Xerox PARC –
an innovation ecology?

IDEA SPARKERS

JSB

Didn't you guys fumble the future
and give it all to Apple??

What question did Arthur D. Little fail to ask that
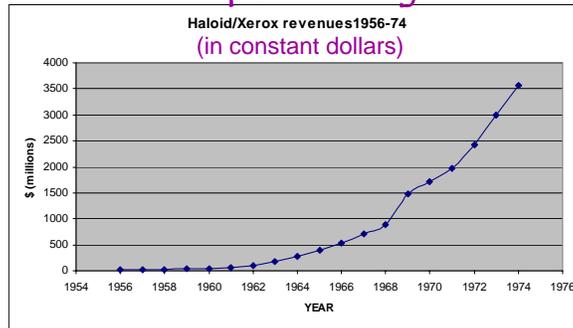caused IBM to turn down buying the patent rights?

914 copier

ah, a radical innovation changes
our work and social practices.

Learning: Think deeply about network effects.

Growth of Xerox outpaces the growth of Microsoft

Haloid/Xerox revenues1956-74
(in constant dollars)

After 15 years, Microsoft was about 70% of what xrx was.

In radical innovation – tech & marketing often need to be creatively coupled.

Fantastic wealth created because of TWO complementary innovations - one tech, the other marketing.

The Art of Seeing Differently
Palo Alto Research Center (PARC)

pioneering new frontiers for the digital age

PARC fulfilled its original charter:
the architecture of information
and the office of the future

ethernet

distributed computing

object-oriented programming

bit-mapped display

windows, Word, icons, folders

wysiwyg

and created the modern xerographic laser printer

Building the foundation for the (Digital) Document Company

and then marched on

Social computing, MOOs, Ubiquitous computing
Smart matter, collaborative filtering, DRM, Liveboard
tablet computing, mems based printing, ePaper,-,-,
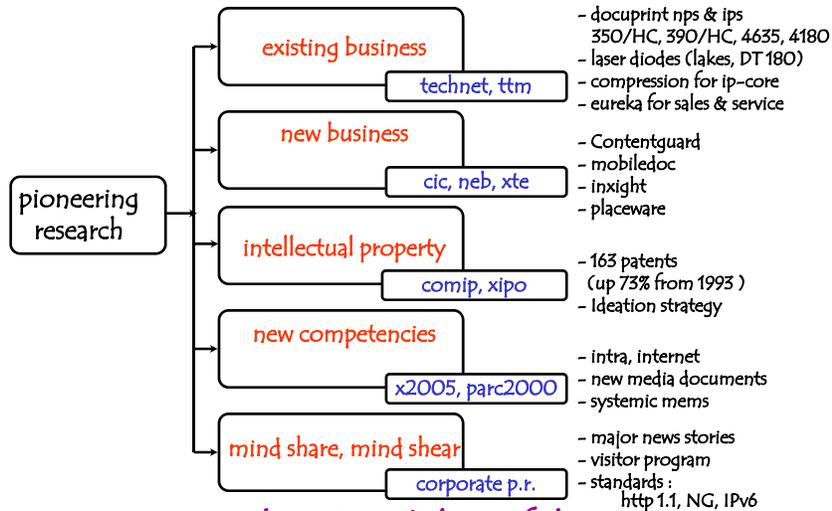and some spin outs.– SPL,……

Who Are We?

Disciplines	Countries	Universities
(atoms to culture)	(27 countries)	(60% Phds)
physics	north america	Stanford
materials science	central america	MIT
electrical engr	south america	Berkeley
computer science	europe	CMU
mathematics	asia	Princeton
psychology		Harvard
linguistics		Cornell
anthropology		Cambridge
design		UCSB
art		+many others

budget ~ $55m
size ~ 325 folks (including post-docs)

1995 or so

paths for creating value

pioneering research

- **existing business**
  - technet, ttm
    - docuprint nps & ips
      350/HC, 390/HC, 4635, 4180
    - laser diodes (lakes, DT 180)
    - compression for ip-core
    - eureka for sales & service

- **new business**
  - cic, neb, xte
    - Contentguard
    - mobiledoc
    - inxight
    - placeware

- **intellectual property**
  - comip, xipo
    - 163 patents
      (up 73% from 1993)
    - Ideation strategy

- **new competencies**
  - x2005, parc2000
    - intra, internet
    - new media documents
    - systemic mems

- **mind share, mind shear**
  - corporate p.r.
    - major news stories
    - visitor program
    - standards :
      http 1.1, NG, IPv6

Increasing the adaptability of the corporation
(1/3 of 1% of revenue ⟶ genetic variance)

