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

Cultures of Participation

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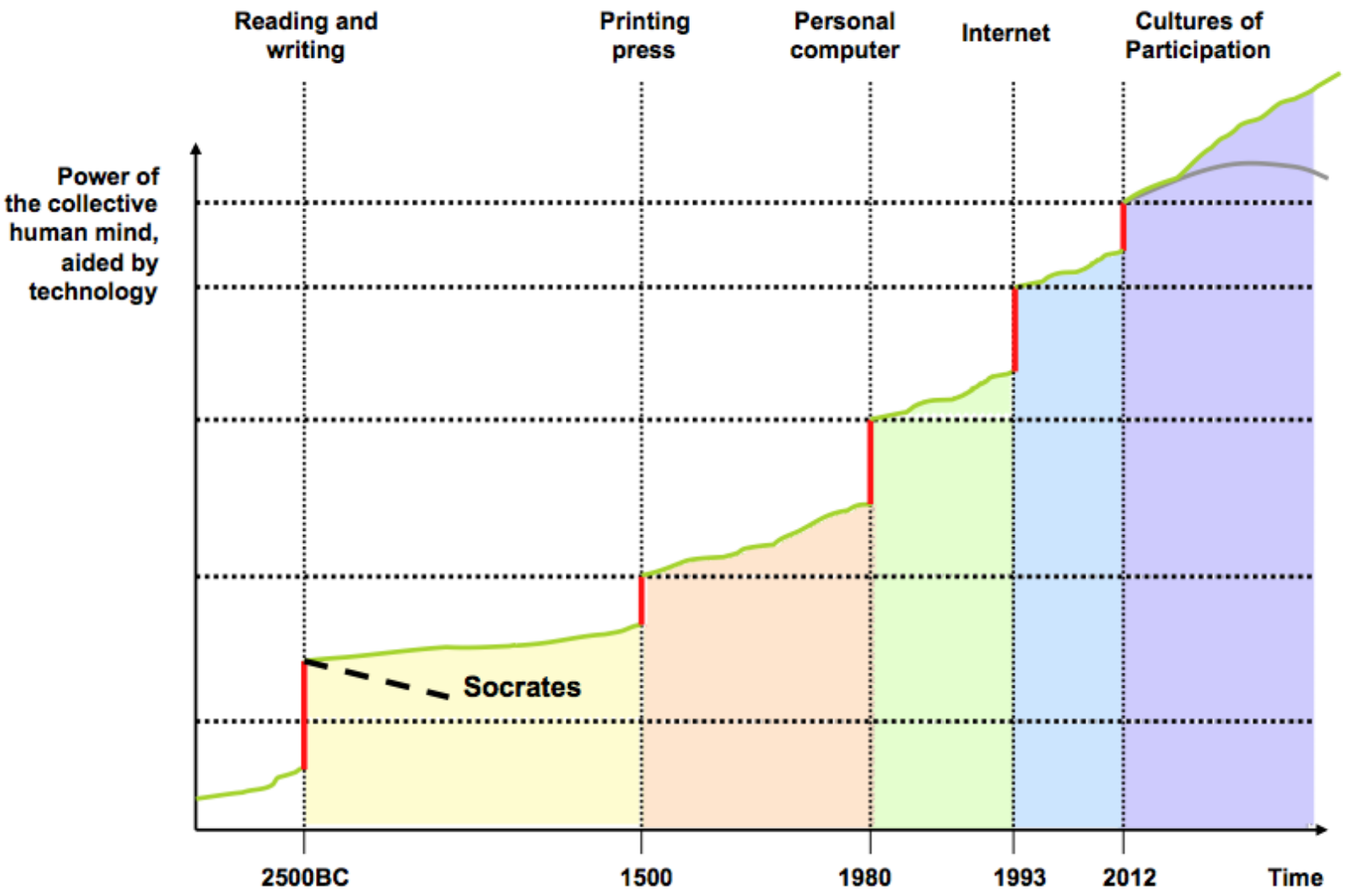
Outline

- **Basic Message**
- **Cultures of Participation**
- **Examples of Innovative Socio-Technical Environments**
- **Conceptual Frameworks for Cultures of Participation**
- **Research Challenges**
- **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

Examples

Warren Miller's Ski Movie

- *http://www.youtube.com/watch?v=jqBkf5ibktU&feature=related*
- *3:54 minutes*
- *134,671 views + high production values → seen by many more people*

Gerhard's YouTube movie

- *http://www.youtube.com/watch?v=5u3bi9KoDNk*
- *1:37 minutes*
- *205 views + low production values → seen by friends + some others????*
- ***use of this movies:***
  - *to tell others about heli-skiing*
  - *to submit it as "application material"*
  - *to remember the vacation*
  - *personally meaningful*
- ***technologies + knowledge how to use this technologies:***
  - *camera to record it + uploading it to a computer*
  - *movie editing + uploading it to Youtube*

Consumer Cultures

- **Examples:**
  - Television audiences
  - Students in an instructionist classroom
  - RO (= Read Only) culture (Lessig)

- **References:**

  - Postman, N. (1985) Amusing Ourselves to Death—Public Discourse in the Age of Show Business, Penguin Books, New York.
  - Fischer, G. (2002) Beyond 'Couch Potatoes': From Consumers to Designers and Active Contributors, in Firstmonday (Peer-Reviewed Journal on the Internet), available at http://firstmonday.org/issues/issue7_12/fischer/.
  - Lessig, L. (2008) Remix: Making Art and Commerce Thrive in the Hybrid Economy, Penguin Press, New York.

Comments about Cultures of Participation

- *"The experience of having participated in a problem makes a difference to those who are affected by the solution. People are more likely to like a solution if they have been involved in its generation; even though it might not make sense otherwise"* [Rittel, 1984].

- *"I believe passionately in the idea that people should design buildings for themselves. In other words, not only that they should be involved in the buildings that are for them but that they should actually help design them"* [Alexander, 1984].

- *"The hacker culture and its successes pose by example some fundamental questions about human motivation, the organization of work, the future of professionalism, and the shape of the firm"* [Raymond & Young, 2001].

- *"Users that innovate can develop exactly what they want, rather than relying on manufacturers to act as their (often very imperfect) agents"* [von Hippel, 2005].

- *"The networked environment makes possible a new modality of organizing production: radically decentralized, collaborative, and nonproprietary"* [Benkler, 2006].

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***

Cultures of Participation — Application Domains

- Web 2.0
- Learning 2.0
- President 2.0
- Science 2.0
- Digital Libraries 2.0
- Electricity 2.0 (Smart Grids)
- Health 2.0
- Crisis 2.0 (CNN versus Bloggers, Twitter, ……)

Cultures of Participation — Concepts

- 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

Environments Created by Cultures of Participation

Site	Objectives and Unique Aspects
Wikipedia	web-based collaborative multilingual encyclopedia with a single, collaborative, and verifiable article; authority is distributed (http://www.wikipedia.org/)
iTunes U	courses by faculty members from "certified institutions"; control via input filters; material can not be remixed and altered by consumers (http://www.apple.com/education/itunes-u/)
YouTube	video sharing website with weak input filters and extensive support for rating (http://www.youtube.com/)
Encyclopedia of Life (EoL)	documentation of the 1.8 million known living species; development of an extensive curator network; partnership between the scientific community and the general public (http://www.eol.org/)
SketchUp and 3D Warehouse	repository of 3D models created by volunteers organized in collections by curators and used in Google Earth (http://sketchup.google.com/3dwarehouse/)

Environments Created by Cultures of Participation

Scratch	Learning environment for creating, remixing, and sharing programs to build creative communities in education (http://scratch.mit.edu)
Instructables	socio-technical environment focused on user-created and shared do-it-yourself projects involving others users as raters and critics (http://www.instructables.com/)
PatientsLikeMe	collection of real-world experiences enabling patients who suffer from life-changing diseases to connect and converse (http://www.patientslikeme.com/)
Stepgreen	library of energy saving actions, tips, and recommendations by citizen contributors for saving money and being environmentally responsible (http://www.stepgreen.org/)

