

# Transformation of the Academic Library

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Journées ABES, Montpellier, 19-20 June 2012



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*You never want a serious crisis to go to waste.*

*Things that we had postponed for too long, that were long-term, are now immediate and must be dealt with. This crisis provides the opportunity for us to do things that you could not do before.*

Rahm Emanuel

Chief of Staff, Barack Obama

Wall Street Journal, November 21<sup>st</sup> 2008

# Urgency for university libraries

## Disruptive elements:

- Google search
- Google books, e-books & e-readers
- Information = digital
- Mobile technology (smart phones, tablets & pads)
- Printing on demand & Espresso book machine
- Changes in science and scholarship: collaborative, programmatic, more data focussed, use resources from outside institution, e-science/e-humanities/e-research

# Science paradigms (Jim Gray)

## Science Paradigms

- Thousand years ago:  
science was **empirical**  
*describing natural phenomena*
- Last few hundred years:  
**theoretical** branch  
*using models, generalizations*
- Last few decades:  
a **computational** branch  
*simulating complex phenomena*
- Today: **data exploration** (eScience)  
*unify theory, experiment, and simulation*
  - Data captured by instruments  
or generated by simulator
  - Processed by software
  - Information/knowledge stored in computer
  - Scientist analyzes database/files  
using data management and statistics



$$\left(\frac{\dot{a}}{a}\right)^2 = \frac{4\pi G\rho}{3} - K\frac{c^2}{a^2}$$



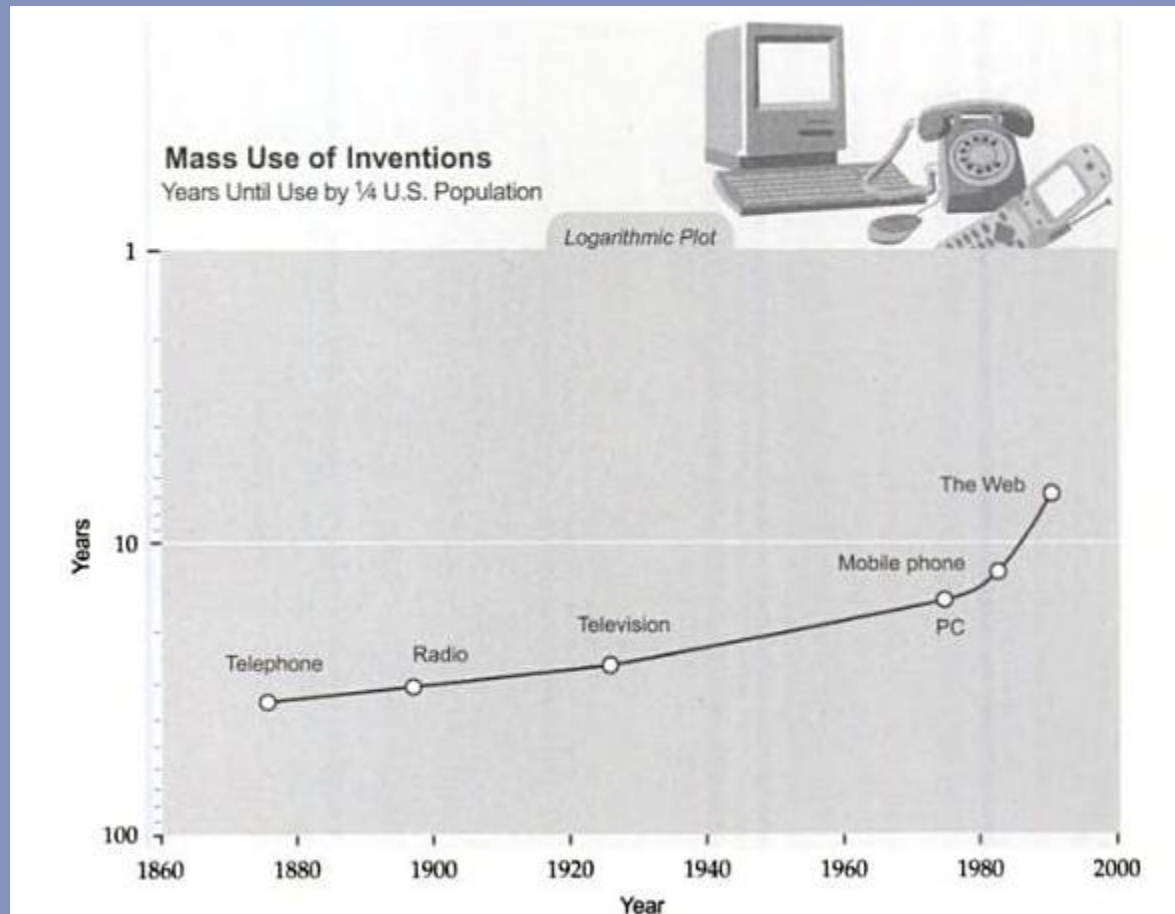
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- Changes in scholarly publishing
- Changes at universities: focus on added value, making choices
- Technological advancement takes place in consumer market

