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

Cultures of Participation and Social Computing: Rethinking and Reinventing Learning and Education

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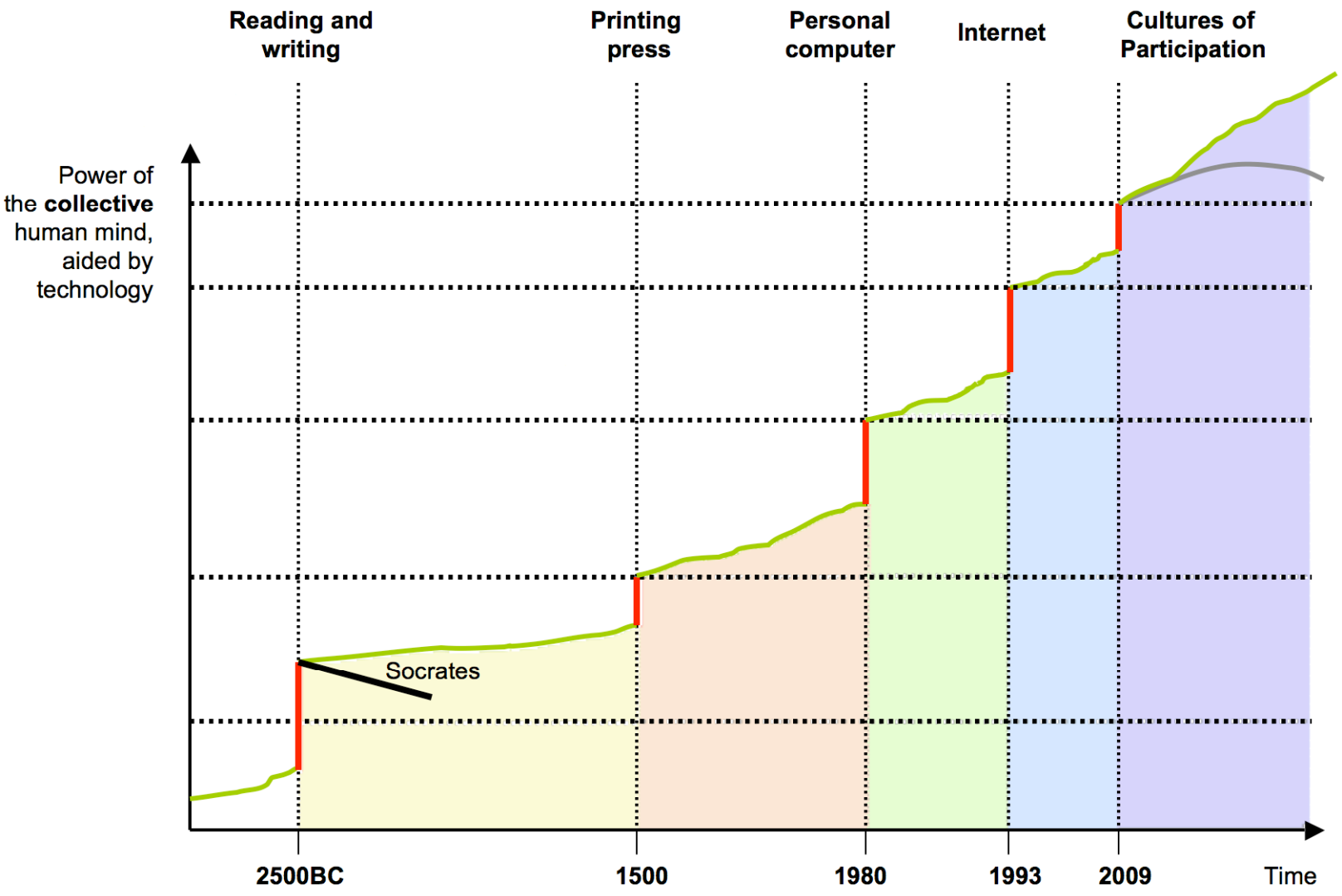
Outline

- **Basic Message**
- **Cultures of Participation**
- **Social Computing**
- **Rethinking and Reinventing Learning and Education**
- **Theoretical Frameworks**
  - Meta-Design
  - Social Creativity
- **Examples of Advanced Learning Technologies**
- **Research Challenges and Conclusions**

