



Center for  
**LifeLong  
Learning  
& Design**

University of Colorado at Boulder

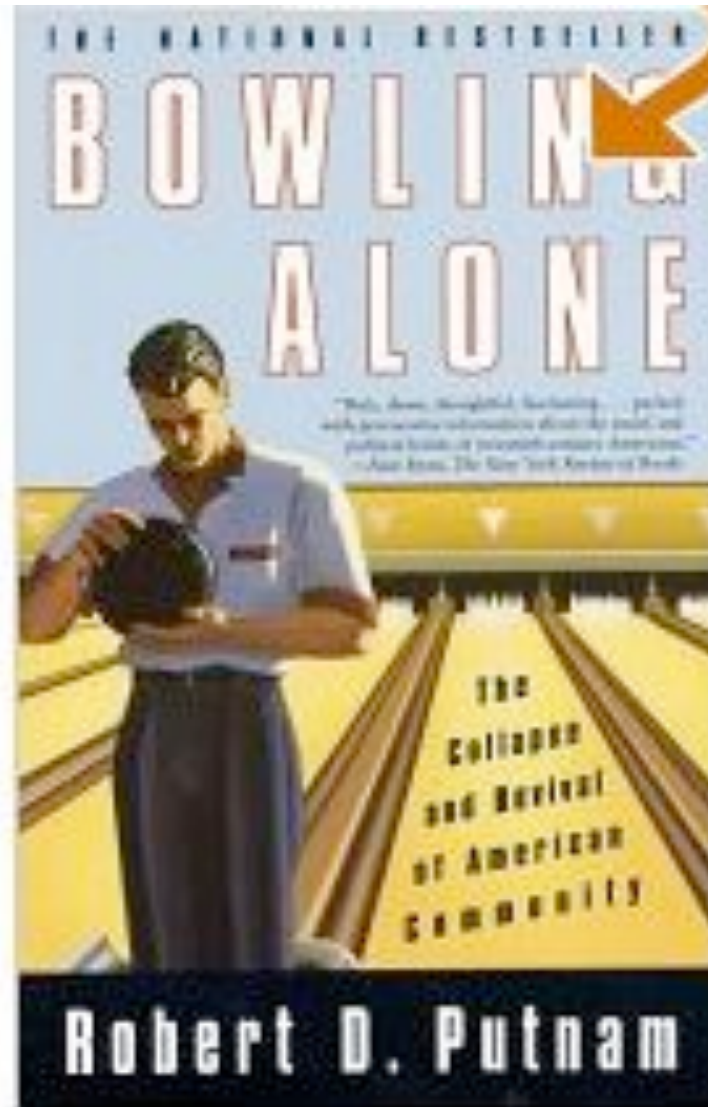
Wisdom is not the product of schooling  
but the lifelong attempt to acquire it.  
- Albert Einstein

## **Democratizing Collaborative Design: Meta-Design, Social Creativity, and the Long-Tail**

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**Presentation SAP Labs, Palo Alto, January 16, 2008**

# *Collaboration and Community Today?*



# Building New Worlds Together

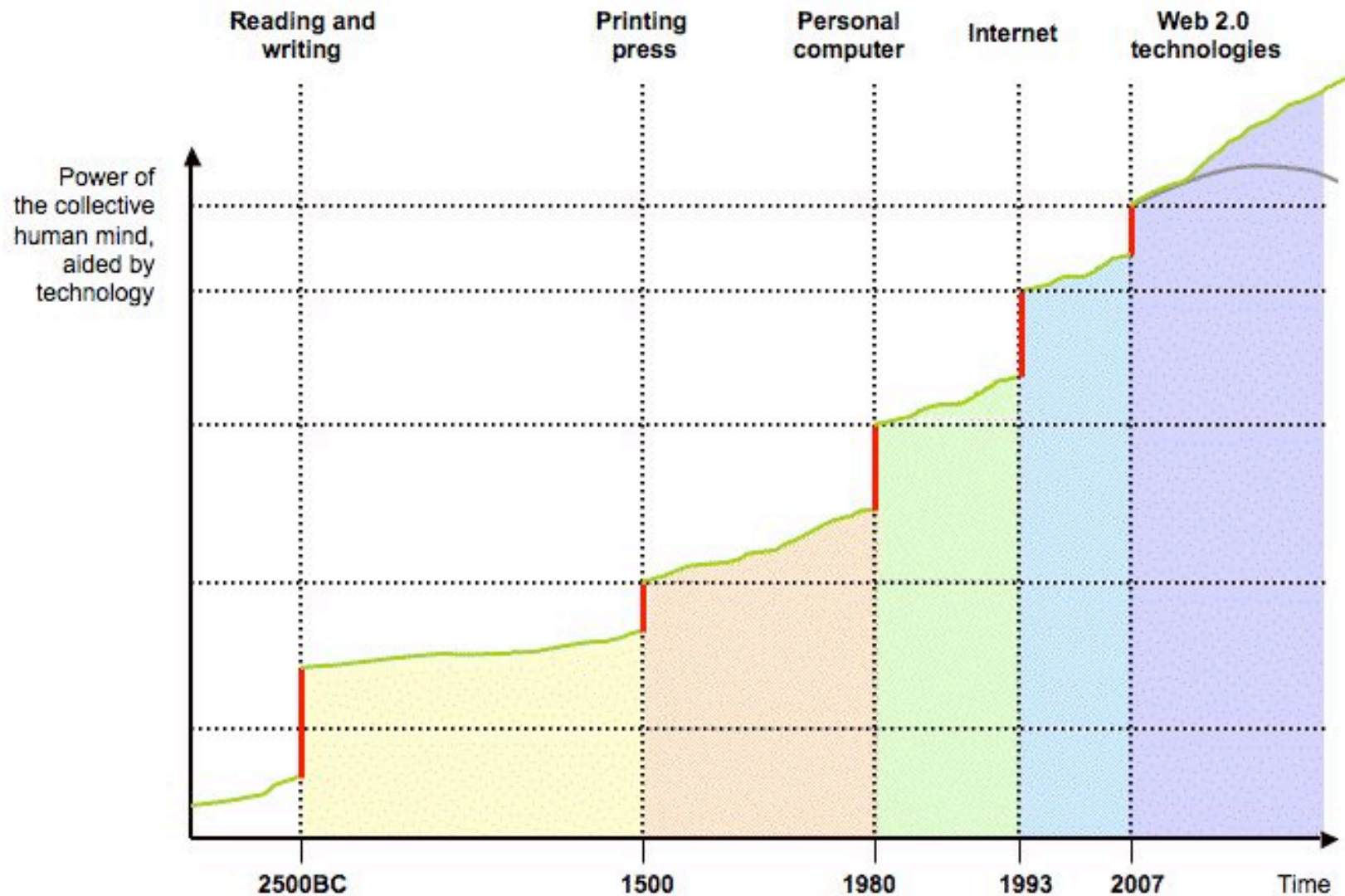
## (Designing the Future Together)

