



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**

**Transcending the Unaided, Individual Human Mind:
Understanding, Fostering, and Supporting
Cultures of Participation**

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Outline

- **Introduction: Center for LifeLong Learning and Design (L3D)**
- **CHIFOO 2009 program**
- **Basic Message**
- **Cultures of Participation**
 - Meta-Design
 - Social Creativity
- **Examples of Innovative Socio-Technical Environments**
- **Research Challenges and Conclusions**

L³D's Research Focus and Intellectual Identity

- **Artificial Intelligence (AI) → Intelligence Augmentation (IA)**
 - replacement → empowerment
 - emulate → complement
(exploit unique properties of new media)

- **instructionist learning → constructionist learning**
 - learning about → learning to be
 - when the answer is known → when the answer is not known
(collaborative knowledge construction)

- **individual → social**
 - knowledge in the head → knowledge in the world
 - access → participation
 - within cultures → across cultures

- **generic → specific**
 - human-computer interaction → human problem domain interaction
 - general → customization, personalization
 - serendipity → task at hand

L³D's Research Focus and Intellectual Identity

- **design**
 - closed systems
 - developers
 - complete systems
- **meta-design**
 - open systems
 - all stakeholders
 - seeds

- **“gift-wrapping”**
 - adding technology to existing processes
- **co-evolution**
 - reinventing new processes about learning and working and new learning organizations

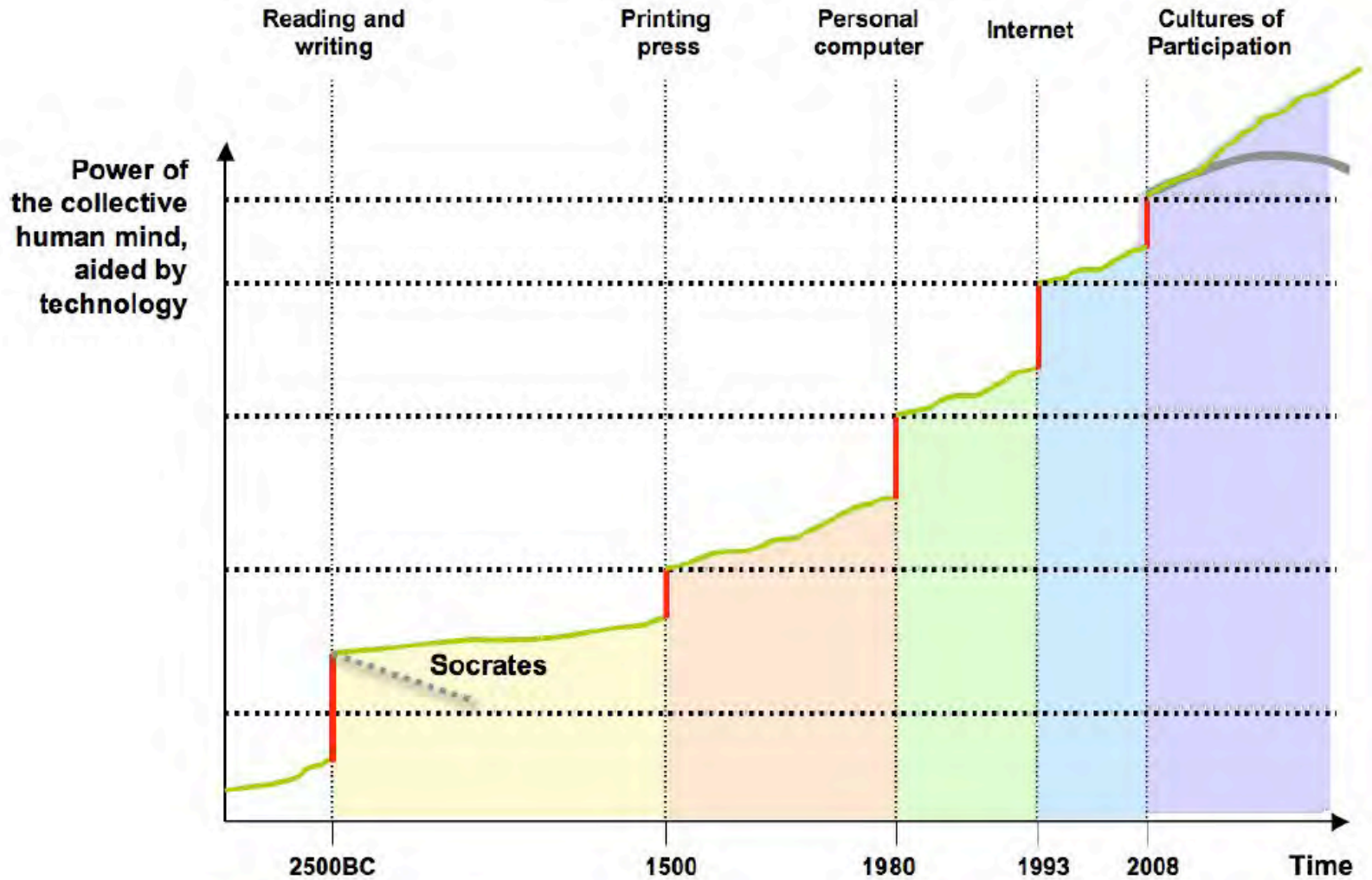
- **desktop**
 - digital
 - desktops / laptops
- **ubiquitous computing**
 - integration of physical and digital
 - going: large (table-tops), small (PDAs), everywhere (RFID)

