



Center for
**LifeLong
Learning
& Design**

University of Colorado at Boulder

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

JCDL'2009, UT Austin, June, 2009

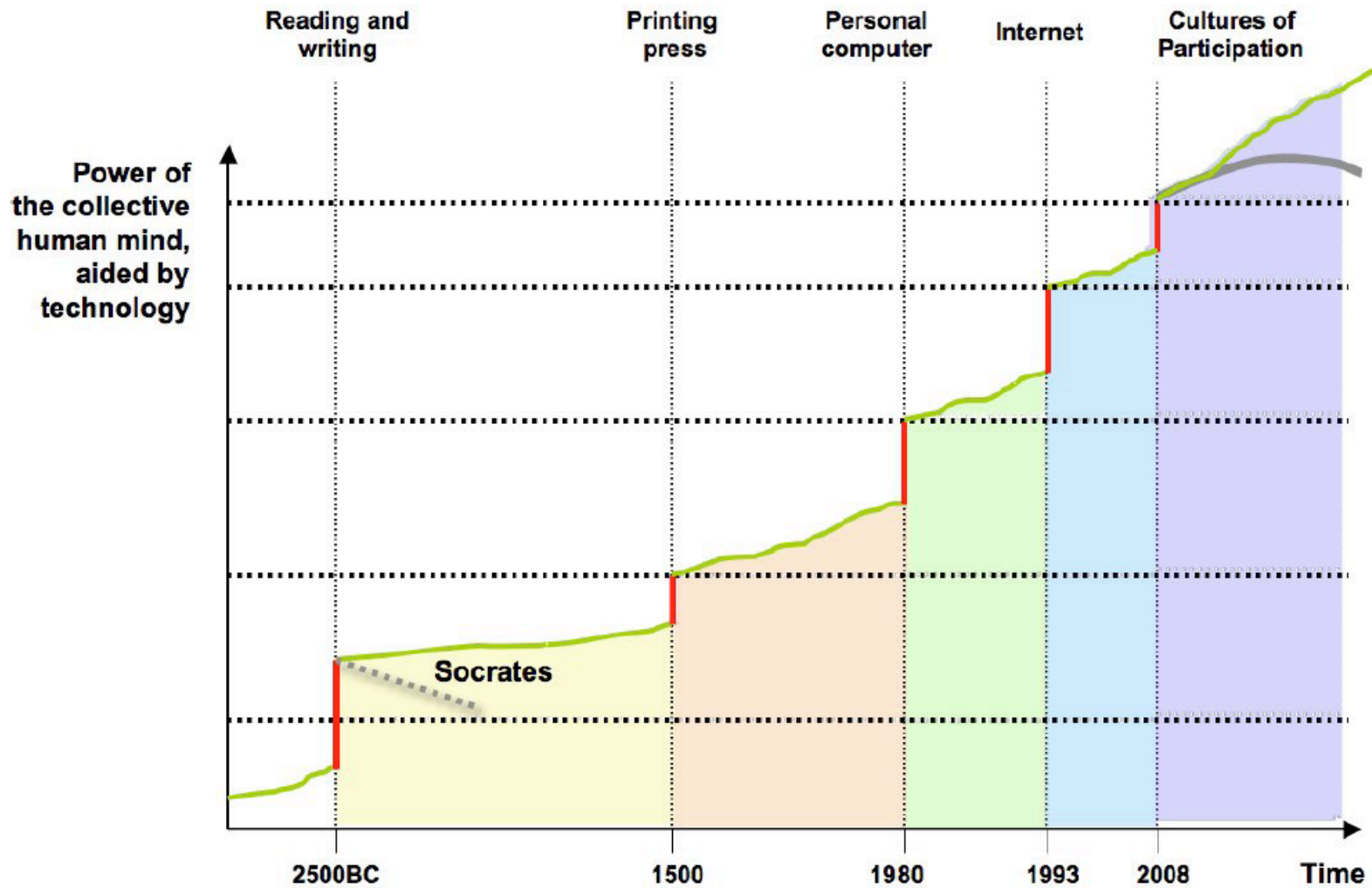
Acknowledgements

- organizers of JCDL for providing me with this opportunity
- L3D colleagues and students (former and present)
- feedback from colleagues to drafts of my slides (including: Gary Marchionini, Frank Shipman, Tammy Sumner, ,)

