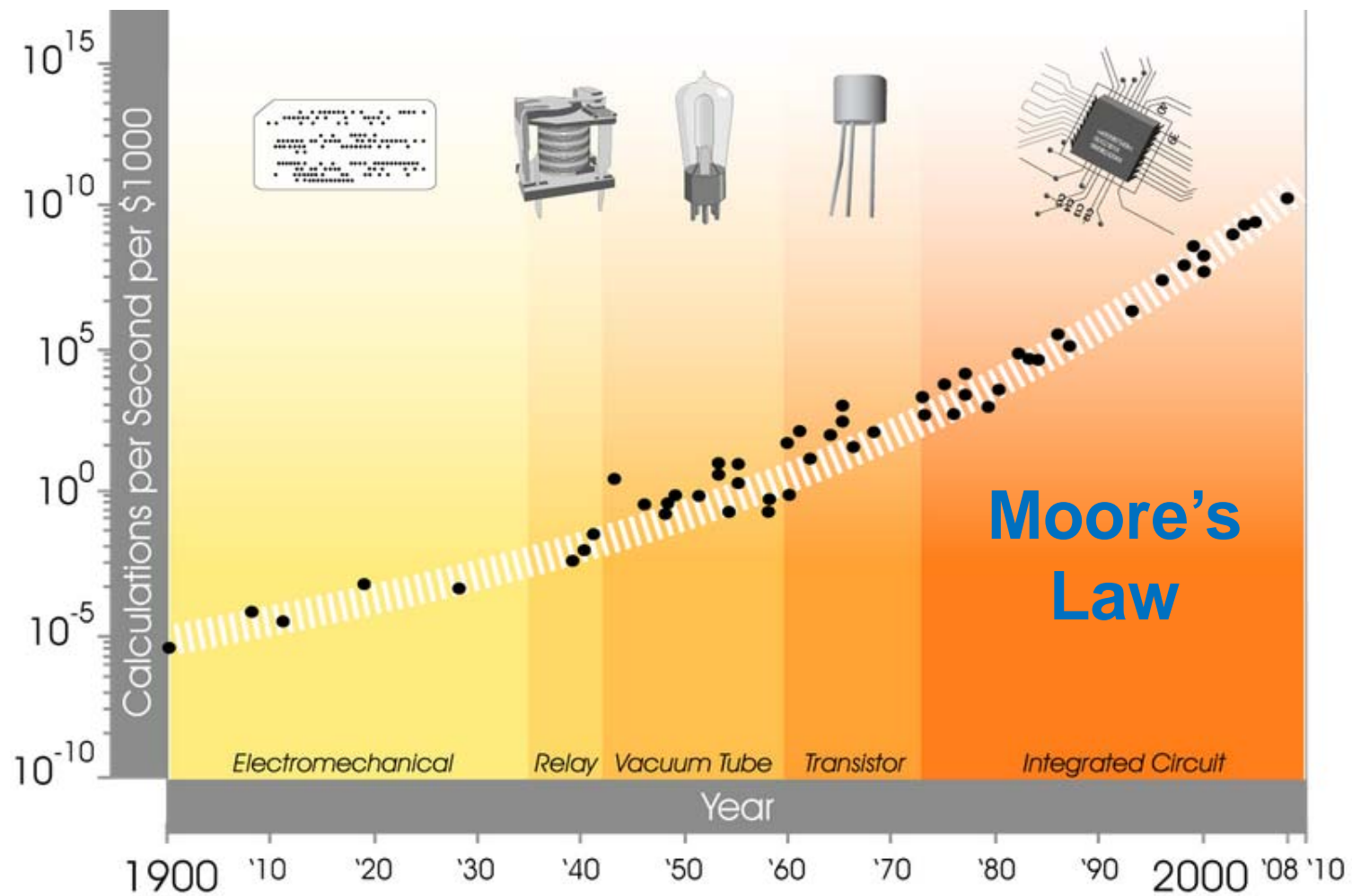
Bill Schweber, "Moore's Law at 50," *Engineering 360*, 16 April 2015, <http://insights.globalspec.com/article/825/moore-s-law-at-50>



# Moore's Law



“Moore’s Law,” Computer History Museum, <http://www.computerhistory.org/revolution/digital-logic/12/267>



Raymond Kurzweil, Kurzweil Accelerating Intelligence, <http://www.kurzweilai.net/exponential-growth-of-computing#!prettyPhoto>

**“The exponential, digital, and recombinant powers of the second machine age have made possible for humanity to create two of the most important one-time events in our history: the emergence of real, useful artificial intelligence (AI) and the connection of most of the people on the planet via a common digital network.”**

**— Erik Brynjolfsson and Andrew McAfee**

Erik Brynjolfsson and Andrew McAfee. *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies* (New York: W. W. Norton & Company, 2014), 90.





Reuters  
Garry Kasparov during the match he lost to Deep Blue yesterday.

“I’m a human being. When I see something that is well beyond my understanding, I’m afraid.”

— Garry Kasparov 1997



“I felt like quiz show contestant was now the first job that had become obsolete under this new regime of thinking computers.”

— Ken Jennings 2011



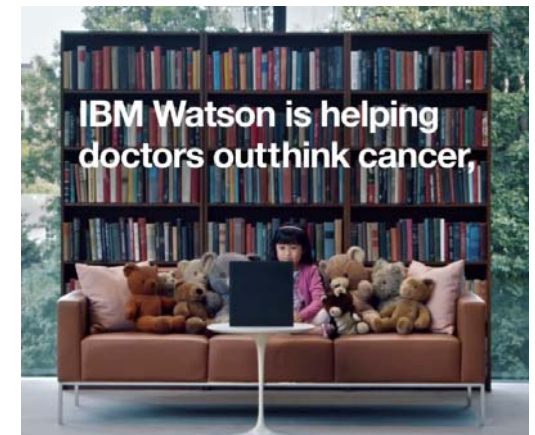
**“I am very surprised because I have never thought I would lose,” Mr. Lee said at a news conference in Seoul. “I didn’t know that AlphaGo would play such a perfect Go.”**

**— Lee Se-dol 2016**

There are about  $10^{170}$  board positions in Go, and only  $10^{80}$  atoms in the universe.



**Watson's hardware cost \$3,000,000 in 2011.  
Assuming Moore's Law holds,  
in 2020 the same hardware will cost less  
than \$50,000.  
in 2030 it should cost less than \$750.**