- **CHIFOO 2009 program**

Collaboration at Work: Putting the Us into the User Experience

- One of the things that makes our field so rich is the multitude of disciplines that must converge to successfully create a new product.
- Topics:
 - How we collaborate at work and with whom?
 - Effective collaboration practices that help unite distributed teams?
 - The role of human-computer interaction in developing new collaborative technologies?
 - How collaborative processes and technologies shape how we solve problems?

Basic Message: Beyond the Unaided, Individual Human Mind



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

DECEMBER 25, 2006 / JANUARY 1, 2007

www.time.com

TIME

PERSON OF THE YEAR



Yes, you.
You control the Information Age.
Welcome to your world.



Consumer and Designers — Beyond Binary Choices

- **claims:**

- there is nothing wrong about being a consumer (watching a tennis match, listening to a concert, ...)
- the same person wants to be a consumer in some situations and in others a designer → consumer / designer is not an attribute of a person, but of a context
consumer / designer ≠ f{person} → 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**

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
- hive mind
- wisdom of crowds
- crowd sourcing
- long tail

→ What is needed:

an analytic model or conceptual framework

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

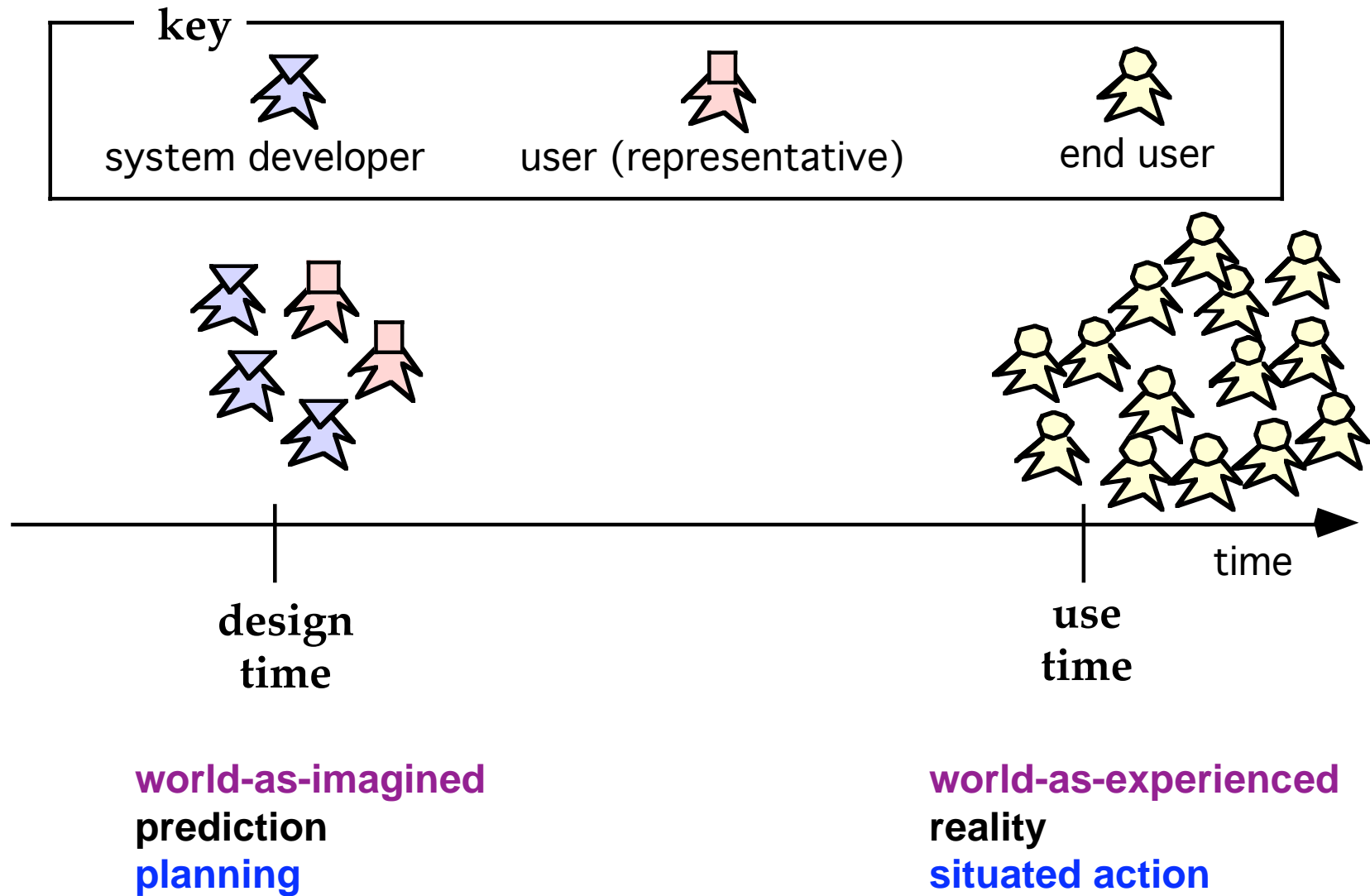
Elements of an Analytic Model: Understanding and Analyzing **Success** and **Failures Models**

- **Wikipedia** = the Drosophila for “cultures of participation”
- **Encyclopedia of Life** = online reference source and database for every one of the 1.8 million species
- **Second Life**
- **Open Source**
- **Google-SketchUp + 3D Warehouse + Google Earth**

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
- **meta-design raises research problems**
 - new **design methodologies**
 - a new understanding of **collaboration, motivation, and creativity**
- **meta-design provides a theoretical framework for Web 2.0 technologies**

