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

Web 2.0 and L3D's Research

Gerhard Fischer

L3D Meeting, May 10, 2006

Past and Present → Future

1986	1996	2006	2016
mainframes and timesharing	personal computer and GUI interactive computing Web 1.0	WWW, multi-media wireless, mobile Web2.0	disappearing computer beyond the desktop social computing
professionally-dominated design	user-centered design, participatory design	meta-design	social creativity

New Classes of Systems

▪ generic systems	→ domain-oriented systems
▪ fundamentally different users	→ people with cognitive disabilities
▪ user interface	→ interaction, engagement
▪ ease of use	→ low threshold and high ceiling
▪ desktop	→ ubiquitous, pervasive computing
▪ decontextualized	→ context awareness
▪ closed systems	→ open systems
▪ productivity	→ innovation, creativity
▪ building from scratch	→ reuse, redesign, evolution, APIs, Mash-ups

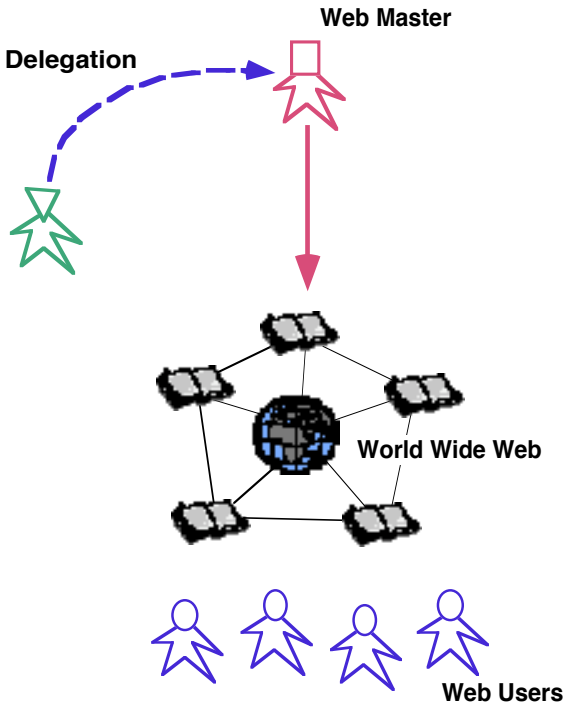
Example: Web 2.0

- **source:** Tim O'Reilly *"What is Web 2.0 — Design Patterns and Business Models for the Next Generation of Software"*

Web 1.0		**Web 2.0**
Britannica Online	→	Wikipedia
personal website	→	blogging
publishing	→	participation
content management systems	→	wikis
scheduled software releases	→	continuous improvements
individual contributions	→	collective intelligence

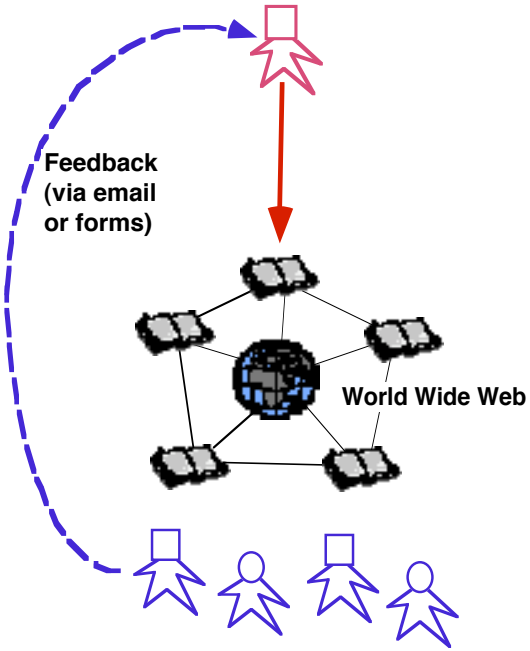
claim**: network effects from user contributions (= knowledge sharing) are the key to market dominance in the Web 2.0 era**