Basic Message: Beyond the Unaided, Individual Human Mind



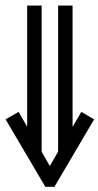
Cultures of Participation

—

Fundamental Challenge and Opportunity

consumer cultures

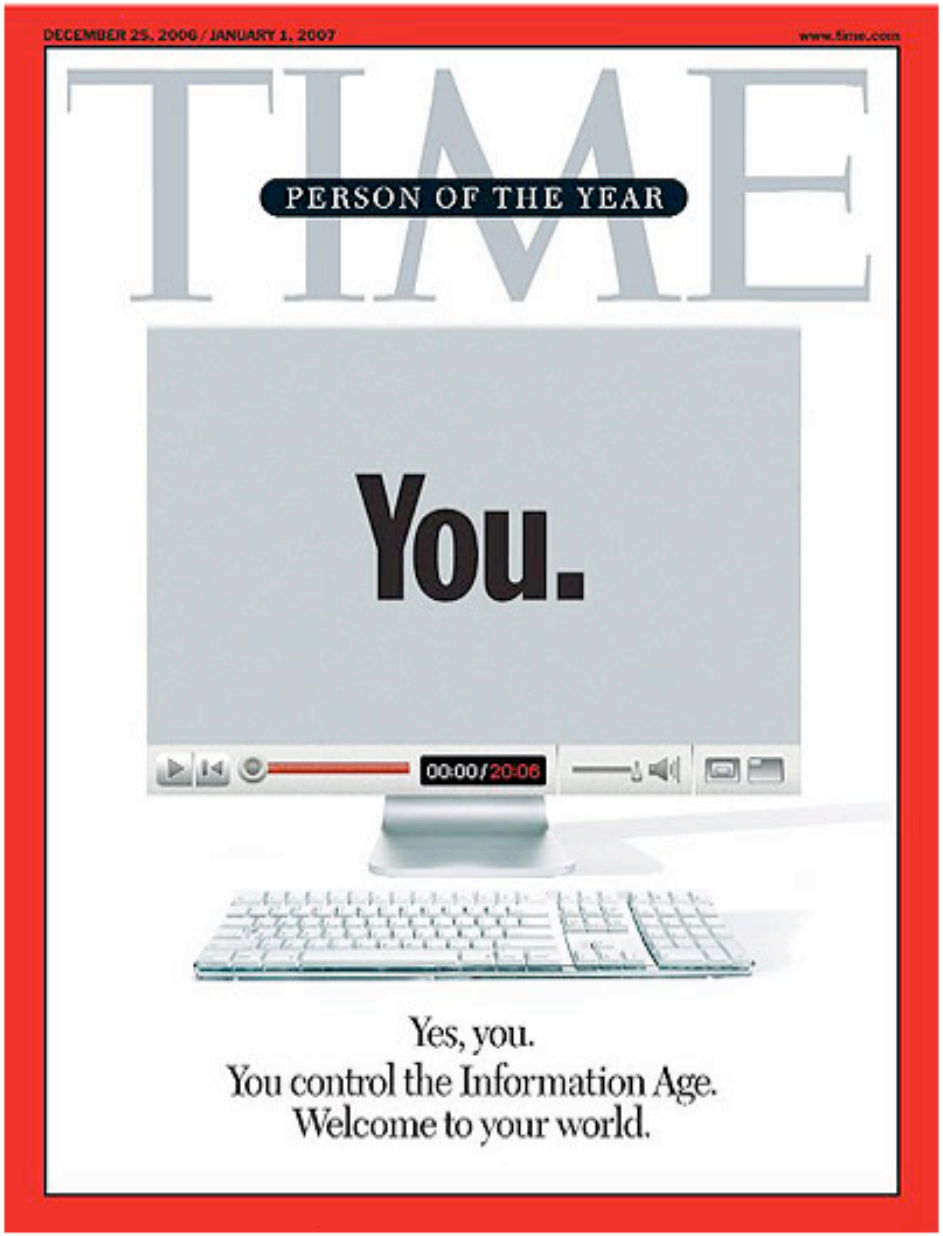
focus: produce finished goods to be consumed passively



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
You.
00:00/20:06
Yes, you.
You control the Information Age.
Welcome to your world.


THE IMMIGRATION WAR • PANDA POLITICS
April 3, 2006 : $3.95
newsweek.msnbc.com
Putting
The 'We' in
WEB
NEXT FRONTIERS From MySpace
To Flickr and YouTube,
User-Generated Sites
Are Rocking the Internet

Social Computing — Some Application Domains

- 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 and Social Computing

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

→ **What is needed:**

a theoretical 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**
- **CreativeIT Wiki**
- **Envisionment and Discovery Collaboratory**

Rethinking and Reinventing Learning and Education

- **many "Advanced Learning Technologies" approaches are too timid and not thinking radically enough**
  - by focusing **only on learning in schools**
  - by **not embracing new learning opportunities** facilitated by social computing (
  - by **not moving beyond "gift-wrapping" and "techno-determinism"** to co-evolution of learning, new media, and new learning organizations

- **challenges:** create a **transformational theoretical framework**

A Transformational Conceptual Framework

▪ school learning	→	**lifelong learning**
▪ unaided individual human mind	→	**distributed intelligence**
▪ "gift-wrapping" and "techno-determinism"	→	**socio-technical environments**
▪ consumers	→	**active contributors (meta-design)**
▪ learning when the answer is known	→	**learning when no one knows the answer (social creativity)**

Major Eras of Education

- **apprenticeship era:** personal, resource intensive, and engaging
- **schooling era:** mass oriented, efficient, and bureaucratic
- **lifelong learning era:** powerful new digital tools (distributed intelligence), interactive, customized, self-directed, collaboration (face-to-face and virtual)

How the World Has Changed

dimension	old paradigm	new paradigm
information	scarce	plentiful (information overload)
reproduction of documents	expensive and restricted	cheap
specialization	low	high
change within a human life time	slow	fast
interaction / collaboration	physical proximity	shared professional interests
economy	rigid, hierarchical organizations, long-term personal identity	dynamic economy, flexibility, networking, no long-term

How the World Has Changed

dimension	old paradigm	new paradigm
coverage of topics	curriculum	long tail
courses	complete, finished course	course-as-seeds
knowledge accumulation	filter and publish	publish and filter

What's Wrong with the Universities of Today

- **lecture dominated** — emphasizing passive knowledge absorption instead of active knowledge construction
- **curriculum dominated** — little room for authentic, self-directed learning activities, passion, intrinsic motivation
- students solve **given problems** — they do not learn to frame problems
- problems in school have **right or wrong answers** — problem in the real world are wicked, ill-defined, ill-structured
- **closed book exams** — ignoring distributed cognition
- little emphasis on **collaborative learning and communication skills** — working together is regarded as “cheating”

Our Credo of Lifelong Learning

- **assumption**: If the world of working and living relies on *collaboration, creativity, definition and framing of problems* and if it requires dealing with *uncertainty, change, and intelligence that is distributed* across minds, cultures, disciplines, and tools

- **consequence:** then education should foster on competencies that prepare students for having meaningful and productive lives in such a world

Science of Learning

- *"A decade of interdisciplinary research on everyday cognition demonstrates that school-based learning, and learning in practical settings, have significant discontinuities.* ***We can no longer assume that what we discover about learning in schools is sufficient for a theory of human learning****."* — Scribner and Sachs

- *"In important transformations of our personal lives and organizational practices, we must learn new forms of activity which are not there yet. They are literally learned as they are being created.* ***There is no competent teacher****. Standard learning theories have little to offer if one wants to understand these processes."* — Yrjö Engeström

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} → 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)