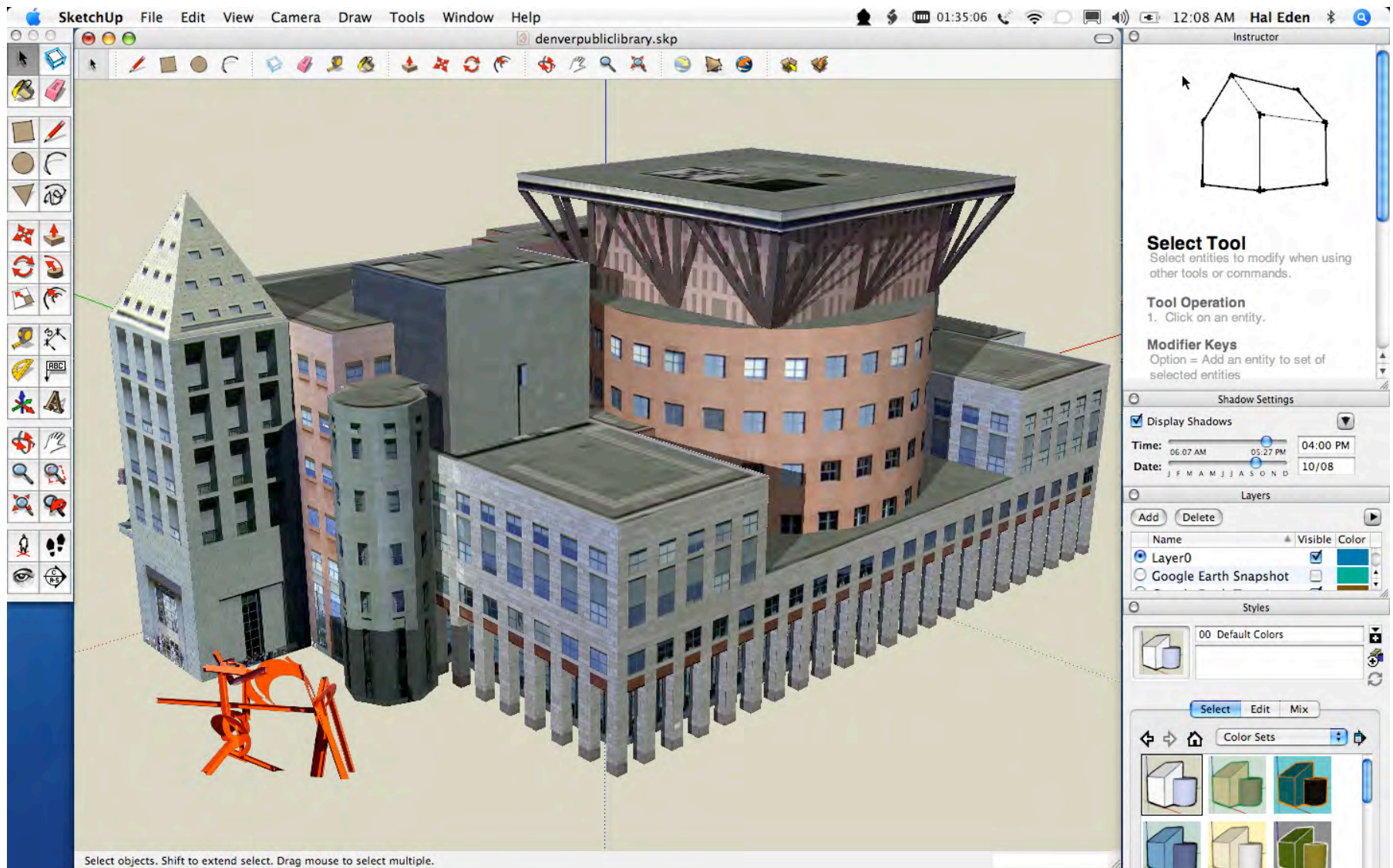
Design Time and Use Time



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)
 - by supporting **remixability**

SketchUp — a high-functionality 3D Modeling Environment



3D Warehouse: a Web 2.0 Environment

<http://sketchup.google.com/3dwarehouse/>

▪ features:

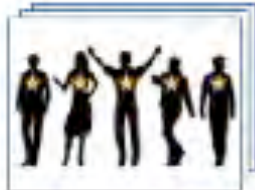
- search, share, and store 3D models created in SketchUp
- models include: buildings, houses, bridges, sculptures, cars, people, pets, ...
- download the 3D models to be modified in SketchUp
- if the model has a location on earth → download it and view it in Google Earth

▪ challenges:

- what will **motivate** people to participate?
- participation requires acquiring skills in using SketchUp → create **learning environments** for SketchUp

3D Warehouse

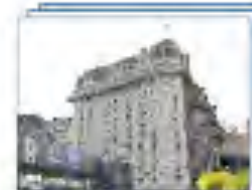
3D Building Collections



[Featured Google Earth Modelers](#)

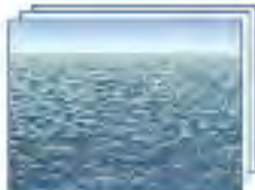


[Help Model a City](#)



[Featured Google Earth Collections](#)

Featured Collections



[Google Earth - Ocean Layer](#)



[SketchUp Components](#)



[Interior Furnishings](#)