Examples

Encyclopedia of Life

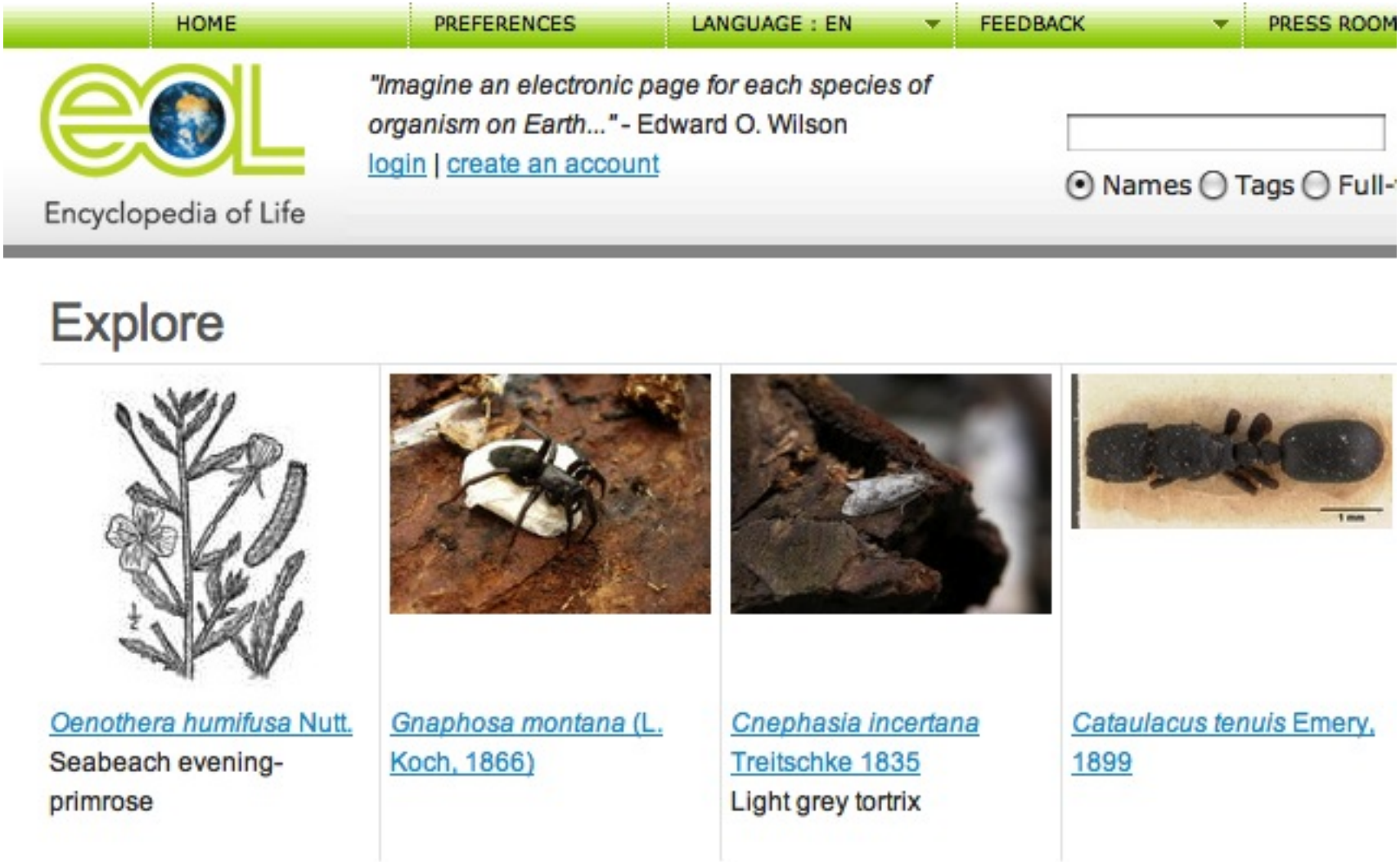
Sketch-Up and 3D Warehouse

The CreativeIT Wiki

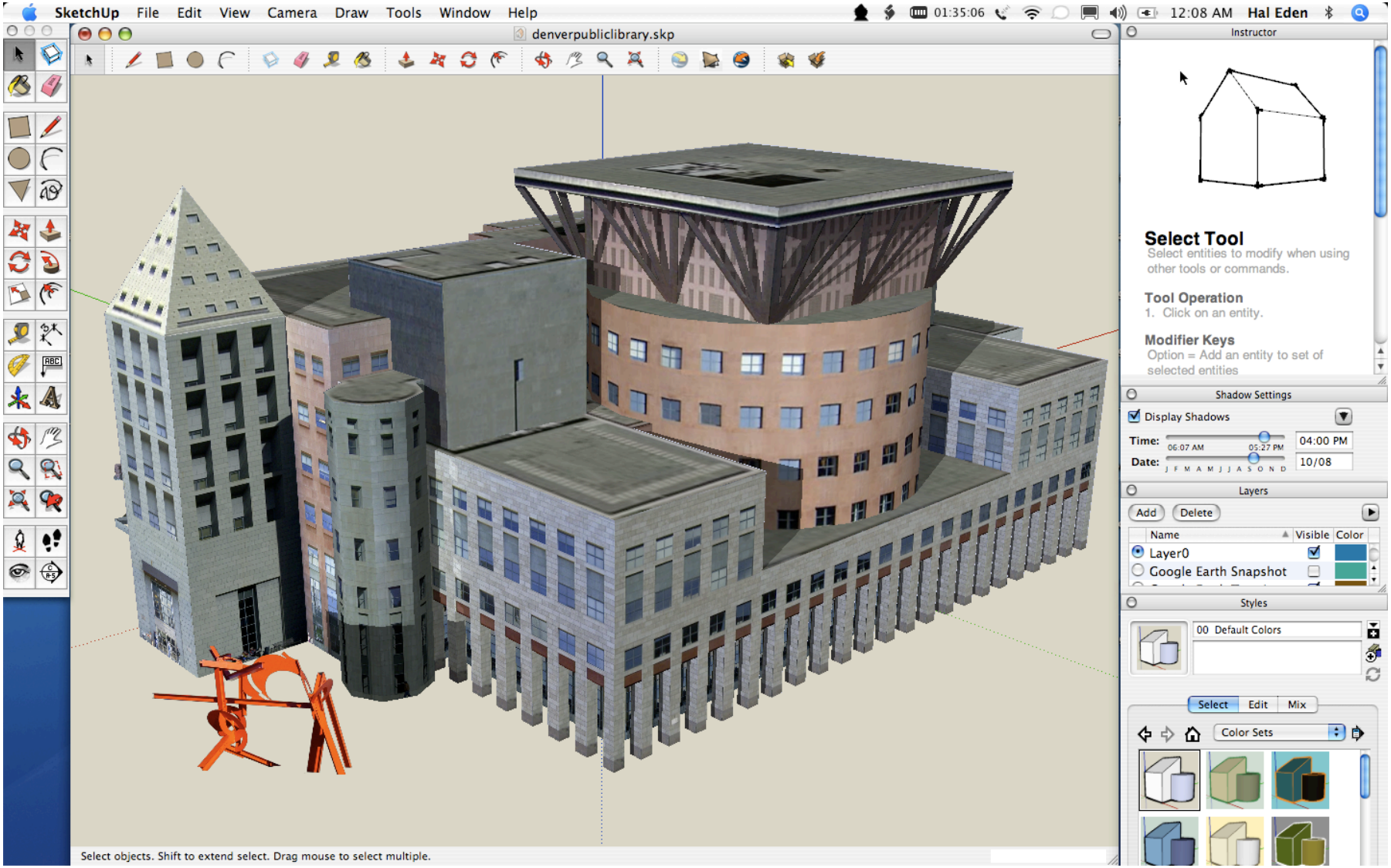
Energy Sustainability

Courses-as-Seeds

Encyclopedia of Life



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 Mart

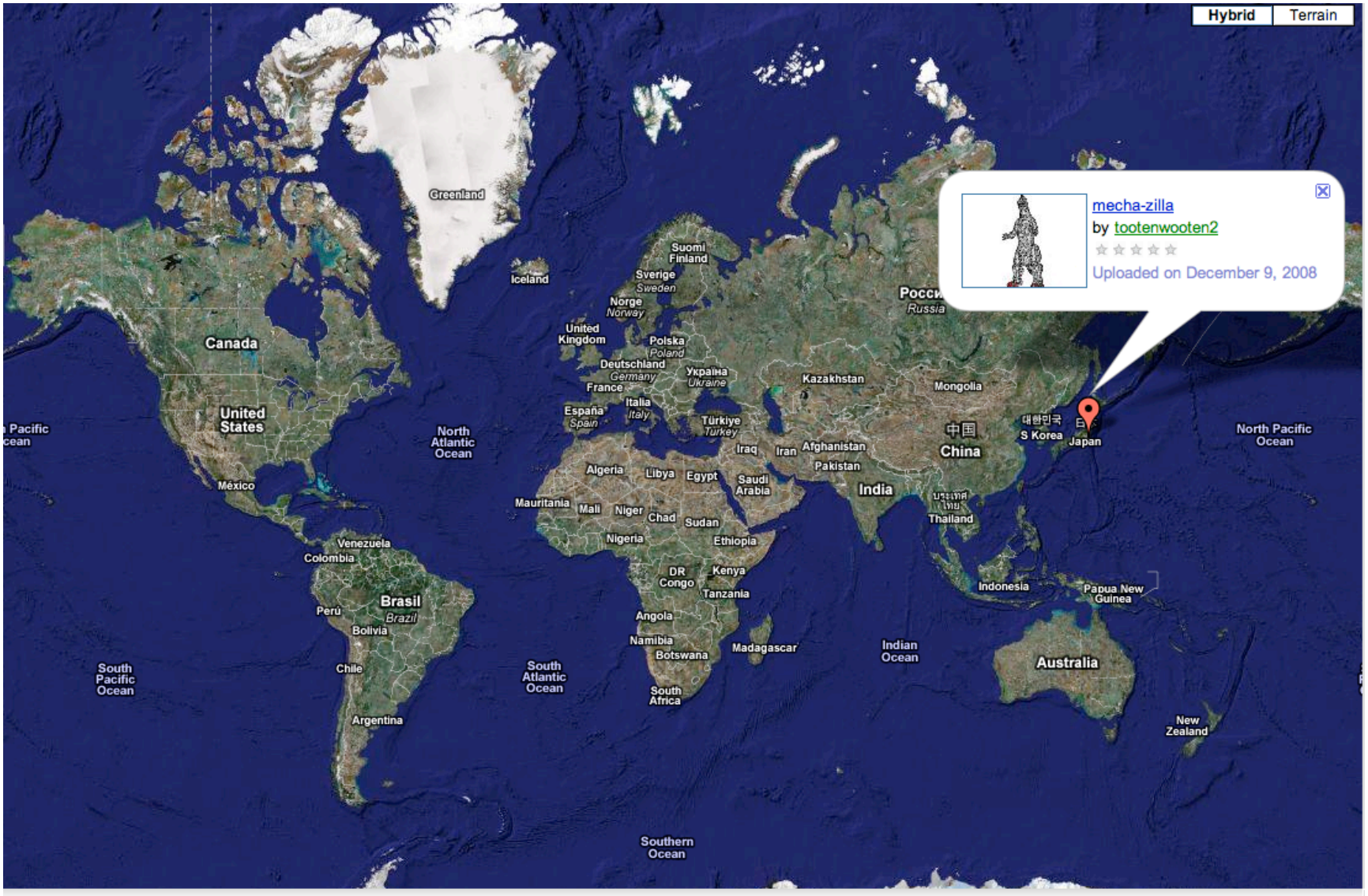
Chair
by Yeroc

People
by Graphic Sketchbook

CU Boulder in 3D

Downtown Denver in 3D

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



The CreativeIT Wiki — http://l3dswiki.cs.colorado.edu:3232/CreativeIT/

Example: Energy Sustainability

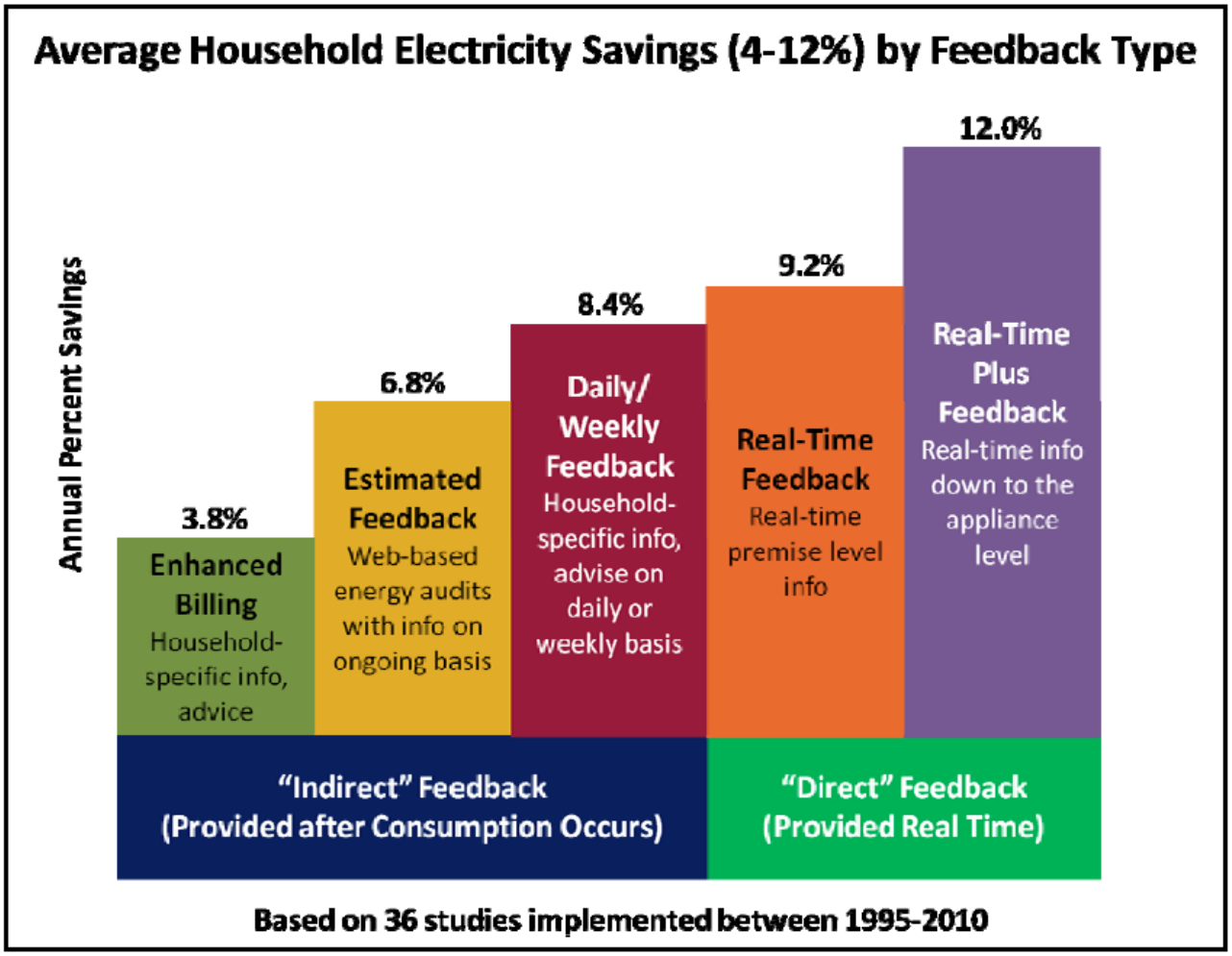
- energy sustainability = a theme of **national and worldwide importance**
- **technical innovations:**
  - Smart Grid + Smart Meters
  - advanced metering infrastructures
- **challenges of harvesting the benefits of technical innovations:**
  - most citizens are unaware of new technological developments **("energy illiteracy")**
  - information presentation is poorly designed
  - feedback alone is not persuasive enough to change human behavior
- **claim:** all of these challenges are grounded in the intersection of **human behavior** (at individual and social levels) and **technology**
- **compare:**
  - *"Uncovering practices of making energy consumption accountable. A phenomenological inquiry"* — Tobias Schwartz, Gunnar Stevens, Leonardo Ramirez, Volker Wulf, FIT and University of Siegen