WWW: From Broadcast to Collaboration Medium



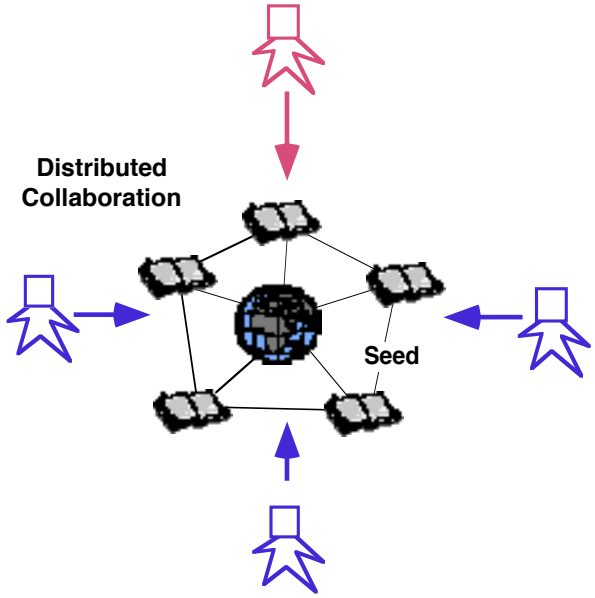
M1

The Web as Broadcast Medium



M2

Broadcast with Feedback



M3

Evolutionary and Collaborative Design

Web 2.0 — Multiple Perspectives

- **technical**
  - AJAX
  - .NET
- **underlying business model**
  - open source
  - Wikipedia
- **political**
  - democratizing innovation

Web 2.0 — Multiple Perspectives

- **educational**
  - how do we educate the "minds of the future" to be citizens / members of the Web 2.0 culture — or: do they educate us?
  - with Wireless and Mobile Technologies(WMT) → tools for living

- **social:**
  - consumer → contributor
  - rewards

- **philosophical:**
  - change of mindsets

- **the challenges: how to keep things**
  - current
  - interactive
  - engaging

Lifelong Learning

- lifelong learning is **more** than adult education → its fundamental objective: "making learning a part of life"

- **basic assumption:** If the world of working and living relies on collaboration, creativity, definition and framing of problems, dealing with uncertainty, change, and distributed cognition — then education needs to prepare students for meaningful and productive lives in such a world

- **objective:** education from a lifelong learning perspective *should*
  - help learners enhance **their abilities to learn** and allow them to engage in **meaningful activities**
  - promote **new civic discourses** because a major role for new technologies is not to deliver predigested information but to support social debates and discussions
  - exploit the **power of media**

Distributed Intelligence

- ***claim:*** *human cognition* has been seen as existing solely "inside" a person's head, and studies on cognition have often disregarded the physical and social surroundings in which cognition takes place

- **distribution:**
  - distributed among people → collaborative learning and working
- distributed between humans minds and artifacts → intelligence augmentation