- while “Bowling communities” are on the decline → **new communities are forming**:
  - Facebook,
  - Flickr and YouTube,
  - Second Life,
  - Wikipedia,
  - 3D Warehouse
- create an **analytic framework** to understand these new communities:
  - **meta-design** = design for designer
  - **social creativity** = to transcend the limitations of the individual human mind
  - **long-tail**= exploit interest and passion for idiosyncratic topics
- the **new Web** (Web 2.0 technologies) — harness collective intelligence and social creativity
  - from broadcast to **participation**
  - all people can become **active contributors** in personally meaningful problems

# A Transformational Framework

▪ <b>established frameworks</b>	→	<b>frameworks for the future</b>
▪ school learning	→	<b>lifelong learning</b>
▪ unaided individual human mind	→	<b>distributed intelligence</b>
▪ consumers	→	<b>active contributors (meta-design)</b>
▪ learning when the answer is known	→	<b>learning when no one knows the answer (social creativity)</b>
basic knowledge and skills	→	<b>idiosyncratic interests and passion (long-tail)</b>

# Beyond the Unaided, Individual Human Mind



# *Meta-Design: Democratizing Collaborative Design by “Design for Designers”*

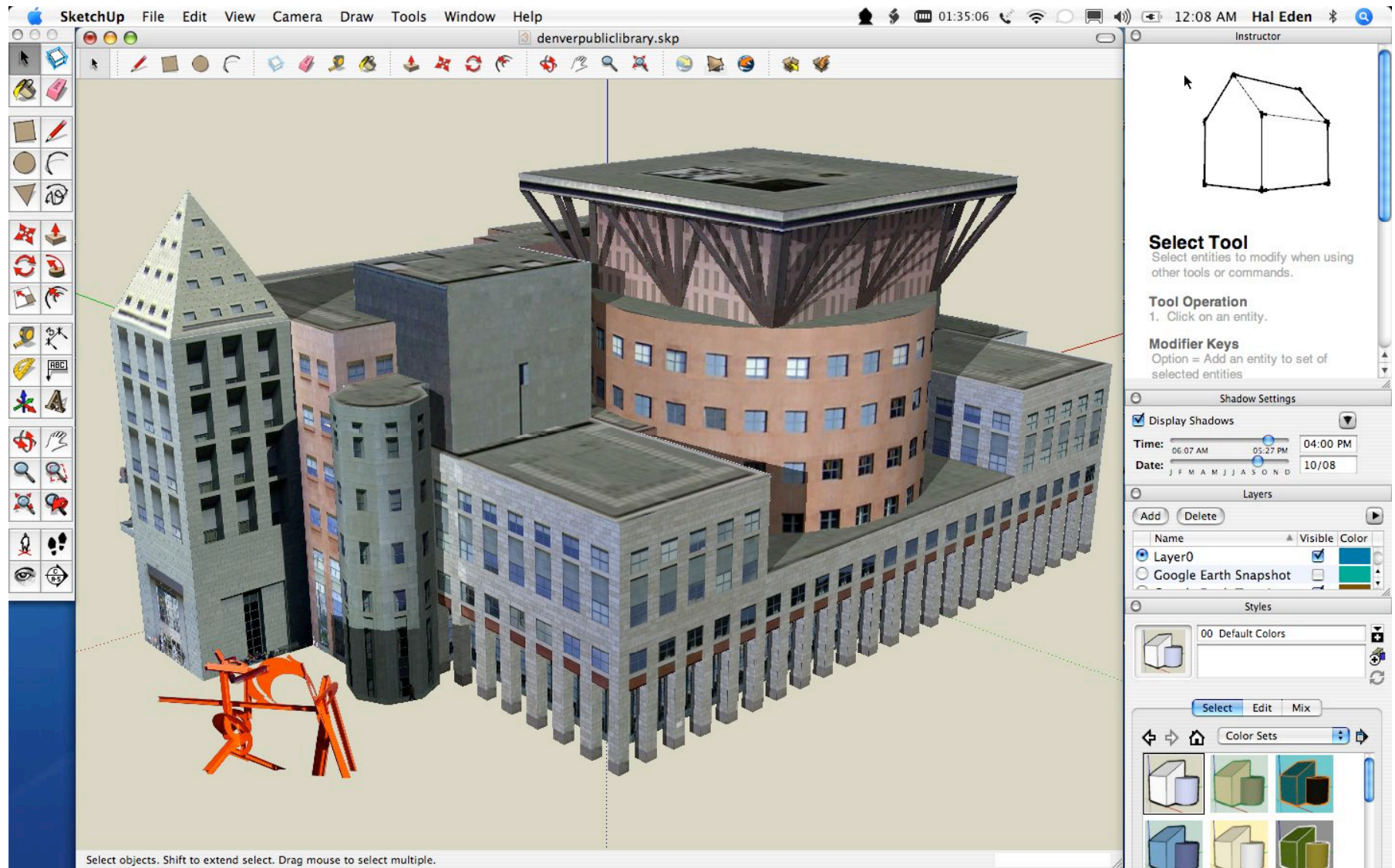
- **meta-design explores:**
  - a culture in which participants can **express themselves** and engage in personally meaningful activities
- **meta-design requires**
  - designers giving up some **control** at design time
  - **active contributors** (and not just passive consumers) at use time
- **meta-design raises research problems of fundamental importance** including
  - new **design methodologies**
  - a new understanding of **collaboration, motivation, and creativity**
- **meta-design** provides a theoretical framework for **Web 2.0 technologies**

