CYBERSCHOLARSHIP

AND THE RESEARCH LIBRARY

ARL Fall Forum
Library Workforce for 21st Century Research Libraries

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October 12, 2012

The future ain't what it used to be …

Come gather 'round people
Wherever you roam
And admit that the waters
Around you have grown
And accept it that soon
You'll be drenched to the bone.
If your time to you
Is worth savin'
Then you better start swimmin'
Or you'll sink like a stone
For the times they are a-changin'.

Bob Dylan - The Times They Are A Changin' (1976)

Cyberscholarship

- Qualitatively different opportunities for new forms of research

- Interdisciplinary investigations engage scientists, technologists, and humanities scholars.

- Transformative opportunities and challenges to libraries and the information professions
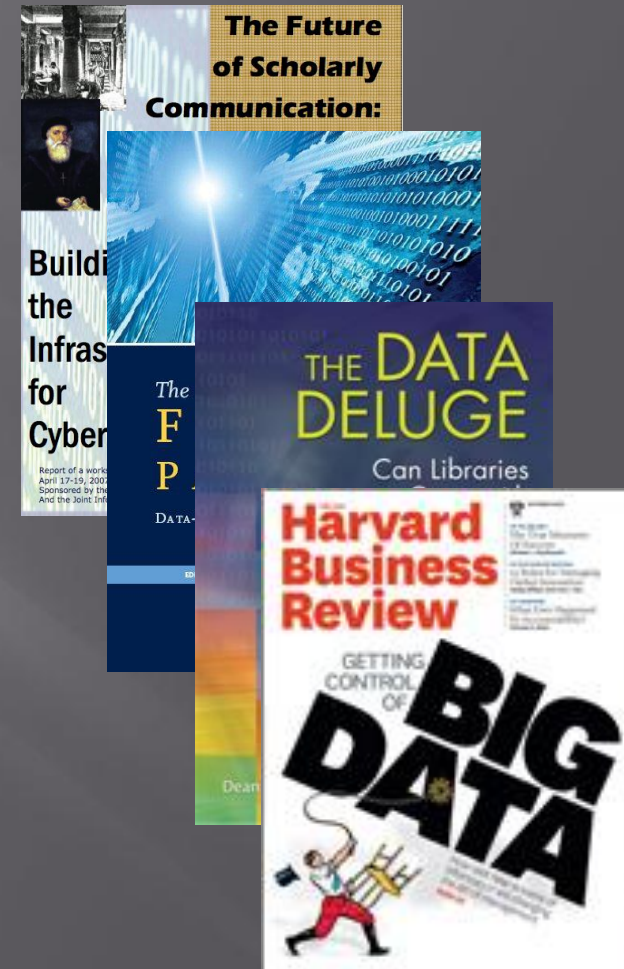
Emerging forms of research

- Data-driven… exploratory, correlative…
  - Technology-enabled: A human reads one document at a time; a computer analyzes millions, revealing otherwise undetectable patterns
  - Transformative: Stretches library traditions to collect, curate, preserve, and provide access to content of enduring value
- Communication-enabled
  - Encourages experimentation
    - arXiv, genomics, NVO, LHC, …
    - social media, wikis, blogs, …
  - Accelerates the exchange of ideas
  - Expands the field of contributors
  - Disrupts conventional librarianship

Infrastructure challenges

- Stewarding contemporary scholarship
  - Digital content
  - Web services
  - Workflows
- Curating primary research data
  - Often discarded
  - Rarely accessible
  - Frequently incompatible
- Approaching a tipping point
  - Digital content the norm in most disciplines
  - Infrastructure and professional services lagging

Peter Murray-Rust (Cambridge)

- "… the current scientific literature, were it to be presented in semantically accessible form, contains huge amounts of undiscovered science."

- "However, the apathy of the academic, scientific, and information communities, coupled with the indifference or even active hostility and greed of many publishers, renders literature-data-driven science still inaccessible."

Challenges / Opportunities

- Refine the MLIS curriculum
  - Reach beyond the library
  - Champion digital stewardship
  - Engage with disciplinary research
- Recruit students to prospective careers
  - STEM students, business students, …
  - Diversity students
- Explore emerging roles
  - Library as data repository & publisher
  - Embedded librarian with disciplinary expertise
- Partner to define and shape new career paths
  - Data librarian / data scientist (e.g., as Co-PI on major research projects)
  - Dual degree programs (e.g., X-Informatics)

No Dearth of Opportunity*

A SAMPLER …

- Web analytics manager
- Information resources specialist
- Documentation specialist
- Digital reference librarian
- Curator
- Archivist, Archival consultant
- Director of emerging technologies and community services
- Discovery metadata librarian
- Associate archivist for digital initiatives and records management