Popular Models



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



[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***

(Social) Creativity

- a **great interest** in recent years
- **creativity: beyond productivity** — National-Research-Council (2003):
“*Beyond Productivity: Information Technology, Innovation, and Creativity*”,
National Academy Press, Washington
- **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:**
 - **collaborative design** (e.g. 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

- **with the EDC, we explore themes in:**
 - **Computer Science:** table-top, computationally enriched physical objects, visualization
 - **Cultures of Participation:** Communities of Interest, emergence, boundary objects, reflection in action, reflective communities

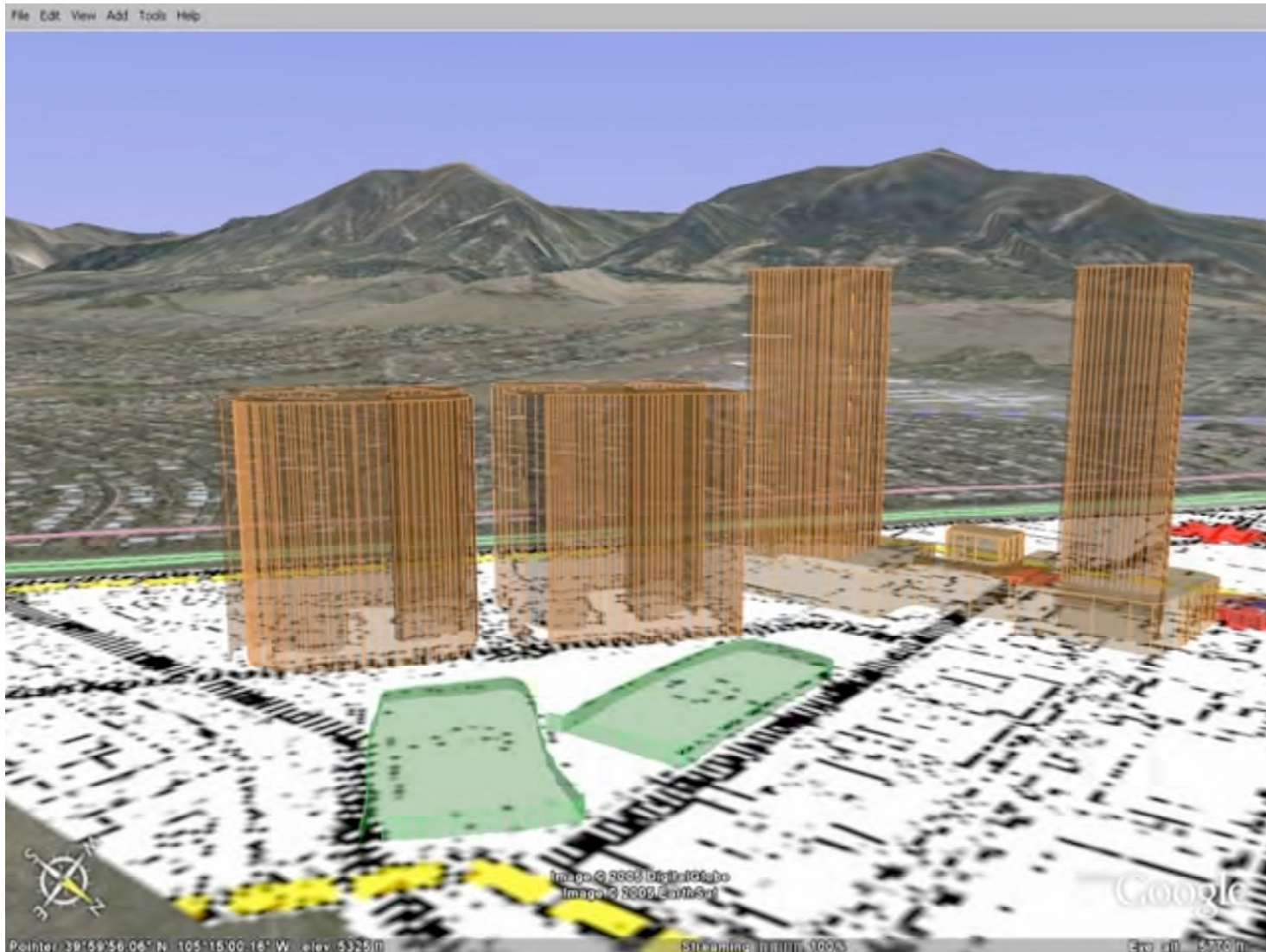
The Envisionment and Discovery Collaboratory