# 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
  - by supporting '**hackability**' and '**remixability**'
  
- **meta-design examples:** Web 2.0 Technologies supporting user-generated content
  - Wikis (Wikipedia)
  - **Google-SketchUp + 3D Warehouse + Google Earth**
  - Second Life
  - Open Source



# 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
- share 3D models by uploading them from SketchUp

## ▪ challenges:

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

# 3D Warehouse



## [Tsim Sha Tsui Clock Tower](#)

by [Google](#)

★★★★☆ (1 rating)

Tsim Sha Tsui Clock Tower,...

[View in Google Earth](#)



## [Figueroa at Wilshire](#)

by [Google](#)

Albert C. Martin and...

[View in Google Earth](#)



## [1500 Walnut Street](#)

by [Google](#)

This building located at 1500...

[View in Google Earth](#)



## [CPL Harold Washington Library Center](#)

by [Google](#)

★★★★★ (6 ratings)

This monumental building,...

[View in Google Earth](#)



## [Marriott Marquis](#)

by [Google](#)

This Hotel in Atlanta rises...

[View in Google Earth](#)



## [Hearst Residence \(Hearst Castle\)](#)

by [Google](#)

★★★★★ (2 ratings)

San Francisco architect Julia...

[View in Google Earth](#)



## [Milwaukee Art Museum](#)

by [Google](#)

★★★★★ (6 ratings)

The history of the Milwaukee...

[View in Google Earth](#)



## [CitySpire Center](#)

by [Google](#)

★★★★★ (2 ratings)

Designed by Murphy/Jahn, Inc....

[View in Google Earth](#)



## CU Boulder in 3D





## Downtown Denver in 3D



# Motivational Aspects and Meta-Design

- **what will make humans want to become designers/active contributors over time?**
  - serious working and learning does not have to be unpleasant but can be personally meaningful, empowering, engaging, and fun
  
- **what will make humans want to share? → requires:**
  - cultural change
  - gift cultures
  - social capital
  - reputation economy

$$\text{Utility} = \text{Value} / \text{Effort}$$

- **increase in value:** motivation and rewards for being a designer
  - feeling in control
  - being able to solve or contribute to the solution of a problem
  - mastering a tool in greater depth
  - making an ego-satisfying contribution to a group
  - enjoying the feeling of good citizenship to a community (“social capital”)
  
- **decrease in effort:**
  - creating support for learning to become an active contributor (= learning SketchUp)
  - extending meta-design to design for design communities
  - exploit automatically collected information sources (e.g.: collaborative filtering = “customers who bought this book also bought ....”)



# “Tip of the Day” in Google Earth



## Existing Environments for Learning and Using SketchUp

Resource	Concept	Weaknesses
Tip of the Day	informal instruction	easily dismissed, irrelevant, <b>not context aware</b>
Help Center	self-directed, inquiry-based	<b>not context aware</b>
SketchUp Help	self-directed	<b>not context aware</b>
Tooltip	just-in-time, on demand	terse, too tightly focused
Instructor	just-in-time, on demand	tool context only
User Forums	community, apprenticeship	no immediate response
Video Tutorials	programmed	passive
Self-Paced Tutorials	self-directed, learning by doing	mistakes can derail learning
Live Training	formal instruction	expensive, strict schedule
Tech Support	inquiry-based, constructionist	have to ask the right question
Error Messages	learning by being told	often too cryptic
Toolbars	discovery	terse