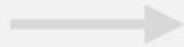


# Start using Watson Analytics in minutes!

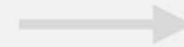


**Sign up for an IBM ID\***

\*or use your existing IBM ID



**Validate your account  
in the confirmation  
email**

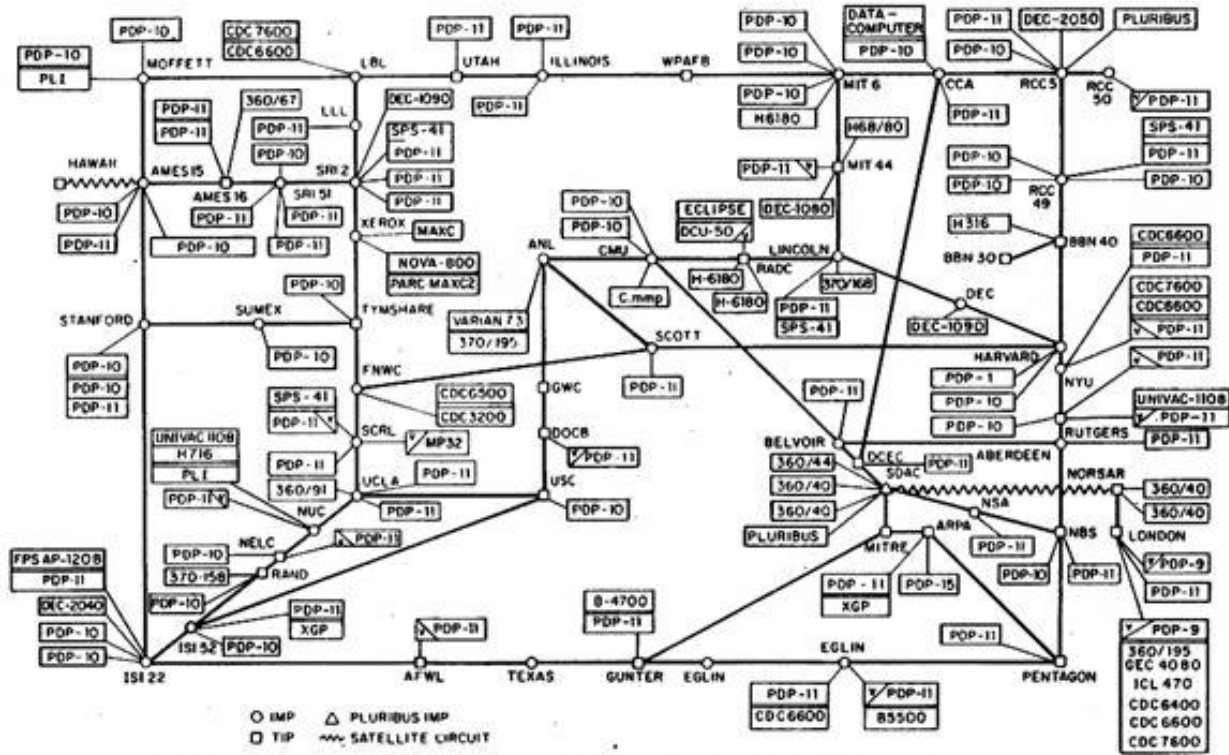


**Log in and start  
exploring your data**

Try it for Free



ARPANET LOGICAL MAP, MARCH 1977



1977



About 3.7 billion Internet Users  
40% of the World's Population

<http://thecreatorsproject.vice.com/blog/what-the-internet-looks-like>

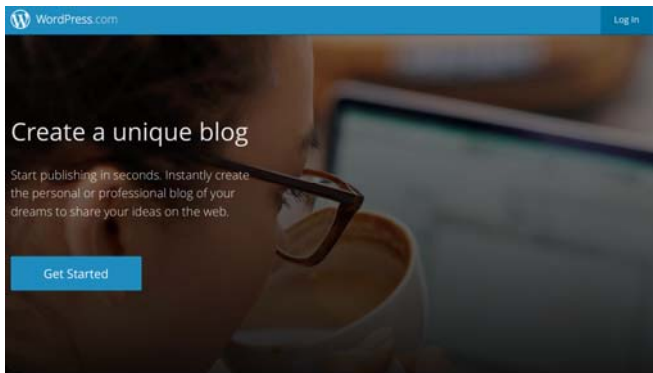


# Google

Google Search

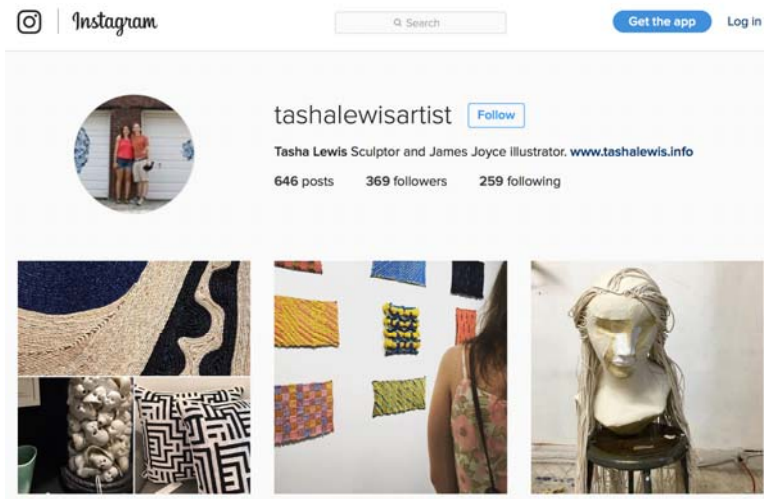
I'm Feeling Lucky

1998



## Powerful publishing platform

Students, parents, Poets, photographers, Scientists, activists. Millions of bloggers tell their stories on WordPress.com.



Etsy

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Clothing & Accessories Jewelry Craft Supplies & Tools Weddings Entertainment More ▾

## Whoever you are, find whatever you're into

What are you shopping for?



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**In the News** Recent Most Viewed

**Ocelot (*Leopardus pardalis*) Density in Central Amazonia**  
Daniel Gomes da Rocha, Rahel Sollmann, [...], Cedric K. W. Tan

**Regulation of Heat Exchange across the Hornbill Beak: Functional Similarities with Toucans?**  
T. M. F. N. van de Ven, R. O. Martin, [...], S. J. Cunningham

**Tweets**

Vignesh Retweeted

**Madhu Pai** @paimadhu  
Predatory OA journals are running out of ideas! This one is running a special issue on "Plosone"! LOL!

2003



2001

# What Has Changed?

**Documents are Digital and on  
the Network**



## **Print Documents**

**Local**

**User goes to the content**

**Takes time to acquire**

**Designed for one user**

**Immutable**

**Preservation understood**

## **Digital/Networked Documents**

**Universal**

**Content comes to the user**

**Available instantaneously**

**Designed for many users**

**Easily changed**

**Can easily incorporate all  
forms of media**

**Preservation challenging**

## **Print Documents**

**Rival good**

**Authorship is most often individual**

## **Digital/Networked Documents**

**Non-rival good**

**Often authorship is shared and social production is common**

**Marginal cost of production and distribution is zero**

## **Print Documents**

**Publishing is a professional activity**

## **Digital/Networked Documents**

**Publishing becomes an amateur activity**

# Illustrating Ulysses

A MIXED-MEDIA PROJECT BY TASHA LEWIS

[View Project](#)

[Project Framework](#)

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A labor of love, of obsession, of erudition, of self-awareness, of self-confrontation, and of restless protean evolution, what Tasha Lewis has done is to create a parallel to the reading experience that not only transforms the text, it elevates it.

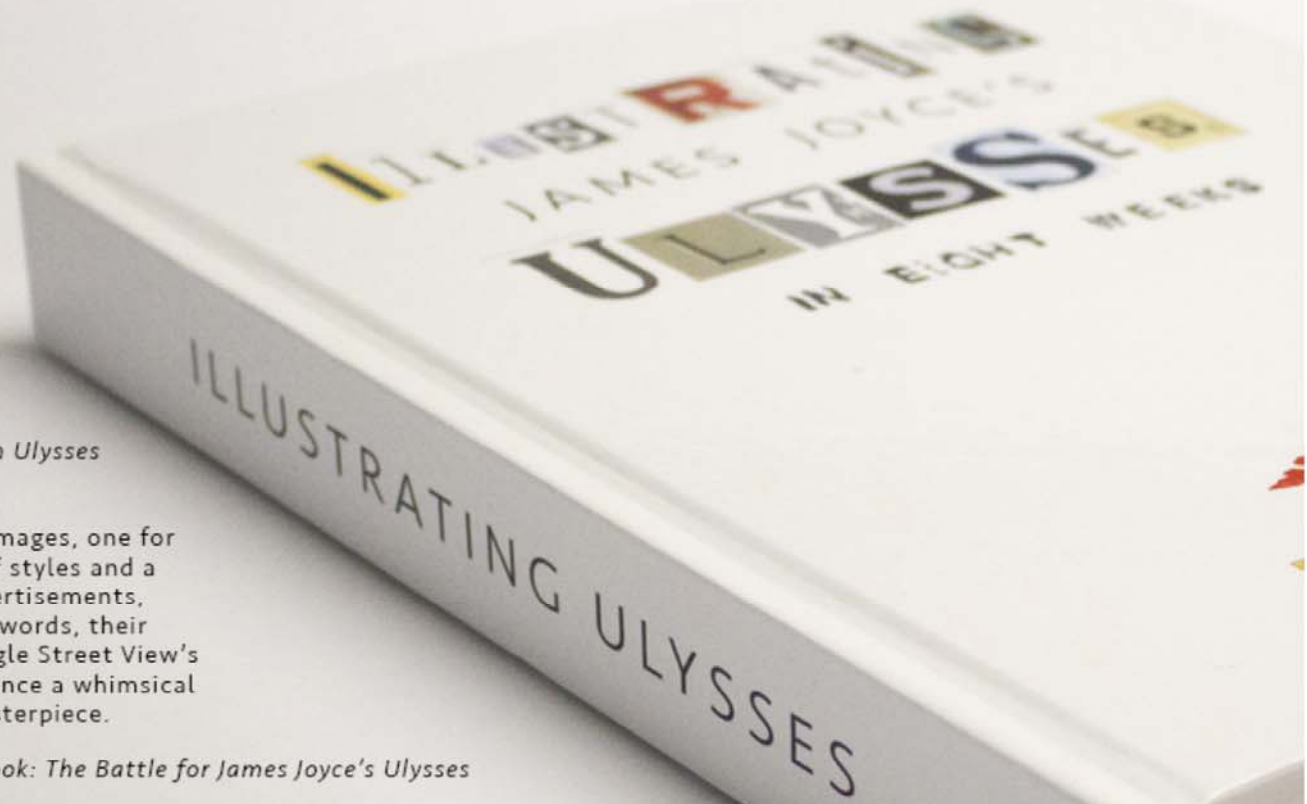
**MATT KISH**, creator of *Moby-Dick in Pictures: One Drawing for Every Page*

*Illustrating Joyce's Ulysses* is a deeply inventive "visualization," rather than illustration, of Joyce's novel. [...] This is a fascinating project.

**KAREN R. LAWRENCE**, author of *The Odyssey of Style in Ulysses*

*Illustrating Joyce's Ulysses* is a monumental feat—644 images, one for each page of the novel. Tasha Lewis offers us a litany of styles and a virtuoso array of techniques: collage, embroidered advertisements, silkscreen hallucinations, food art, the aural shapes of words, their histories embedded in wax, Polaroid nostalgia and Google Street View's All-Seeing Eye. The result is a provocative artwork, at once a whimsical homage and a beautiful recreation of James Joyce's masterpiece.