Boulder City Council and University of Colorado Regents



Buildings Sketched into a Google-Earth Client



Fat-Pencil Technologies and Incremental Formalization



The Future: Virtual Versions of the EDC in Second Life / OpenSim



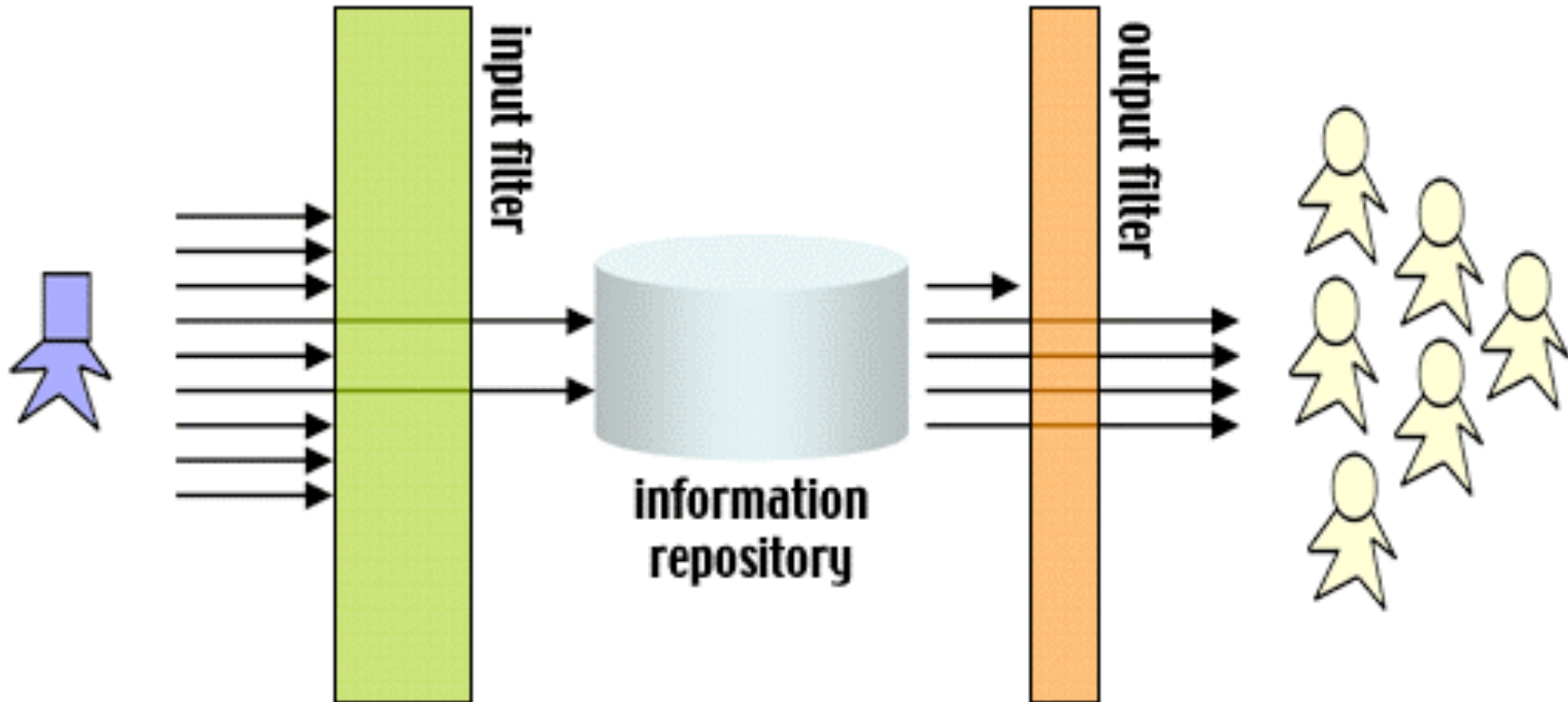
Research Challenges

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

- “**Long Tail**” theory → from business to education

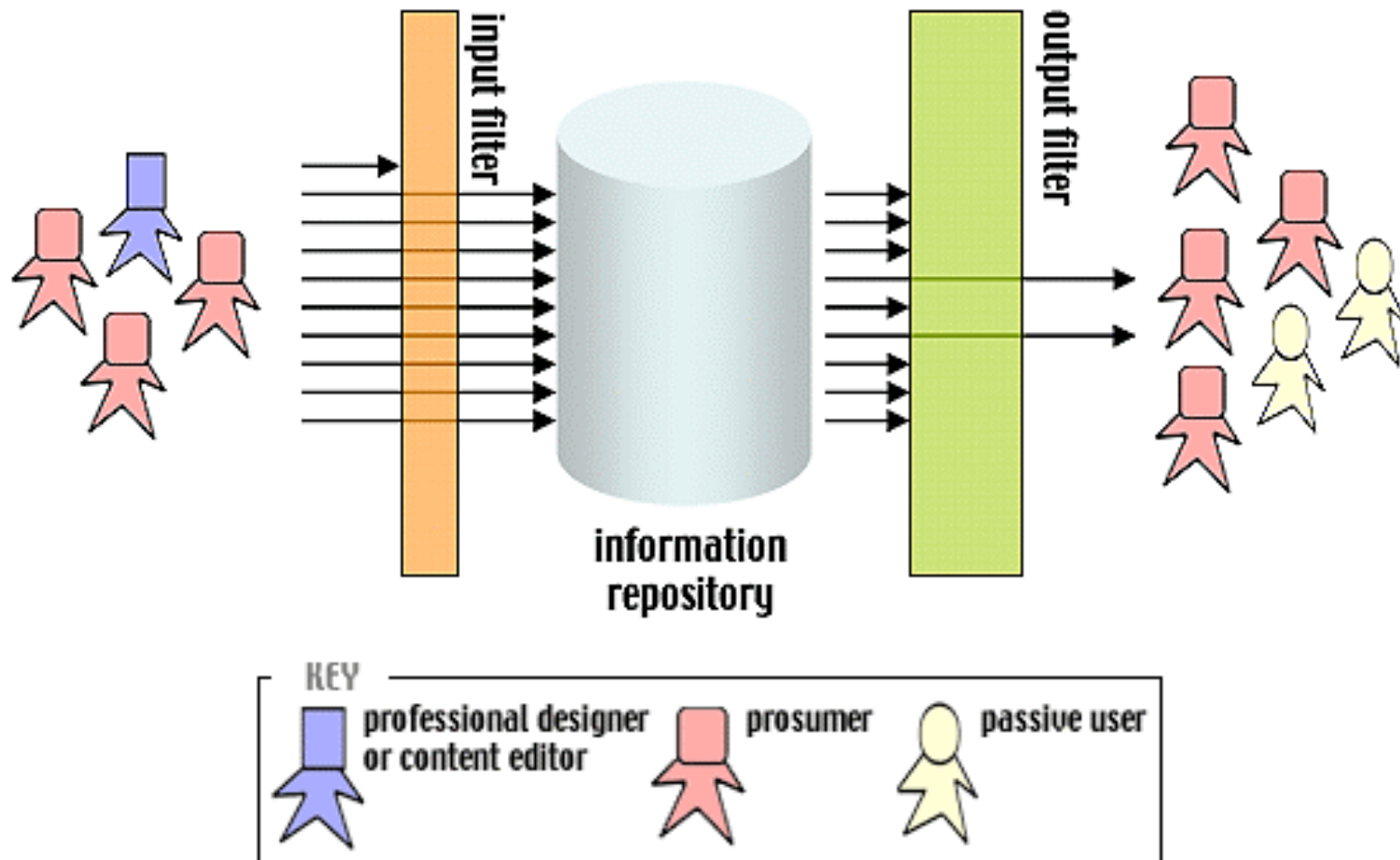
Model Authoritative underlying Consumer Cultures

- **“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:** our culture and economy is increasingly shifting away from a focus on a relatively small number of “hits” (mainstream products and markets) at the head of the demand curve and toward a huge number of niches in the tail
- **main opportunity — 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 and other bottlenecks of distribution, narrowly-target goods and services can be as economically attractive as mainstream fare.