Outline

- **Basic Message**
- **Cultures of Participation**
 - Meta-Design
 - Social Creativity
- **Examples of Innovative Socio-Technical Environments**
- **Research Challenges and Conclusions**

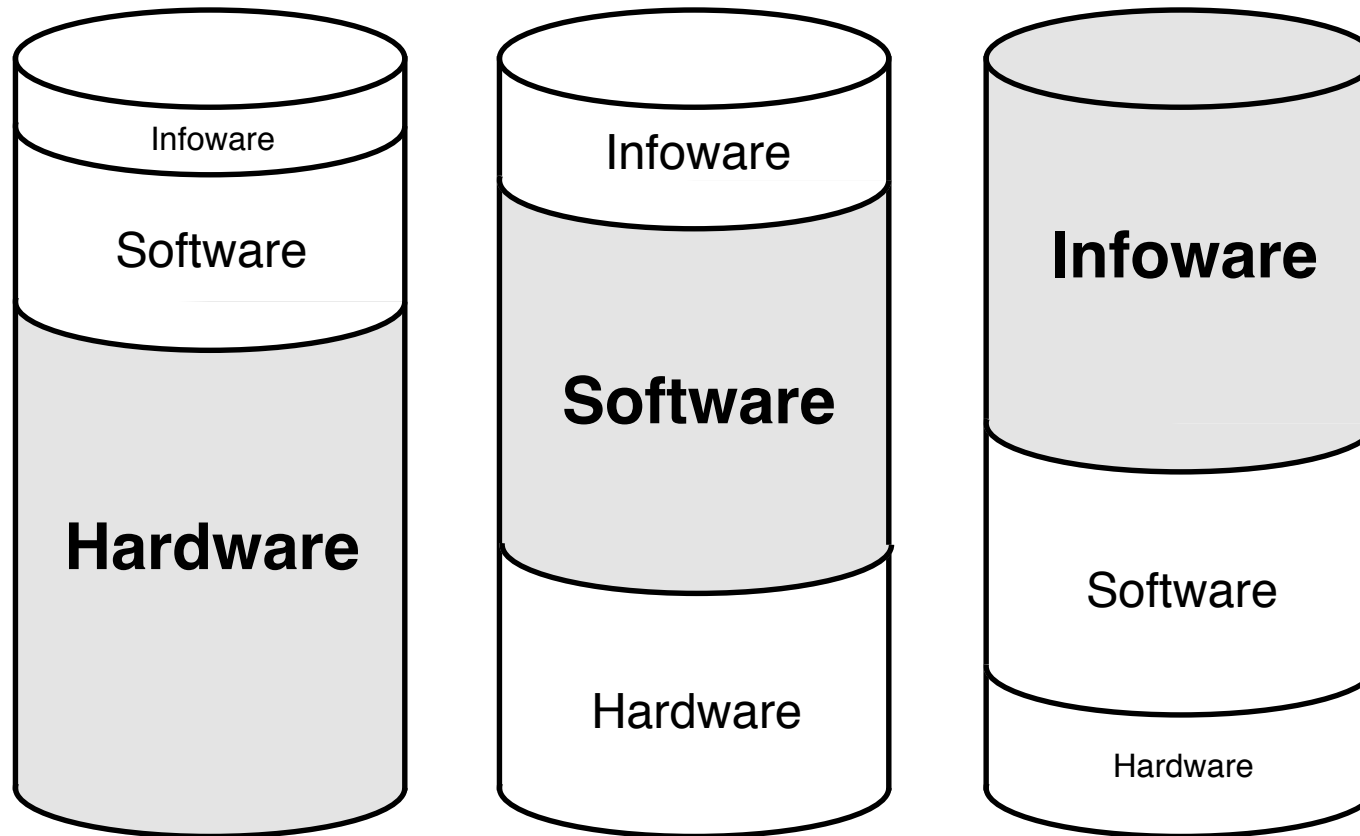
Basic Message: Beyond the Unaided, Individual Human Mind