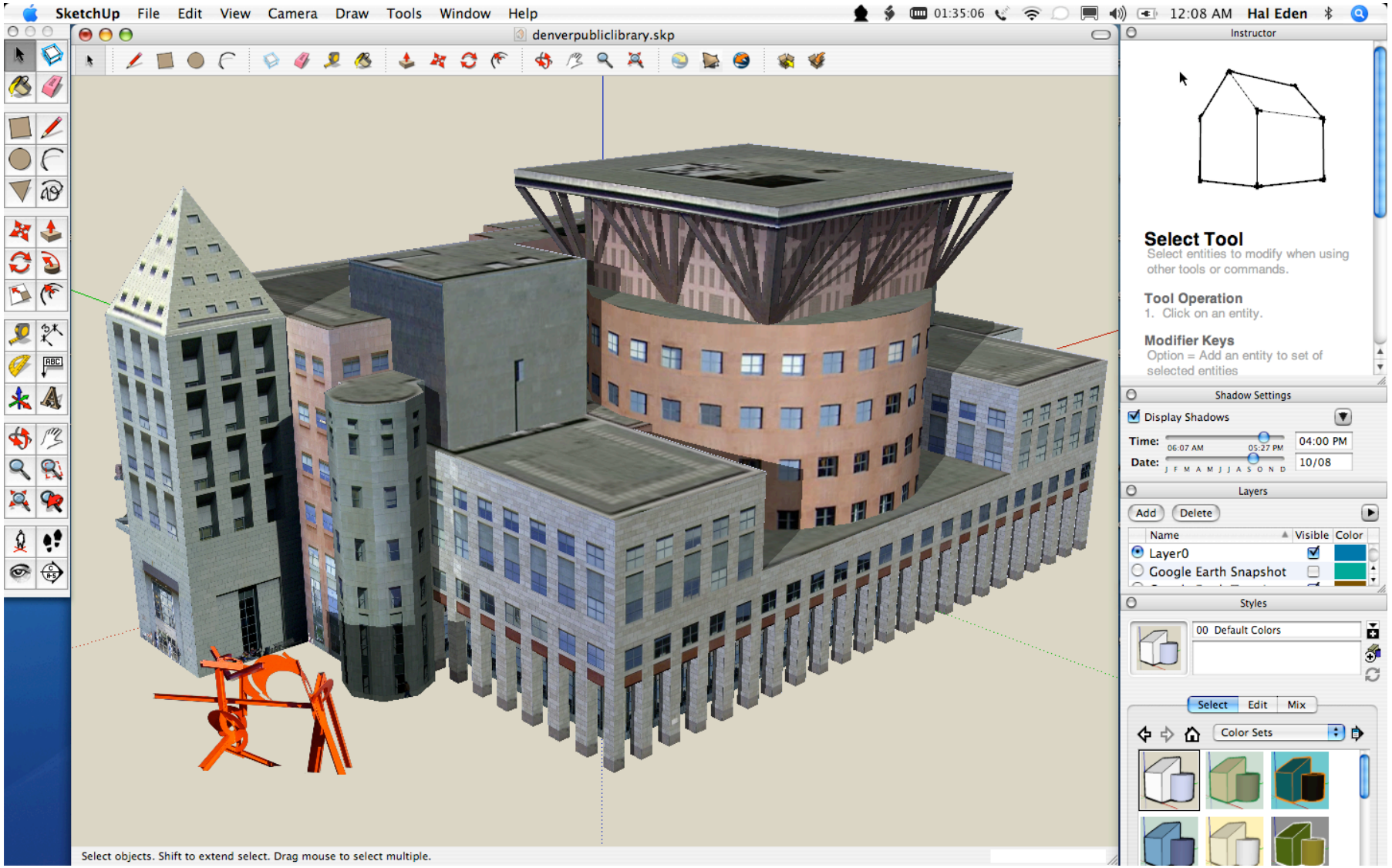
- **a meta-design perspective for education:**
  - dePaula, R., Fischer, G., & Ostwald, J. (2001) "Courses as Seeds: Expectations and Realities." In Proceedings of the European Conference on Computer-Supported Collaborative Learning, Maastricht, Netherlands, pp. 494-501.
  - Fischer, G. (2007) "Designing Socio-Technical Environments in Support of Meta-Design and Social Creativity." In Proceedings of the Conference on Computer Supported Collaborative Learning (CSCL '2007)

