The Library XG

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Outline

1. Library - The Past
2. Library - The Present
3. Library - The Future

Library Past – Origin

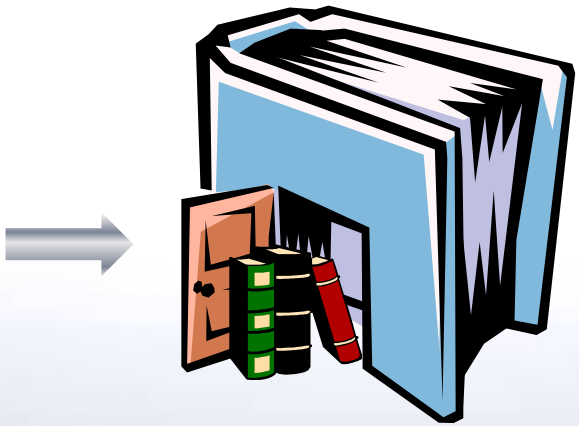
- The Beginning

  → Archives of writings (e.g., clay tablets in 3000 BC)

  - Marks the beginning of **history**

  ❖ Library of Alexandria (300-40 BC, Egypt)

  - Aim ⇒ **Collect all the world's knowledge**
  - A major center of **scholarship** (i.e., research center)



Library Past – Evolution

- Ancient Libraries of Greece & Rome
  - → Private Libraries (Greece) ⬅ *Works of poets, philosophers*
  - → Classification System (Callimachus, 300 BC)
  - → Public Libraries (Rome) ⬅ *Sharing of knowledge*
- Islamic & Christian Libraries
  - → Expansion ⬅ *Library + Religion*
- The Golden Age of Library
  - → Printing press (Gutenberg, 1450) ➡ *Cost reduction*
  - → University libraries (1600s & 1700s) ⬅ *Library + Academia*
- Modern Public Library
  - → Public Library Act (1850, U.K) ➡ *Taxes for library support*
  - → Public School Law (1870, U.K) ➡ *Increased demand for library*

Library Past – Evolution

- Libraries in the Digital World
  - → Decline in library use
    - e.g., 54% circulation reduction in UC Library System (1991-2001)
    - Increased availability of e-resources
    - Internet as the main way to satisfy information needs
    - Changes in library users
  - → Integration of **Technology** in Libraries
    - Online Public Access Catalogs (1975, Ohio State University)
    - WorldCat (Online Computer Library Center)
    - Digitization of library collections (e.g., Google Books)
  - → Shift from **Collection** to **Services**
    - Information Commons
    - Reference Service to Digital Curation

Library – The Present

- A Library

  → An access point to an organized collection of information

- Libraries in the U.S.

  → Visits to library = 3 * visits to movie theater
  More libraries than MacDonalds's
  (Augst & Wiegand, 2003)

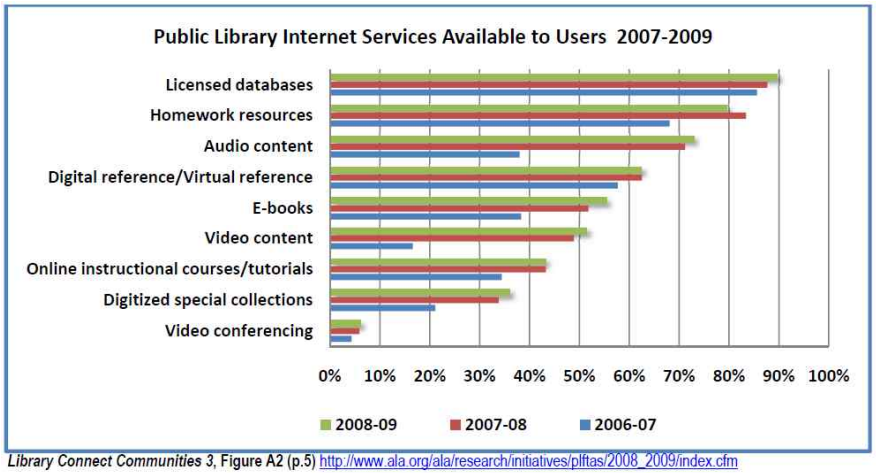
Total	121,785
Public Libraries	9,225
Academic Libraries	3,689
School Libraries	99,180
Special Libraries	8,313
Armed Forces Libraries	280
Government Libraries	1,098