**KEVIN BIRMINGHAM**, author of *The Most Dangerous Book: The Battle for James Joyce's Ulysses*





## **Libraries in the Print World**

**Local**

**Complicated to use**

**Subject to congestion**

## **Libraries in the Digital/Networked World**

**Network scale**

**Powerful discovery tools**

**Fast, cheap and easy**

## **Libraries in the Print World**

**Acquire and manage  
content from the world  
for the community or  
institution**

## **Libraries in the Digital/Networked World**

**Manage and preserve local  
content for the world**

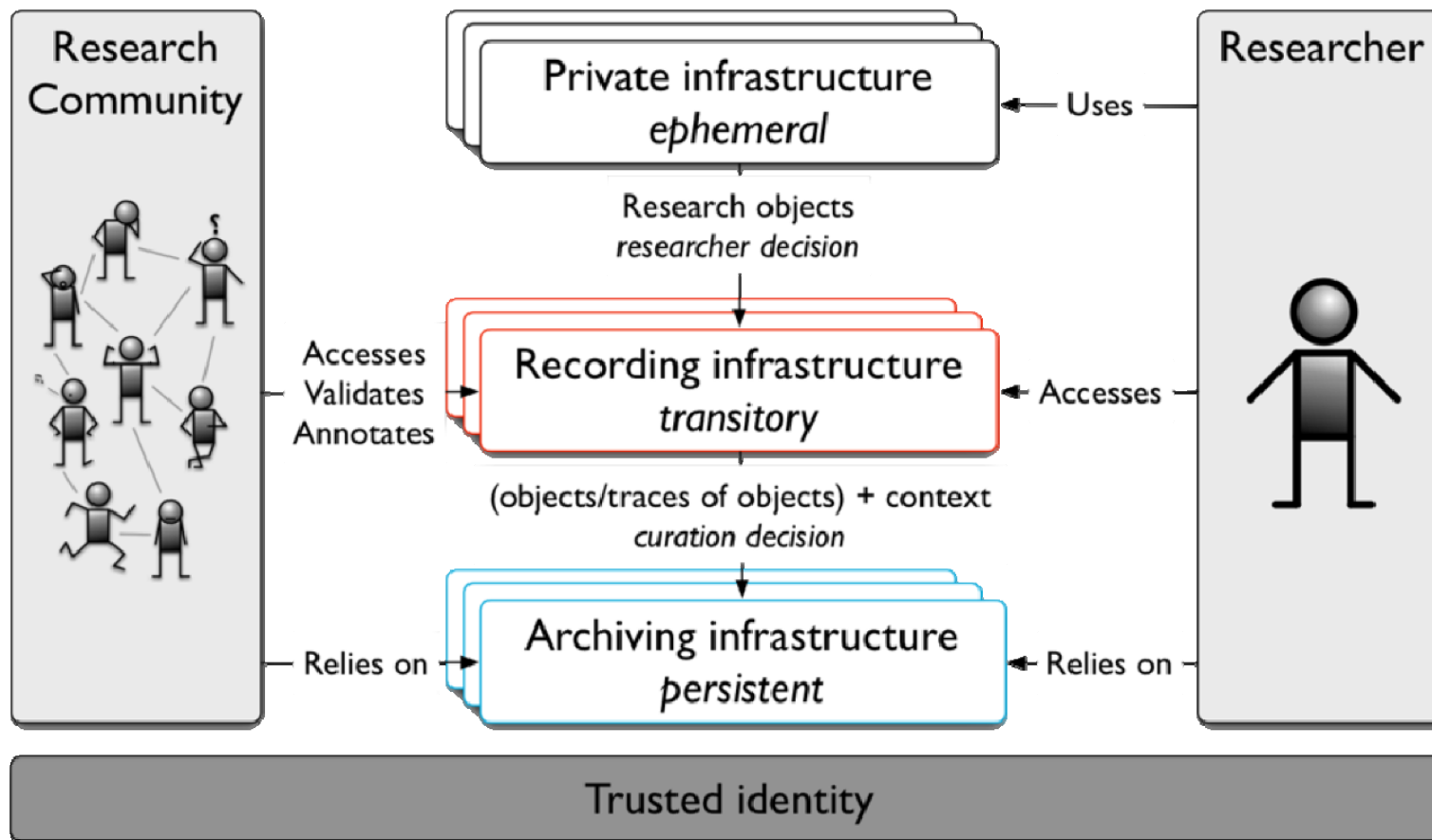
# What Has Changed?

**The Scholarly Record is Bigger,  
Slipperier and Harder to Manage**



From Brian Lavoie, Eric Childress, Ricky Erway, Ixchel Faniel, Constance Malpas, Jennifer Schaffner and Titia van der Werf, *The Evolving Scholarly Record* (Dublin, OH: OCLC Research, June 2014), 10, <http://oclc.org/content/dam/research/publications/library/2014/oclcresearch-evolving-scholarly-record-2014-5-a4.pdf>





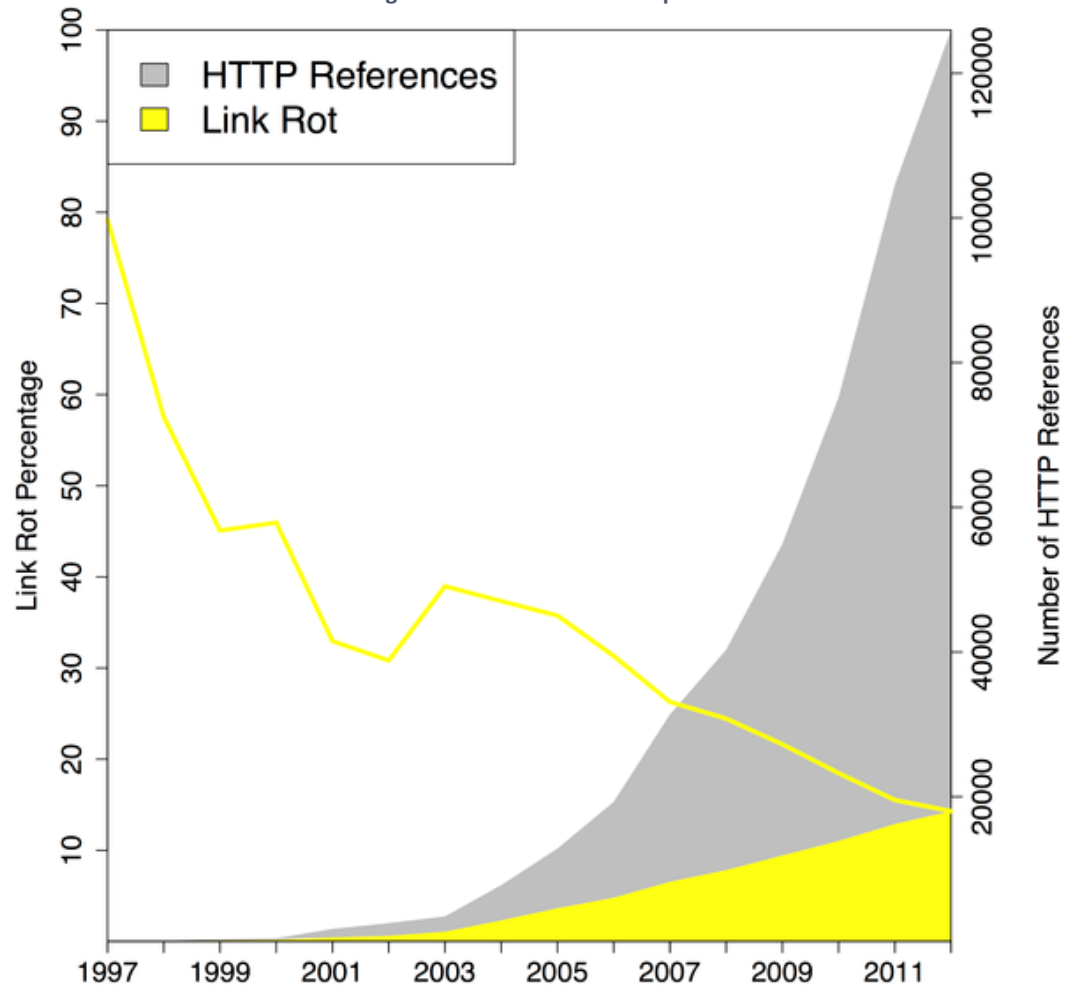
From: Herbert Van de Sompel and Andrew Treloar, "A Perspective on Archiving the Scholarly Web,"  
*Proceedings of the 11th International Conference on Preservation of Digital Objects iPRES 2014*, Melbourne, 6-10 October  
 (Melbourne: State Library of Victoria, 2014), 194-198, [https://www.nla.gov.au/sites/default/files/ipres2014-proceedings-version\\_1.pdf](https://www.nla.gov.au/sites/default/files/ipres2014-proceedings-version_1.pdf)

# Characterizing Research Process and Outputs

Characteristic	Past Practice	Future
Research Process	Hidden	Visible
Nature of the Object	Fixed	Varying
Atomicity of Object	Atomic	Compound
Process of Making Public	Discrete	Continuous
Speed of Communication	Delayed	Instant
Communicated Object	Publication plus Data Proxies	Publication plus Linked Data plus Linked Models
Nature of Process	Formal	Informal

Adapted from: Inge Angevaere, "On-line Scholarly Communications: vd Sompel and Treloar Sketch the Future Playing Field of Digital Archives," *KB Research in KB* (blog), January 22, 2014, <http://researchkb.wordpress.com/2014/01/22/on-line-scholarly-communications-and-the-role-of-digital-archives/>

Figure 12. Link Rot - PMC corpus.