Feedback Mechanisms

- "feedback mechanisms can influence energy consumption and can increase the potential of energy savings by 10%-15%" *(Schwartz et al)*

- ***what** kind of feedback, given **when**?*

- ***feedback:***
  - **back-talk of the situation** (Schön, D. A. (1983) The Reflective Practitioner: How Professionals Think in Action, Basic Books, New York.
  - **critiquing systems** (Fischer, G., Nakakoji, K., Ostwald, J., Stahl, G., & Sumner, T. (1998) "Embedding Critics in Design Environments." In M. T. Maybury, & W. Wahlster (Eds.), Readings in Intelligent User Interfaces,
  - **eco-arts** turning energy consumption into meaningful and engaging objects (Holmes, T. (2007) "Eco-Visualization: Combining Art and Technology to Reduce Energy Consumption." In Proceedings of Creativity & Cognition, ACM
  - energy as an entity of the **natural world** (e.g. measured in physical terms like 'kW') ←→ energy as part of an **intentional world**, where it carries a meaning (e.g. given and judged in normative terms like 'wasting' or 'sparing' (Schwartz et al)



source: Ehrhardt-Martinez, K., Donnelly, K. A., & Laitner, J. A. S. (2010) *Advanced Metering Initiatives and Residential Feedback Programs: A Meta-Review for Household Electricity-Saving Opportunities,* American Council for an Energy-Efficient Economy.

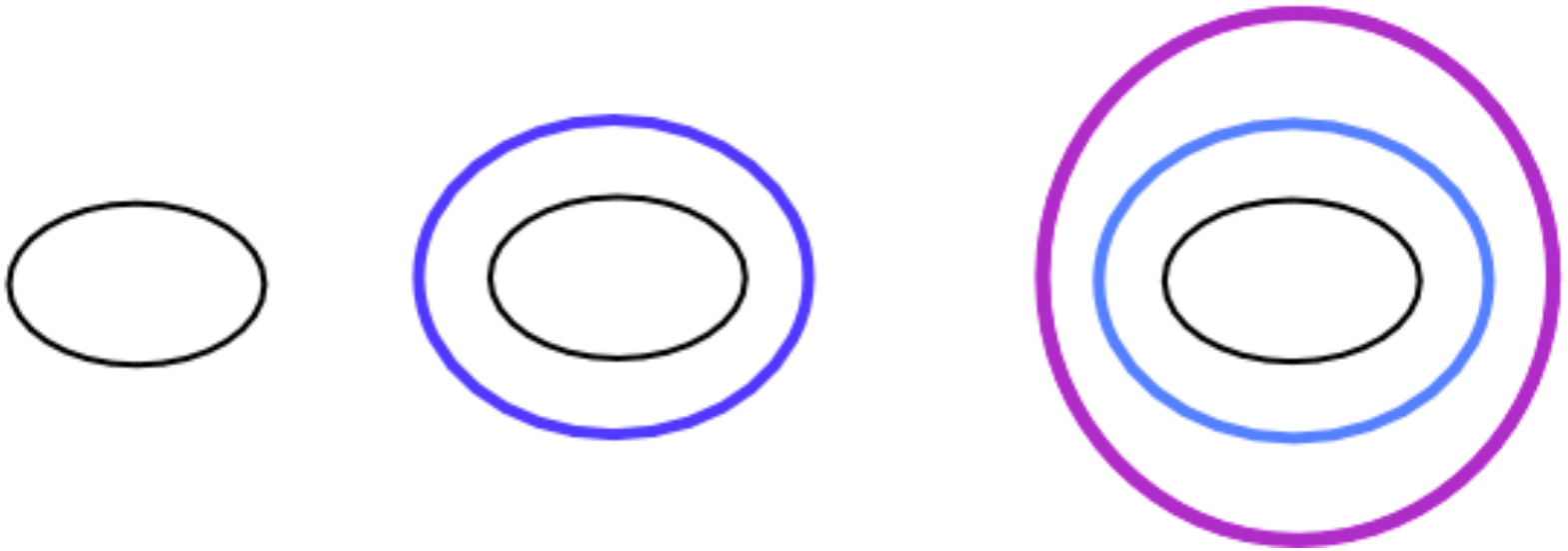
Socio-Technical Environments for Energy Sustainability

Electric Grid → Smart Grid → Human Grid

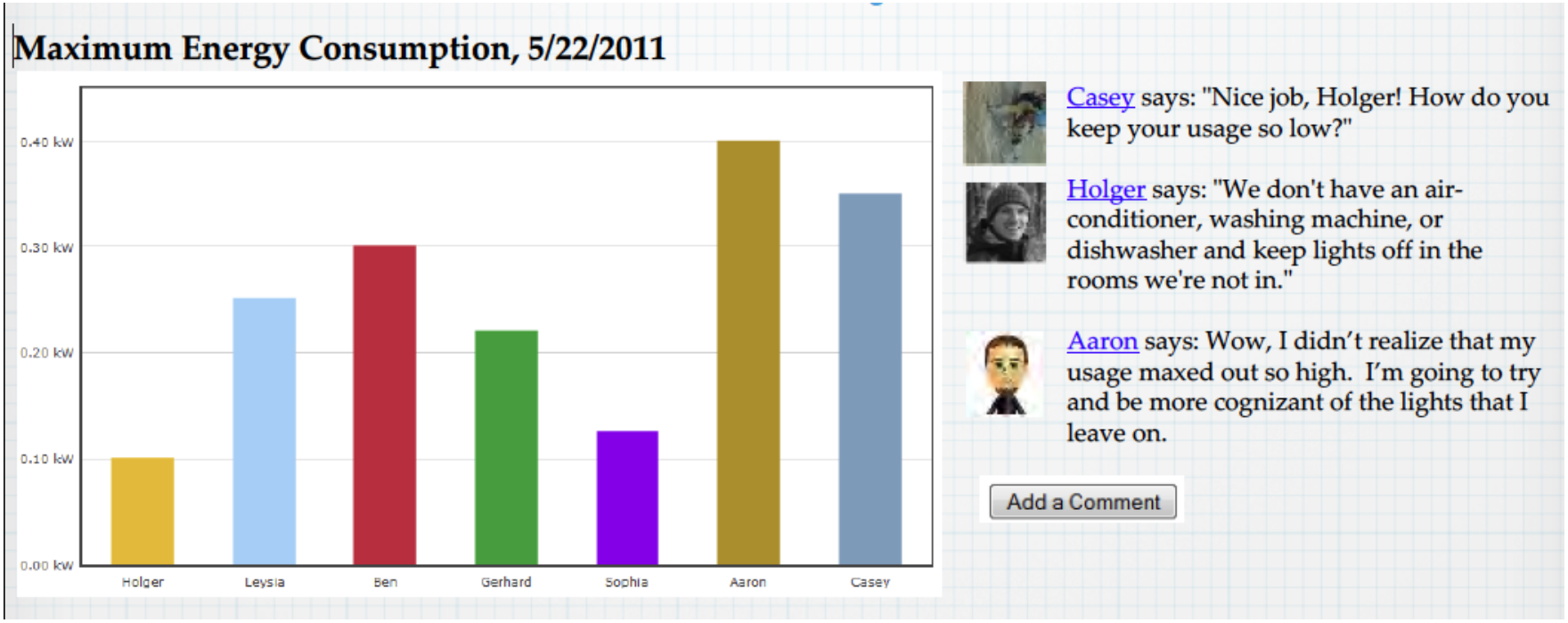
electrical grid

information and communication technologies:
smart grid + smart meters +
advanced smart infrastructure

social environment:
energy illiteracy + control +
intrinsic motivation + social norms +
changing human behavior + eco-arts