American Library Association, December 2011

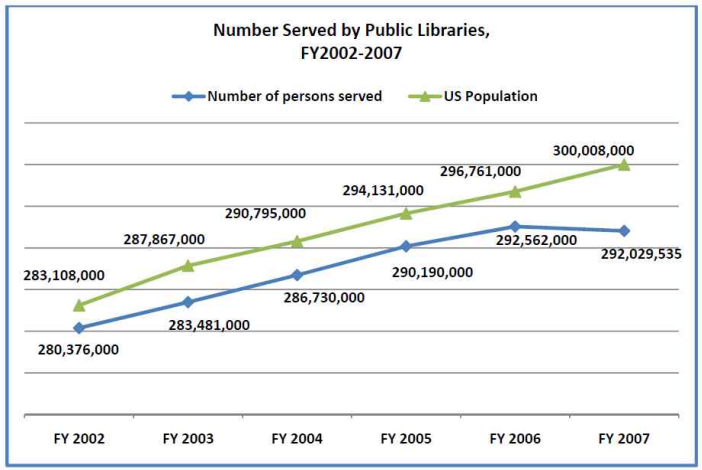
OCLC Statistics, May 2010

Public Library Trends

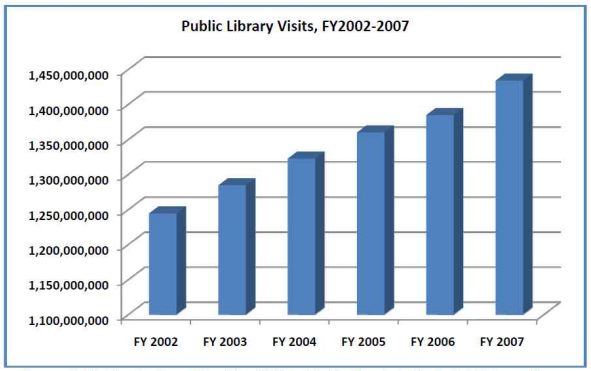
- Budget & User population ↓
- Library visits & Internet Services ↑



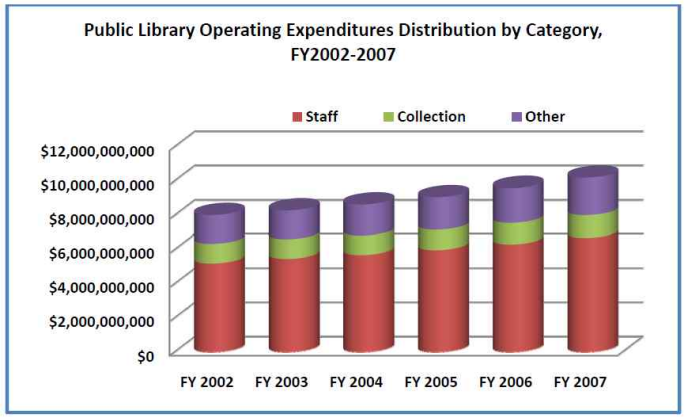
Library Connect Communities 3, Figure A2 (p.5) http://www.ala.org/ala/research/initiatives/plftas/2008_2009/index.cfm



Source: Persons served and US population figures are compiled from IMLS/NCES *Public Libraries in the United States* (http://harvester.census.gov/imls/index.asp).



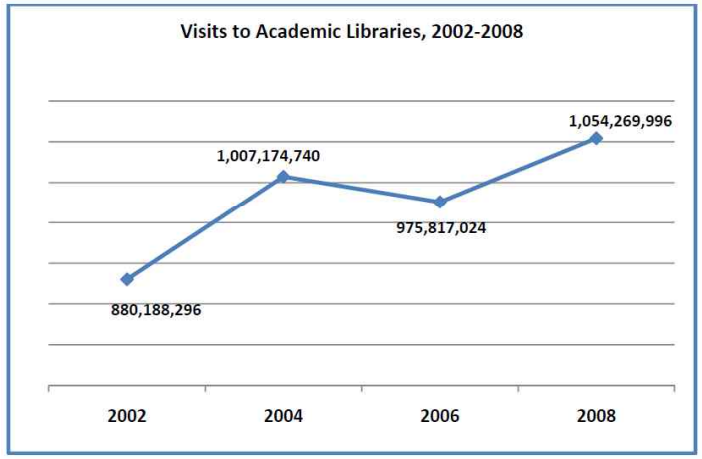
Source: *Public Libraries Survey Fiscal Year 2007* and *Public Libraries in the United States*, various years (http://harvester.census.gov/imls/index.asp).