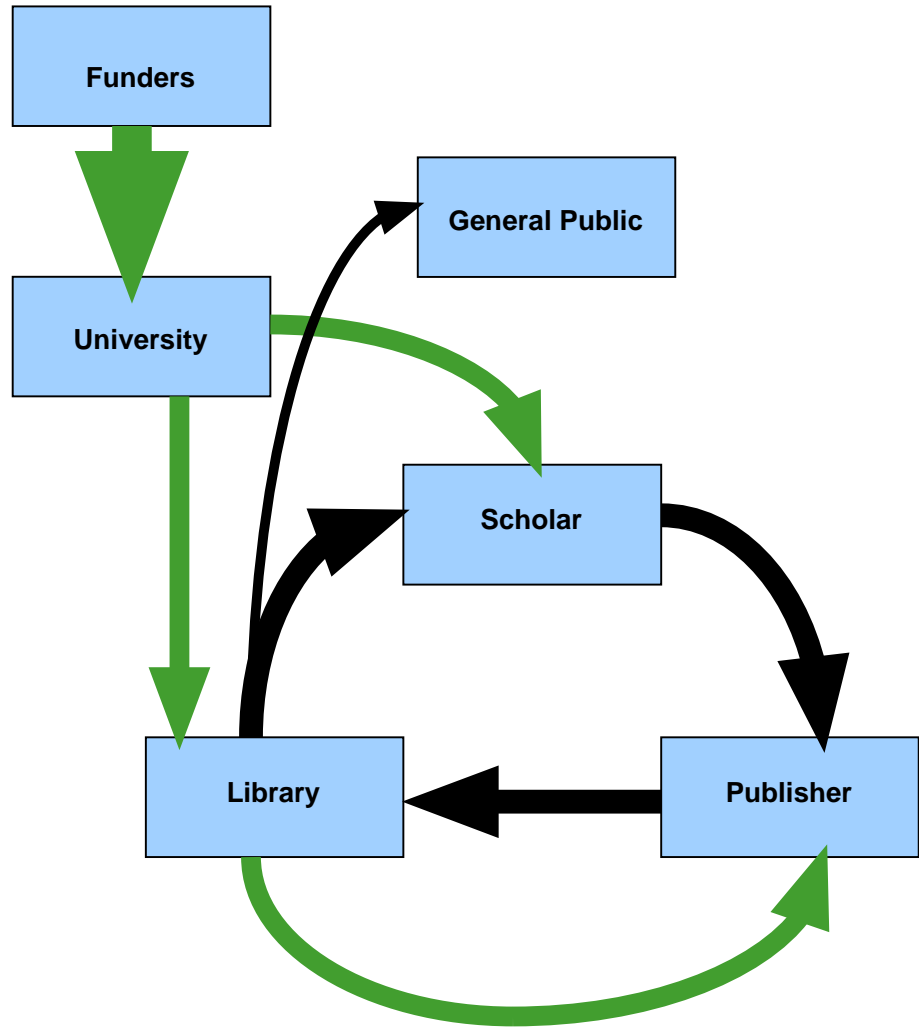


Klein M, Van de Sompel H, Sanderson R, Shankar H, Balakireva L, et al. (2014)  
Scholarly Context Not Found: One in Five Articles Suffers from Reference Rot. *PLoS ONE* 9(12): e115253.  
doi:10.1371/journal.pone.0115253

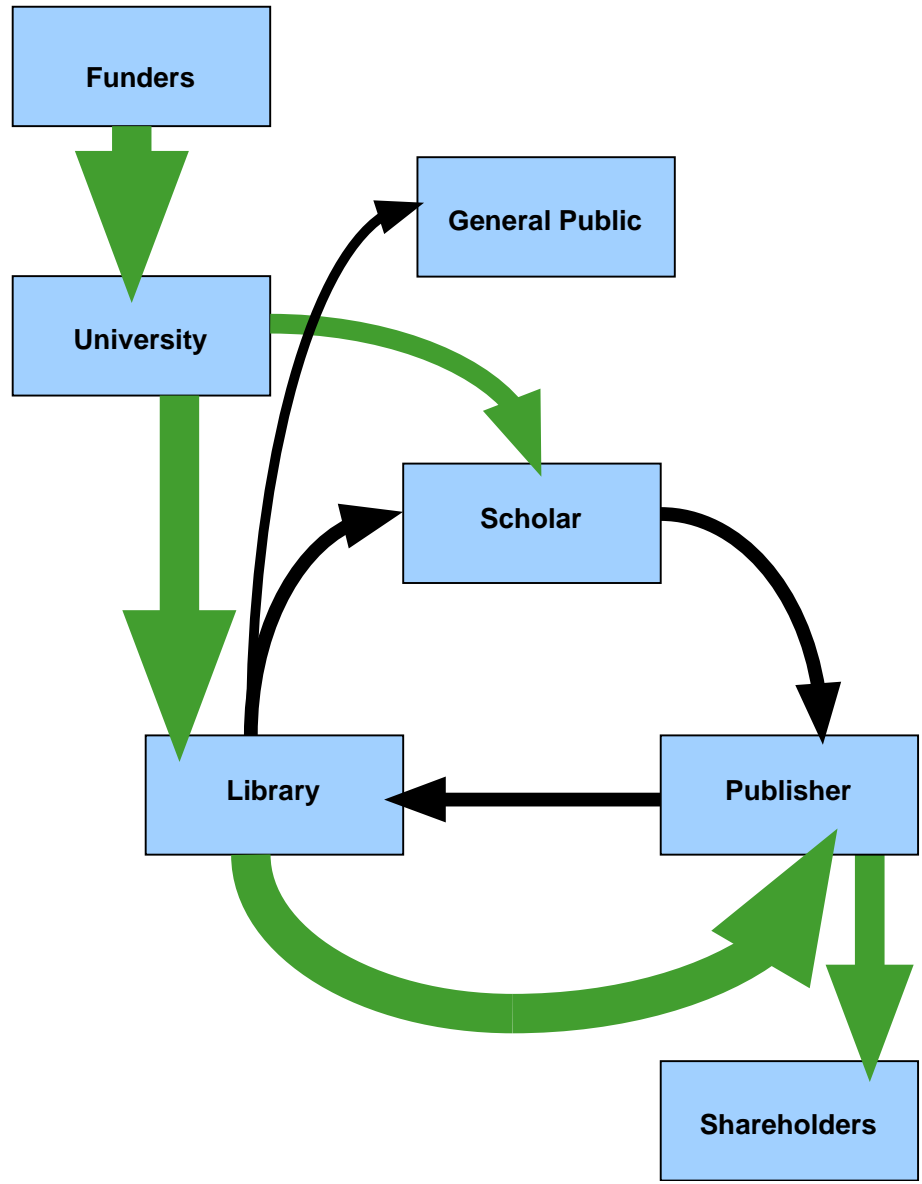
<http://journals.plos.org/plosone/article?id=info:doi/10.1371/journal.pone.0115253>

# What Has Changed?

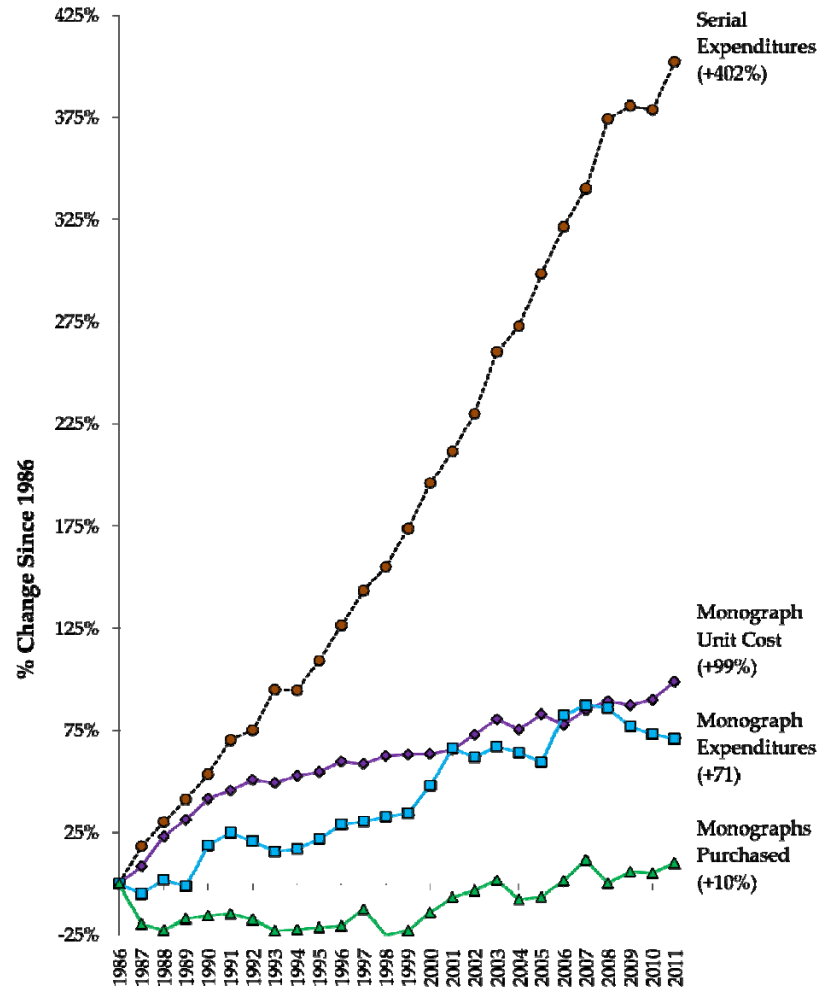
**Economics of Scholarly  
Information No Longer Work**