Example-1: the World in 3D and and Google Earth

CU Boulder in 3D

Downtown Denver in 3D

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

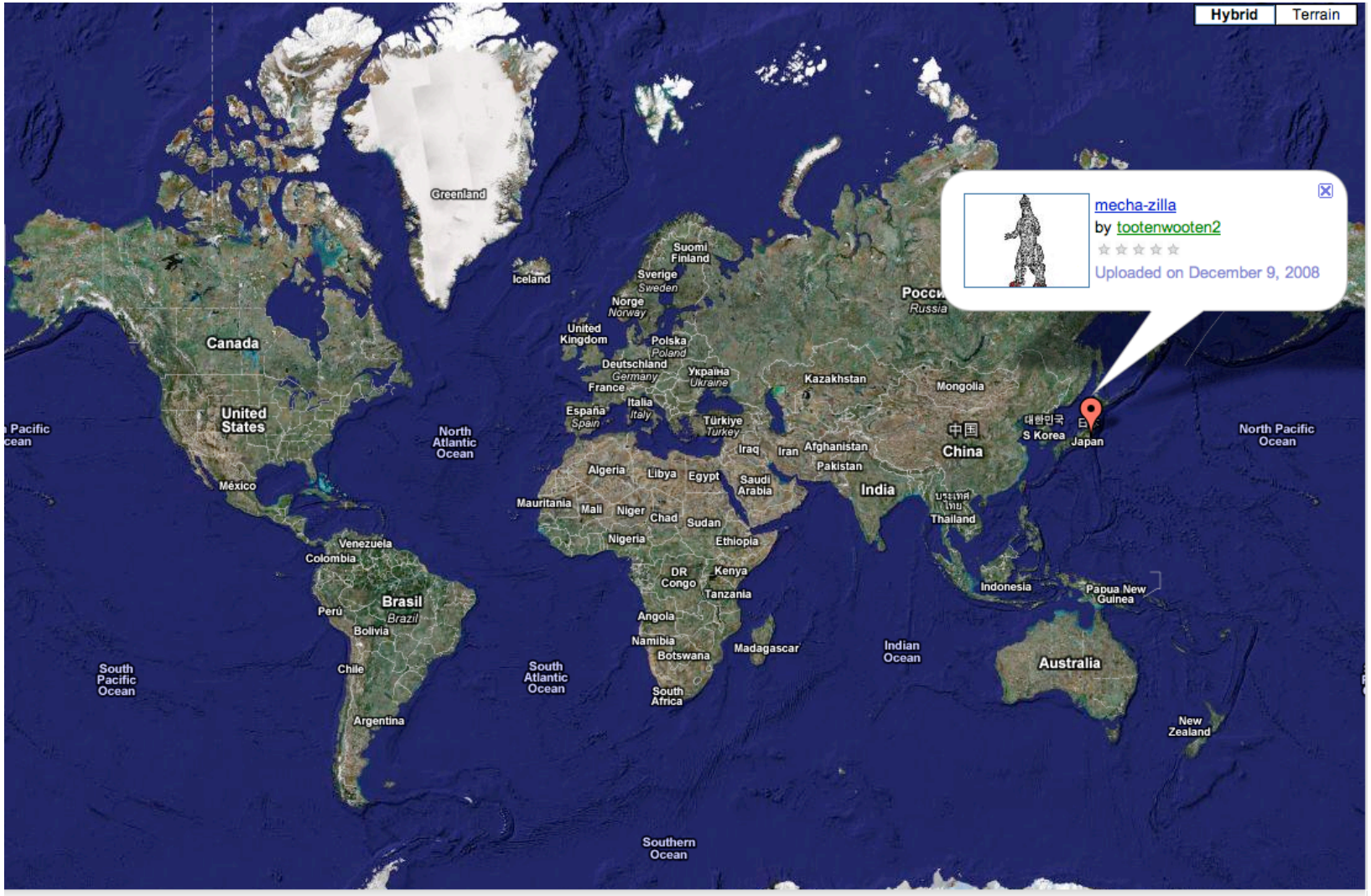
Egg Chair
by Mart

Chair
by Yeroc

People
by Graphic Sketchbook

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

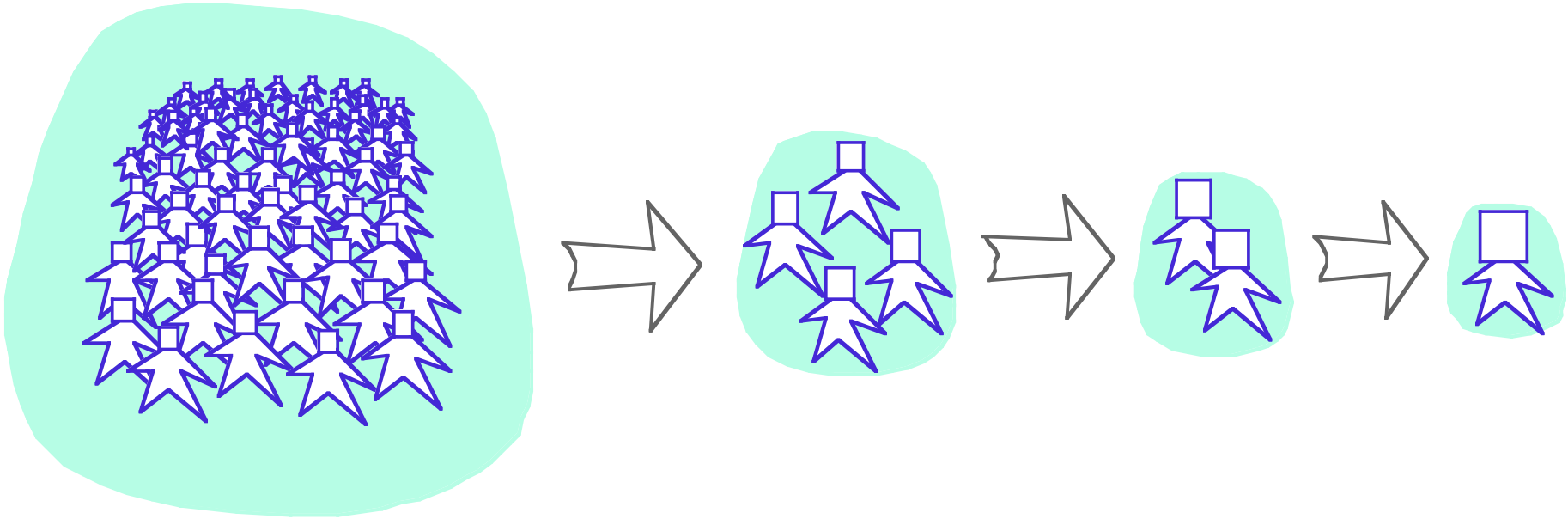
http://sketchup.google.com/3dwarehouse/modelcycle?scoring=d



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



passive users
active users

contributors
raters
taggers

curators

defining
contexts

(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"

Example-2 — 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

- **symmetry of ignorance**
  - none of us knows everything
  - each of us knows something

- **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

Example-3: Envisionment and Discovery Collaboratory (EDC)