- Manager, information services
- Metadata analyst
- Data officer
- Digital services manager
- Records management manager
- Data management analyst
- Information management officer
- Intelligence associate
- Wine librarian
- Clinical informatics librarian
- Freelance researcher

* "61 Non-Librarian Jobs for LIS Grads", Mia Breitkopf, Syracuse iSchool (December 2011 blog posting)
http://infospace.ischool.syr.edu/2011/12/23/61-non-librarian-jobs-for-librarians/

Emerging Roles & Careers for Data Professionals*

- **Data Creator** - Researchers with domain expertise

- **Data Manager** - Computer scientists or information technologists responsible for computing facilities, storage, continuing access, and preservation of data

- **Data Scientist** – Information professionals working with data creators, engaging in creative inquiry and analysis

- **Data Librarian** – Information professionals specializing in digital stewardship, including the curation, preservation and archiving of data

* JISC

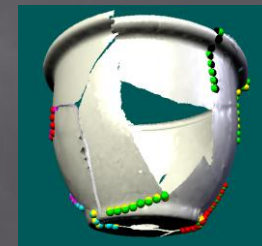# Opportunities to Rethink "Collections" and "Services"

highest

Computational objects & digital rendering of the human record

Value-added experimental data (human involvement)
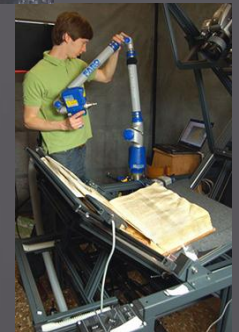
Priority
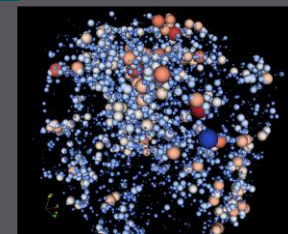
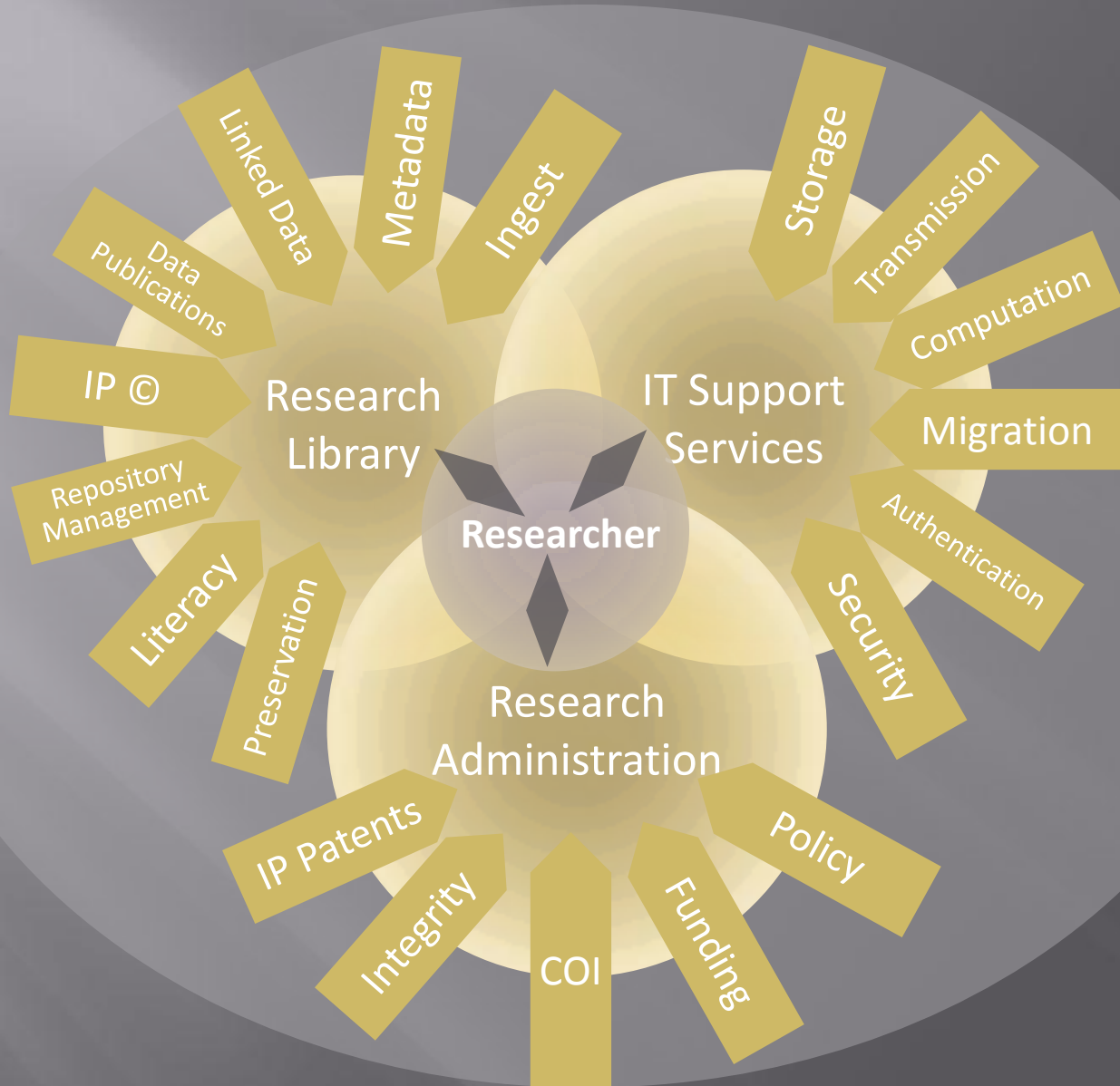Irreplaceable sensor data (automated collection and preparation)