### Monograph & Serial Costs in ARL Libraries, 1986-2011\*

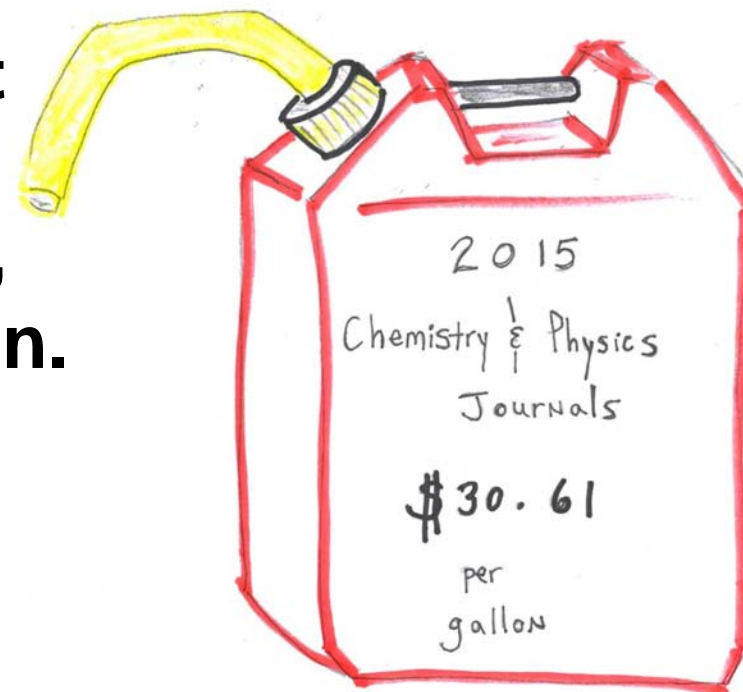


NOTE: Data for monograph and serials expenditures was not collected in 2011-12.

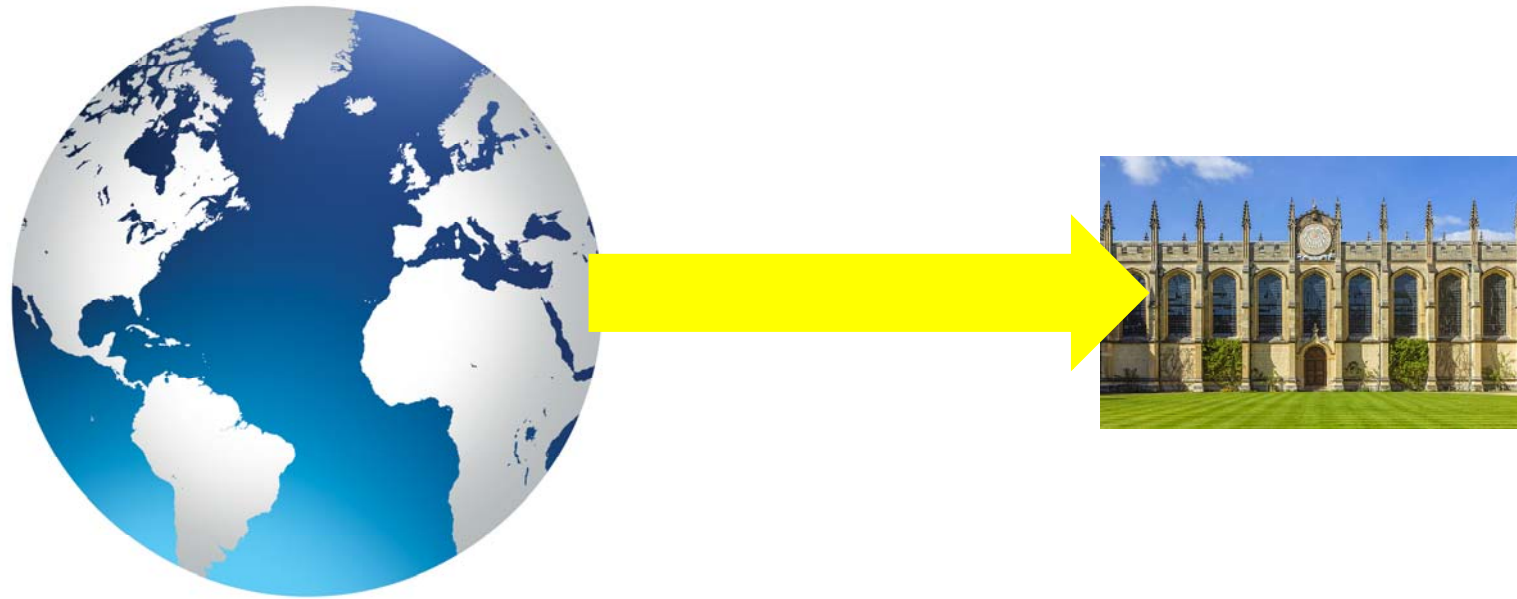
Source: ARL Statistics 2010-11 Association of Research Libraries, Washington, D.C.  
 \*Includes electronic resources from 1999-2011.

**If gasoline had increased in price at the same rate as Chemistry and Physics journals from 1975 to 2015, it would cost \$30.61 (£23.03) a gallon.**

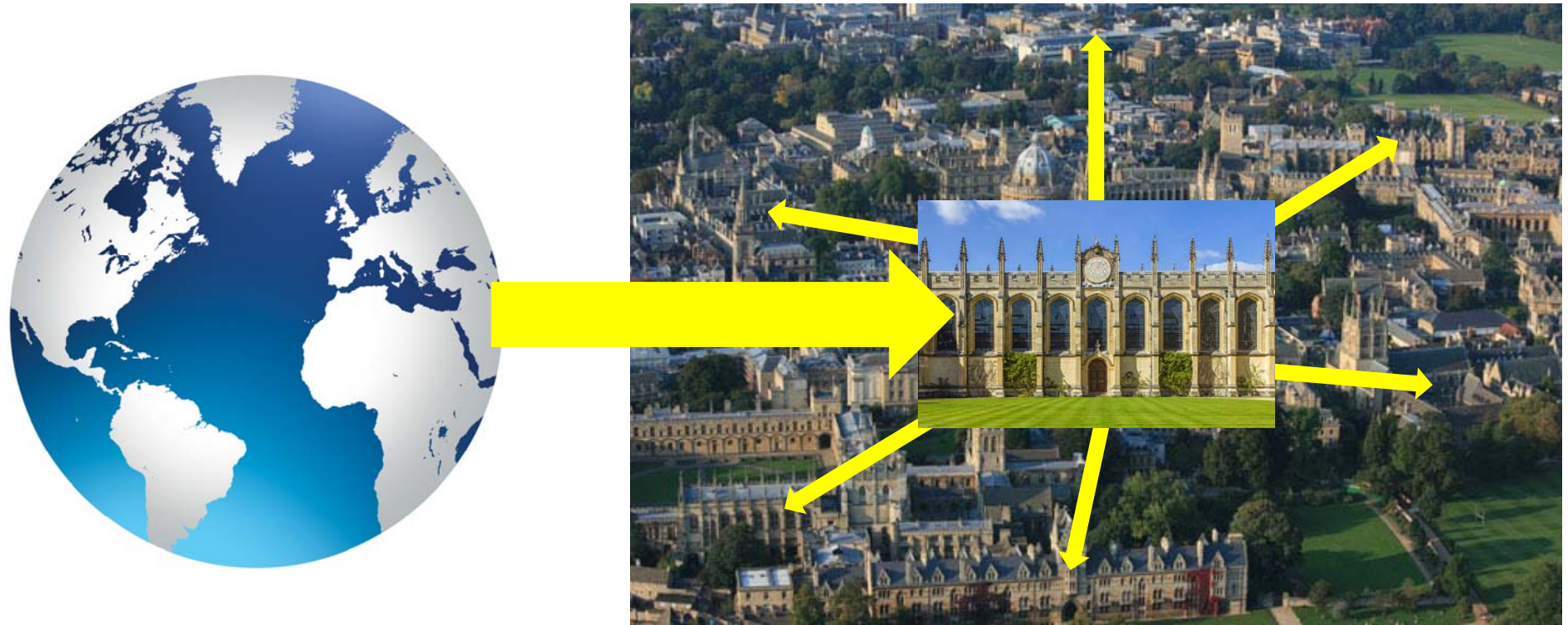
**In the U.S. gasoline currently costs \$2.50 to \$3.00 a gallon**