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

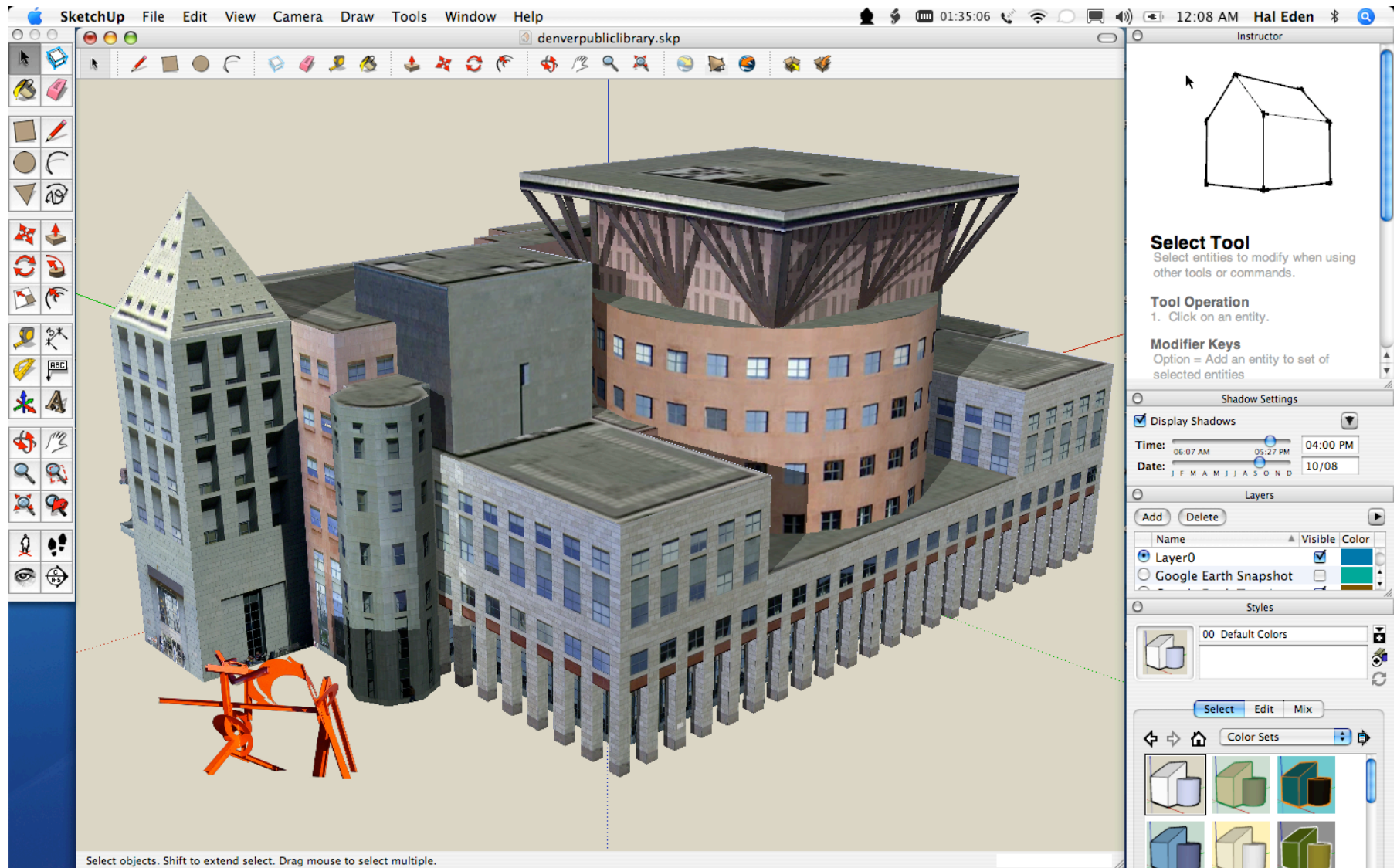
- **consumer / designer \neq f{person} but a f{context} \rightarrow problems:**

- someone wants to be a designer but is forced to be a consumer \rightarrow ***personally meaningful activities***
- someone wants to be a consumer but is forced to be a designer \rightarrow ***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:
 - **digital libraries:** Wright, M., Marlino, M., & Sumner, T. (2002) "Meta-Design of a Community Digital Library", D-Lib Magazine, Volume 8, Number 5,
 - **education:** Fischer, G. (2009) "Cultures of Participation and Social Computing: Rethinking and Reinventing Learning and Education." In Proceedings of ICALT Conference