# *Research Challenge*

## **Avoid Information Overload with Context Awareness**

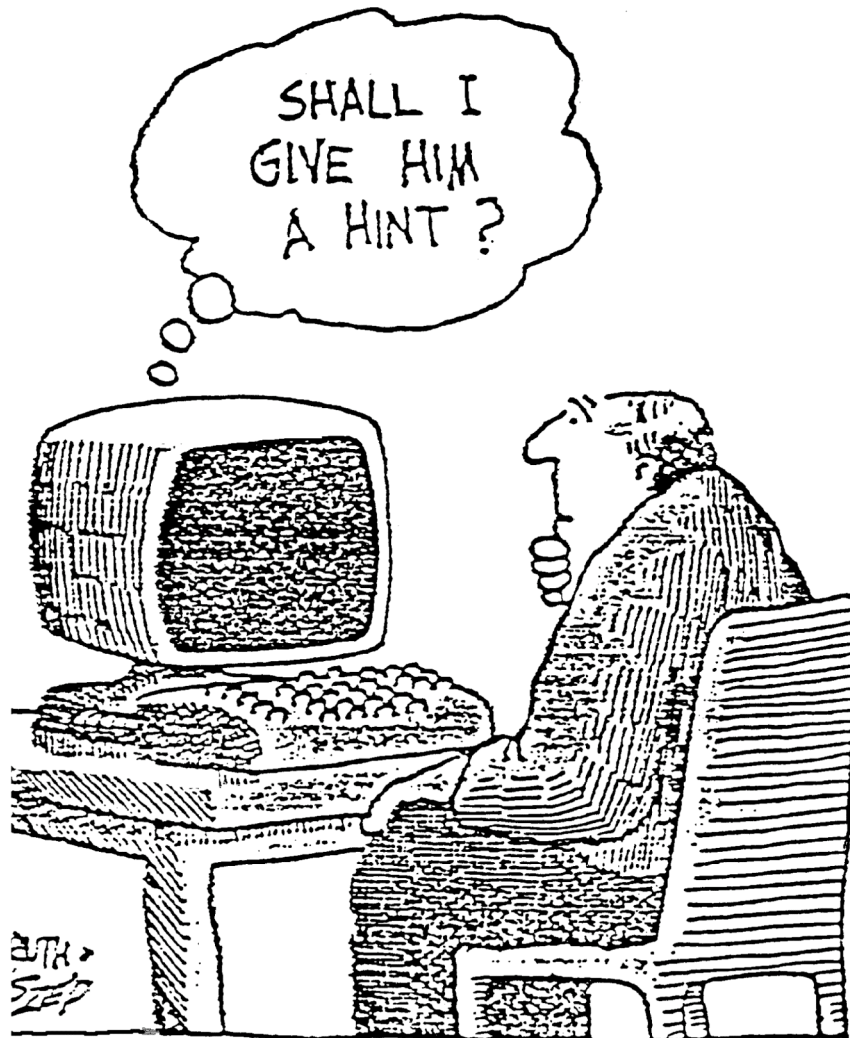
From “Anywhere, Anytime, Anyone”



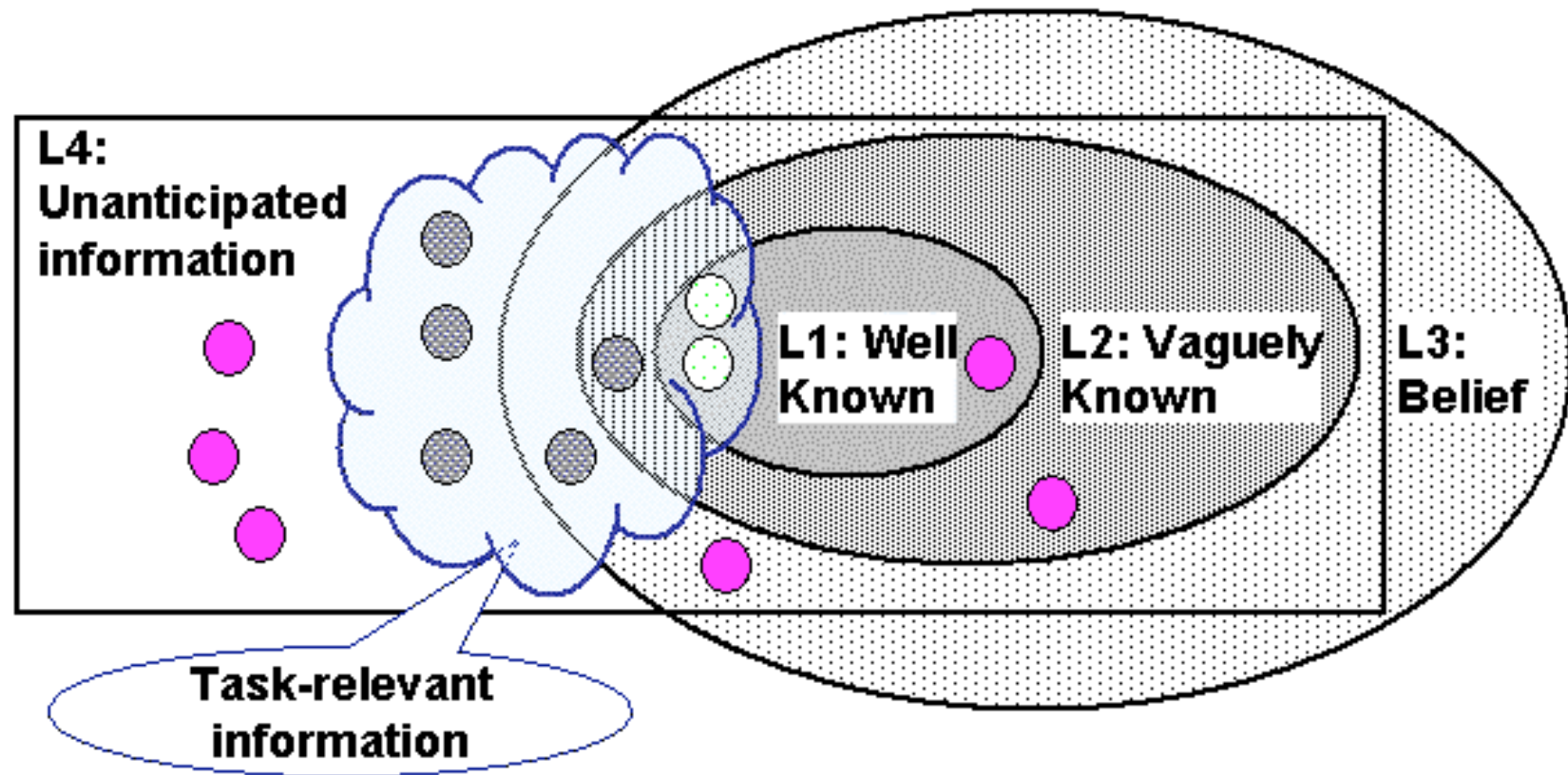
“The ‘**Right**’ Information at the ‘**Right**’ Time, in the ‘**Right**’ Place, in the ‘**Right**’  
**Way** to the ‘**Right**’ Person”

