How to Shape the Future of Research Libraries in the Digital Age?

Ho Nam Choi
hnchoi@kisti.re.kr
Future?

...the top 10 in-demand jobs in 2010 did not exist in 2004
Future?

We are currently preparing students for jobs that don’t yet exist...

using technologies that haven’t been invented...
Internet Trends

- Mobile
- Social
- Image
- Smart

- adapted from SERI Management Note 114 -
Education Trends

- Individualised e-lessons
- Texting/tweeting/social media
- Virtual 3D classrooms
- Simulation
- Games
- Web 3.0
- Learning on the move
- Augmented reality
- Direct foreign language translation
- Electronic education networks

Bill Gates: In Five Years The Best Education Will Come From The Web – Tech Crunch Aug 2010

“The idea of young adults having to go to universities in order to get an education is going to go away relatively soon”
Changes of Internet Business

Future Trends of Internet Business

4 Keyword
- Mobile
- Image
- Social
- Smart

Major Fields
- Search
- SNS
- Shopping
- Game

Detail Trends
- Mobile search
- Image search
- Social search
- Smart search
- Mobile SNS
- Image SNS
- Evolving Social SNS
- Smart SNS
- Mobile shopping
- Image shopping
- Social shopping
- Smart shopping
- Mobile game
- 3D game
- Social game
- Smart app
What a Scholarly Communication?

- Process by which scholars and scientists conduct their research and make the results of their work known

- “Communication is the Essence of Science”

  - Garvey & Griffith –
i. Identification of knowledge
  e.g. undertaking literature reviews using peer reviewed sources

ii. Creation of knowledge
  by professional researchers usually behind closed doors

iii. Quality assurance of knowledge
  e.g. peer review, filtering the best for publication

iv. Dissemination of knowledge
  e.g. publication, presentation at conference

adapted from “Social media: A guide for researchers”
Changing Aspects in Digital Scholarly Communication

- Research & Publishing Cycle: Linear ➔ Nonlinear
- Role of Stake Holders: Clearly Divided ➔ Overlapped or Confused
- Change of Scholarly Communication Pattern ➔ Change of Publishing Process
- Fragmentation: Journals Being Less Important
- More Focused on Non-text Resources and Scientific Data
Change of Researchers’ Information Behavior

- No Longer regard Library as an Information Gateway
- Library is No Longer a Starting Point of Research ➔ Google, Scholarly DB
- Reliance on Digital Resources is Increasing
- Library is going farther away from Research Process
- Library Needs to break away from the Concept of Paper-based Library Holding
How to make Changes?

“we know that libraries must change, but we do not know how to make this transition”

– adapted from Rush. Miller’s slides, “Keeping the academic library relevant to digital era”–
How to make Changes?

Not incremental change. . .

– adapted from Rush. Miller’s slides, “Keeping the academic library relevant to digital era” –
How to make Changes?

but transformative!

– adapted from Rush. Miller’s slides, “Keeping the academic library relevant to digital era” –
Trends of the Future

- New Generation of Learners: “digital natives”
- Learning Spaces: providing learning space in both a "social" context and a more traditional "scholarly" presence.
- Learning and Information Literacy
- Technology
- Scholarly Information System/Publishing
- Digital Archives and Repositories
- Campus/Community Cultural Events
- Workforce: a mix of teaching skills, additional discipline expertise, and technology skills
Future DL

- DL’s Challenges to support Scholarly Communication
  - Cycle of Information Seeking, Using and Creating
  - Social Life of Documents
  - Electronic Publishing
  - Increased interdependency of scholarly documents
  - indefinite preservation of digital documents
  - business models for electronic publishing and digital libraries
  - conflicts between physical and virtual aspects of libraries
Future DL

- Web
  - increasingly participatory
  - increasingly about user-generated content
  - increasingly open
  - increasingly social
  - increasingly linked

→ very much open, social and linked
Future DL

- concentration
- ‘of’ the Web
  - they support diffusion thru simple and open APIs, the use of RSS, cool URIs for everything of value, a RESTful architectural approach, and so on...
  - being mashed as a virtue
- identity (in these services)
  - digital identity has become user-centric
  - not just concerned with questions like “who are you and what are you allowed to do?”
  - but also “this is me, this is who I know, and this is what I’ve created”
  - concentration, diffusion and identity are enablers of **social interaction**
Future DL