Learning from and Being Motivated by other's Experiences



Conceptual Frameworks for Cultures of Participation

- meta-design = design for designers
- seeding, evolutionary growth and reseeding (SER) model
- authoritative versus democratic models of knowledge accumulation, sharing, and dissemination
- richer ecologies of participation

Meta-Design: Design for Designers

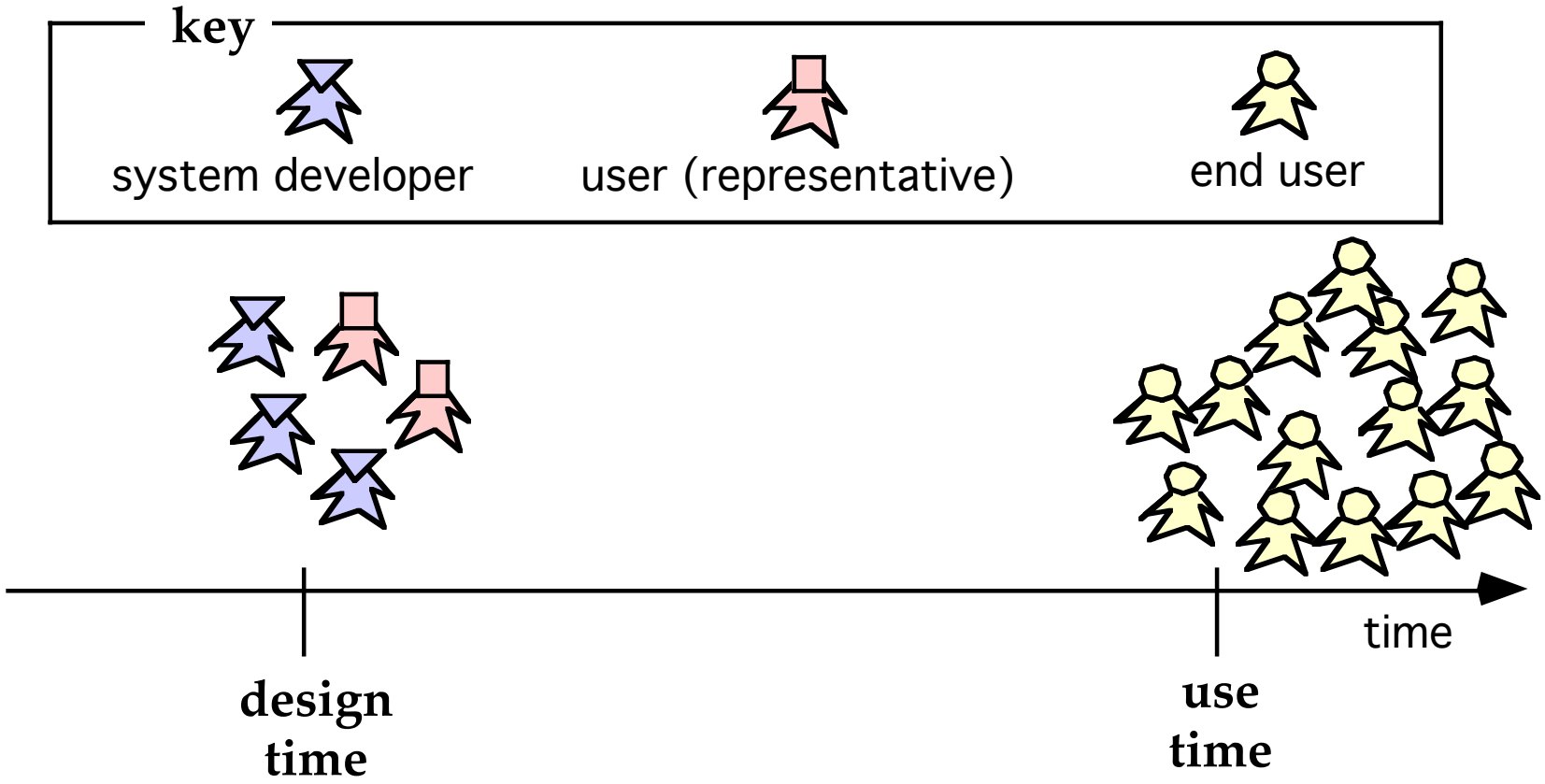
- **meta-design explores:**
  - cultures in which participants can **express themselves** and engage in personally meaningful activities

- **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



world-as-imagined
prediction
planning

world-as-experienced
reality
situated action

Meta-Design
and
Designing for Accountability in the Energy Domain (Schwartz et al)

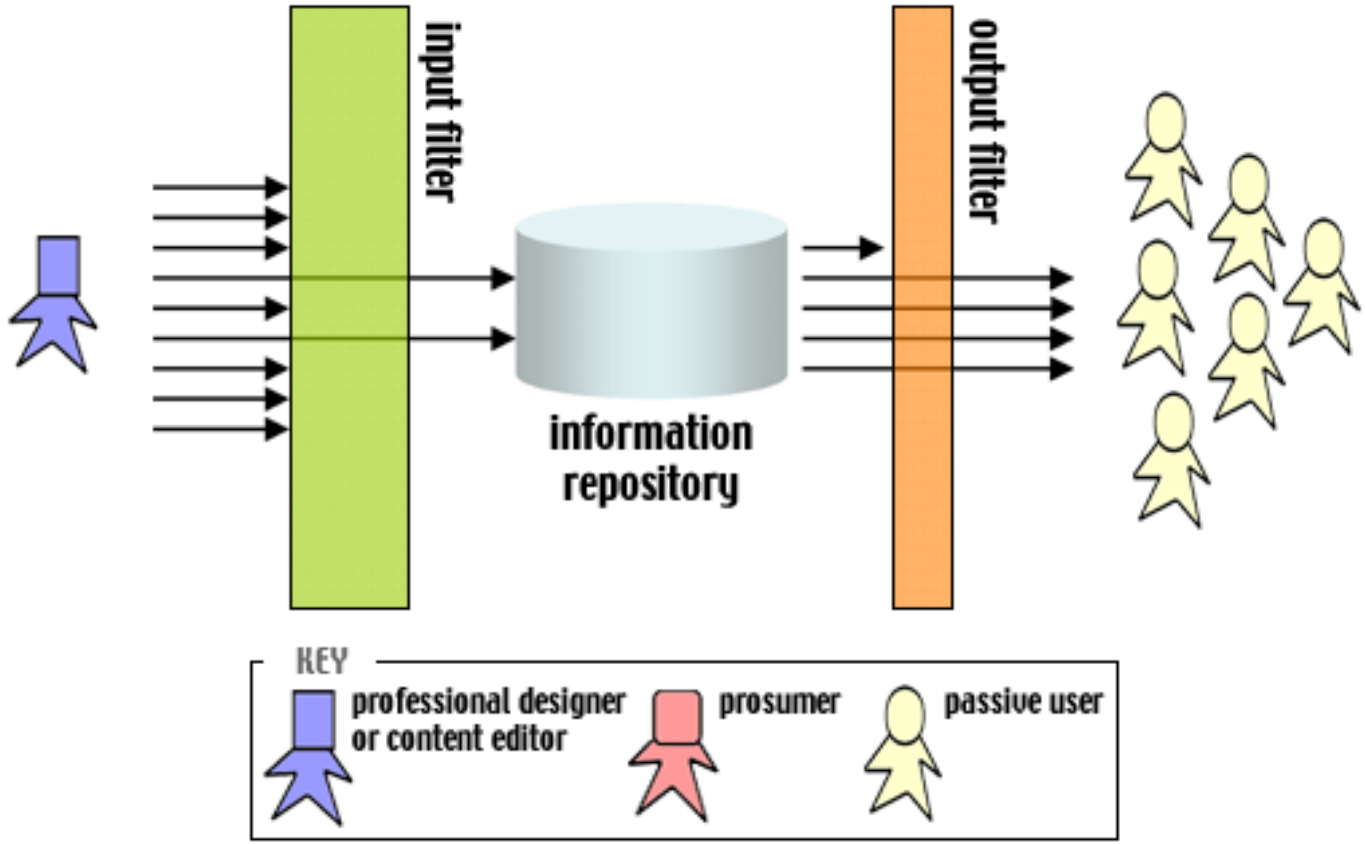
- **making computational support adaptable** — why? → value systems are highly dynamical and change from situation to situation

