New Knowledge Frontiers in a Flat World: A Campus Perspective

William Hoffman
Founding Executive Director
Minnesota Biomedical and Bioscience Network
MBBNet.umn.edu
Sterling Memorial Library
Yale University
September 28, 2006

What does this mean for your future?

"Web Site of the Week"
Metronet Regional Library Network
June 1995

- Hill Museum & Manuscript Library, St. John's University
- Biomedical Engineering Center, University of Minnesota

"On the Internet, nobody knows you're a dog"

New Knowledge Frontiers in a Flat World

- Printing, a Flattener Extraordinaire
- Universities, Libraries and the Machine
- Higher Ed Faces a Flat World
- Technology, Maps, and Global Partnerships
Printing, a Flattener Extraordinaire

Bridging Town & Gown

• Printing created a "bridge over the gap between town and gown."
  -- Elizabeth Eisenstein, The Printing Press as an Agent of Change, 1979

Trithemius of Sponheim

• Abbot John Trithemius built a renowned library in the Benedictine monastery at Sponheim, Germany.

• Author of a treatise entitled In Praise of Scribes, a criticism of the new technology.

• Trithemius did not shun the new technology of printing. His library included both printed and handwritten works.
  -- Hill Library

New Technology and the Ultimate Flattener

Globalization 1.0: The Age of Discovery

Universities, Libraries and the Machine
Abraham Lincoln creates the Land Grant colleges

Lincoln signing the Morrill Act, July 2, 1862
Eugene Francis Savage, HSSE Library, Purdue University

Abraham Lincoln Signs the Pacific Railway Act

On July 1, 1862, Lincoln signed an act "to aid in the Construction of a Railroad and Telegraph Line from the Missouri River to the Pacific Ocean.

Vannevar Bush and the Memex

- Vannevar Bush first described the Memex, a "microfilm rapid selector," in a famous article "As We May Think" published by The Atlantic Monthly in 1945.
- His report to the President "Science the Endless Frontier" set the stage for the world of science and technology we live in.

Dynamic Diagrams, Inc.

J.C.R. Licklider

"If books are intrinsically less than satisfactory for the storage, organization, retrieval, and display of information, then libraries are bound to be less than satisfactory also."

MIT Press, 1965

Scholarly Journals

"We are on the threshold of dramatic changes in scholarly publications.... The question is whether they will die out like the dinosaurs, or whether they will adapt to the new era."

Andrew Odlyzko, PhD.
AT&T Bell Laboratories
"Tragic loss or good riddance? The impending demise of traditional scholarly journals." 1994

Libraries and Open Access


interlibrary borrowing: +148%
student population: +18
circulation: -1
reference transactions: -34

Andrew Odlyzko, PhD.
Director, Digital Technology Center, U Minnesota
In "Open Access: Key Strategic, Technical and Economic Aspects." Forthcoming
Libraries and Open Access

- Spending for information and communication technologies - ICT - is far larger than the library budget, and over 10 times as large as the book and serial acquisition costs of the library.

- Costs of supporting Open Access...are a very small fraction of ICT costs. Almost the entire required infrastructure is already in place.

Andrew Odlyzko, PhD.
Director, Digital Technology Center, U Minnesota
In “Open Access: Key Strategic, Technical and Economic Aspects.” Forthcoming

Higher Ed Faces a Flat World

Google at the ALA Meeting

Conrad Winke
Columbia College Chicago
Abigail Goben, WebMD
Valerie Perry, U Kentucky
Martha Kruy
Fairfield University
Anne Harrison
Library of Congress
Juan Jaime
UCLA Medical Library
James Jones
Atlanta Public Library
Eiva

The Unified Nature of Knowledge

- Knowledge isn’t inherently compartmentalized; there is only one nature, only one human record.

-- William Wulf
“Warning: Information Technology Will Transform the University.” 1995

“Killing Off the American Future”

America’s domination of the global information economy did not come about by accident. It flowed directly from policies that allowed the largest generation in the nation’s history broad access to a first-rate college education regardless of ability to pay.

