The Net Generation as Harbingers of Change

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Friends

- **Facebook**
- 36 million US visitors (March 2008)
- 6th most trafficked site
- 2nd most trafficked social networking site globally
- 85% market share among US four-year universities


Technology to connect with friends

- *100%* communicate every time they go online
- *94* average number of phone numbers in mobile (globally)
- *86* people in social network community
- *78* people on messenger buddy list
- *70%* check IM as the first thing when they turn on their computer
- *53* number of online and face-to-face friends (ages 14-24)

"Kids don't love the technology itself; they love how it enables them to communicate all the time."
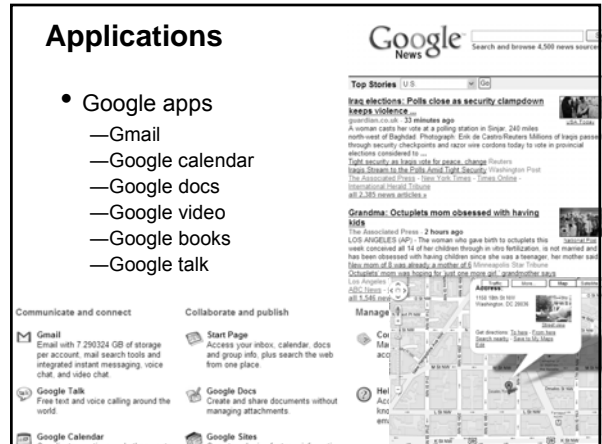
– MTV, Nickelodeon & Microsoft, 2007

Entertainment

- YouTube
- Music
- TV
- Movies
- Games
- Consume and create
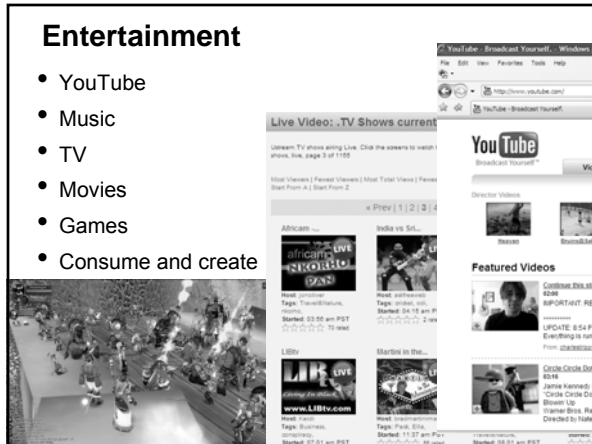
Applications

- Google apps
  —Gmail
  —Google calendar
  —Google docs
  —Google video
  —Google books
  —Google talk

Cloud computing across generations

Activity	Ages 18-29	Ages 30-49	Ages 50-64	Ages 65+
Use webmail services	77%	58%	44%	27%
Store personal photos	50	34	26	19
Use online apps (e.g., Google Docs)	39	28	25	19
Store personal videos	14	6	5	2
Pay to store files online	9	4	5	4
Have done at least 1 activity	87	71	59	46
Have done at least 2 activities	59	39	31	21

—Horrigan, 2008

Mobiles

- Used for more than talking
- College students text more than talk
- New features
  - Multi-touch displays
  - Motion and orientation sensing
  - Communicate with other devices
  - Location aware
  - Record video, audio
  - Multimedia storage device

Tailored to where you are

- Buzzd
- Geolocation
- City guide and social networking tool for mobile devices
- Includes ratings and tips