# Fundamental Shift

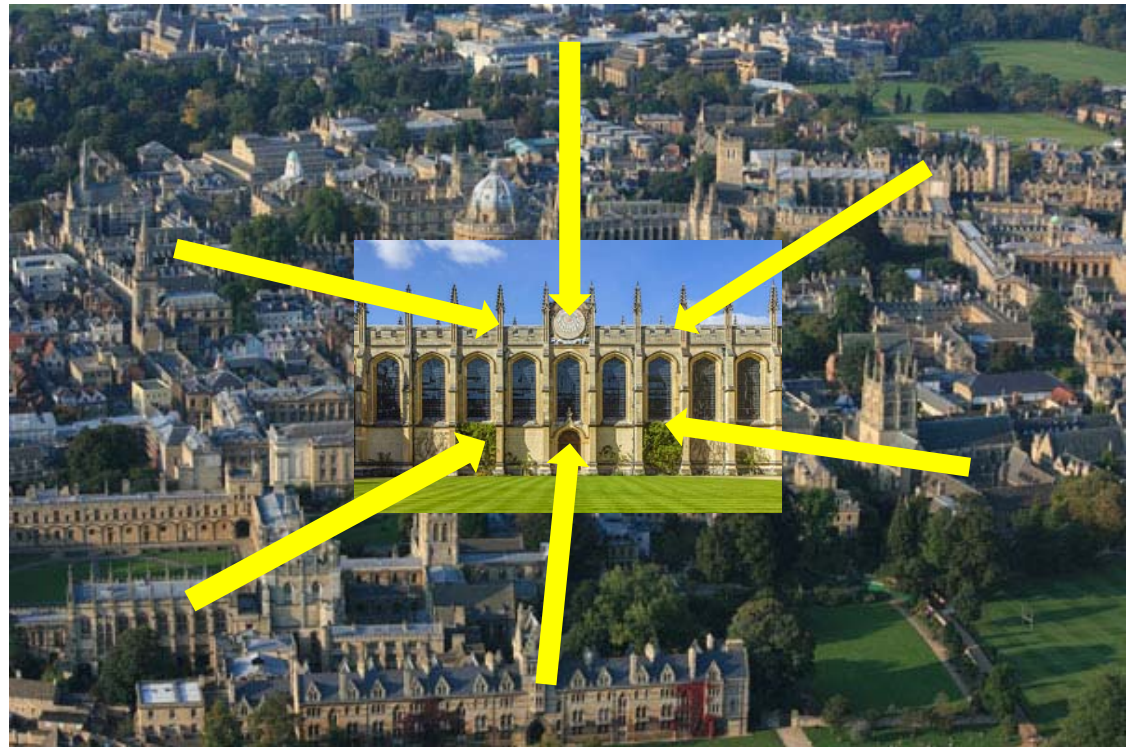


# Fundamental Shift

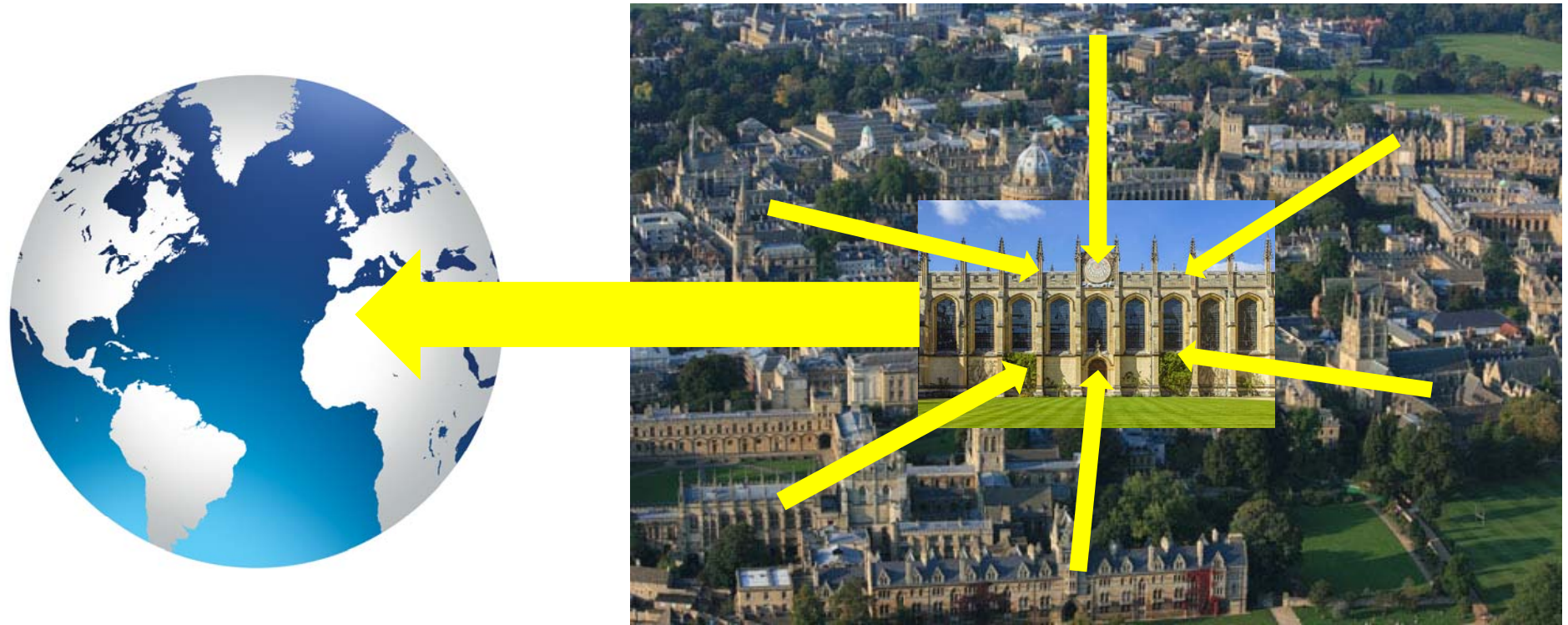




# Fundamental Shift

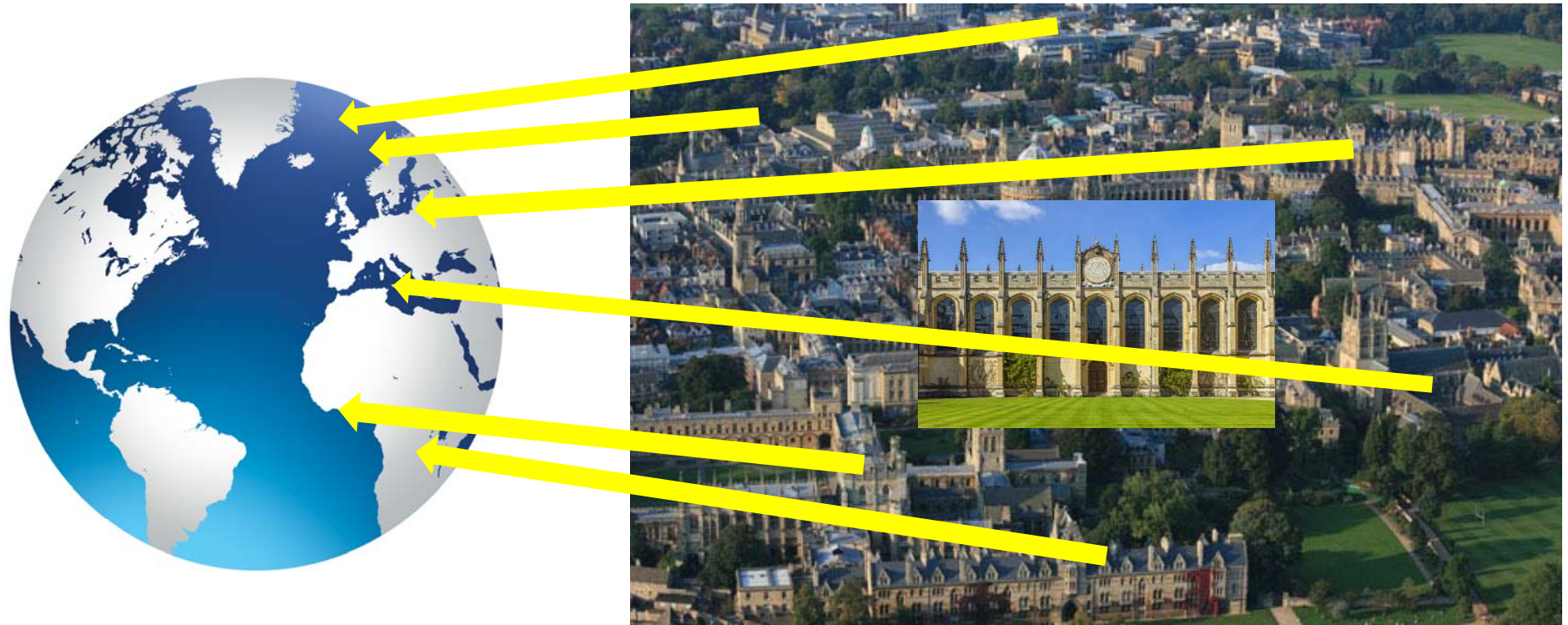


# Fundamental Shift





# Fundamental Shift

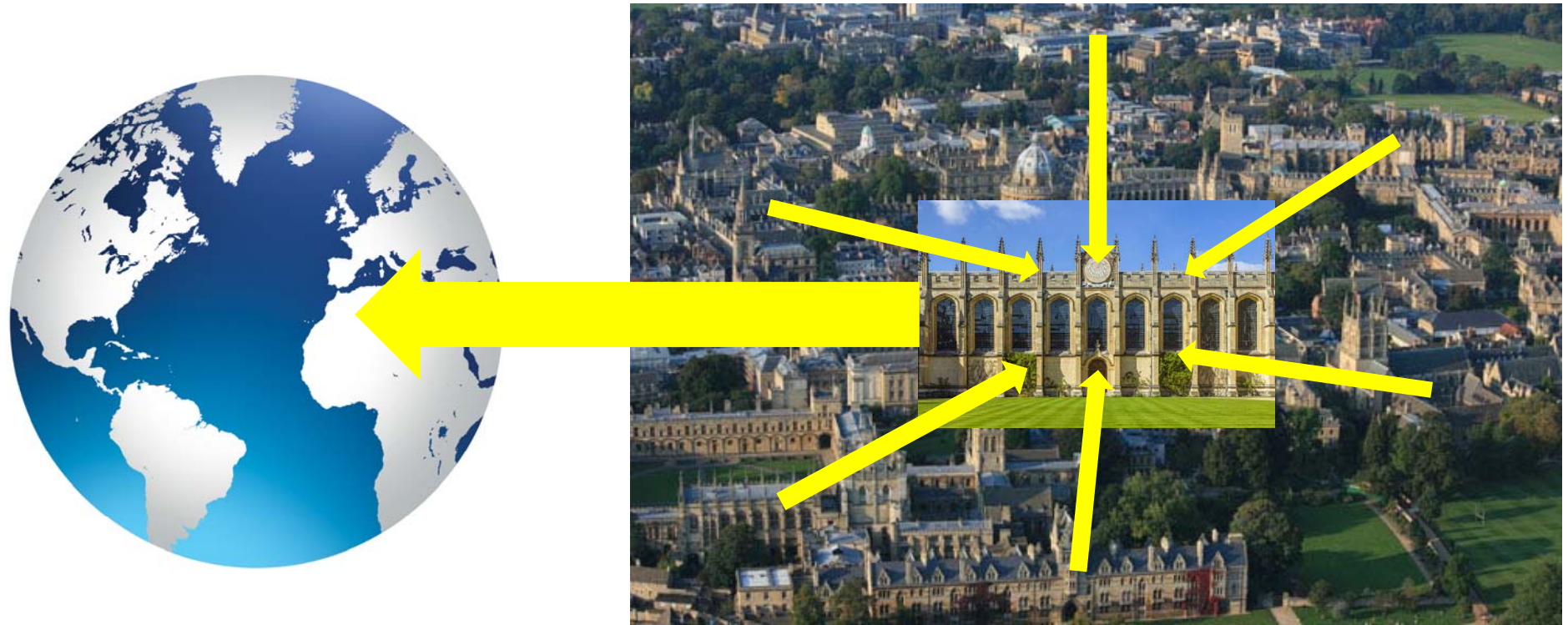


# Fundamental Shift





# Fundamental Shift





# Steps

**Defining the Job**

**Creating the Library as Place**

**Retiring the Legacy Print  
Collection**

**Preserving Digital Content**

**Making the Money Work**

**Working with the Smart  
Machine**



**Ronald H. Coase asks the question: if markets are the most efficient means for the economy to work, why do we have firms?**

**Transaction costs**

Ronald Harry Coase. "The Nature of the Firm," *Economica* 4 no. 16 (1937): 386-405.

**Academic libraries provide a function for the university that has been brought in-house because the market in the past has been unable to provide the documents and other services that the university required.