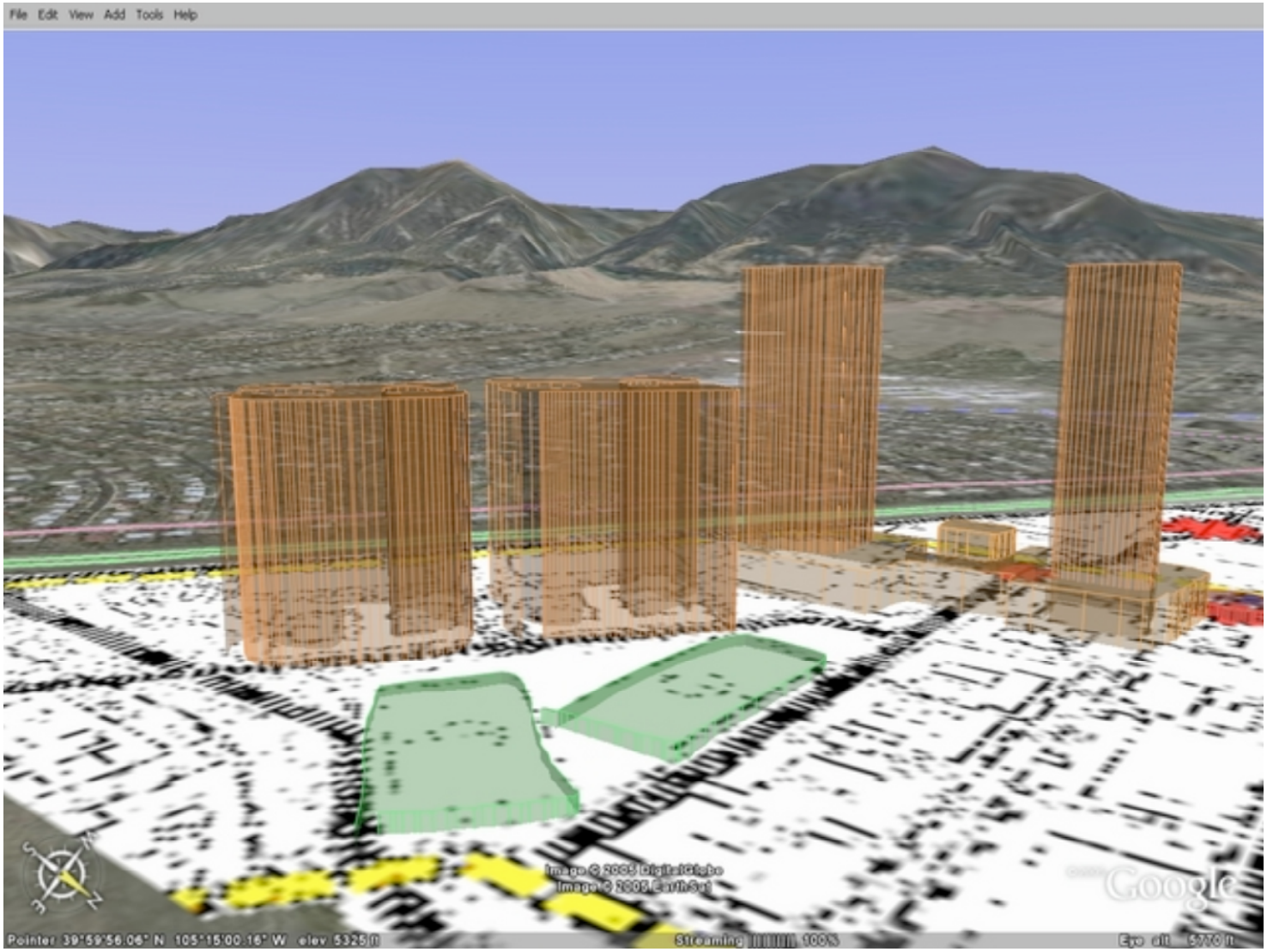
- **the EDC supports and fosters Cultures of Participation:**
  - **collaborative design** → in: urban planning, emergency management
  - **social creativity** → learning when no one knows the answer
  - **meta-design** → a version of SimCity in which content is generated by users

- **the EDC explores innovative themes in Advanced Learning Technologies**
  - table-top computing
  - computationally enriched physical objects
  - visualization

The Envisionment and Discovery Collaboratory

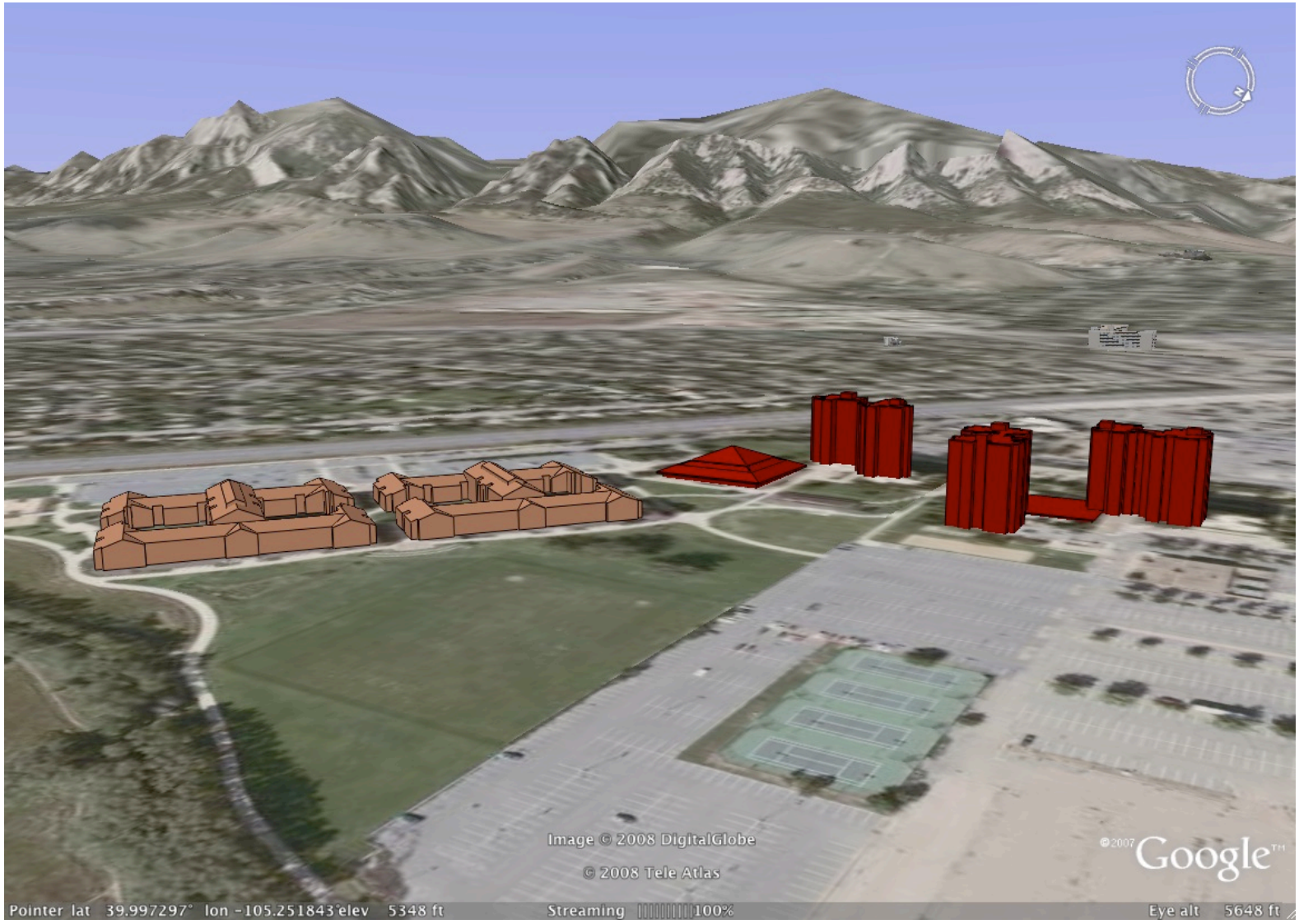
Boulder City Council and University of Colorado Regents