# Technological progress

Intuitive linear vs historical exponential view



Ray Kurzweil: *The singularity is near: when humans transcend biology*. 2005. p. 50

# Technological progress

## Intuitive linear vs historical exponential view

- The rate of paradigm shift (technical innovation) is accelerating, right now doubling every decade.<sup>28</sup>
- The power (price-performance, speed, capacity, and bandwidth) of information technologies is growing exponentially at an even faster pace, now doubling about every year.<sup>29</sup> This principle applies to a wide range of measures, including the amount of human knowledge.
- For information technologies, there is a second level of exponential growth: that is, exponential growth in the rate of exponential growth (the exponent). The reason: as a technology becomes more cost effective, more resources are deployed toward its advancement, so the rate of exponential growth increases over time. For example, the computer industry in the 1940s consisted of a handful of now historically important projects. Today total revenue in the computer industry is more than one trillion dollars, so research and development budgets are comparably higher.

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- Technological advancement takes place in consumer market
  
- Major budget cuts
- Increase of cost of information keeps outpacing inflation



# How do libraries deal with change?

- Libraries have changed tremendously, have innovated, have added digital services, have generated more research/teaching time at the faculty level
  - But to a great extent have not ended services and have kept within the existing library paradigm
  - Major driver for decisions about libraries within university administrations: budgetary considerations
  - Change is outpacing us.

# Some traditional functions

- Selection/Acquisition
- Cataloging
- Archiving
- Reference desk
- Outreach
- Making available
- “Find it” business
- Special Collections
- Technology management

# Selection and acquisition

Journals:

**NOW:**

licensing, big deals (consortial)

<3 YRS:

+ flexible big deals based on usage and research profiles

<3 YRS:

+ backfiles from digital period will be OA?

# Selection and acquisition

Books:

- NOW:** title by title selection → approval plans
- <3 YRS:** big deals based on licensing?
- <3 YRS:** ordered directly by user at moment of need?
- <5 YRS:** books as a subscription stream (“Spotify for books”)?
- <10 YRS:** ordered (in)directly for user by smart personalized software agents?

# Selection and acquisition

Institutional repository:

- NOW:** variety of formal and grey literature
- <3 YRS:** dissertations & theses
- <3 YRS:** grey literature
- <3 YRS:** teaching related (e.g. course on video)
- <3 YRS:** open access mandated publications by funding agency

# Cataloging

**NOW:** record sharing and 'item by item' cat

**NOW:** real efficiency in and outsourcing of the back office processes are at the top of our agendas.

<3 YRS: towards managing record/data flow

<3 YRS: 3<sup>rd</sup> party created records with added enrichment & user created information

<5 YRS: focus on special collections & local information

<5 YRS: data flow is mainly managed at a national or international level, with some local enrichment

What does this mean for our national information infrastructures?

# Archiving

Paper collections:

**NOW:** in stacks locally, curated and managed

**NOW:** shift from open to closed stacks

**<10 YRS:** paper has been digitized (= mode of delivery)

**<10 YRS:** paper collections warehoused on a national/regional level or national retention arrangements

**<15 YRS:** only special collections are locally curated and managed

# Archiving

Electronic collections:

- NOW:** relatively vague agreements between libraries and publishers about permanent access
- <5 YRS:** clear agreements and collaboration between publishers and national libraries and/or transnational digital archives
- <10 YRS:** national digital archiving strategy



# Archiving

Digital collections & data:

**NOW:** ad hoc local

**<10 YRS:** agreements and facilities at national and/or transnational level

# Reference desk

- NOW:** plenty of libraries still have reference desk staffed with highly qualified staff in conjunction with virtual desk
- <3 YRS:** replaced by virtual desk (email, chat, telephone)
- <3 YRS:** and/or replaced by physical who/what/where
- <3 YRS:** and/or replaced by multi-organisation service desk

# Outreach

**NOW:**

away from collection specialists to faculty liaison and development of 'typical' library services

**<3 YRS:**

faculty liaison, services specialists & partners in research & teaching

- o data curation
- o copyright
- o text and datamining
- o e-publishing & dissemination
- o GIS
- o datasets
- o ...