Example: SketchUp — a 3D Modeling Environment



3D Warehouse (<http://sketchup.google.com/3dwarehouse/>)

3D Building Collections



[Featured Google Earth Modelers](#)



[Help Model a City](#)



[Featured Google Earth Collections](#)

Featured Collections



[Google Earth - Ocean Layer](#)



[SketchUp Components](#)



[Interior Furnishings](#)

Popular Models



[Egg Chair](#)
by [Mart](#)



[Chair](#)
by [Yeroc](#)



[People](#)
by [Graphic Sketchbook](#)

CU Boulder in 3D



Downtown Denver in 3D



A Tiny Percentage of a Huge Population → Large Number of Participants

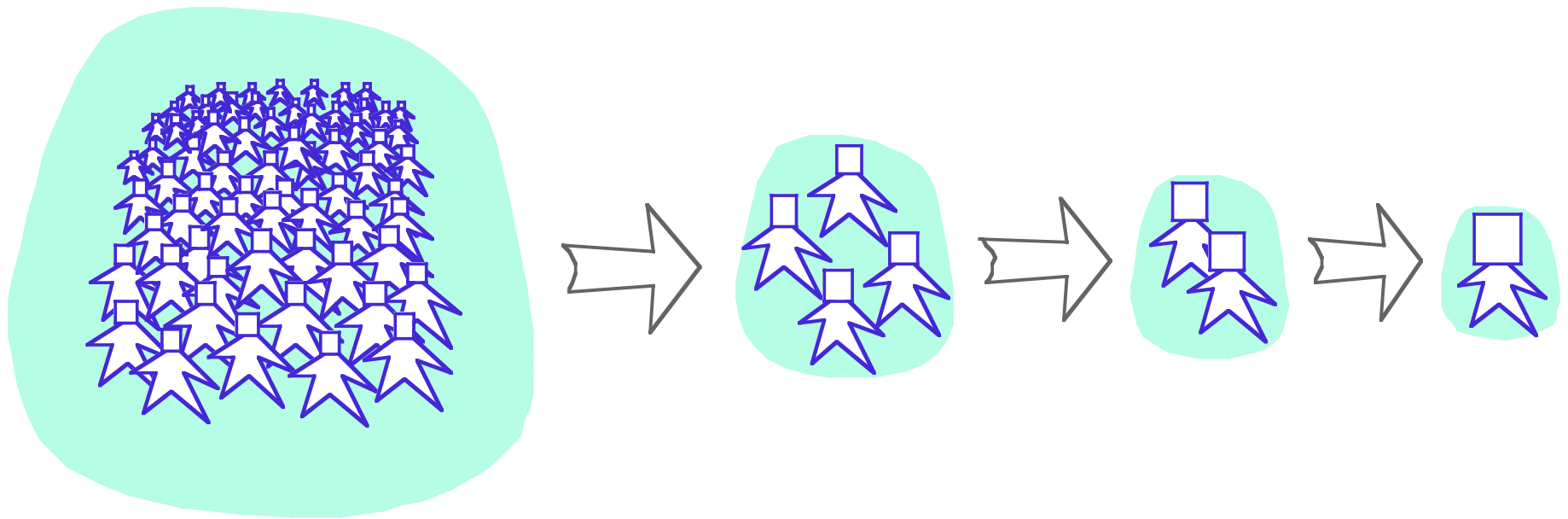
<http://sketchup.google.com/3dwarehouse/modelcycle?scoring=d>



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)”
<http://www.nsf.gov/pubs/2007/nsf07562/nsf07562.htm>
- **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