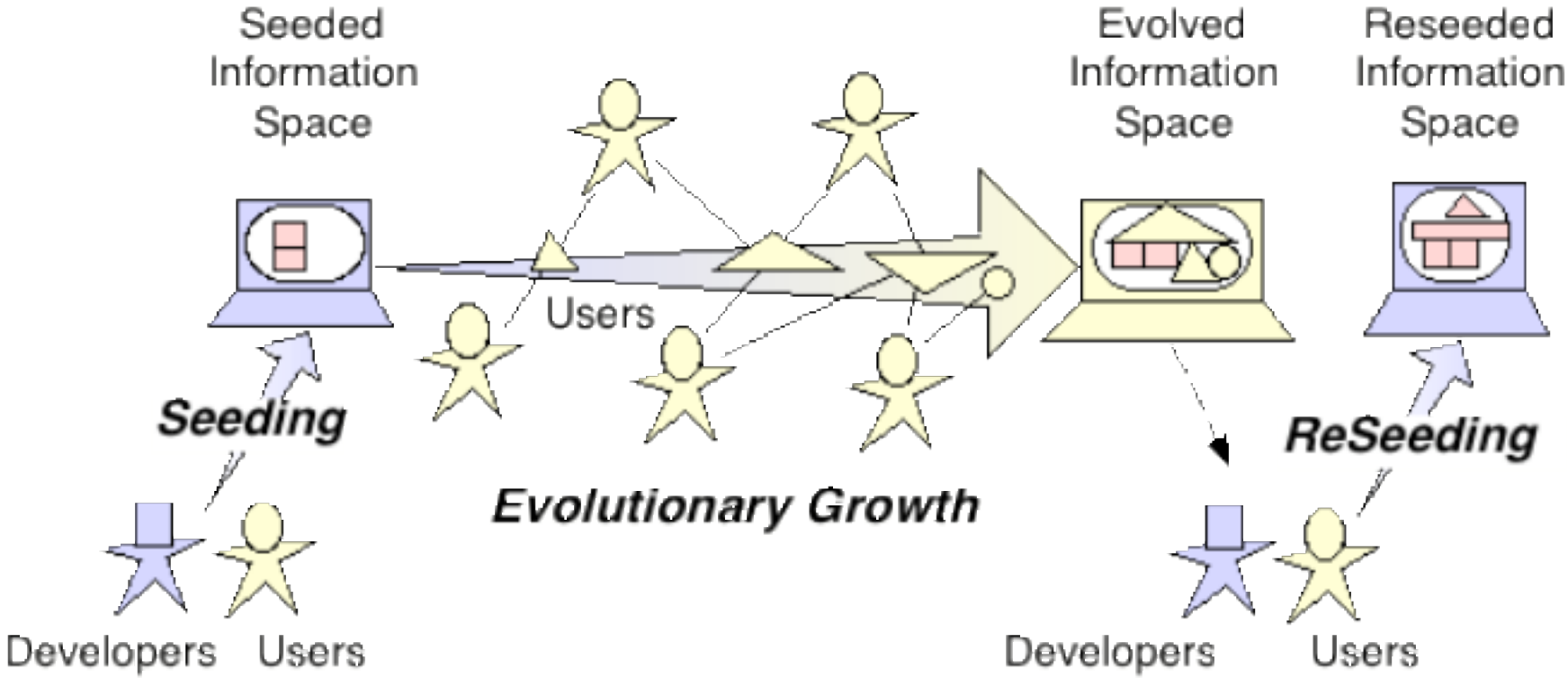
The Seeding, Evolutionary Growth, Reseeding (SER) Model Supporting Meta-Design

- **at design time:**
  - development of an initial system that can change over time (seed)
  - underdesign: creating design options for users

- **at use time:**
  - support for "unself-conscious culture of design": users will experience breakdowns by recognizing "bad fit" at use time
  - end-user modifications allow users to address limitations they experience
  - evolutionary growth through incremental modifications

- **reseeding:**
  - significant reconceptualization of the system
  - account for incremental modifications, mitigate conflicts between changes, and establish an enhanced system

The Seeding, Evolutionary Growth, Reseeding (SER) Model



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
  - comment by an artist: *"programming is not hard, but it is boring"*

- **what will make humans want to share?** → requires: mindset change, culture change, community knowledge bases, gift cultures, social capital
  - more details: Fischer, G., Scharff, E., & Ye, Y. (2004) "Fostering Social Creativity by Increasing Social Capital." In M. Huysman, & V. Wulf (Eds.), Social Capital and Information Technology, MIT Press, Cambridge, MA, pp. 355-399.

- **who is the beneficiary and who has to do the work?** → organizational rewards

Utility = Value / Effort

- **increase in value: motivation and rewards for a "design culture"**
  - feeling in control (i.e., independent from "high-tech scribes")
  - 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:**
  - meta-design is hard
  - extending meta-design to design for design communities