# Making available

- NOW:** we build traditional 'just in case' collections
- <3 YRS:** e-books / e-readers will become standard
- <3 YRS:** libraries offer printing on demand services (e.g. Espresso book machine)
- <5 YRS:** paper books are delivered in digitized form upon request
- <10 YRS:** from 'just in case' collections to 'just in time' collections?
- <10 YRS:** general paper collections are housed in national/regional warehouses

# 'Find it' business

**NOW:** libraries are still in the 'find it' business

**<5 YRS:** libraries have left to a great extent the 'find it' business as a local service and subscribe to 'find it' cloud services

**<5 YRS:** libraries have moved into the 'get it' business and are providing another array of services

# Special collections

- NOW:** many libraries have special collections, but often as a traditional prestige object and role in research and teaching is not always substantial
- <3 YRS:** special collections at a university library need to have an active role in research and teaching (more than just the study of the book) and are focal point for fundraising and therefore also for societal outreach
- <10 YRS:** special collections that have a purely museum or cultural heritage function will be moved to specialized institutions (museums)

# Technology management

**NOW:** local management of a large number of library & information systems

**NOW:** more systems / investments for our traditional processes will increasingly become a hard sell.

**<3 YRS:** present library information systems are moved to the cloud (discovery layer, catalog, acq/cat, circ, digital library, linking server, repository)

**<5 YRS:** technology efforts focussed on connection between information systems in the cloud and local application and tools?

**<5 YRS:** some national information infrastructure will become irrelevant

How do we act in a context of exponential change?

# How do we act in a context of exponential change?

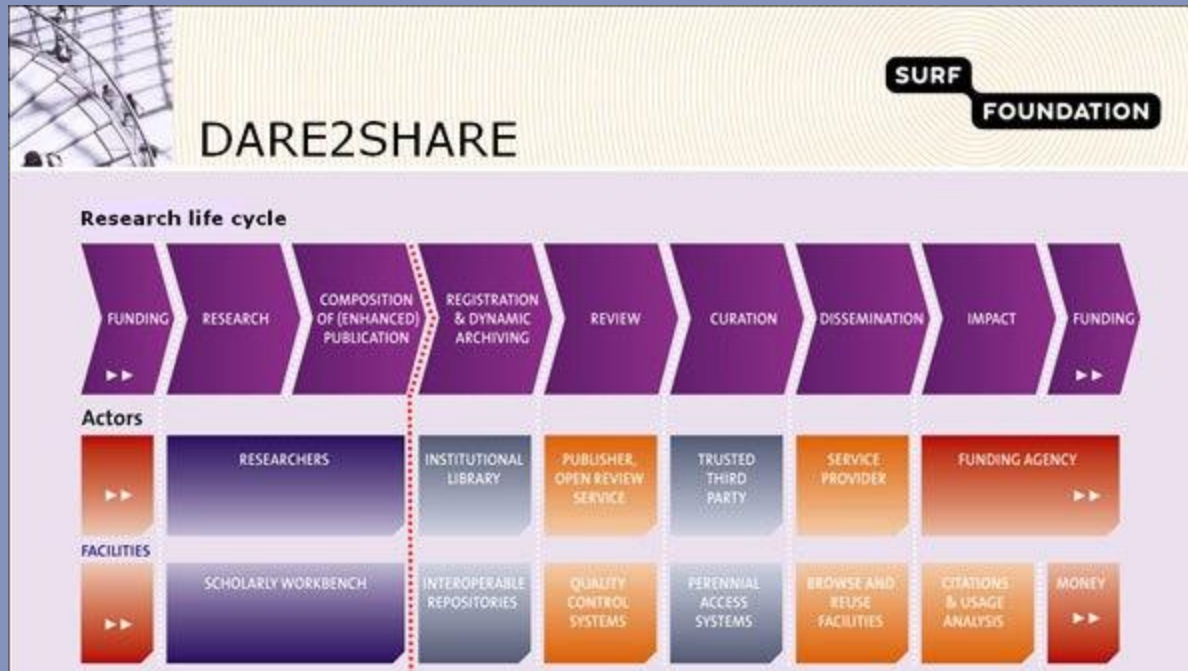
- Stop doing generic work that can easily be outsourced.
- Focus on specific needs for furthering education and research at your own institution.
- Collaborate on a national or transnational level (Portico, HathiTrust, ...).