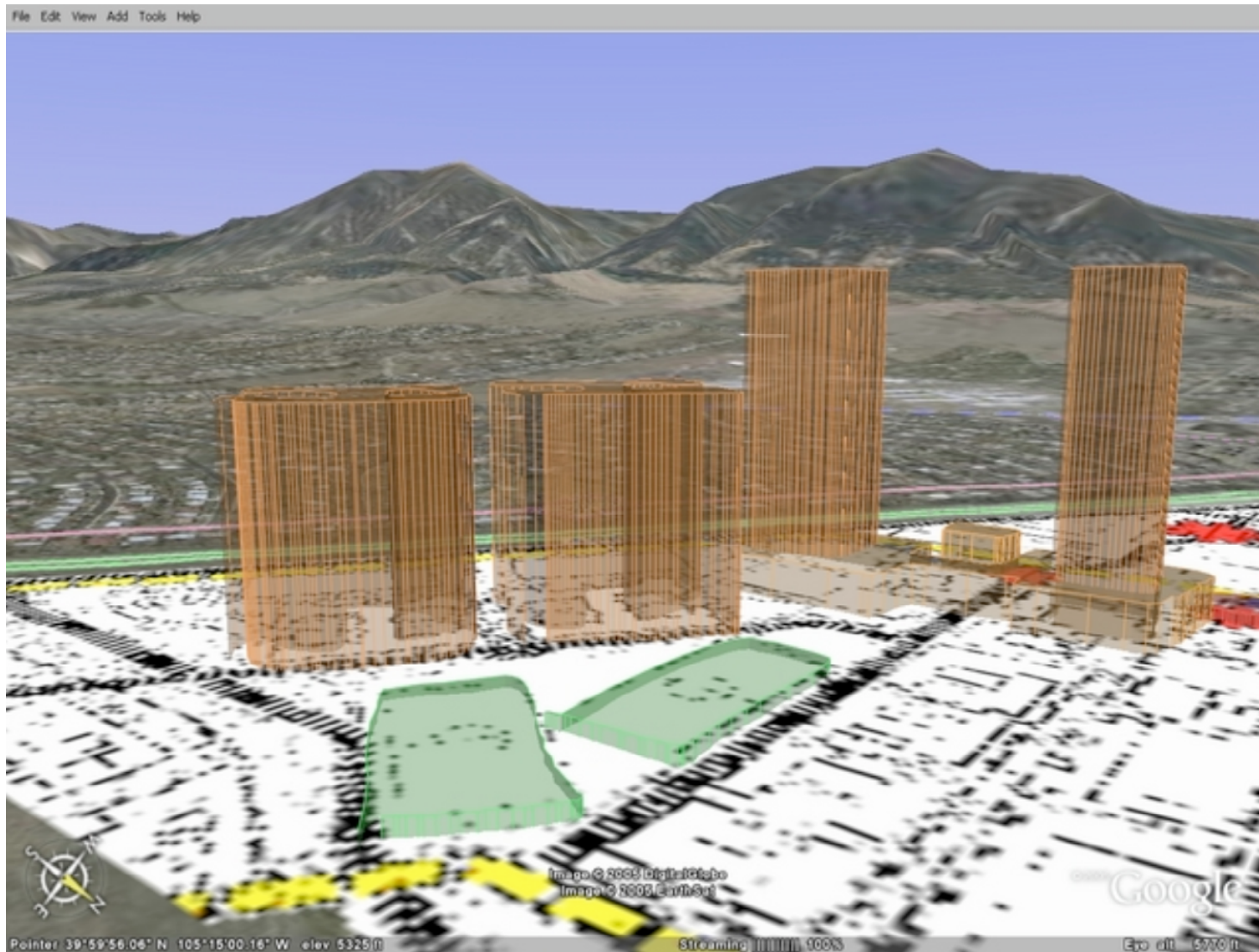
The Envisionment and Discovery Collaboratory