- NOT a resource oriented approach,
- NOT a system oriented approach,
  ➔ But a service oriented approach
Chris Shipley, a Co-founder and CEO of Guidewire Group coined the term ‘Social Media’ at the conference “BlogOn” in 2004

Media for Social Interaction using Highly Accessible and Scalable Publishing Techniques

Evolving as various types such as Blog, U-Tube, Mini Homepage, Twitter, Facebook, etc.
Property of Social Media

- Big Bang of Public Opinion
- Strong Diffusivity
- Relieved Anonymity
- More Popular with Mobile Device
  - Tablet PC will bring a rapid increase of Social Media use
# Type of Social Media

<table>
<thead>
<tr>
<th>Communication</th>
<th>Blogging:</th>
<th>Blogger, LiveJournal, TypePad, WordPress</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Microblogging:</td>
<td>Twitter, Yammer, Google Buzz</td>
</tr>
<tr>
<td></td>
<td>Location:</td>
<td>Foursquare, Gowalla, Facebook Places</td>
</tr>
<tr>
<td></td>
<td>Social networking:</td>
<td>Facebook, LinkedIn, MySpace</td>
</tr>
<tr>
<td></td>
<td>Aggregators:</td>
<td>Google Reader, Netvibes, Pageflakes, iGoogle</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Collaboration</th>
<th>Conferencing:</th>
<th>Adobe Connect, GoToMeeting, Skype</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Wikis:</td>
<td>PBworks, Wetpaint, Wikia</td>
</tr>
<tr>
<td></td>
<td>Social bookmarking:</td>
<td>Delicious, Diigo, BibSonomy</td>
</tr>
<tr>
<td></td>
<td>Social bibliography:</td>
<td>CiteULike, Mendeley</td>
</tr>
<tr>
<td></td>
<td>Social news:</td>
<td>Digg, Reddit, Newsvine</td>
</tr>
<tr>
<td></td>
<td>Social documents:</td>
<td>Google Docs, Dropbox, Zoho</td>
</tr>
<tr>
<td></td>
<td>Project management:</td>
<td>Bamboo, Basecamp, Huddle</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Multimedia</th>
<th>Photographs:</th>
<th>Flickr, Picasa, SmugMug</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Video:</td>
<td>Viddler, Vimeo, YouTube</td>
</tr>
<tr>
<td></td>
<td>Live streaming:</td>
<td>Justin.tv, Livestream, Ustream</td>
</tr>
<tr>
<td></td>
<td>Presentation sharing:</td>
<td>Scribd, SlideShare, SlidRocket</td>
</tr>
<tr>
<td></td>
<td>Virtual worlds:</td>
<td>OpenSim, Second Life, World of Warcraft</td>
</tr>
</tbody>
</table>

Trends of Social Media

- Social media as a customer service tool
- More companies using social media sites for competitions (and some really creative competitions too)
- Social media will more prominently affect search engine results
- More companies will include user reviews and ratings on their websites
- Social media and relevance
- Greater impact for social media in B2B sector
Advantages of Social Media

- Collaboration is the Essence of Research
- Traditional forms of collaboration have restrictions by place and time
- Social media open up new forms of collaboration without any restrictions by place and time
Population of World Social Media Users

![Bar chart showing the population of social media users in various countries, with USA at 17,400, China at 9,700, Germany at 3,800, Russia at 3,500, India at 3,300, Japan at 3,200, and Korea at 2,500.]

Social media usage by researchers

(Corsa, Van Der Heyden, Kersten, 2009)
Typical Functions of SNS

- post information about yourself in the form of a profile
- post short snippets of information as status updates
- post photos and files
- comment on other people’s content
- engage in one-to-one and many-to-many conversations
- create private or public spaces for themed discussions
Researcher-specific SNS

- **ResearchGate** ([www.researchgate.net](http://www.researchgate.net))
  - Scientists and Researchers
  - enables to connect with colleagues, discover new research, share scientific methods and collaborate online

- **Graduate Junction** ([www.graduatejunction.net](http://www.graduatejunction.net))
  - Online Social Community for PhD researchers found in 2008
  - connects masters and PhD research students covering all subject areas in the UK