lowest
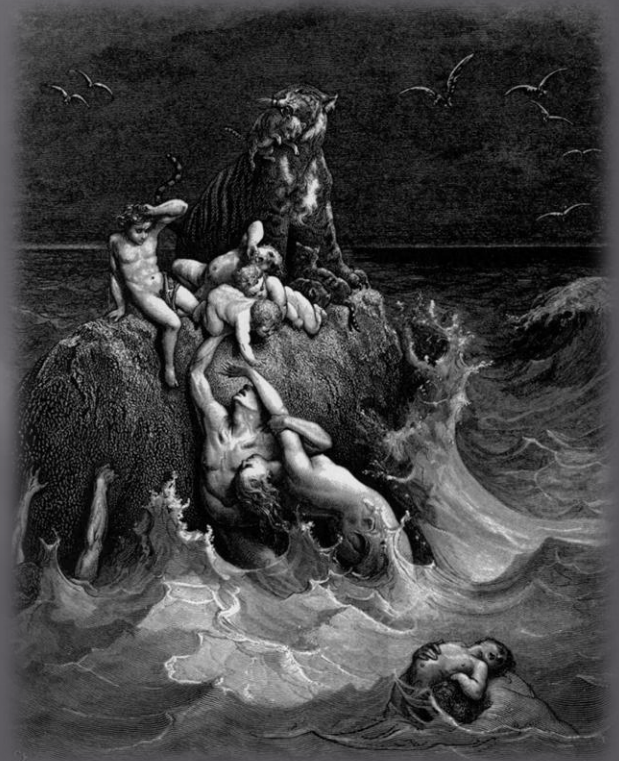
Re-generable (e.g., simulation) data

Opportunities to Rethink Leadership

Workforce Issues in Turbulent Times

- Retaining the high ground

- Sustaining linkage to institutional mission

- Creating new value-added services

- Supporting disciplinary research teams
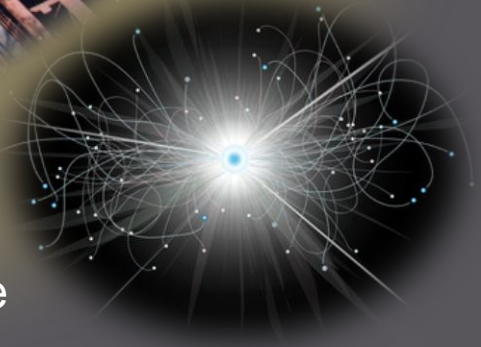
- Assuring stewardship of the scholarly record