Name that tune

- Shazam
- Identify song, artist, album
- Add information to Facebook; buy song
- "Point your mobile and Shazaming it"

iPhone App Store

- 10,000 applications
  - Music (PocketGuitar; DigiDrummer)
  - News (Newsstand; Lottery results)
  - Education (IQ-Test; Spanish Anywhere)
  - Games (Monopoly; Hero of Sparta)
  - Medical (Medical Spanish; Med Facts)
  - Sports (NFL Live; Where to golf)
  - Productivity (Todo; Shopper)
  - Reference (World Factbook)
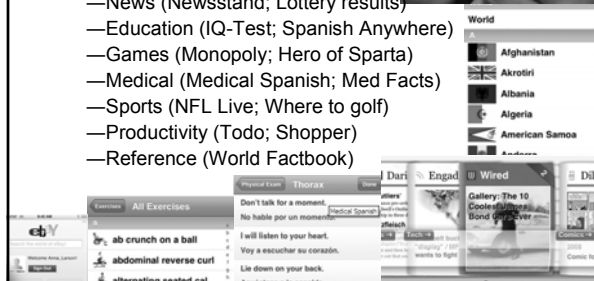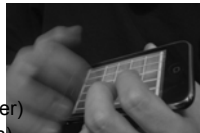
Convenience

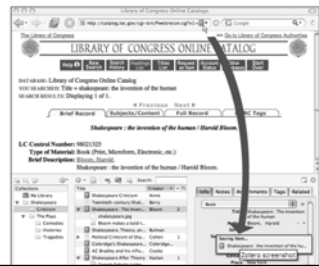*—Knell & Cook, 2007*

Finding information

Lectures online

Track references

- Zotero
- Reference tool; adds bibliographic note cards to web browser
- Save a link, notes, bibliographic reference
- Assembles a list of organized, annotated links to materials like a personal online catalog
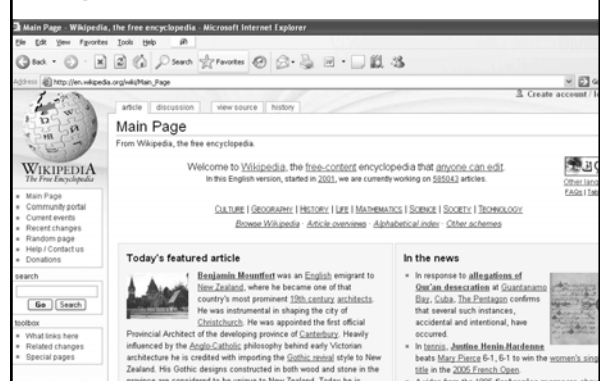

Today's learners

- Social
- Connected
- Mobile
- Instantaneous

The Internet is not just a technology….it is a mindset

Expertise redefined

Collective intelligence

- Wikipedia is a process not just a product
- Collective intelligence: everyone has something to contribute
- Knowledge is created not possessed
- Social connections are important
- Need "skills for participation" (e.g., social skills; cultural competencies) not just individual skills
- Age doesn't matter; a "newbie" can be 60 and the expert 16

—Jenkins, 2008

21st Century learning

- Experiences (learning-by-doing) may be more important than information (active learning vs. assimilation)
- Knowledge is distributed across a community rather than held by an individual
- Assessment through reputation, experiences and accomplishments rather than tests
- Self-directed, informal, web-based environments

—Dede, 2006

Changing the rules

- Internet provides an architecture for participation and collaborative creation
- Accessible work can be modified
- Society benefits from small, cumulative contributions of millions of people
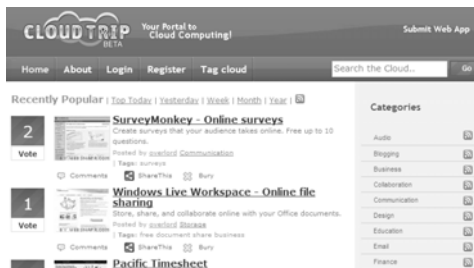- Use by everyone does not exclude use by anyone

—Digital Connections Council, 2006

Ownership or access

Cloud computing

- Internet ("cloud") use of applications, resources
- Directory of cloud computing sites

Virtualization

- Virtualization: partition one server to operate like multiple machines
- Enables server consolidation (e.g., using 1 server instead of 4)
- Reduces cost and energy consumption
- Example: Princeton's plasma physics lab
  - —Cut 75% of annual power and cooling costs
 - —Improved processing power 3x
  - —Emitted 28 fewer tons of CO_2