# The function of libraries?

- Fullfill information needs of faculty, researchers, students, university.
  - An attractive work, meeting and social space.
  - Information manager for the university (CRIS, research data, research output, e-learning objects).
  - Expert centre digital information for research and teaching.
  - Part of the research & teaching workflow.
  - Support knowledge creation & dissemination.
  - Integrate information literacy in regular curriculum.
  - Bring information and tools in the environments our users are utilizing.
  - Support e-research.
- ➔ Larger organisations and collaboration with external parties.

# Example: Research life cycle



Leo Waaijers: *The DARE Chronicle: Open Access to Research Results and Teaching Material in the Netherlands*, Ariadne, 53, October 30, 2007.

<http://www.ariadne.ac.uk/issue53/waijers>

- Virtual Research Environments (VRE) for research groups (planning, workflow, collaboration, bibliographic management, versioning, library services, ...).
- Data Information Office (data management plans, data models, ...).
- DataLabs (data gathering, data storage, data use, ...).
- New areas of expertise (text & data mining, geographical information, ...).

- Virtual Research Environments (VRE) for research groups (push to repository, management of public website/blog/wiki).
- Institutional Repository.
- Support for enhanced/enriched publications.
- Set up or collaborate with University Press.
- Copyright Office.
- Publication advice services.

REGISTRATION

ARCHIVING

- Current Research Information System (CRIS) for registration of publications and research projects.
- Library assigns *Digital Author Identifier* for university's authors.
- Institutional Repository.
- Virtual Research Environments (VRE) & DataLabs (library focuses on data management during research project).
- Digital Faculty Archives.

## REVIEW

- No activities by library.
- Open peer review support.

## CURATION

- Repository materials curated at a trusted digital archive (at national library or international digital archive).
- DataLabs (data curated long term at national data archives).

- Repository connected with general search engines (Google, WorldCat, ...), specialized search engines (NARCIS, DRIVER, DART, ...).
- Manage publication pages of faculty.
- VRE (public website, blog, wiki).
- University Press.
- Work with international initiatives such as OAPEN (*Open Access Publishing in European Networks* – [www.oapen.org](http://www.oapen.org)).



## IMPACT

- Monthly repository statistics per publication available to authors.
- Set up or work with bibliometric centre for impact measurement of research impact.

## FUNDING

- Collaborate with university's Research and Innovation Services.
- Incorporate topics such patent information, IPR in information literacy programmes.

# Example : Library as space

- Extremely popular with **students**.
  - Libraries are becoming well equipped, attractive learning centers for students.
  - Social & educational role of libraries becomes more important.
  - Books as stored paper objects will disappear from libraries.
  - Quality of the learning center is an important selling point for the university.
- Invest in those areas where **researchers** still look at the library as a research and social space.
  - Special collections reading room and services.
  - Support for prolonged visits of international researchers.
  - Support for conferences, lectures, meetings, exhibitions.
- Take up societal role: cultural-scholarly programme.

# But ... what holds us back?

- Transition is difficult to manage and takes years.
- Some of our users.

# Pushing the paradigm's envelope



- Monitor quiet study area
  - Creating variety of study areas (quiet, noise, collaborative, lounge)
- More material in open stacks
  - Reduced size open stacks: creating learning environment
- Limited need for group spaces
  - Creating variety group spaces
- Don't close institute libraries
  - Closed down small libraries and transferring collections to main library/closed stacks

# But ... what holds us back?

- Transition is difficult to manage and takes years.
- Some of our users.
- Some of our librarians.
- Our framework, our tradition.
- Institutional territory.
- It's risky.
- But also plenty of uncertainties:
  - Are we indeed moving towards the end of the hybrid library?
  - Will Google continue to invest in becoming the “world library.”
  - Will e-books become the norm?
  - Will open access become a viable model?
  - Will faculty support the transformation of the library into the university's information manager?
  - Major publishers seem to pursue competitive strategies.
  - Will libraries play a role in e-research and which ones?

# Moving forward

- Start this discussion with library staff, the university administrators and faculty.
- Personnel transition, new specification of skills, training & education.
- Collaborate with other libraries and other organisations.
- Starting with pilot project in close collaboration with faculty.
- Demonstrate the value and the impact of these new services.
- Be proud of and show your results.

Lets put the fundamental transformation of the library on the agenda & create the roadmap.

Thank you for your attention!

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