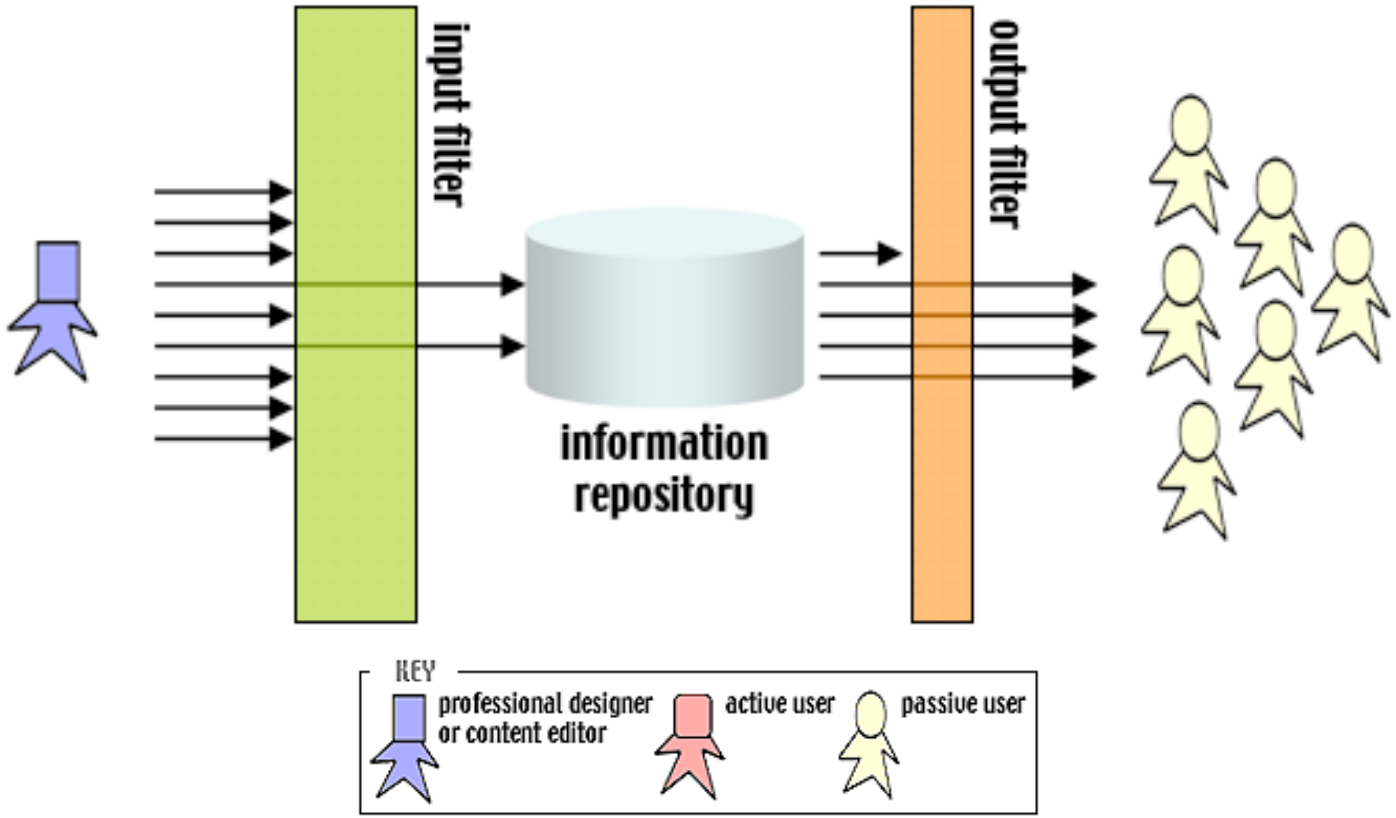
Learning, Knowledge Sharing and New Media

- education, learning, teaching and knowing = **f{media}**

- **lifelong learning:**
  - learning about ←→ learning to be
  - learning when the answer is known ←→ learning when the answer is not known
  - learning and teaching are not inherently linked
    - there is a lot of learning without teaching
    - there is a lot of teaching without learning
  - integration of formal and informal learning