Research Libraries –
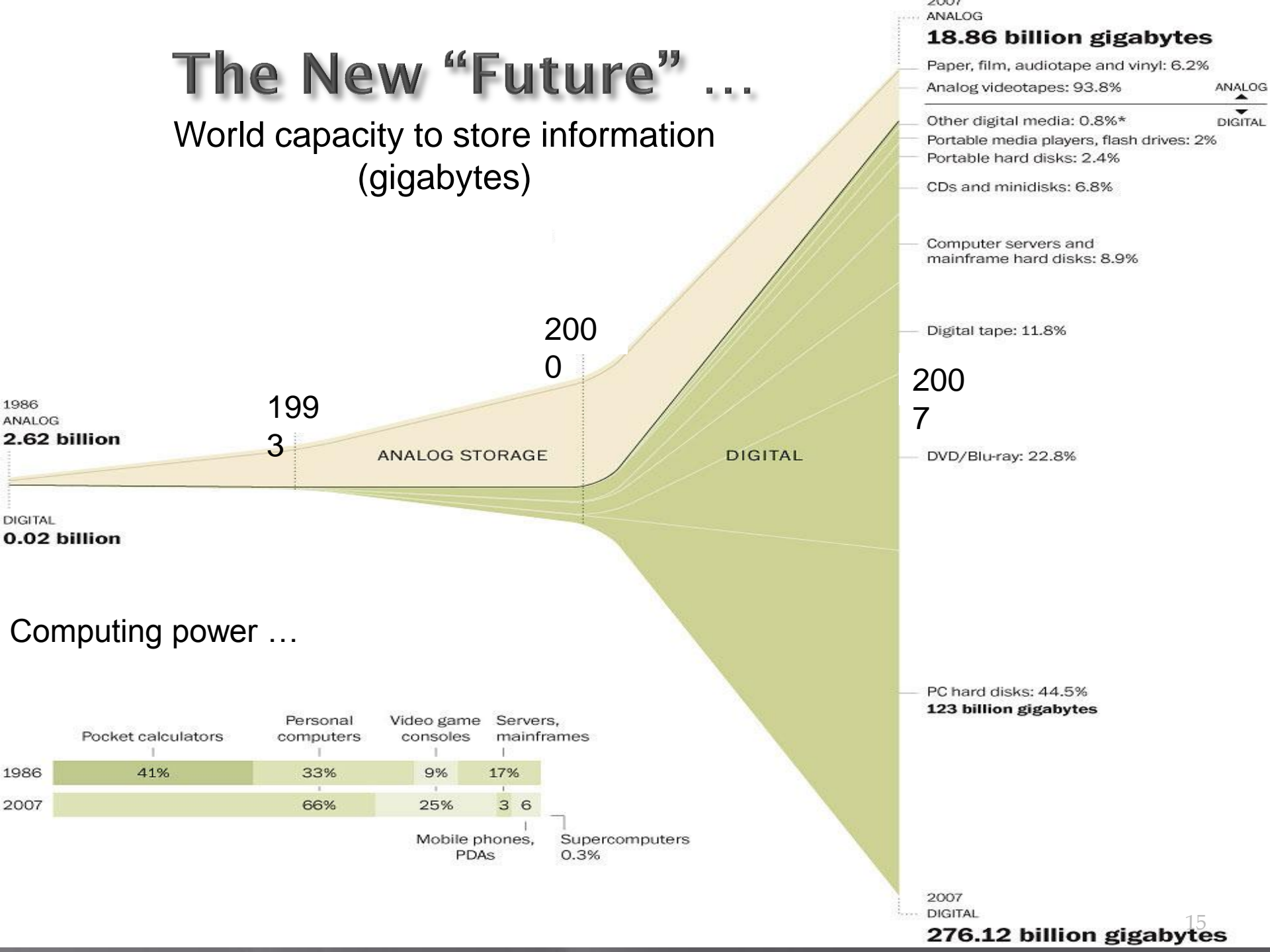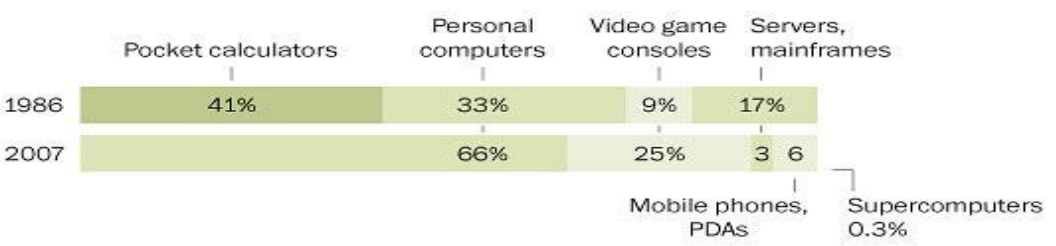## Sustaining a Mission of Connecting & Preserving

Curation

Access

Capture

The New "Future" …

World capacity to store information (gigabytes)

1986 ANALOG
2.62 billion

DIGITAL
0.02 billion

1993

2000

2007

ANALOG STORAGE

DIGITAL

2007 ANALOG
18.86 billion gigabytes
Paper, film, audiotape and vinyl: 6.2%
Analog videotapes: 93.8%

ANALOG
DIGITAL

Other digital media: 0.8%*
Portable media players, flash drives: 2%
Portable hard disks: 2.4%

CDs and minidisks: 6.8%

Computer servers and mainframe hard disks: 8.9%

Digital tape: 11.8%

DVD/Blu-ray: 22.8%

PC hard disks: 44.5%
123 billion gigabytes

2007 DIGITAL
276.12 billion gigabytes

Computing power …

	Pocket calculators	Personal computers	Video game consoles	Servers, mainframes	
1986	41%	33%	9%	17%	
2007		66%	25%	3	6

Mobile phones, PDAs

Supercomputers 0.3%

15

Consequences of digitization
(NSF/JISC Repositories Workshop*)

- Transformation of *scholarly communications*

- *Data-driven discovery* as new scientific paradigm

- Reconciling issues with *scale and complexity*

- Adapting *organizations* to exploit distributed heterogeneous information

- Enabling conditions for wide adoption by *individuals*