Buildings Sketched into a Google-Earth Client



Incremental Formalization

<<Buildings from the 3DWarehouse>>



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

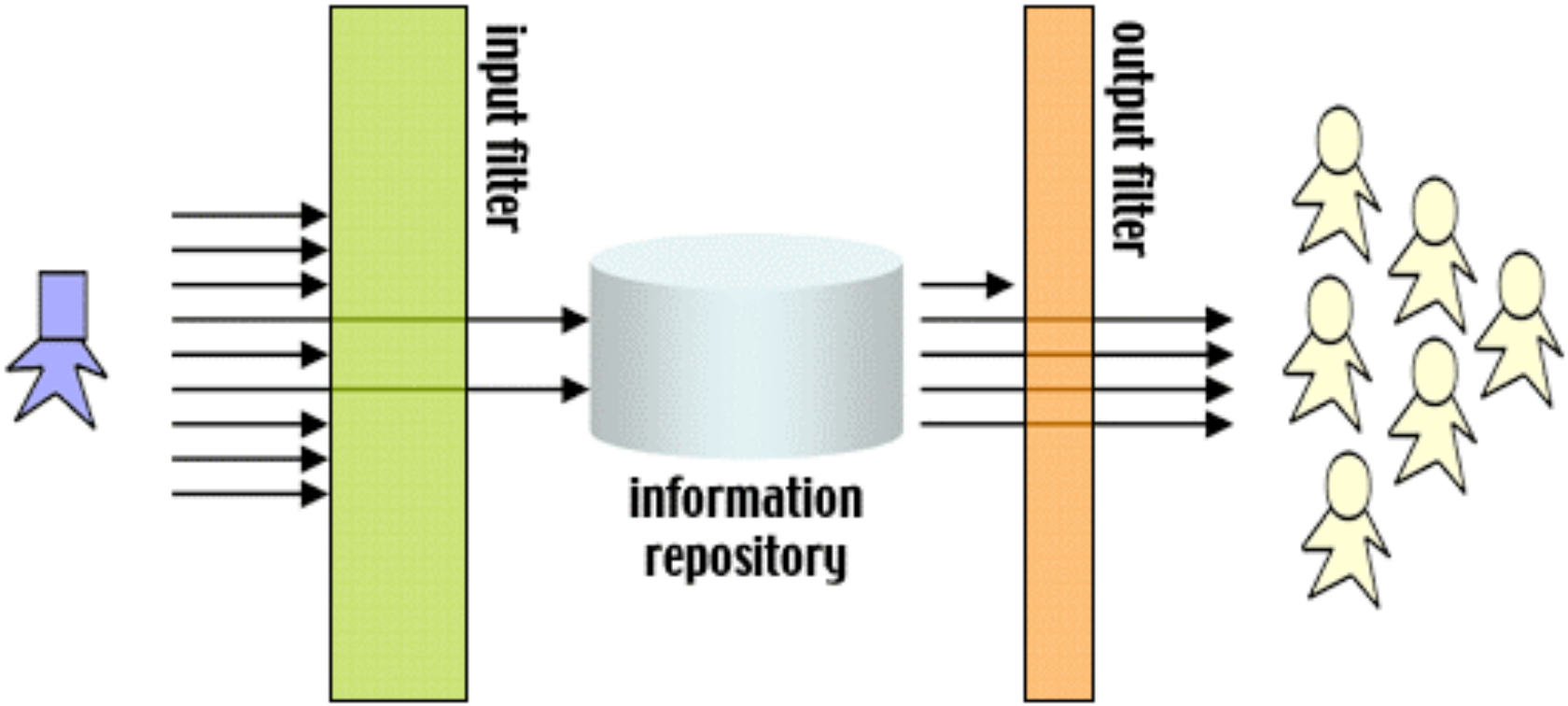
Implications and Challenges

- **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

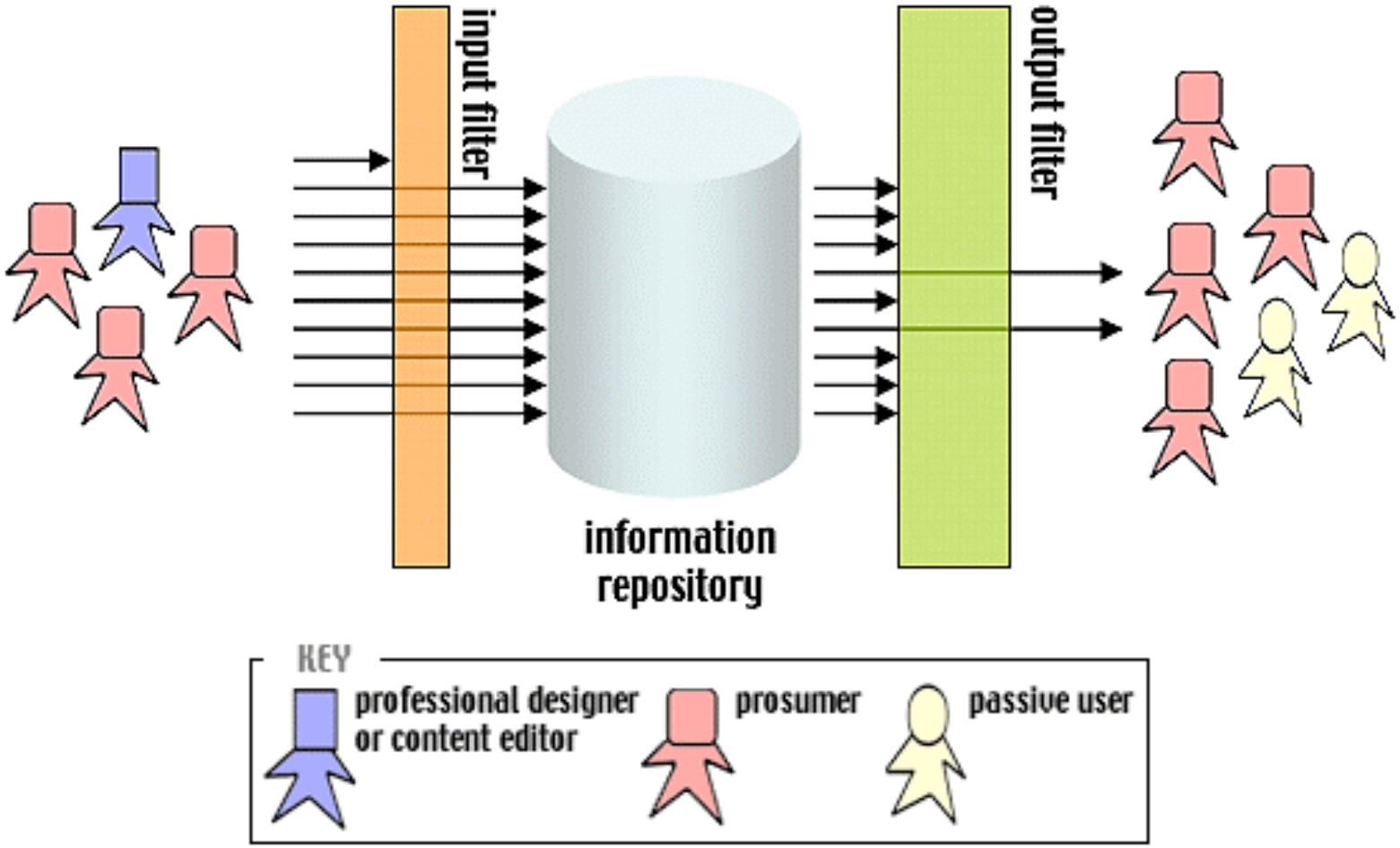
Model Authoritative underlying Consumer Cultures