**Human attention** — not information — is the scarce resource

# Information Delivery, Contextualization, and Intrusiveness



# Identification of **User Background Knowledge** and of the **Task at Hand** in High-Functionality Environments



# ***Creativity – For All of us?***

- a **great interest** in recent years
- creativity: **beyond productivity**
- **new National Science program**: “Creativity and Information Technology (IT)”
- **L3D’s research projects** in this area:
  - A Next Generation Wiki for Creativity and IT (funded)
  - Democratizing Design to Unleash Social Creativity (pending)



# Creativity —The “Wrong” Image?

“The Thinker” by Auguste Rodin



# 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 21<sup>st</sup> century
- **distinct domain of human knowledge exist** → of critical importance: mutual appreciation, efforts to understand each other
- **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

# The Envisionment and Discovery Collaboratory

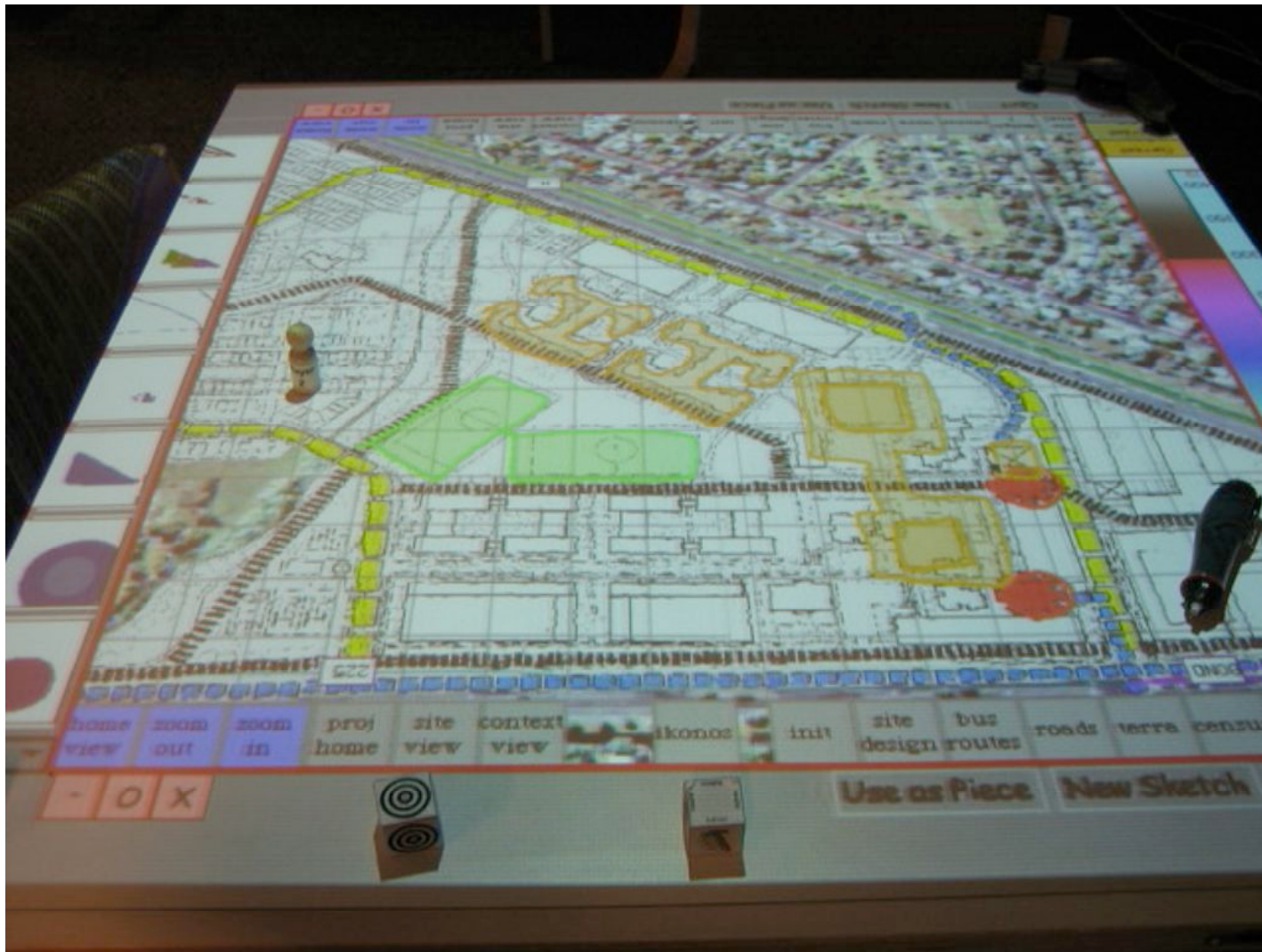


## Boulder City Council and University of Colorado Regents





# Sketching Support in the EDC



# Buildings Sketched into a Google-Earth Client





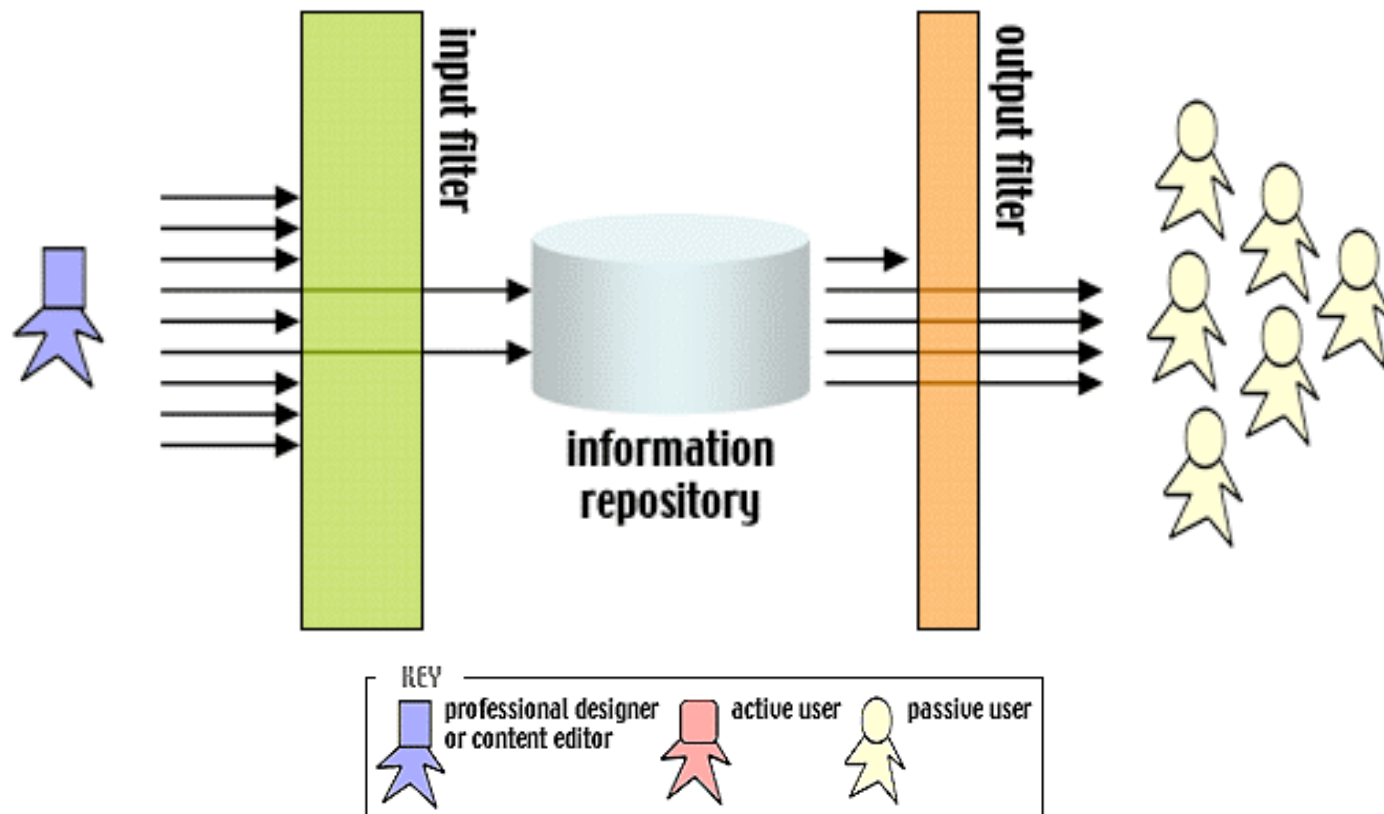
# ***Research Challenge***

## **Understanding New Relations between Consumers and Producers**

- Consumer Culture (“Access”) and Design Culture (“Participation”)
- Exploiting “Long Tail” Opportunities