**

**Now the market can provide many of the services once provided by the library.**



**Who is hiring us? To do what job?**

**What product or service can help students and faculty do more effectively, conveniently and affordably a job they've been trying to do in their scholarly lives.**

“Clayton Christensen: Milkshakes Understanding the Job,” video, <http://ed.ted.com/on/KwEb5IAJ>



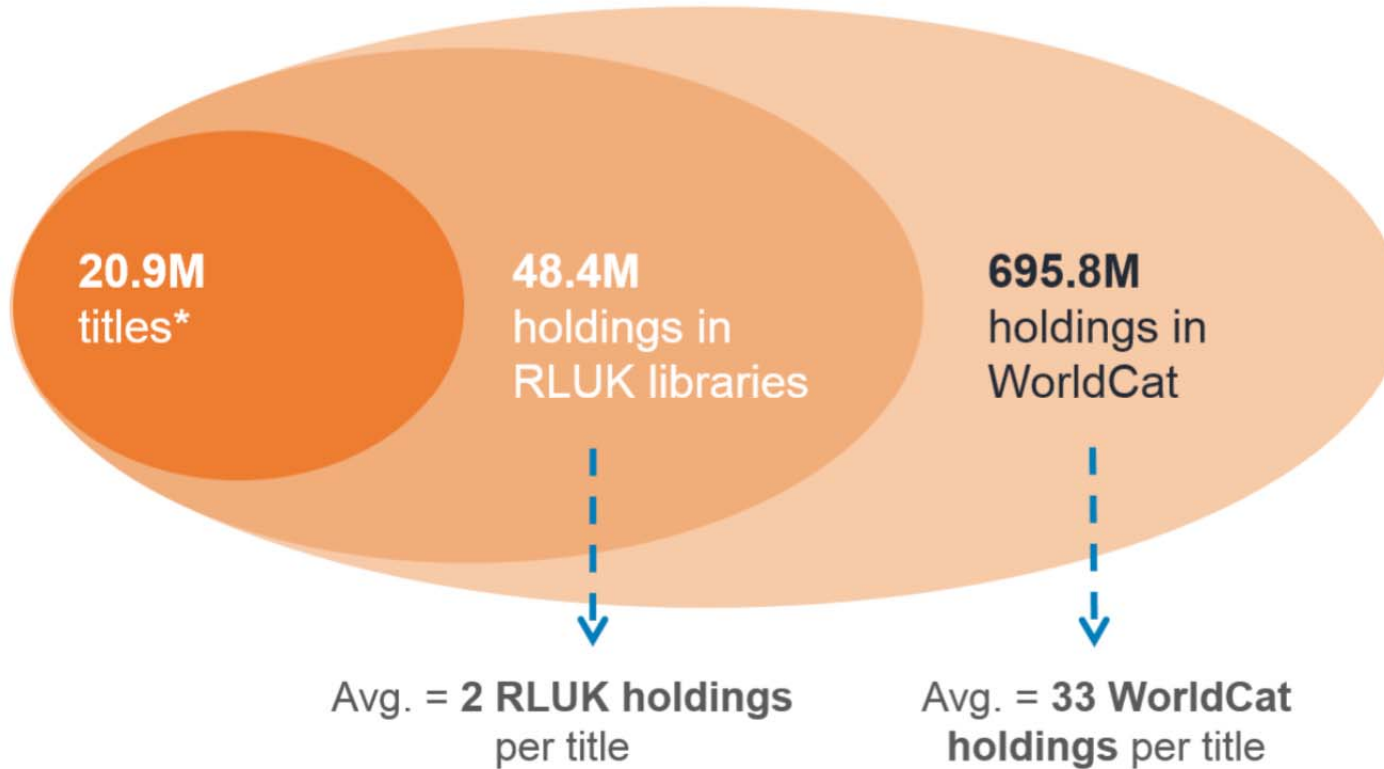




# The Legacy Print Collection Needs to be Safe

- **Who Keeps What?**
- **Use Copies and Dark Preservation Copies**
- **Discovery and Delivery**
- **Financial Model**
  
- **“Collective Collection” – National Scale Project Allows Local Action**

# RLUK Collective Print Book Collection: Size

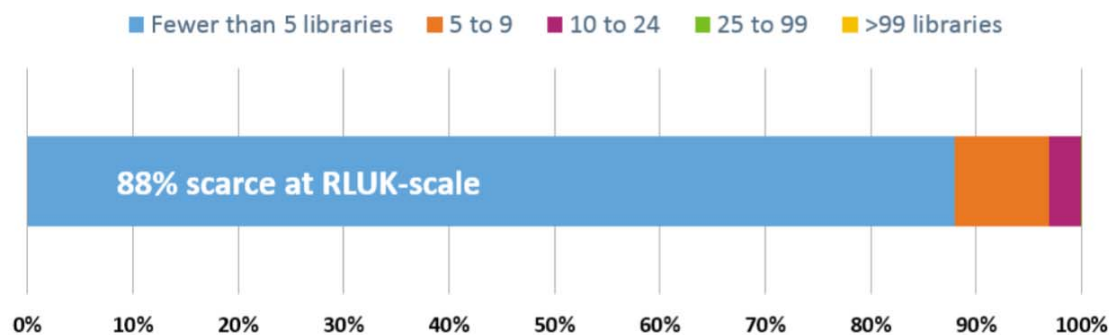


\*distinct publications; de-duplicated OCLC numbers

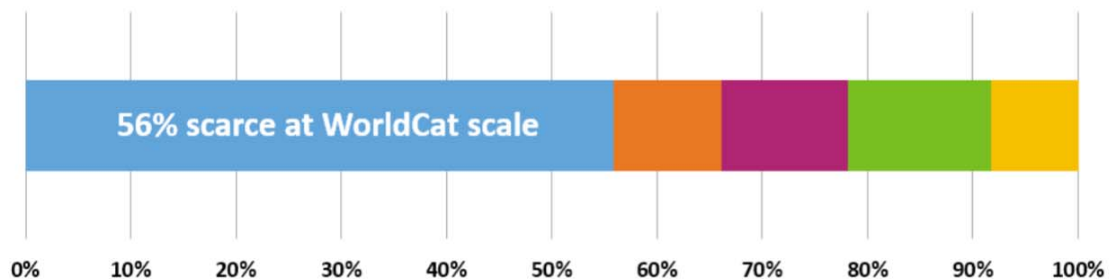
Malpas and Lavoie. 2016.