- **MethodSpace** ([www.methodspace.com](http://www.methodspace.com))
  - social site connecting research community run by the publisher Sage

- **Nature Network** ([http://network.nature.com](http://network.nature.com))
  - Science-focused social network service run by Nature
Social Bookmarking

- delicious (www.delicious.com)
- diigo (www.diigo.com)
  - Allows users to highlight content from marked pages, either directly via the site or via a toolbar which users must install in their browser
- BibSonomy (www.bibsonomy.org)
  - an academically-orientated service with many of the features of delicious plus the metadata gathering capabilities of a social citation service such as CiteULike (see overleaf)
  - allows all resources – from informal Web sources to formal published resources – to be stored and accessed in a single location
- Reference Management
- Share information about what researchers are reading
Social Citation-Sharing

- **CiteULike** ([www.citeulike.com](http://www.citeulike.com))
  - Enables to store, tag and retrieve bibliographic information
  - Citation sharing
  - Make connections with other researchers
  - ‘watch’ what other people are adding to their library

- **Mendeley** ([www.mendeley.com](http://www.mendeley.com))
  - a reference manager and academic social network.

- **Zotero** ([www.zotero.org](http://www.zotero.org))
  - a bibliographic service which contains some social/collaboration elements.
SNS based Business Models

- Zynga: Social Game
- Groupon: Social Commerce
- LinkedIn: Business Network Service (User-Centered Information)
- Huffington Post: Social News
- Foursquare: Location based Mobile SNS
Zynga : Social Game

SNS based game

User

Zynga

User

provides games free

Gives items as present

purchases items
Groupon: Social Commerce

Sharing commodity info using SNS

- Customer
- Customer
- Groupon
- Allied companies

- Discounted selling by region
- Collects customer info
- Provides AD channel
- Sales commission
LinkedIn : Business Network Service

- **LinkedIn**
  - Sells premium subscription service
  - Collects job seeker info
  - Sells employment solutions

- **Job seeker**
  - Using Human network using SNS

- **Advertisers**

- **Recruiting Company**

- **AD commission**
SNS based Business Models

- Huffington Post : Social News

Sharing of articles & comments using SNS

- Subscriber
- Blogger based articles
- Collects subscriber comment & activity info
- Provides AD channel
- AD commission

Advertisers
SNS based Business Models

- Foursquare: Location based Mobile SNS

Sharing of venue & tip using SNS

Customer

provides badge & qualification ← AD commission

Foursquare

collects customer info

supports marketing

Customer

Allied companies & Advertisers
Success Factor of SNS based Business

- Enhance Service Value using SNS
  - Groupon
    - Induce Continuous Visit by Selling an Item at a Great Bargain Sale Price everyday
  - Linkedin
    - Provide Reliable Evaluating Information about Job Hunter to Recruiter
  - Foursquare
    - Provides Users with Price Discount or Special Menu in Alliance with Starbucks, Amex, Gap
    - Provides Business Partners with Business Dashboard
- Include Entertaining or Emotional Elements to induce continuity
- Sense of Fellowship
Use of SNS

- Used as
  - Internal Communication
  - Advertising Channel
  - Marketing Tool

**Purpose of Corporate SNS Use**

Is SNS a core factor of marketing strategies?

- Yes: 11%
- No: 89%

Use of SNS is Expanded to New Area

- Social Funding
- Social SCM (Supply Chain Management)
- Social Indexing

Data: Samsung Economic Research Institute
Use of SNS

- Social Funding (Crowd Funding)
  - Collective Donating of Small Money or Individual Gift for the Success of a Specific Project
  - A New Business Model Emerging by Supporting SNS Users’ Voluntary & Creative Behavior (Social Funding Brokerage)

Ex: American novelist Donald Miller announced to fund-raise US$125,000 to make a film for his best seller “Blue Like Jazz”.