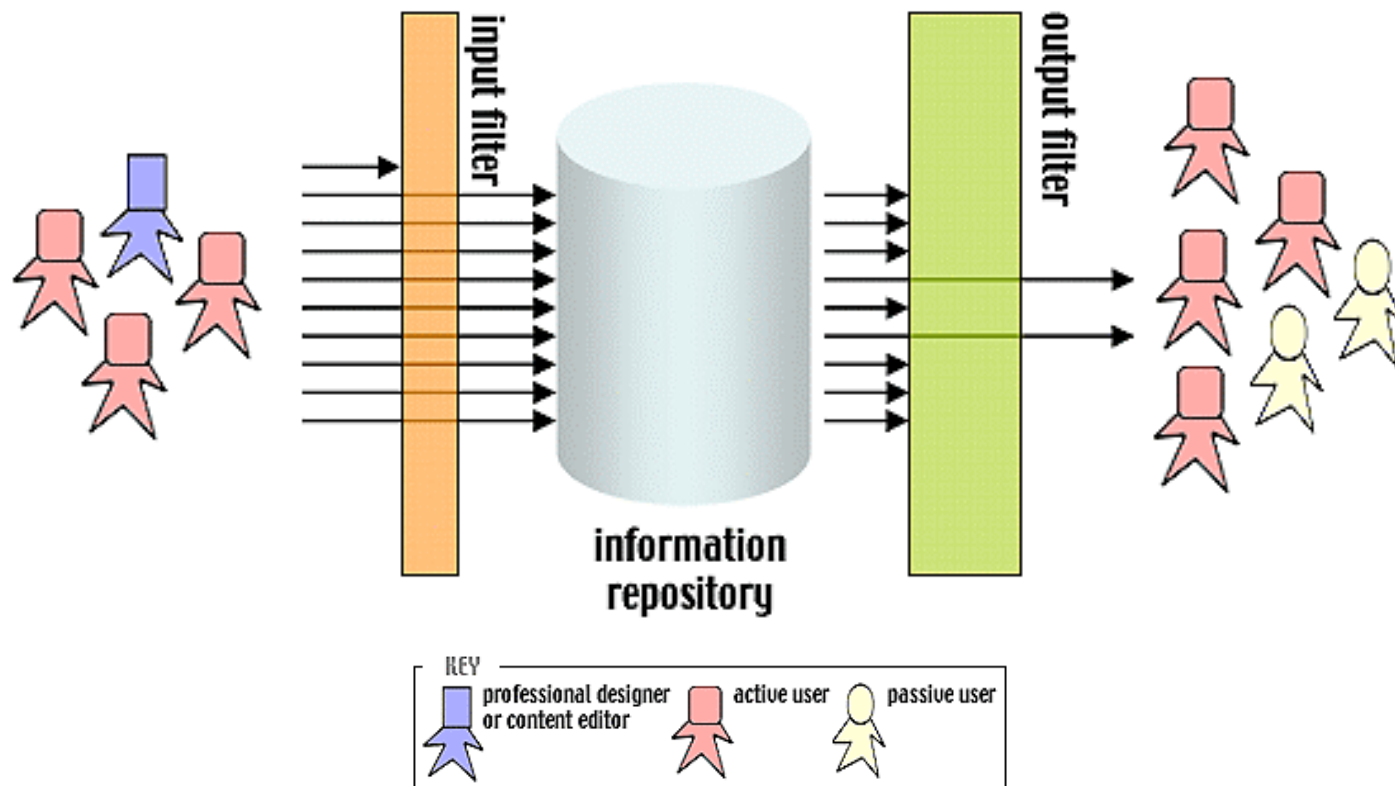
# Producer/Consumer Models in a **Consumer Culture**