Source: *Public Libraries Survey Fiscal Year 2007* and *Public Libraries in the United States*, various years (http://harvester.census.gov/imls/index.asp).

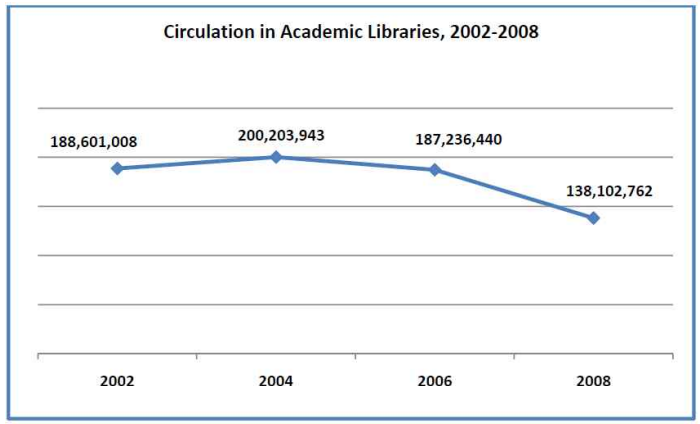
Academic Library Trends

- Circulation & Reference Services ↓
- E-books & Library visits ↑

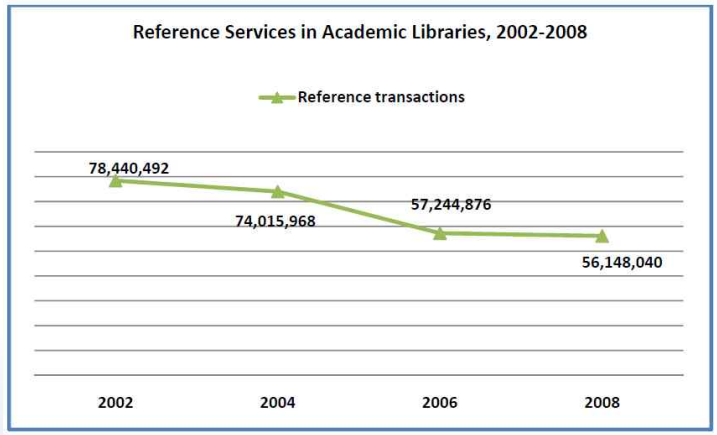


Source: National Center for Education Statistics. *Academic Libraries*, various years. Table 3. (http://nces.ed.gov/pubsearch/getpubcats.asp?sid=041#)

- From *just-in-case* to *just-in-time*
  → Patron-driven acquisition
- Demands for librarians with diverse skill sets



Source: National Center for Education Statistics. *Academic Libraries*, various years. Table 1. (http://nces.ed.gov/pubsearch/getpubcats.asp?sid=041#)



Source: National Center for Education Statistics. *Academic Libraries*, various years. Table 2. (http://nces.ed.gov/pubsearch/getpubcats.asp?sid=041#)

Library – The Present

- Librarians
  - → Facilitator for fulfilling information needs
- Users
  - → Have extensive experience on easy-to-use systems (Fast & Campbell, 2004)
  - → Want fast, easy access to unlimited, full-text content (Bell, 2004)
  - → See reference as instant answers to all types of problems (Straw, 2003)
  - → Prefers search engine to satisfy their information need (OCLC, 2005)
  - → Use the library catalog as a location tool, not discovery tool
    - 2006 DEFF study, "*User expectations & requirements in relation to the hybrid library*"
      - Users use the library to get material already found by other means

"We believe that free communication is essential to the preservation of a free society and a creative culture." – American Library Association

Library – User Expectations

- Easy access to comprehensive collection
  - → Expect to find results quickly without much effort (Akselbo et al., 2006)
  - → Likes finding all types of resources with a single search
- Expect high quality information (OCLC, 2006)
- Desire access to online contents (Mele, 2007)
  - → 95% of the scientist surveyed wanted access to full text
- User-centric and interactive interfaces
  - → Web 2.0 applications (e.g., blogs, Facebook)
- 24/7 access

