Wisdom is not the product of schooling but the lifelong attempt to acquire it.
- Albert Einstein

Cultures of Participation: Opportunities and Challenges for the Future of Digital Libraries

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Preserving the Past, Designing the Future — Today

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Outline

- Basic Message

- Cultures of Participation
  - Meta-Design
  - Social Creativity

- Examples of Innovative Socio-Technical Environments

- Research Challenges and Conclusions
Basic Message: Beyond the Unaided, Individual Human Mind
Digital Libraries

- libraries have served as the record of collective culture for “preserving the past”

- **cultures of participation**: a transformational framework for “designing tomorrow”
  - **meta-design**: consumers → active contributors
  - **social creativity**: learning when the answer is known → learning when no one knows the answer
  - **long tail**: core curriculum (“head”) → passion for unique topics (“tail”)
Digital Libraries: From Hardware and Software to Infoware

- Hardware
  - Software
  - Infoware
- Compilers, Operating Systems
  - EE Departments
- AI, HCI, CSCW
  - CS Departments
- Information, Digital Libraries
  - Schools of Information
Cultures of Participation

Fundamental Challenge and Opportunity

consumer cultures
focus: produce finished goods to be consumed passively

cultures of participation
focus: provide all people are with the means to participate actively in personally meaningful problems

broad interest and attention: title stories in TIME and NEWSWEEK
Yes, you.
You control the Information Age.
Welcome to your world.
Domains of Cultures of Participation

- Web 2.0
- Learning 2.0
- President 2.0
- Science 2.0
- Digital Libraries 2.0
- Electricity 2.0
- Health 2.0
Concepts of Cultures of Participation

- prosumers (= producers + consumers)
- pro-ams (= professionals + amateurs)
- user-generated content
- wisdom of crowds
- crowd sourcing
- long tail

→ What is needed:

**an analytic model to understand and foster cultures of participation**
Elements of an Analytic Model: Understanding **Strengths**

- to engage the *talent pool of the whole world*
- to put *owner of problems* in charge
- to make *all voices* heard
- to reach *extensive coverage*
- to expose artifacts to *public scrutiny*
Elements of an Analytic Model: Understanding Weaknesses

- collective is not always better
- loss of individuality
- accumulation of irrelevant information
- lack of coherent voices
- companies offload work to customers → drawbacks of “Do-It-Yourself Societies”
- customers lack the experience and the broad background knowledge to do tasks efficiently and effectively
Elements of an Analytic Model: Understanding and Analyzing Success and Failures Models

- **Wikipedia** = the Drosophila for “cultures of participation”

- **Encyclopedia of Life** = online reference source and database for every one of the 1.8 million species (with 6000 curators)

- **Second Life**

- **Open Source**

- **Google-SketchUp + 3D Warehouse + Google Earth** (example for meta-design)

- **Envisionment and Discovery Collaboratory** (example for social creativity)
Meta-Design: Design for Designers

- **meta-design explores:**
  - cultures in which participants can **express themselves** and engage in personally meaningful activities

- **meta-design requires**
  - designers giving up some **control** at design time to contributors at use time

- **consumer / designer ≠ f{person} but a f{context} → problems:**
  - someone wants to be a designer but is forced to be a consumer → **personally meaningful activities**
  - someone wants to be a consumer but is forced to be a designer → **personally irrelevant activities**
What Do Meta-Designers Do?

- they use their own creativity to create socio-technical environments in which other people can be creative
  - by creating contexts and content creation tools rather than content
  - by creating technical and social conditions for broad participation in design activities (socio-technical systems)

- application areas of meta-design:
Example: SketchUp — a 3D Modeling Environment
3D Warehouse (http://sketchup.google.com/3dwarehouse/)
Downtown Denver in 3D
A Tiny Percentage of a Huge Population \rightarrow Large Number of Participants

http://sketchup.google.com/3dwarehouse/modelcycle?scoring=d
Richer Ecologies of Participation

- **in the past:**
  - software developers and users
  - producers and consumers
  - professionals and amateurs

- **in the future: more roles**
  - producers, raters, taggers, curators, stewards, active users, passive users

- **roles are distributed in communities:**
  - power users, local developers, gardeners

- **challenge:** support migration paths with “low threshold, high ceiling” architectures
Consumer $\rightarrow$ Contributor $\rightarrow$ Collaborator $\rightarrow$ Meta-Designer
Social Activities in Digital Libraries

- **authoring** of new resources → **contributors**

- implicit and explicit **rating** of resources → **raters**

- attachment of **metadata** to resources → **taggers**

- expression of **relations** among resources → **curators**

- **sharing** of resources → **collaborators**

- **defining contexts** (environments, guidelines) → **meta-designers**
(Social) Creativity

- **creativity: beyond productivity** — a great interest in recent years

- **new National Science Foundation (NSF) program**: “Creativity and Information Technology (IT)"
  

- **L3D’s research projects** in this area:
  - “A Next Generation Wiki for Creativity and IT”;
  - “Increasing Participation and Sustaining a Research Community in Creativity and IT”
The CreativeIT Wiki — http://l3dswiki.cs.colorado.edu:3232/CreativeIT/
Individual and/versus Social Creativity

“The strength of the wolf is in the pack, and the strength of the pack is in the wolf.”
Rudyard Kipling