# RLUK Collective Print Book Collection: Duplication Rates

In-group Duplication of RLUK-held Print Book Titles (N = 20.9M)



WorldCat Duplication of RLUK-held Print Book Titles (N = 20.9M)



Malpas and Lavoie. 2016.



**Membership \$20,000 per year includes  
5TB for 20 years  
Extra TB for \$5,000 for 20 years**



**Membership: \$5,500-\$3,000 per year  
Storage: \$585/TB/year**



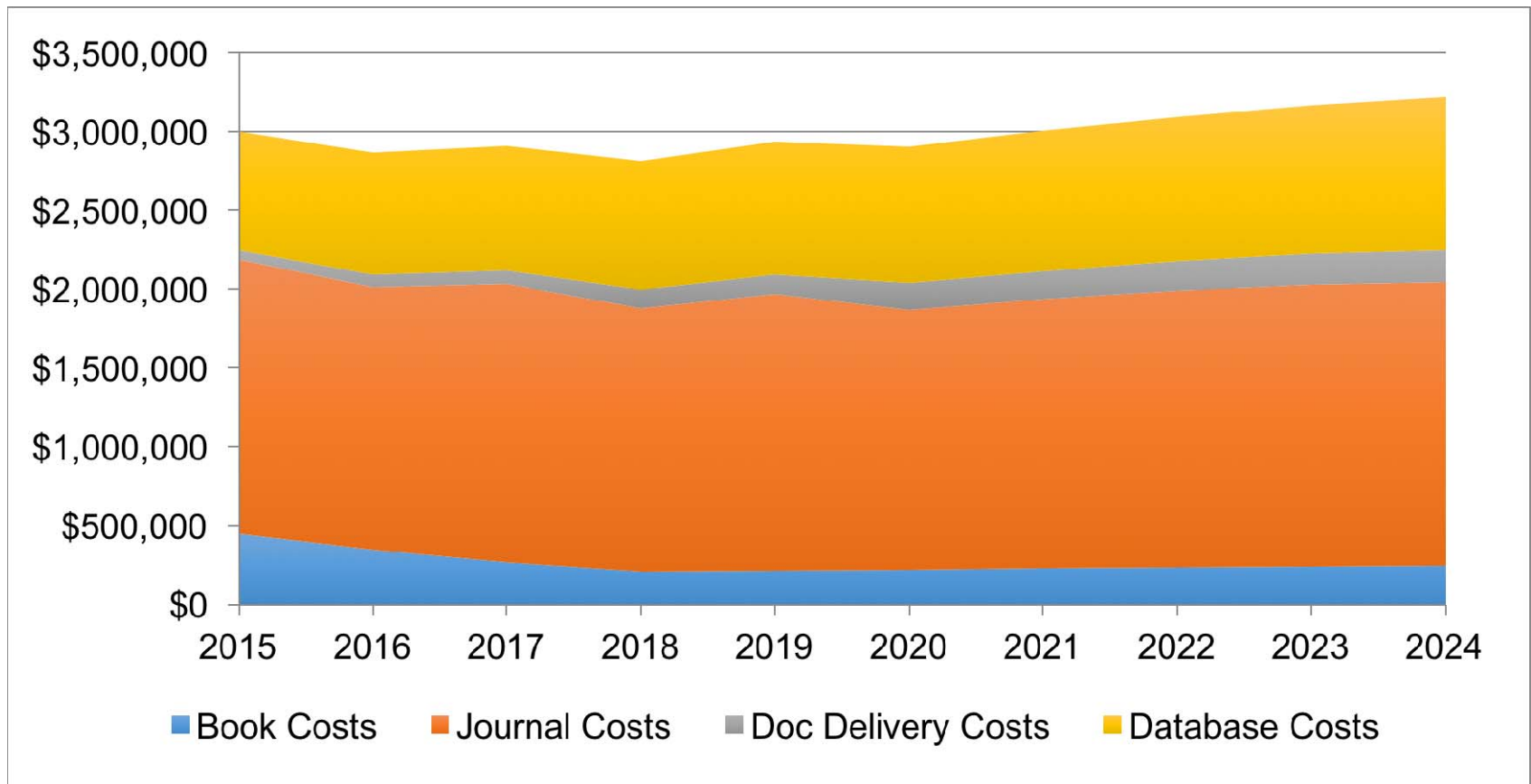
**Many options \$700 to \$3,000 per  
TB/year  
Hub for DPN**



**Invitation only membership \$20,000  
per year includes 10 TB  
Hub for DPN**



- 1. Patron Driven Acquisition (PDA) for books, both print and e-books.**
- 2. Article purchasing rather than subscriptions for journals.**
- 3. Gold Open Access (OA) journals will continue to grow and become the business model of choice for a large portion of scholarly journal publishing.**
- 4. The growth in open content and open discovery tools on the Web, such as Wikipedia and Google Scholar, will reduce the need for paid database content.**



David W. Lewis "The Future of Academic Library Materials Expenditures: A Thought Experiment," April 2015,  
<https://scholarworks.iupui.edu/handle/1805/6110>

**“We're close to the point where the available knowledge at the hands of the individual, for questions that can be posed clearly and articulately, is not so far from the knowledge of the entire world.”**

**— Tyler Cowen**

Tyler Cowen, *Average is Over: Powering America Beyond the Age of the Great Stagnation* (New York: Dutton, 2013), 7.

- 1. What do we teach?**
- 2. How do we support people using information?**
- 3. How do we support people creating information?**

# Things to Do Now



- 1. Retire the Legacy Print Collection Now.**
- 2. Have a materials Budget Strategy to Manage the Transition from Traditional Publishing Models to Open Access.**
- 3. Support the Creation of, Access to, and Preservation of the Scholarly Content Created on Your Campus.**
- 4. Commit to the Special Collections Your Library will Support and Make the Required Investments.**

**5. Develop a Space Plan**

**6. Infuse the Curriculum with the Skills Necessary to Create and Consume Information Productively.**

**7. Invest in the Development and Sustainability of Network Level Tools and Services.**

**8. Understand the Demographics of Your Organization and Have a Plan to Hire or Develop the Expertise the will Library Need.**

**9. Sell the Change.**

**10. Get the Culture Right.**

**“Take a close look at these stories, and you’ll see that they deal with three fundamental issues. First is justice: Is this a fair place? Second is security: Is it safe to work here? Third is control: Can I shape my destiny and have influence in this organization?”**

**— Adam Grant**

Adam Grant, “Which Company Is Right for You?” *New York Times Sunday Review*, page 7, December 20, 2015  
<http://www.nytimes.com/2015/12/20/opinion/sunday/the-one-question-you-should-ask-about-every-new-job.html>

**“All of the risks and all of the opportunities lie in the workforce. In just cultures, no one needs permission to be creative or courageous. But they do need support, encouragement, and belief.”**

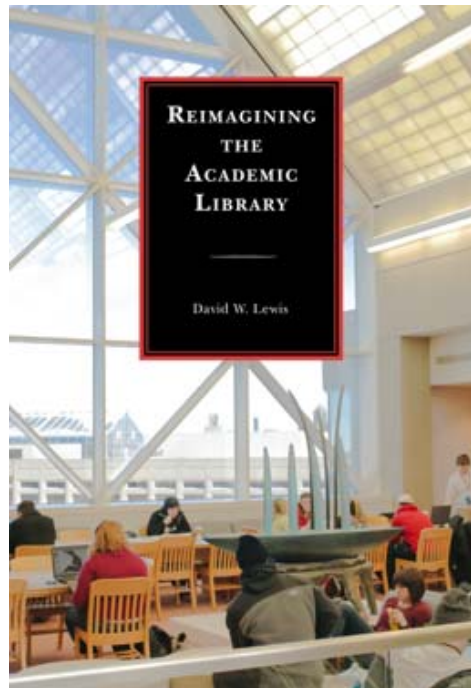
**— Margaret Heffernan**

Margaret Heffernan. *Beyond Measure: The Big Impact of Small Changes*. (New York, NY: TED Books Simon & Schuster, 2015), 75.

See also: *Margaret Heffernan: Why It's Time to Forget the Pecking Order at Work*. TEDWomen 2015 May 2015,  
[http://www.ted.com/talks/margaret\\_heffernan\\_why\\_it\\_s\\_time\\_to\\_forget\\_the\\_pecking\\_order\\_at\\_work](http://www.ted.com/talks/margaret_heffernan_why_it_s_time_to_forget_the_pecking_order_at_work)



# Questions?



<https://rowman.com/ISBN/9781442238572/Reimagining-the-Academic-Library>

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