- **"Filter and Publish":** Strong Input Filters, Small Information Repositories, Weak Output Filters
- **Limitation:** Making All Voices Heard



Model Democratic underlying Participation Cultures

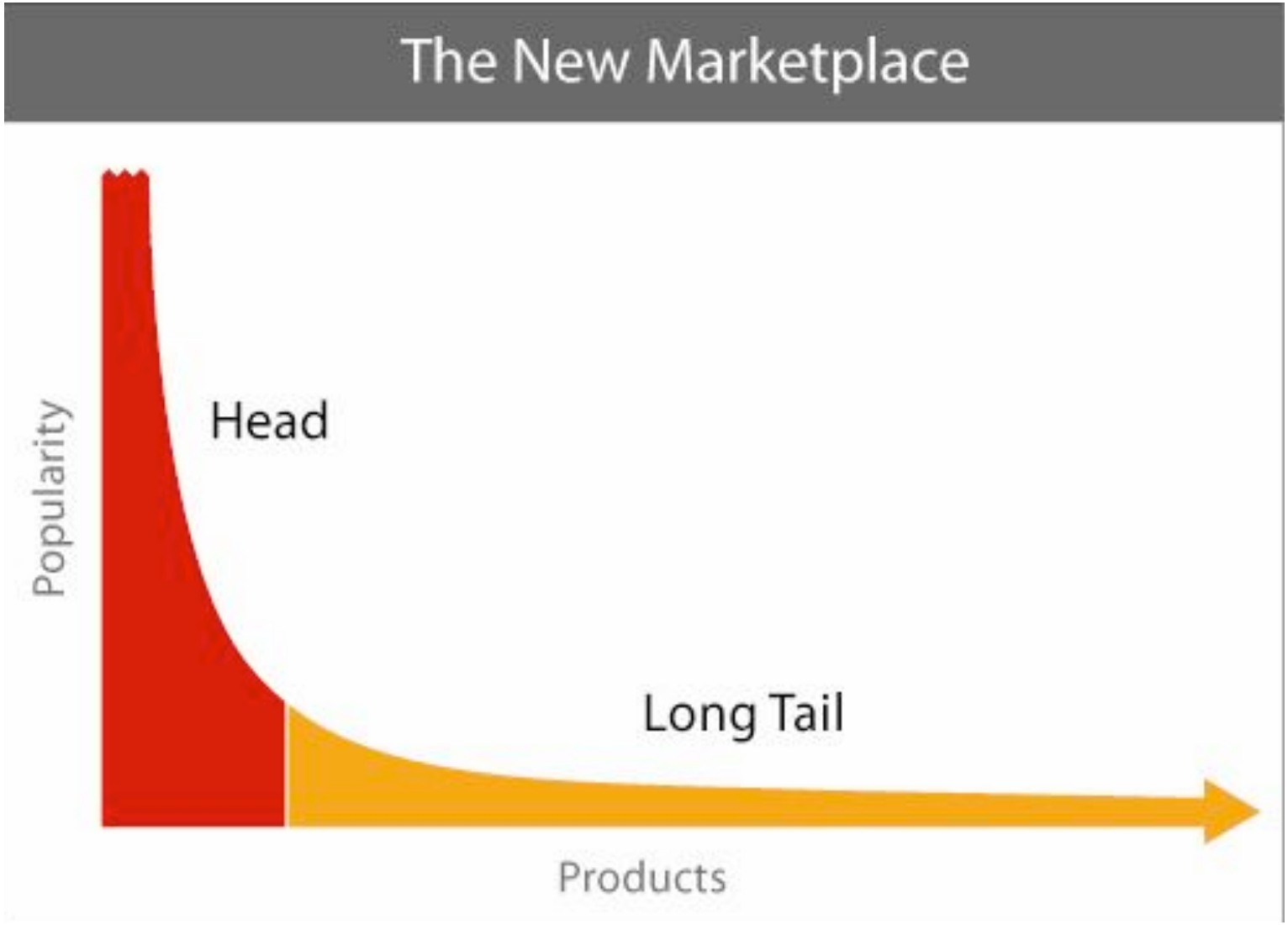
- **"Publish and Filter":** Weak Input Filters, Large Information Repositories, Strong Output Filters
- **Limitation:** Trust and Reliability of Information