This project successfully raised over its funding goal with total US$346,000 from 4,495 backers.
Use of SNS

Social SCM

- a Company can save expenses and enhance customer satisfaction by instantly sharing problems and counter measures occurred in all of supply chain processes thru the Use of SNS

Ex: BestBuy’s Social SCM Use

BestBuy, an American Electronic Products Seller improves its SCM by using SNS

- Over 2,600 employees enhance customer satisfaction by doing real time consulting about customer’s complaint thru twitter account of Twelpforce
- Q&A content on Twelpforce is automatically connected to BBYFeed site to establish a guide to improve service and logistics
Use of SNS

- **Social Indexing**
  - Technology for Collecting Social Index Shared thru SNS
  - ‘Like’ of Facebook and ‘+1’ of Google
  - ‘Recommending Service’ on Existing web sites is restricted to within the site, but ‘Social Index’ can be shared beyond the border of sites
  - MIT selected Social Index as one of “2011 10 Promising Technologies”
  - Using Social Index, personally customized information service is available based on Preference Information created by customers and their friends
Mobile applications
QR Codes
Google Applications
Twitter
Virtual reference
Collaborations between librarians
Teaching social media classes
Using social media as a teaching tool

Why Social Media in the Library?

- Search engines include Social Media in top results
- Social Media is where an increasing number of users ask questions and share information
- Communications with users
- Respond to feedback
- Marketing and Advertising

Cited from http://www.rba.co.uk/
Why Less Progressive in the Library?

- SNS is recognized by Library as a Private Network that is hardly employed to Library Business
- Few Opportunities for Librarians to learn about ‘Social Software’
- Web 2.0 Users Show Active Behavior, whereas Library 2.0 Users Show Passive Behavior caused by Library’s One-Way Demand for User Participation
Social Media in Libraries

- What to Post
  - Library News and Events
  - New additions to your collection
  - Links to articles, videos, etc on the Web
  - Community Information
  - Solicit Feedback
  - Respond to People
  - Pictures
  - Anything else that will attract people
Social Media in Libraries

- How to Market
  - Link Wherever Possible
  - Talk to People
  - Instruction sessions
  - Print advertising
  - Web ads
  - Build a contingent of friends
  - Follow and be followed in return
  - Give it time
Library Applications of SNS

- **LibraryThing for libraries**
  - Cataloging thru Social Networking
  - LibraryThing helps you create a library-quality catalog of your books
  - LibraryThing connects people based on the books they share

- **Delicious in libraries**
  - a Social Bookmarking service
    - save all your bookmarks online
    - share them with other people
    - see what other people are bookmarking

- **Mash up in libraries**
  - Mashup your Library's Twitter, Flickr, Youtube, Facebook accounts
  - Libraries mash up content, services and ideas
How to shape Future

- Build a vision of a new kind of library
- Be more involved with research and learning materials and systems
- Be more engaged with campus communities
- Make library collections, services, and librarians more visible in university communities of practice
- Move to next generation systems and services
  - Open, Social, Linked

A NEW KIND OF LIBRARY

The library in the community

adapted from R. Miller’s slides, “Keeping the academic library relevant to digital era”
How to shape Future

- Make the best Use of Collective Intelligence
- Collaborations
- Creativity
- Personalized Intelligent Learning Support
  ➔ by developing a **Mobile Cloud based Smart Library**
Korean Scientists’ R&D Life Cycle Study

adapted from “Korean scientists' R&D life cycle study”, 2011. KISTI

<Research activities by R&D stages>

adapted from “Korean scientists' R&D life cycle study”, 2011. KISTI
Information needs and demanded sources by R&D stage

**Findings**

- Hot information for idea formation is obtained from conferences.
- Funding information is mostly coming from affiliated institution or funding agencies.
- Experiment methods and know-how are obtained from related bulletin board, experiment protocol, journals, textbooks.
- It is important to identify IF of journal for output publishing.
- Bibliographic searches happen in every R&D stages.
- Finding information about products, market, technology trends, government report is still difficult.
How to shape Future

Smart Library Information Service Synopsis

- Electronic library system
  - acquisitions
  - cataloging
- Circulation
  - serials control
- Library portal system
- Collection management system
  - collection development
  - registration & archiving
  - contents management

- Collective intelligence based smart learning system
  - Intelligent learning engine
  - Learner diagnosis
  - Content recommendation
  - Course recommendation
  - Open e-learning interaction framework
    - Knowledge base manager
    - Knowledge base
      - 3D, Video, Text
    - 3D, 4D, 5D learning engine
      (augmented reality, virtual experience, simulation)

✓ Existing library system provides one-way information service, whereas smart library system provides intelligent, tangible, personalized, and hands-on knowledge thru collective intelligence-based knowledge creation, authentication, and organization.
Thank you