- addressing adaptability → **meta-design / End User Development (EUD)** = the creation of tools and techniques to allow users to re-define the behavior of the system and to tailor it to their needs
  - the importance of mechanisms used by people in making their own consumption processes accountable and explainable
  - providing feedback mechanisms supporting people in creating methods to configure their energy consumption
  - "technology should help people contextualize information and support the construction of connections between consumed energy units and events in life" → Fischer, G. (2012) "Context-Aware Systems: The 'Right' Information, at the 'Right' Time, in the 'Right' Place, in the 'Right' Way, to the 'Right' Person." Proceedings of the Conference on Advanced Visual Interfaces (AVI 2012), ACM, Capri

Model Authoritative underlying Consumer Cultures

"filter and publish"

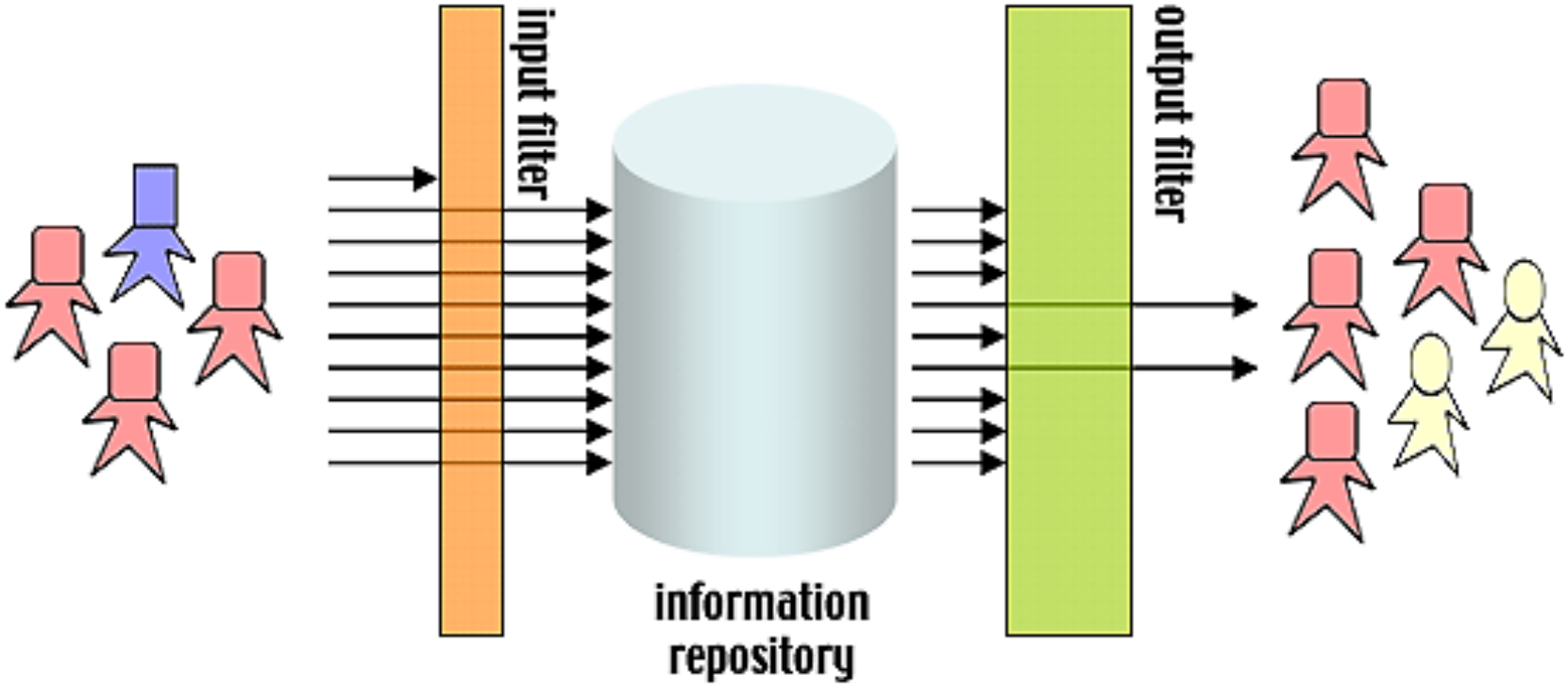
- Strong Input Filters, Small Information Repositories, Weak Output Filters
- **Limitation:** Making All Voices Heard



Model Democratic underlying Participation Cultures

"publish and filter"

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



Rich Ecologies of Participation

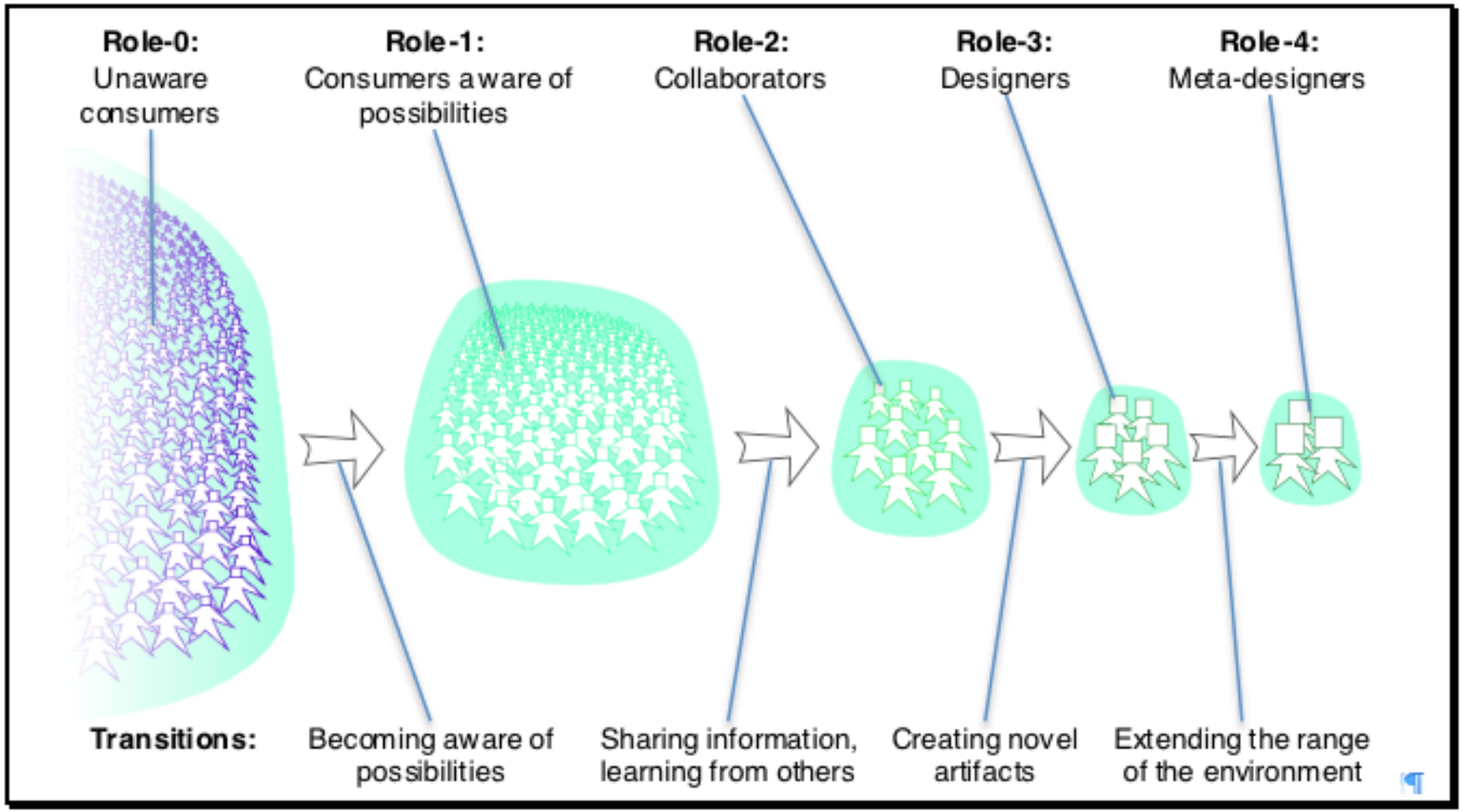
- ***in the past:***
  - software developers and users
  - producers and consumers
  - professionals and amateurs