Library – Today's Landscape

- Information Technology
  - → No need to physically visit the library to access its collections
    - Ubiquitous computing (wireless, tabletPC, smartphone)
  - → Diminishing use/Obsolescence OR Expanded usage (IT-integrated)
- Shift in Educational Paradigm
  - → From traditional teaching to active learning
- Competitors
  - → E-resources, information access portals, Search providers
- Changes in library users
  - → Technology-savvy, active learners, accustomed to instant-gratification
- Changing World of Libraries
  - → Budget cuts, changing demographics, e-books outselling books
  - → Basic reference-based information needs handled online
  - → Increasing demands for library services
    - Over 70% as their community's only free public access to computers & the Internet (American Libraries, November 2009)

Libraries: *The vision of Future*

- "The Academic Libraries in 2012"

  - essay contest in 2002 by New Jersey ACRL & Fairleigh Dickinson University Libraries

→ Technology to enhance information access and knowledge discovery

- visual infrastructure (e.g., video-displaying walls)
- virtual reality to visit places, people, & times
- individualized information portfolios created by librarians using virtual reality helmets and diagnostic tools
- malleable, globally linked archives of knowledge and information

→ Shift in functions & roles of libraries

- from physical, static collection to virtual, dynamic collection
- from collection development to service (e.g., curation)

Libraries: *The vision of Future*

- "University Libraries of the Future"

  - Daniel Greenstein at 2009 Ithaka meeting, "sustainable scholarship

  Scarce funding & limited space → cost reduction

  → Physically consisting of mostly special collections and study areas
    - shared repositories of print and digital materials