—American Consumer Institute, 2008

Distributed research infrastructure

- TeraGrid: Open, distributed scientific discovery infrastructure—brings campus resources together in grid
- Low-threshold access to more resources than a campus could afford individually
- Distributed facility; resources independently owned and mana
- 100+ discipline-specific databas
- Enables communities to use resources through a common interface
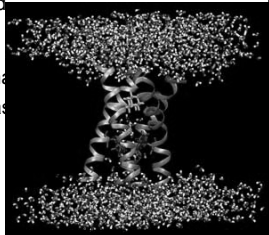
Remote instruments

—del Alamo, 2003
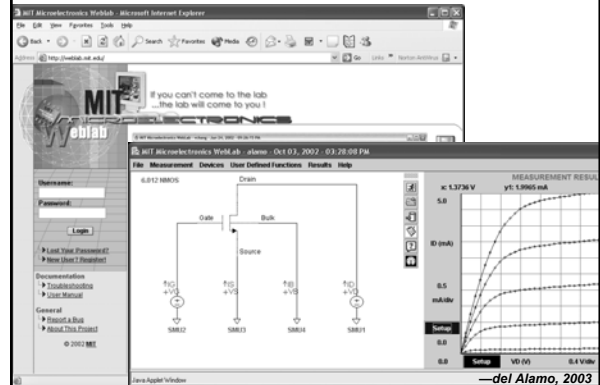
Virtual observatory

Open educational resources

- Open Courseware Initiative
- Connexions
  —Open access educational resource
  —Collections of re-usable learning modules
  —Modules can be modified
 —350 collections; 6500 modules

Open Books

- Flat World Knowledge
- Provides free, peer-reviewed textbooks online
- Build-a-book
- Community tools; notetaking

Individual or collective

Virtual organizations

- Distributed acr... participants sp... institutions (ca... 'citizen scientis...
- Distributed acr... synchronous a... asynchronous...
- Collaboration s... systems
- Computationa... simulations, da... analytic servic...
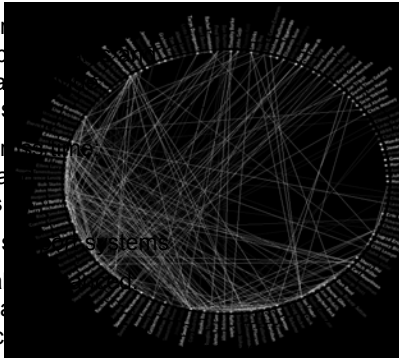
Co-laboratories

- Network for Earthquake Engineering Simulation (NEES)
- National collaboratory: a distributed research center
- Advances understanding of how earthquakes and tsunamis affect man-made infrastructure
  —Roads
  —Buildings
  —Port facilities
  —Public utility systems
- Shared, community-wide data system
- Open system for community contributions

Science gateway

- nanoHUB
- Science gateway for nanotechnology
- Learning modules: lectures, podcasts
- Industry-level tools
- Community
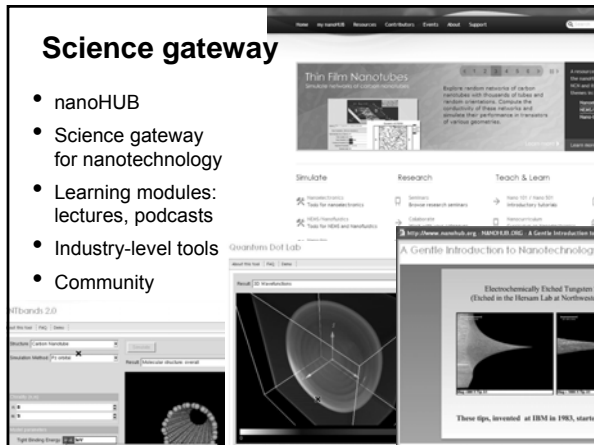
Web-based publishing

- Omeka
- Digital dissertation
- Primary source collection
- Scholars, librarians, archivists, museum professionals