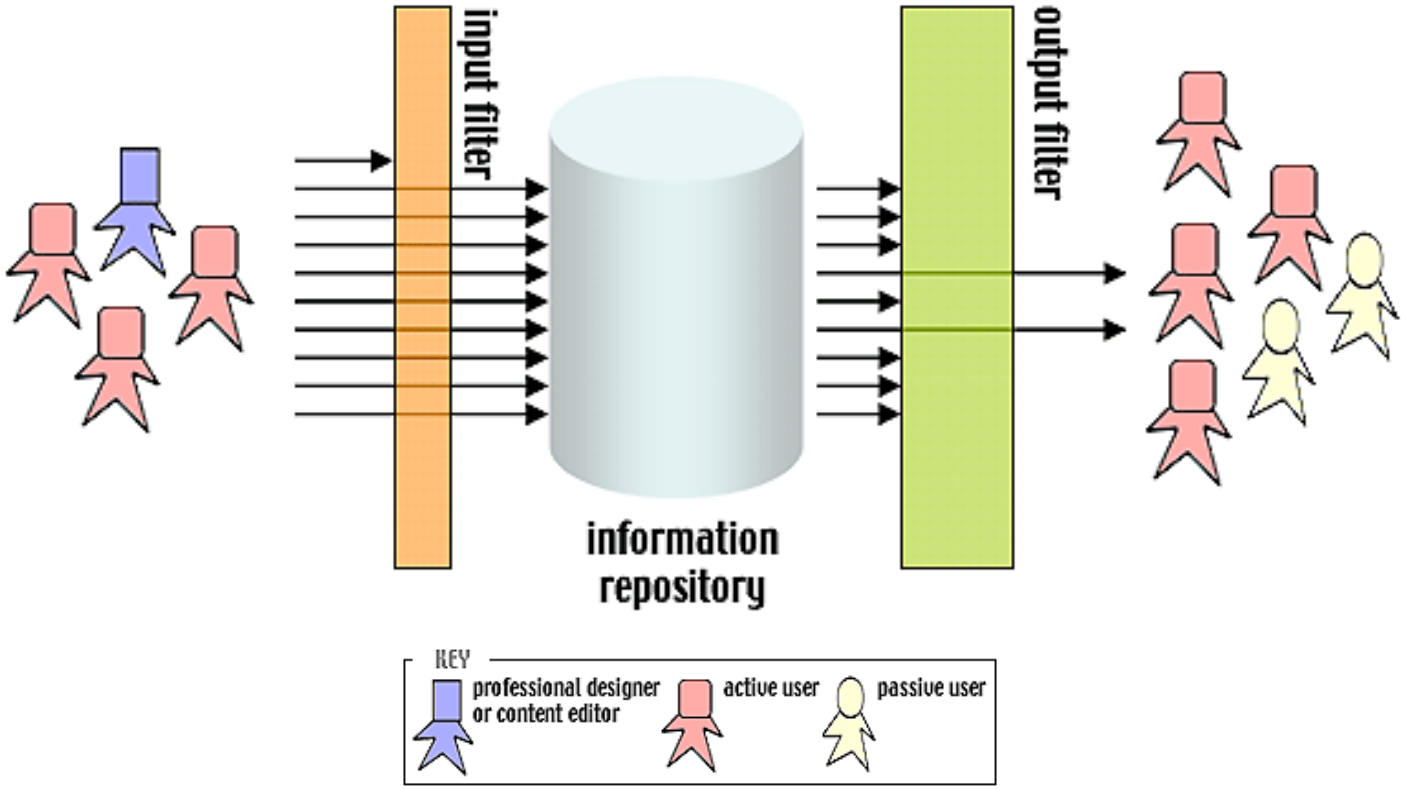
Knowledge Sharing in a Consumer Culture ("Access")

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



Knowledge Sharing in Design Culture ("Informed Participation")

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



Trust

- open source software versus commercial software → "if there are enough eye balls, are bugs are shallow

- Wikipedia versus Encyclopedia Britannica

- South Korea's stem cell scandal → the results were published in ***Science*** and ***Nature*** (two of the most carefully reviewed journal)

Shift the Discourse

- **from:** a concern about who has access to new information technologies
  - 95% of the 15-24 years old population in Japan in 2001 owned a web-enabled cell phone
  - will the $100 laptop solve the problem?
  - differentiate between necessary and sufficient

- **to:** who will have the knowledge to design, create, invent, and use the technologies enhancing human lives
  - basic belief on earlier slide: "*the deep and enduring changes of our ages are not technological but social and cultural*"

Beyond the Unaided, Individual Human Mind