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

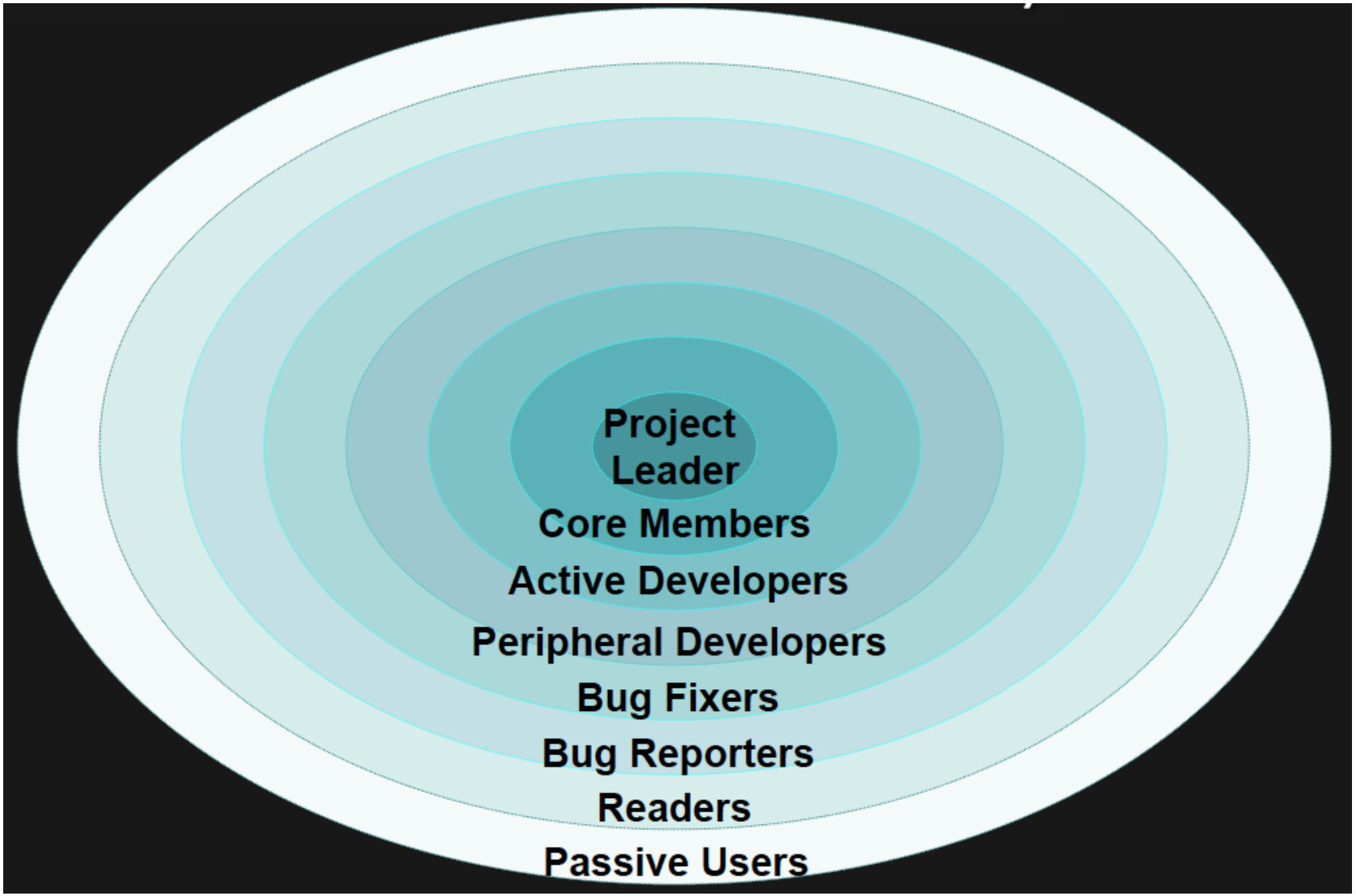
- ***roles are distributed in communities:***
  - power users, local developers, gardeners

- ***challenge:*** *support migration paths with "low threshold, high ceiling" architectures*

Richer Ecologies of Participation:
Consumer → Contributor → Collaborator → Meta-Designer



Ecologies in Open Source Communities



Research Challenges for the Future

Cultures of Participation and A Long Tail Framework for Learning and Education

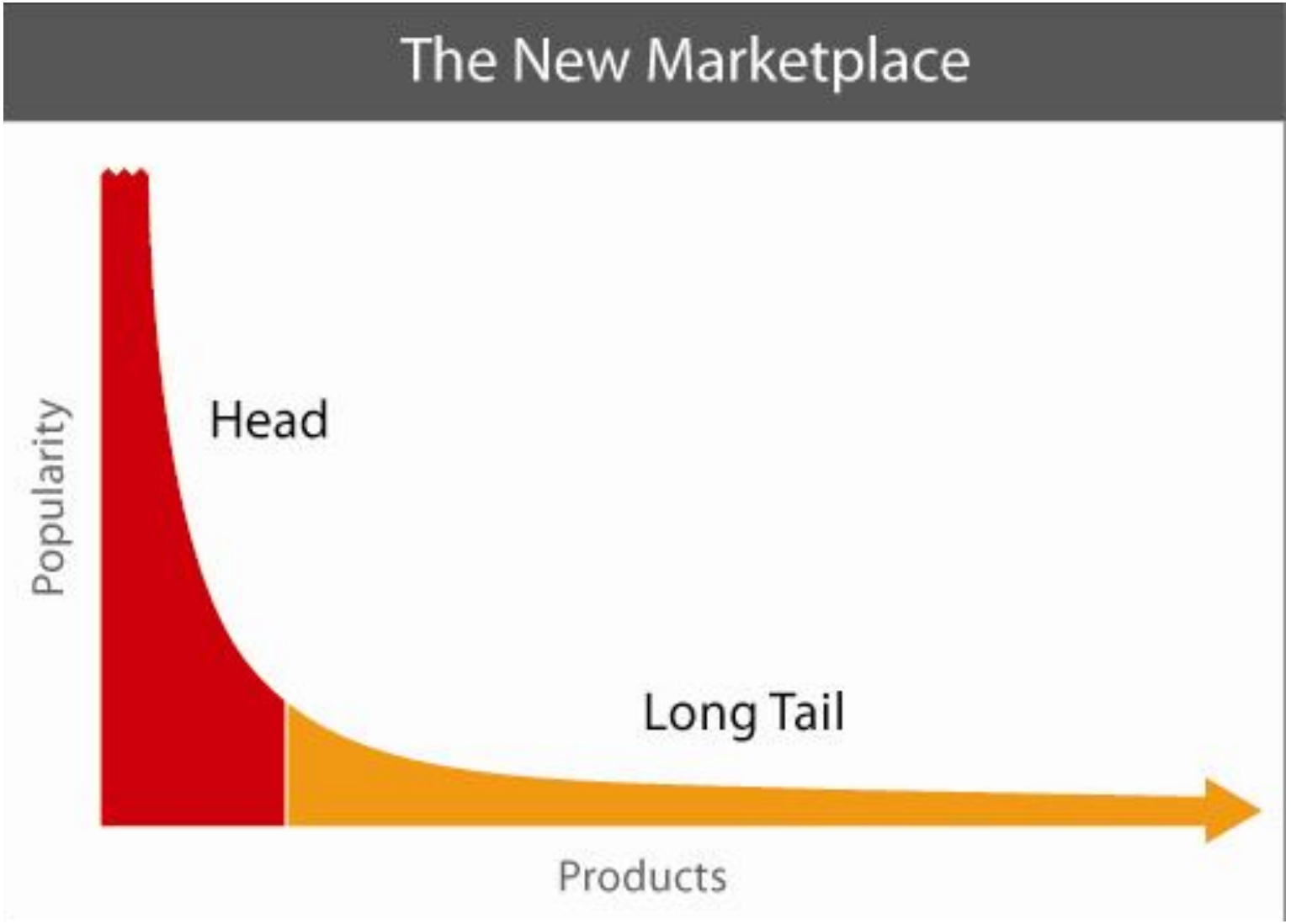
<<Anderson, C. (2006) *The Long Tail: Why the Future of Business Is Selling Less of More*>>