- the Renaissance scholar (who knows “everything”) does not exist anymore in the 21st century

- complex design problems are systemic problems; they seldom fall within the boundaries of one specific domain → they require the participation and contributions of several stakeholders with various backgrounds
A Socio-Technical Environment

Envisionment and Discovery Collaboratory (EDC)

- the EDC supports and fosters **Cultures of Participation:**
  - **collaborative design** → in: urban planning, emergency management
  - **social creativity** → learning when no one knows the answer
  - **meta-design** → a version of SimCity in which content is generated by users

- the EDC explores innovative themes in **Computer Science:**
  - table-top computing
  - computationally enriched physical objects
  - visualization
The Envisionment and Discovery Collaboratory
Boulder City Council and University of Colorado Regents
Buildings Sketched into a Google-Earth Client
Incremental Formalization
The Future: Virtual Versions of the EDC in Second Life / OpenSim
Implications and Challenges

- what does this all mean for **digital libraries research**

- **models** for knowledge accumulation and sharing in different cultures
  - Model Authoritative → “Filter and Publish”
  - Model Democratic → “Publish and Filter”

- “**Long Tail**” → from business to education
Digital Libraries: Preserving the Past

- **how to preserve**
  - information in digital environments??
  - contexts in which the information was created?

- **social-technical system perspective** is the preservation
  - a technical issue? → yes: the right kind of technology is necessary, but **not sufficient**
  - a participation issue
    - who is the beneficiary and who has to do the work?
    - incremental formalization (Frank Shipman’s research, stubs in Wikipedia, …)
Why Preserving the Past is Not Enough
—
Transcending the Information Given
(back to Meta-Design and Social Creativity)

- **example:** people walking through the Denver’s 3D-scape → preserve
  - the different paths taken
  - most frequent stopping points

- **allow the consumers to become active participants**
  - add photos and facts
  - add personal experience
  - update the digital world to correspond to a changed external world
Model Authoritative underlying Consumer Cultures

- “Filter and Publish”: Strong Input Filters, Small Information Repositories, Weak Output Filters
- Limitation: Making All Voices Heard
Model Democratic underlying Participation Cultures

- "Publish and Filter": Weak Input Filters, Large Information Repositories, Strong Output Filters
- **Limitation**: Trust and Reliability of Information
The Long Tail

- theory of the Long Tail: hits (in the “head”) → niches (in the “tail”)

- opportunity with digital artifacts: computer programs, movies, books, 3D models of buildings, …. → as the costs of production and distribution fall, there is less need to lump products and consumers into one-size-fits-all containers

- hypothesis: without the constraints of physical shelf space narrowly-target goods and services can be economically attractive
Exploiting “Long Tail” Opportunities in Business
### Specific Examples of the Long Tail

<table>
<thead>
<tr>
<th>Inventory</th>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rhapsody</td>
<td>Songs</td>
<td>735,000</td>
</tr>
<tr>
<td>Wal-Mart</td>
<td>Songs*</td>
<td>39,000</td>
</tr>
<tr>
<td>Amazon</td>
<td>Books</td>
<td>2.3 mil</td>
</tr>
<tr>
<td>Barnes &amp; Noble</td>
<td>Books*</td>
<td>130,000</td>
</tr>
<tr>
<td>Netflix</td>
<td>DVDs</td>
<td>25,000</td>
</tr>
<tr>
<td>Blockbuster</td>
<td>DVDs*</td>
<td>3,000</td>
</tr>
</tbody>
</table>

* = inventory in a typical store
Rethinking and Reinventing Learning and Education from a “Long-Tail” Perspective

<symposium at CSCL’2009, June 2009, Rhodes, Greece>

- basic belief: all people are interested in something (Viking Ships, Dinosaurs, gambling, Nuremberg trials, Castles in Northern Germany, ……)

- a new synergy and hybrid model: integrate head and tail by creating richer learning environments
  - head — basic knowledge and skills: learning to learn, learning on demand, preparation for future learning, soft skills, digital fluency, ……………
  - tail — personally meaningful problems: idiosyncratic interest and passion, self-directed learning, intrinsic motivation, local knowledge in a globalized world

- extensive coverage needed for supporting the infinite numbers of interesting topics — will be facilitated by “meta-design”

- the opposite of: cultural literacy (Hirsch), No Child Left Behind, ….
Castles in Northern Germany

- Bergedorfer Castle
  by picturemaker
  In Hamburg in the middle of a...
  History
  View in Google Earth

- Schloss Richmond
  by der Uhlenbusch
  Schloss Richmond wurde...
  View in Google Earth

- Gottorp Castle - Schleswig -
  by JWagner
  The Gottorp Castle in...
  View in Google Earth

- Schloss (Schlossmuseum)...
  by Projekt-Oldenburg
  mehr folgt......
  View in Google Earth

- the current environment:
  - 14 models (4 of them shown)
  - contributed by: 6 contributors
  - owner of the collection serves as curator
Conclusions

- one of the most exciting innovations and transformations
  - past decades: digital media have provided new powers for the individual
  - future: the world's networks are providing enormous unexplored opportunities for groups and communities
  - cultures of participation → opportunities and challenges to provide all citizens with the means to become co-creators of new ideas, knowledge, and products in personally meaningful activities

- meta-design, social creativity, and long tail are frameworks to support and foster cultures of participation