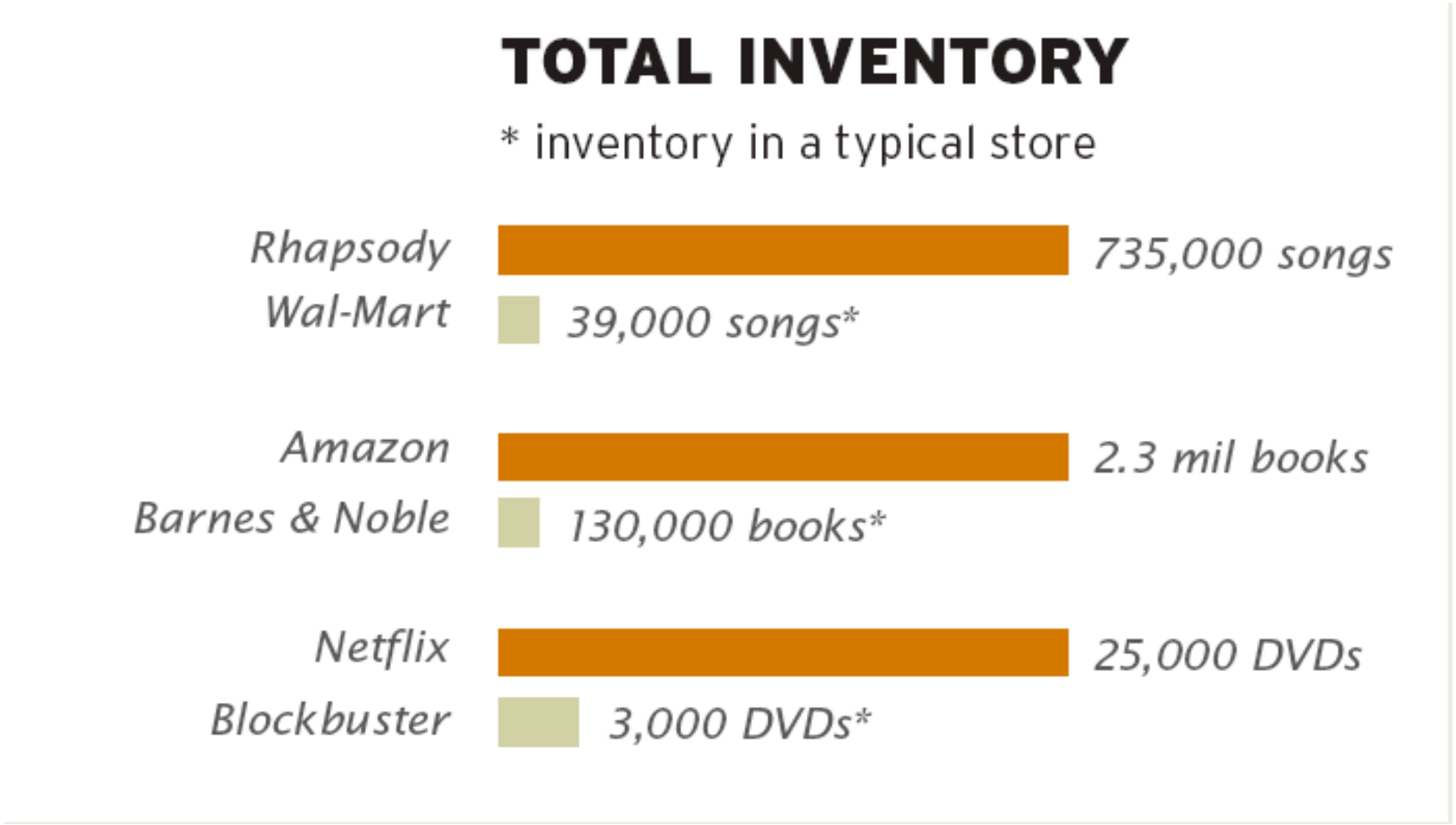
The Long Tail

- **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



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, ….

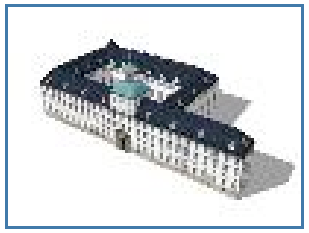
Castles in Northern Germany in the 3D Warehouse

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: The Future of Advanced Learning Technologies

- **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** → 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 and social computing**

- **my personal belief:** these objectives provide important and exciting challenge for **Advanced Learning Technologies (ICALT)**

Conclusion: Changes and Innovations

- the future is not out there to be discovered — it has to be **invented and designed**

- **Machiavelli:** *"People who want to change institutions, have all those as their enemies who have done well under the old conditions"*

- **Winston Churchill:** *"This is not the end. It is not even the beginning of the end. But it is, perhaps, the end of the beginning."*