  → Library services outsourced
    - e.g., cataloging contracted out to Google

  → Sparsely staffed & highly decentralized

- Alternatives

  → Develop (cost-effective) new services

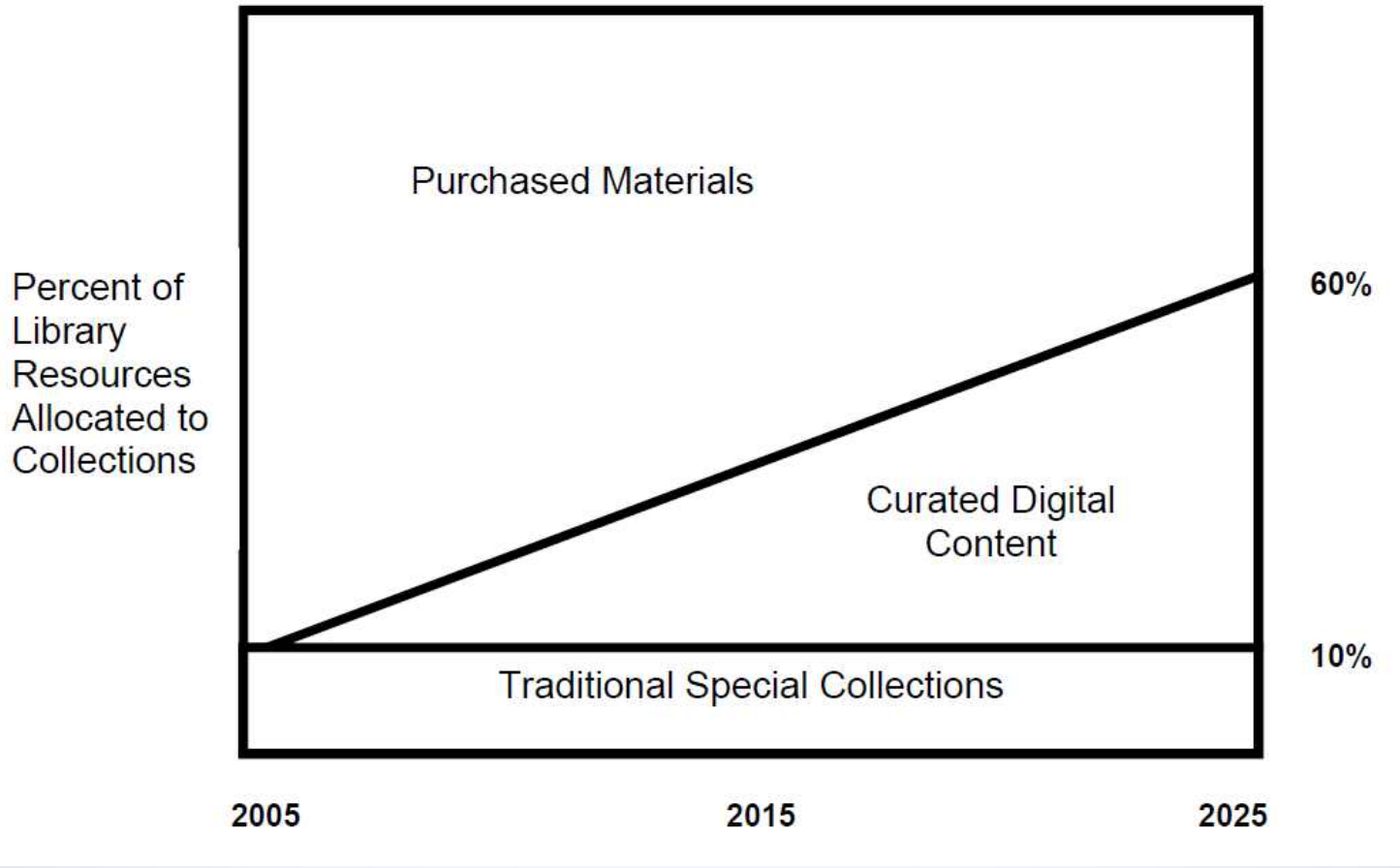
  → Focus on access rather than storage

  → Co-evolve with research, learning & teaching

Libraries: *Past to Present*

- From traditional services to web-based services
  - → Card catalog → Online catalog
  - → Interlibrary loan → Electronic document delivery
  - → Serials collections → Online journal subscriptions
- From collections to services
- From access to stewardship
- From special collections to born digital documents
- From impact of technology on libraries to influence of technology on library users

Libraries: *In Transition*



David W. Lewis, “A Strategy for Academic Libraries in the First Quarter of the 21st Century”

Libraries: *Realities & Trends*

- Not top choice for access to electronic resources

  - 2005 OCLC report *"Perceptions of Libraries and Information Resources"*

  → To begin an information search
  - 89% use search engines, 2% use library web site

  → Satisfaction with search experience
  - 93% with search engines, 84% with a librarian, 10% with library web site

- Alternative providers of information services

  → e.g. Google Scholar, Web of Science

- Rapidly changing information landscape

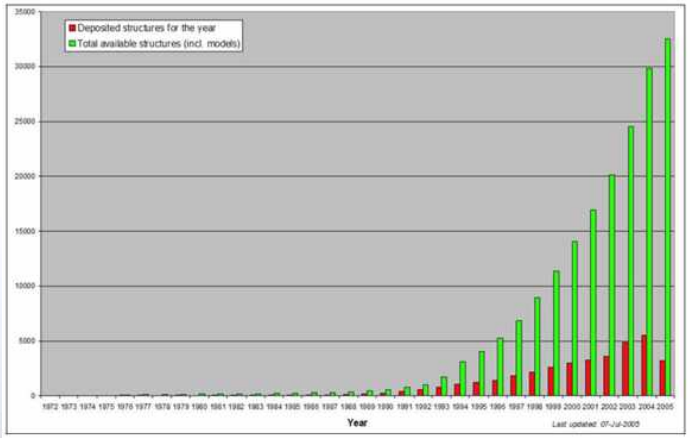
  → Exponential growth of heterogeneous data (volume & complexity)

  → Need for manipulation, analysis & interpretation of data

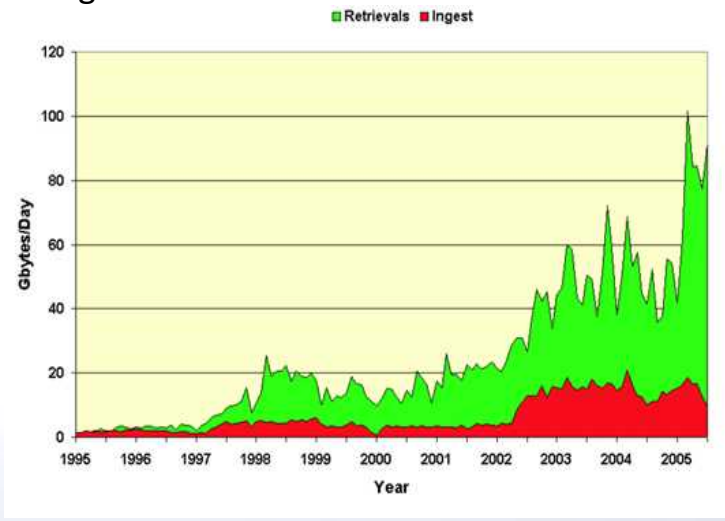
  → Reliance on distributed, derived & integrated (digital) information