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



# Producer/Consumer Models in a **Design** Culture

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



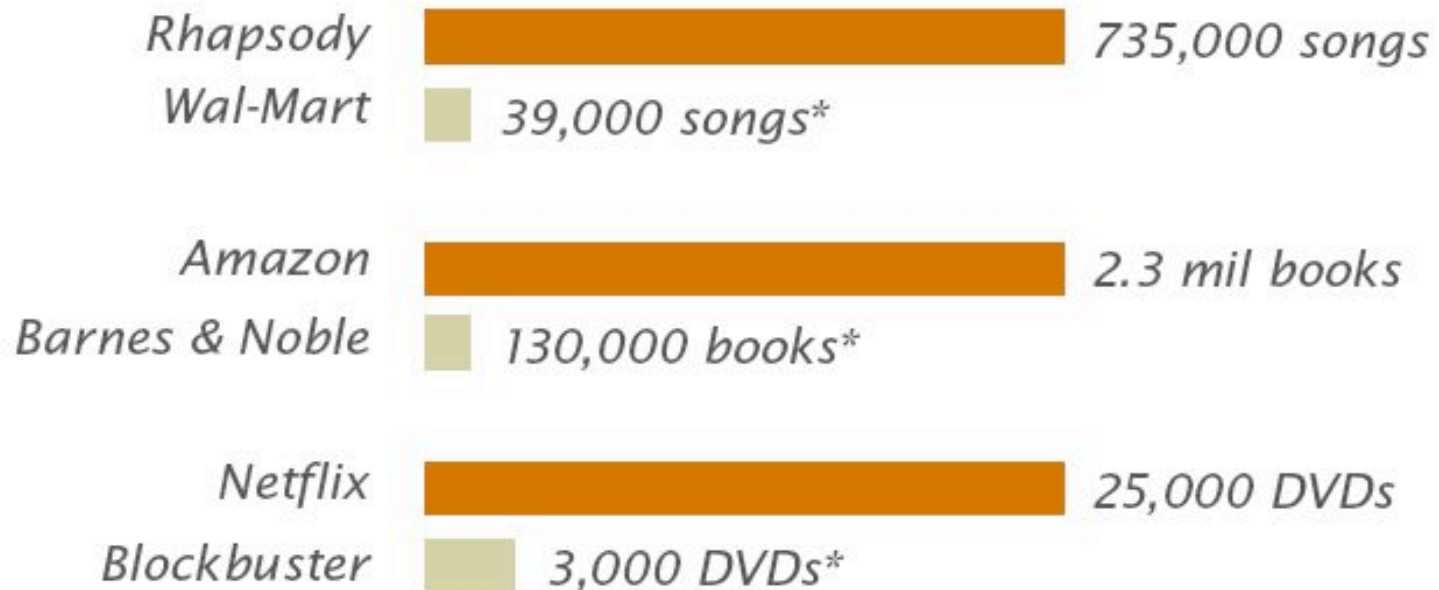
# Exploiting “Long Tail” Opportunities



# The Long Tail

## TOTAL INVENTORY

\* inventory in a typical store

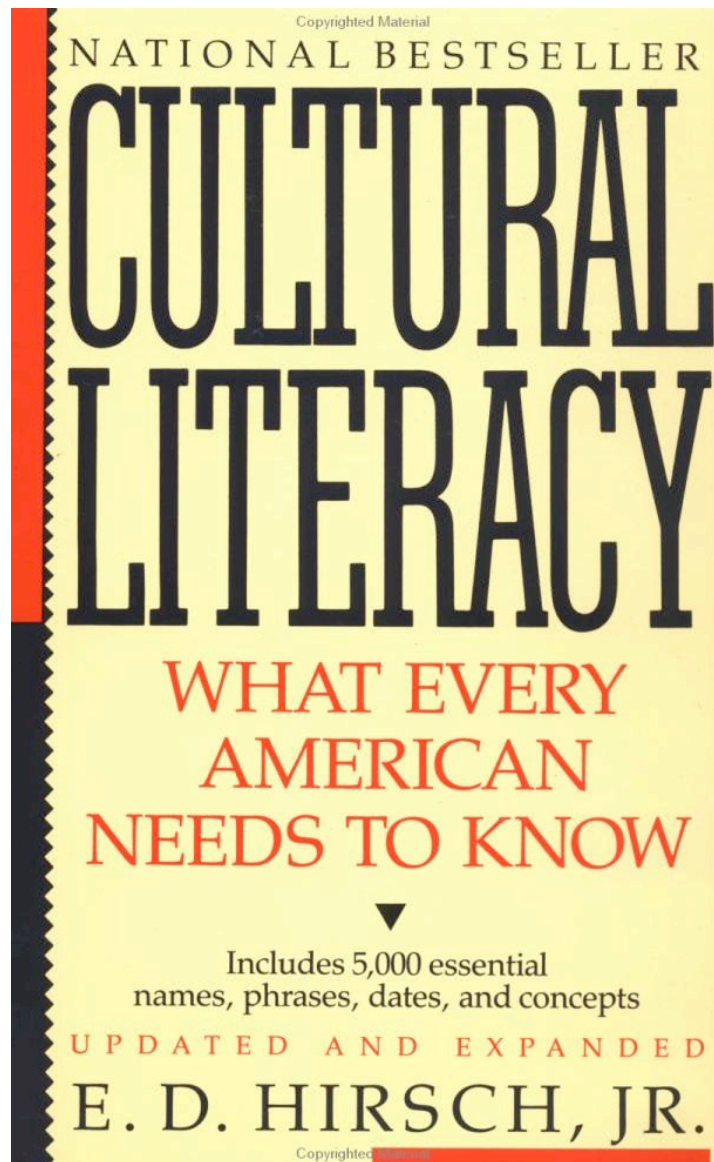


# Exploiting the “Long-Tail” in Education

- **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 learningscapes
- **basic knowledge and skills:** learning to learn, learning on demand, preparation for future learning, soft skills, .....
- **long-tail:**
  - interest and passion
  - self-directed learning and intrinsic motivation
  - personally meaningful problems
  - interesting example → movie: “October Sky”
- **extensive coverage** needed for supporting the infinite numbers of interesting topics — will be facilitated by a “meta-design” culture (Wikipedia)



## The Other End: Cultural Literacy



# Meta-Design Issues in Real-World Settings

—

## Improvisations versus Standardization

- **example:** SAP (German Computer Company) Info, July 2003, p 33: “Reduce the Number of Customer Modifications”
- **rationale:**  
*“every customer modification implies costs because it has to be maintained by the customer. Each time a support package is imported there is a risk that the customer modification may have to be adjusted or re-implemented. To reduce the costs of such on-going maintenance of customer-specific changes, one of the key targets during an upgrade should be to return to the SAP standard wherever this is possible”*
- **compare:**
  - “forking” in Open Source
  - “reseeding” in Seeding, Evolutionary Growth, Reseeding Model

# **SAP / L3D Project: Giving All Stakeholders a Voice: Understanding and Supporting the Creativity and Innovation of Communities Using and Evolving Software Products**

- **Globale Objective:**

- identify the type and quality of information which is exchanged within SAP Customer Communities
- analyze value for SAP with respect to its suitability to drive product improvements and innovation

- **Expected Result:**

- get some insights about if and how to instrument such user communities in an efficient way for co-designing products

## Conclusion: “Democratizing Collaborative Design”

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