Boulder City Council and University of Colorado Regents



Buildings Sketched into a Google-Earth Client



Incremental Formalization



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

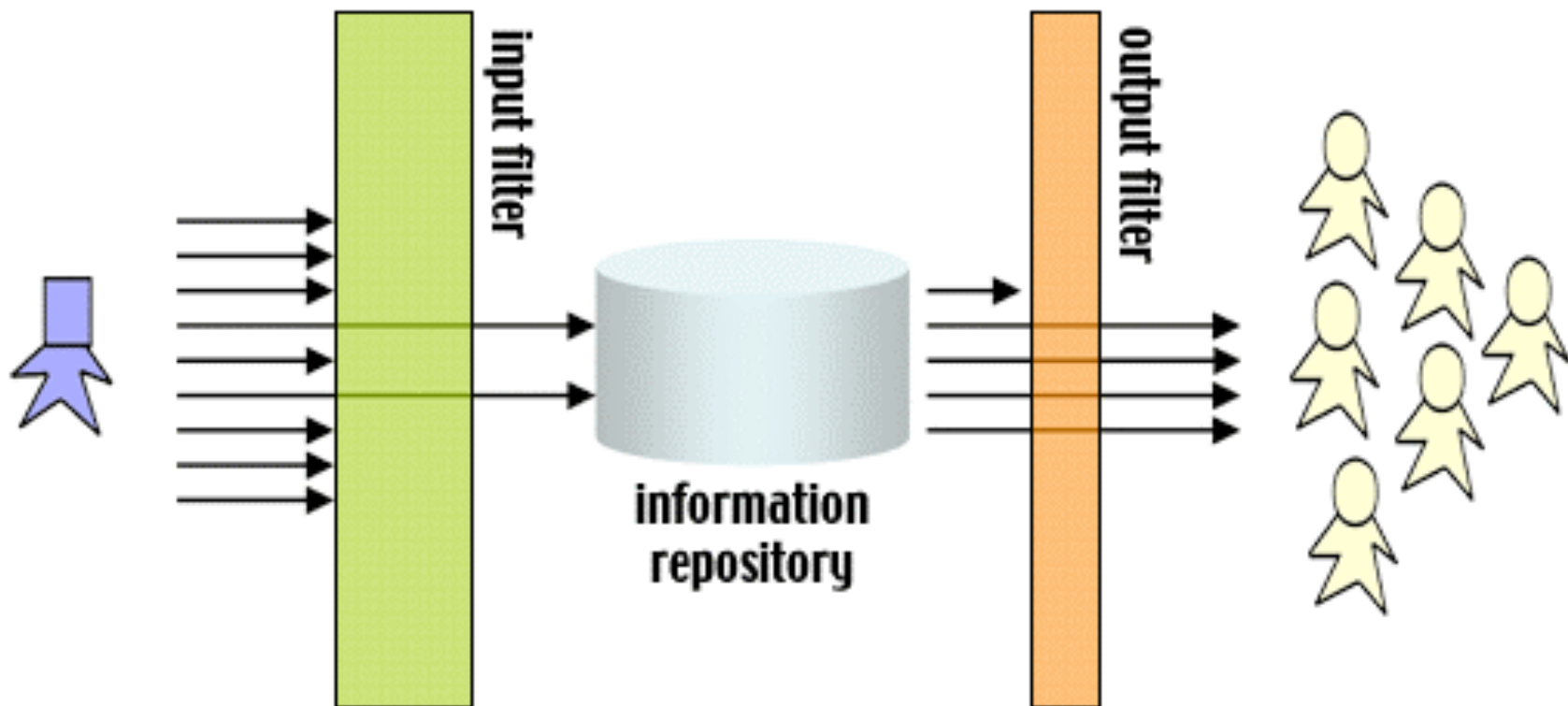
Transcending the Information Given

(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

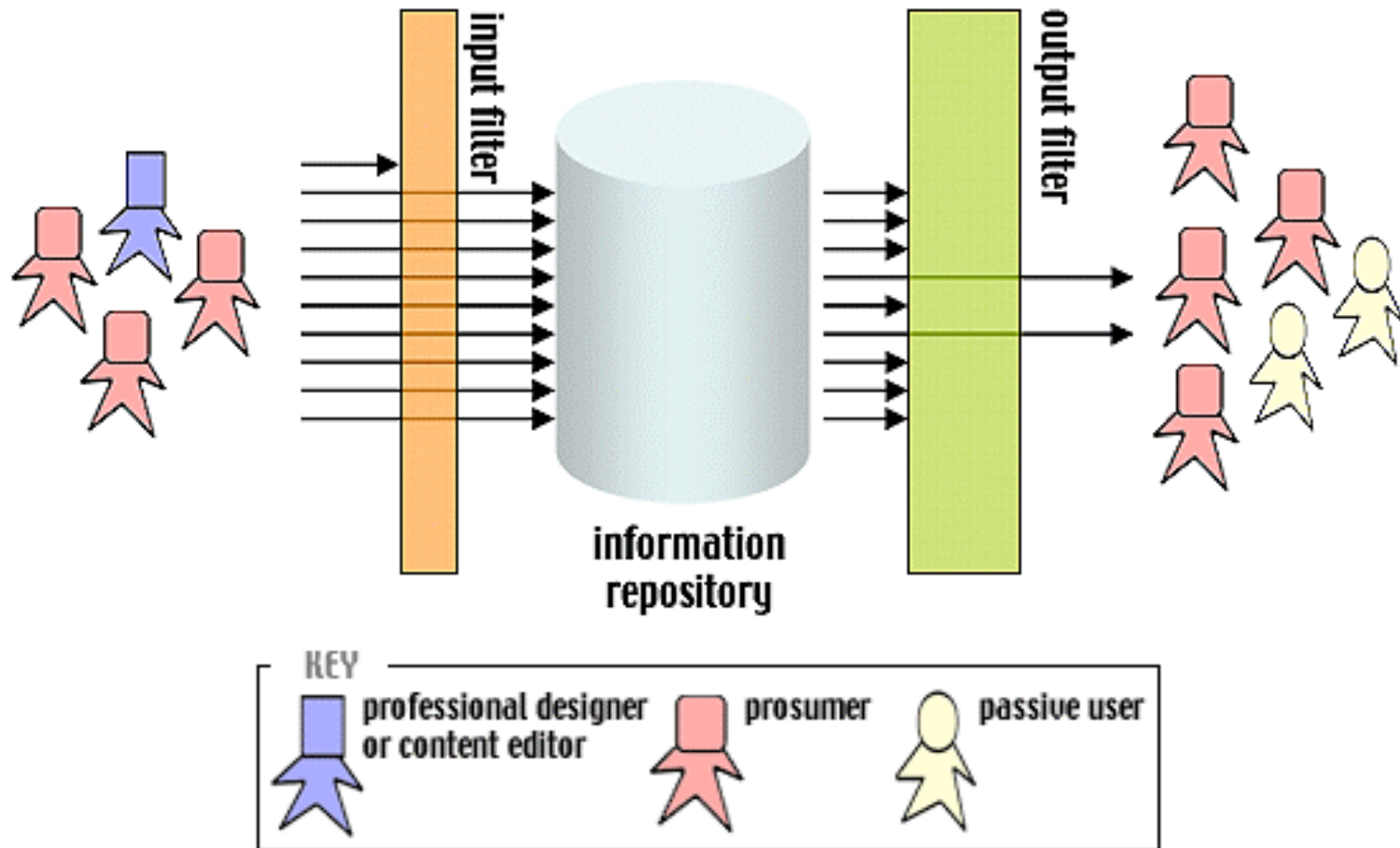
Model Authoritative underlying Consumer Cultures

- **“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-targeted 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

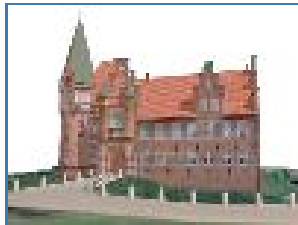


Rethinking and Reinventing Learning and Education from a “Long-Tail” Perspective

<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



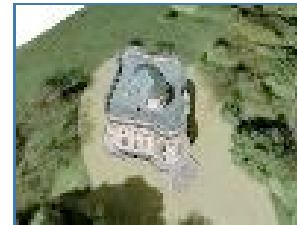
[Bergedorfer Castle](#)

by [picturemaker](#)

In Hamburg in the middle of a...

[History](#)

[View in Google Earth](#)

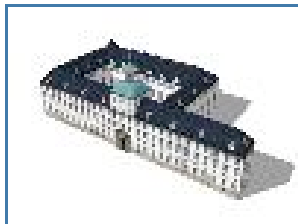


[Schloss Richmond](#)

by [der Uhlenbusch](#)

Schloss Richmond wurde...

[View in Google Earth](#)



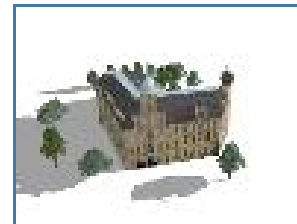
[Gottorp Castle - Schleswig -](#)

...

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**