- **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

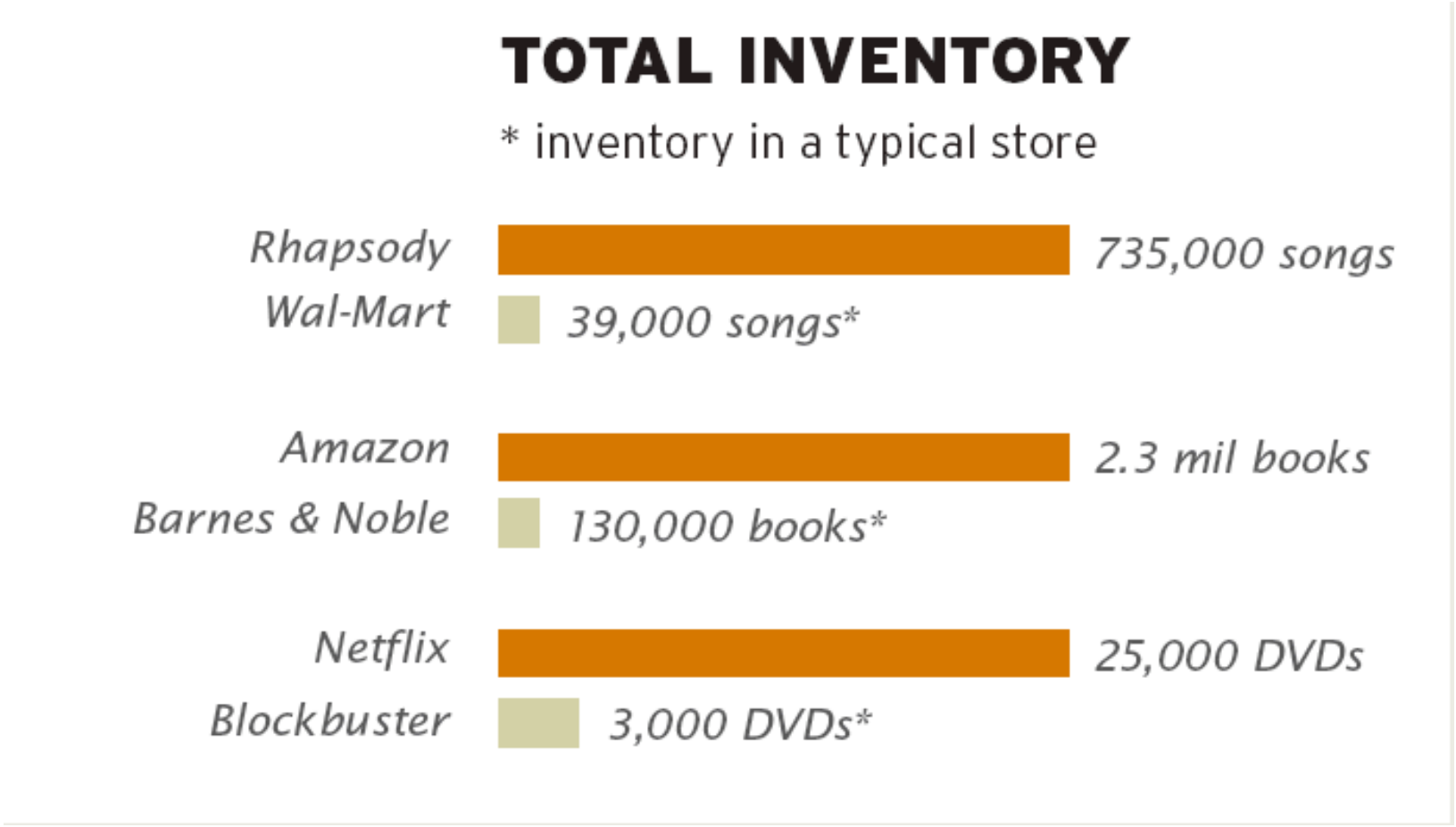
- **main opportunity — digital artifacts:** computer programs, movies, books, 3D models of buildings, …. → as the costs of production and distribution fall, there is less need to lump products and consumers into one-size-fits-all containers

- **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



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

Design Trade-Offs for Cultures of Participation

- **advantages of cultures of participation**
  - extensive coverage of information
  - creation of large numbers of artifacts
  - creative chaos by making all voices heard
  - reduced authority of expert opinions

- **disadvantages**
  - participation overload
  - accumulation of irrelevant information
  - lack of coherent voices
  - fragmented culture based on too many idiosyncratic voices (a modern version of the "Tower of Babel")

Drawbacks of Cultures of Participation:
Engaging People in Personally Irrelevant Activities

- **we have all become**
  - telephone operators and travel agents
  - check-in clerks (at airports) and check-out clerks (in supermarkets)
  - file expense reports and typeset our papers
  - <<……many more things ……>>

- **drawbacks:**
  - we (e.g., as faculty members) are paid more money per hour than staff members being experts in these activities
  - we are not particularly skillful doing these activities (doing them only very rarely)

- **questions:**
  - who are the winners (e.g.: companies off-loading work to us)?
  - are these additional burdens only felt by the “non-digital natives”)?
  - are our systems supporting us in these activities still too inefficient?

Conclusion

—

Cultures of Participation

represent opportunities and challenges to provide **all citizens** with the means to become **co-creators** of new ideas, knowledge, and products in **personally meaningful activities**

Relevant Perspectives for Cultures of Participation

- **social production** → Benkler, Y. (2006) "*The Wealth of Networks: How Social Production Transforms Markets and Freedom"*
- **democratizing innovation** → von Hippel, E. (2005) "*Democratizing Innovation"*
- **richer ecologies of participation** → Preece, J., & Shneiderman, B. (2009) "The Reader-to-Leader Framework: Motivating Technology-Mediated Social Participation"
- **mass collaboration** → Tapscott, D and Williams, A. (2006): *"Wikinomics: How Mass Collaboration Changes Everything"*
- **wisdom of crowds** → Surowiecki, J. (2005): *"The Wisdom of Crowds"*
- **Web 2.0** → O'Reilly, T. (2006): *"What Is Web 2.0 - Design Patterns and Business Models for the Next Generation of Software"*
- **creative commons** → Lessig, L. (2008): *"Remix: Making Art and Commerce Thrive in the Hybrid Economy"*
- **learning / education** → Collins, A. and Halverson, R. (2009): *"The Second Educational Revolution: How Technology is Transforming Education Again"*

References for Cultures of Participation (L3D)

- Fischer, G. (2009) "Cultures of Participation and Social Computing: Rethinking and Reinventing Learning and Education." In Proceedings of the International Conference on Advanced Learning Technologies (ICALT), IEEE Press, Riga, Latvia, pp. 1-5.

- Fischer, G. (2010) "End-User Development and Meta-Design: Foundations for Cultures of Participation," Journal of Organizational and End User Computing 22(1), pp. 52-82.

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