No longer the world leader in terms of the proportion of young people enrolled in college, the country now ranks 16th among the 27 nations examined when it comes to the proportion of college students who complete college degrees or certificate programs.

New York Times editorial
Sept. 16, 2006

The Spellings Report

The paragraph

“New initiatives such as OpenCourseWare, the Open Learning Initiative, the Sakai Project, and the Google Book project hold out the potential of providing universal access both to general knowledge and to higher education.”

was replace by

“Both commercial development and new collaborative paradigms such as open source, open content, and open learning will be important in building the next generation learning environments for the knowledge economy.”

after the Commission had voted on the final draft.

“Changing the Report, After the Vote”
Inside Higher Ed
Sept. 1, 2006
“Envisioning a Transformed University”

“In a sense, the library may be the most important observation post for studying how students really learn. If the core competency of the university is the capacity to build collaborative spaces, both real and intellectual, then the changing nature of the library may be a touchstone for the changing nature of the university itself.”

James J. Duderstadt
William A. Wulf
Robert Zemsky
Issues in Science & Technology
Fall 2005

Challenge: Journalism Beat Structure

<table>
<thead>
<tr>
<th>Science</th>
<th>Technology</th>
<th>Business &amp; Finance</th>
<th>Politics</th>
<th>Culture</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Beat Structure" /></td>
<td><img src="image2.png" alt="Beat Structure" /></td>
<td><img src="image3.png" alt="Beat Structure" /></td>
<td><img src="image4.png" alt="Beat Structure" /></td>
<td><img src="image5.png" alt="Beat Structure" /></td>
</tr>
</tbody>
</table>

Today: Innovation – a topic within the beats
Vision: Innovation – a multidisciplinary beat

www.innovationjournalism.org

Technology, Maps and Global Partnerships

Hispaniola, Christopher Columbus, 1492-93

Christopher Columbus in the Sargasso Sea, 2003

Bioscience: The New Maps

Foster et. al.
PLoS Biology, April 2005
The Library of YOU

Human chromosome map

Human Genome Project

"I think the next breakthrough in bioscience could come from a 15-year-old in Bucharest who downloads the human genome."

Thomas Friedman

Human Embryonic Stem Cell Research Policy

Countries in brown represent 3.5 billion people. Those in light brown allow research on IVF donations. Those in dark brown also allow nuclear transfer / research cloning. All have banned human reproductive cloning.

Global Stem Cell Research Centers

"...let us not underestimate our strength or the innovation that could explode from the flat world when we really do connect all the knowledge centers together." — The World is Flat

Global Bioscience Clusters


EMBO reports, Science & Society, February 2006

The World is Spiky: Population


With permission.
The World is Spiky: Light Emissions

Map by Tim Gulden, University of Maryland.
From Richard Florida, "The World is Spiky."
The Atlantic Monthly, October 2005
With permission.

The World is Spiky: Patents

Map by Tim Gulden, University of Maryland.
From Richard Florida, "The World is Spiky."
The Atlantic Monthly, October 2005
With permission.

The World is Spiky: Scientific Citations

Map by Tim Gulden, University of Maryland.
From Richard Florida, "The World is Spiky."
The Atlantic Monthly, October 2005
With permission.

MBBNet

"As an agent of change, printing altered methods
of data collection, storage and retrieval systems and
communications networks
used by learned
communities throughout
Europe."

-- Elizabeth Eisenstein
The Printing Press as an
Agent of Change, 1979

MBBNet

The MBBNet - Zürich MedNet Internet Alliance
"There is one world of Science out there," said [Yale President Richard] Levin. "and this kind of international division of labor makes a lot of sense." Quoted in *The World is Flat.*

Tian Xu, PhD., director of the Fudan-Yale Center, can watch "knock-out" mice in Shanghai from his laboratory in New Haven.

"It’s a Wiki, Wiki World"

"It’s been suggested to me that we actually turn the book into an open-source product. Just put it up on the web like Wikipedia and let people add to it."

Thomas Friedman
In "An Open Source Guide to a Flat World" *Financial Times*, Nov. 28, 2005

Round Wiki World

Flat Wiki World