Citizen media project

- Stories that Fly
- Collection of digital stories about general aviation
- Contributed by student journalists, aviators, others
- Airports, events and people in Ohio aviation

Text or more

Interfaces

- World to the desktop: access to
  —Distant experts
  —Collaboration
  —Mentors
  —Communities of practice
- Alice in Wonderland, multi-user virtual environment
  —Participants and avatars and artifacts interact
  —Shared virtual environments
- Ubiquitous computing
  —Wireless devices infuse resources in the real world
  —Smart objects; intelligent contexts

—Dede, 2005
Image courtesy of Rachel Smith
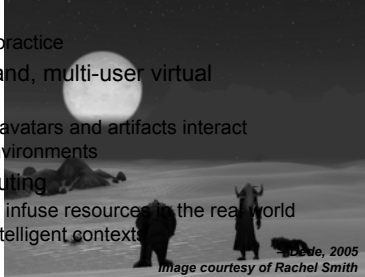
Online resources to replace texts

- SmARThistory
- Edited, online art history resource
- Augments or replaces traditional art history textbooks
- Podcasts, video, images, links, commentary
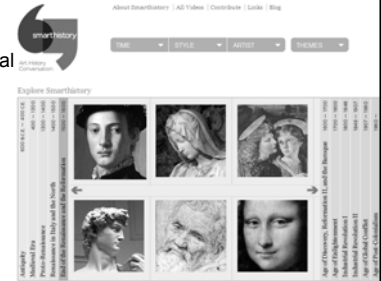
Integrating text, images, location

- Geotagging
- Annotated maps and real-world locations
- Map of the course traveled in *The Travels of Marco Polo*
- Includes passages from the text, photographs of places mentioned, annotations and links

Experiencing weather

- Material developed by NOAA in Second Life
- Experiential learning and discussion
  —Tsunami
  —Hurricane
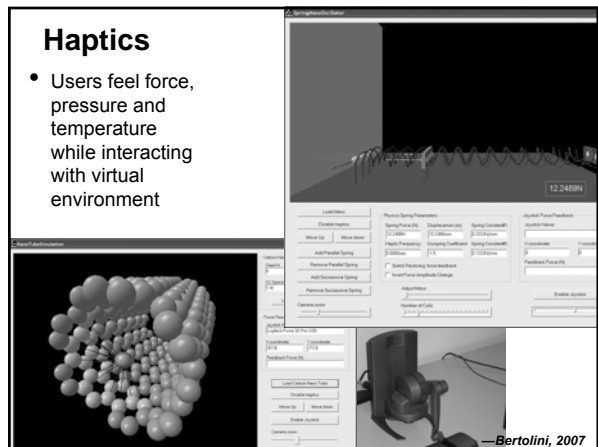 —Ice sheet melting
  —Underwater explorer
  —More

—Hackathorn, 2007

Visualization

Haptics

- Users feel force, pressure and temperature while interacting with virtual environment

—Bertolini, 2007

Summary

Big questions

Changing nature of scholarship:

- How does scholarship change when it is "born digital"?
- The value of intellectual capital is tied to effective dissemination
- Do we maintain the rights necessary to make scholarly content usable and accessible?
- What is the future of scholarly publishing?

Big questions

Copyright/intellectual property:

- How much do you need to own? How much needs to be openly available?
- Is the institution's reputation best served by holding material close or giving it away?
- Are the original reasons for copyright still valid? Is there a better approach for 2010?

Big questions

Collaboration

- What might we gain from greater collaboration? What are the risks?
- Do we have a collaborative culture and a rewards structure that encourages collaboration?
- Are our students learning enough teamwork, collaboration and other social skills?
- Are we investing in the tools that enable collaboration?

Key points

- The Internet is more than a technology—it is a mindset
- You don't have to own an asset to receive value from it
- Collaboration and co-creation are more powerful than individual action
- Business models are changing
- Our students are harbingers of change

uncommon thinking for the **common good**

It's not about information.
Or technology.
It's what we do with IT
that counts.

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