Libraries: *Realities & Trends*

- e-Science
  - → Computationally intensive research utilizing digital data collections in distributed network environments
  - → One of the main sources of information growth
    - Large Synoptic Survey Telescope (10 PB/yr), CERN Large Hadron Collider (15 PB/yr)
  - → Collection-based science
    - Data sharing/reuse, information integration



Protein Data Bank Content Growth 1972–2005
© 2005 Research Collaboratory for Structural Bioinformatics



Hubble Space Telescope & Far Ultraviolet Spectroscopic Explorer Data Archive: Retrievals and Ingest 1995–2005
© 2005 Space Telescope Science Institute

Libraries: *Opportunities*

- Need for Digital Preservation & Curation
  - → e-Science data (publications, databases, documentations, applications) represents an investment of billions in research and learning.
  - → Research, learning and creativity build upon previous works.
  - → The longevity and effective reuse of e-data requires digital curation.
    - data environment (hardware/software), context, history, provenance
  - → Data curation is outside the purview of scientists.
    - Typically, the research lifecycle for scientists involves generation and use of data, not preservation.
    - Data curation involves application of protocols and systems for descriptive analysis and metadata generation in customized solutions.
  - → Academic libraries are well-suited for the task of DP&C.
    - expertise, infrastructure, mission

Digital Curation: "*The activity of managing and promoting the use of data from its point of creation, to ensure it is fit for contemporary purpose, and available for discovery and re-use.*" (Digital Curation Centre: http://www.dcc.ac.uk/)

LibraryXG – The Future

- A Library
  - → A portal to "universal collection"
  - → A place for *teaching*, *learning*, and *research* in the digital age
  - → Local nerve center for information
  - → A shared public space, community
- Librarians
  - → Experts at new ways to find & organize information
    - Data hound, guide, producer, connector, teacher
  - → Online credibility guide
  - → Needed more than the library?
- Users
  - → Why do they come to the library?
  - → How do they use the library?
    - How they learn, use information, participate in a learning community

LibraryXG – Characteristics

- From books to tools
  - → No longer a warehouse of books
  - → Enhanced catalogs, digital surrogates, linked DBs, and infrastructure to bring it all together at fingertips
- Merging of boundaries
  - → Interdisciplinary environment
  - → e.g., academic & research libraries, academic & public
- Library 2.0 (technology-infused)
  - → Interactive: Feedback
  - → Collaborative: e.g., Group work space, presentation room, VR labs
- Technology leveraged as opportunity
  - → Shared resources, larger user base
  - → Physical + Virtual/Digital library
  - → e.g., access to the world's knowledge from desktop
- Shift from Service to Learning culture
  - → Circulation of knowledge to produce learning

LibraryXG – The Roles

- Access to quality, value-added resources
  - → Curate non-digital & non-internet data
  - → Resources for independent learning
- High-tech workplace
  - → "A centralized location where new & emerging technology can be combined traditional knowledge resources in a user-focused, service-rich environment" (Freeman, 2005)
  - → Wireless access to library resources, high-speed internet, mutimedia. etc.
- A place for teaching, learning, and research in the digital age
  - → An extension of the classroom, "A temple of scholarship"
  - → Offer tools and expertise needed (e.g., information/digital literacy, learning, research)
  - → Offer training and support
- Library as a Community
  - → Sanctuary, Oasis for contemplation (e.g., Reading room)
  - → Information Commons
  - → Place for collaboration & partnership

Through the looking glass

Children's answers to "What will the library of the future look like?"

- "The future library will be located in a spaceship. The spaceship will have blue tables and purple chairs."
- "Libraries will have flying desks and iPads for each person."
- "The future library will be open twenty four hours."
- "The library will have ninety thousand computers."
- "If you have a book that is out of date, it will warp back to the library."
- "As much as I love the library, I'm 100% sure future libraries would be even more awesome. Just think how amazing the library will be in the future, with robots and electronics."

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Q & A