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

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*
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/)
CU Boulder in 3D
Downtown Denver in 3D
A Tiny Percentage of a Huge Population → 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 → Contributor → Collaborator → 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 \(\rightarrow\) in: urban planning, emergency management
  - social creativity \(\rightarrow\) learning when no one knows the answer
  - meta-design \(\rightarrow\) 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 $\rightarrow$ “Filter and Publish”
  - Model Democratic $\rightarrow$ “Publish and Filter”

- “Long Tail” $\rightarrow$ 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 \(\rightarrow\) 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

**TOTAL INVENTORY**
* inventory in a typical store

- **Rhapsody**: 735,000 songs
- **Wal-Mart**: 39,000 songs*
- **Amazon**: 2.3 mil books
- **Barnes & Noble**: 130,000 books*
- **Netflix**: 25,000 DVDs
- **Blockbuster**: 3,000 DVDs*
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

- **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