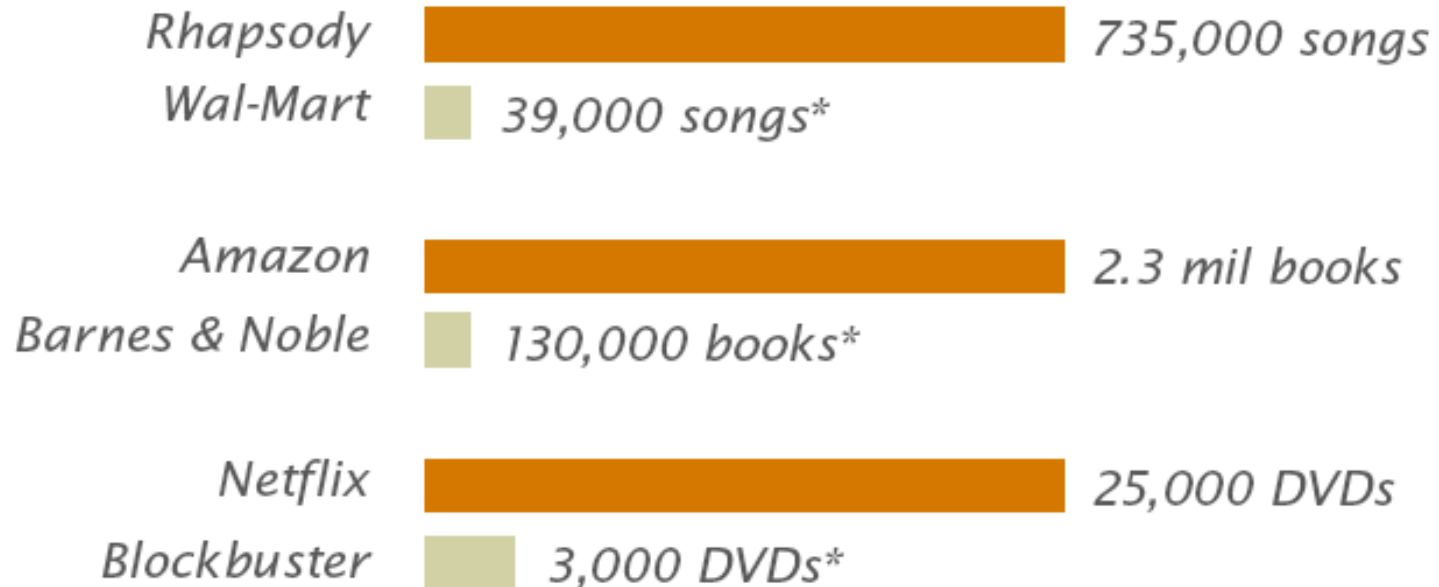
Exploiting “Long Tail” Opportunities in Business



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>

- the **opposite** of: cultural literacy (Hirsch), No Child Left Behind,
- **basic belief**: all people are interested in **something** (Viking Ships, Dinosaurs, gambling, Nuremberg trials, White Rose, Castles in Northern Germany,)
- a **new synergy and hybrid model**: integrate basic knowledge and skills (head of the long-tail) and idiosyncratic interests and passion (tail of the long-tail) → create 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: interest and passion, self-directed learning and 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”

Castles in Northern Germany



[Bergedorfer Castle](#)

by [picturemaker](#)

In Hamburg in the middle of a...

[History](#)

[View in Google Earth](#)

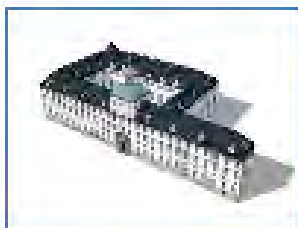


[Schloss Richmond](#)

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 show below)
- 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 and social creativity** are prerequisites to bring **cultures of participation** alive

References for Cultures of Participation (Global)

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- **democratizing innovation** → von Hippel, E. (2005) *“Democratizing Innovation”*
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