How We Work

core values
* bold but grounded
* inter-disciplinary
* honoring the emergent
* passion for impact

we strive to hire:
* those with deep intuitions
* the creative
* those with a passion for impact
* risk takers

style
* radical (both meanings):
  1) go to the root
  2) think out of the box

style prime
* QTL^4:
  1) link
  2) listen
  3) learn
  4) lead

pioneering research: opening up new frontiers

Key Insight

At 1/3rd of 1% can almost be viewed
as a round-off error
and thus doesn't need adult supervision

stay small – but large enough
to achieve critical mass
and be fundamentally unpredictable
(failure permitted)

PARC Themes

Knowledge Ecologies: Content Context Community	Document Tools and Practices to Support Knowledge Creation and Use in Organizations
Networks and Documents	Secure Document Services on the Internet
Smart Matter	Combining Computation and Matter at New Scales and Revolutionizing Xerox Product Competency

Early Mantra

Build what you need – use what you build

Ah, you had to eat your own dog food..

The Alto (1974 or so)

Designed to be experimented with.

Deep Focus on the Soft Stuff

Subsidized and great cafeteria

Cross disciplinary teams nearly always

Long lunch tables – so disciplines ate with each other

Wall to wall whiteboards near all the coffee machines

Coffee machines on ether net

Labs never larger than 60 people, usually 45.

Heavy use of intern program for hiring

High rate of failure expected.

Never micro managed.

Big audacious projects the norm – 15 folks or more for multi years

Craft folks appreciated as much as researchers.. (treated the same)

Rich Gold's PARC2000 Poster Journal

War for Talent & Whom We Sought

imagination

taste

intuition   aspiration
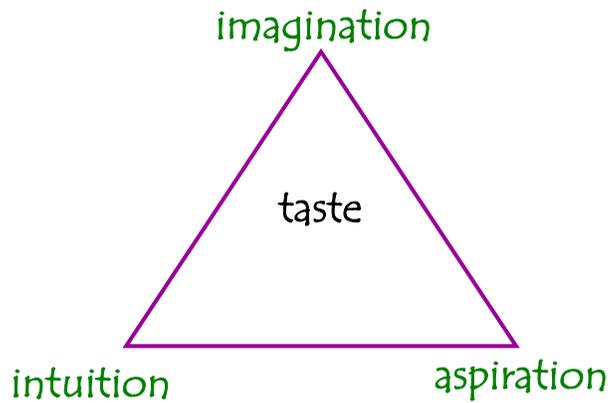
Never looked at a transcript

The Innovative Organization:
productively bridging two worlds

STRATEGIC CAPABILITY   STRATEGIC EXPLORATION

edge
designers

Serious Scientist   Young "artist"

deep domain knowledge   playful
grounded   grounded
analytic   artistic
focused on trenches   transcending boundaries
predictable   unpredictable

Applies to a regional advantage as well
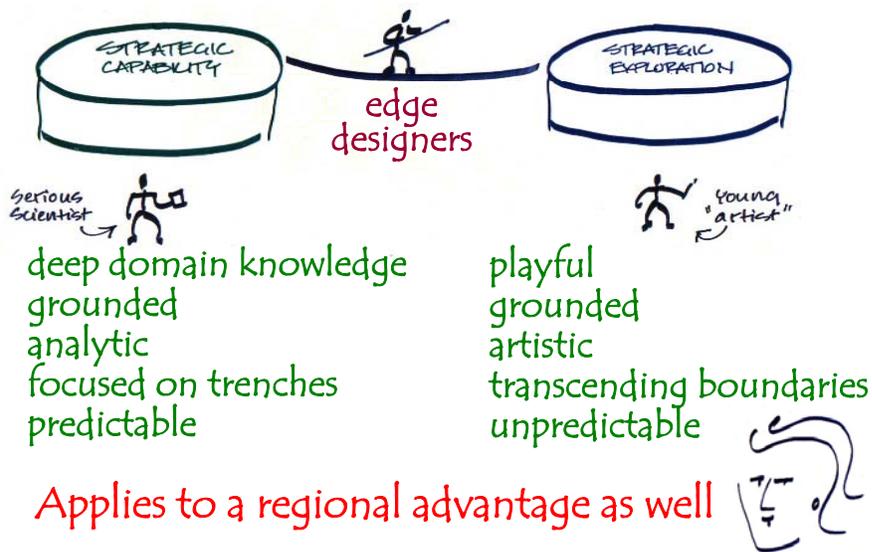
The Secret Receipt

SUCCESS: ALL FOUR COMBINED

ART — SCIENCE

DESIGN — ENGINEERING

SPECULATIVE DESIGN / SPECULATIVE ENGINEERING

INWARD

OUTWARD

MOVE MINDS — MOVE MOLECULES
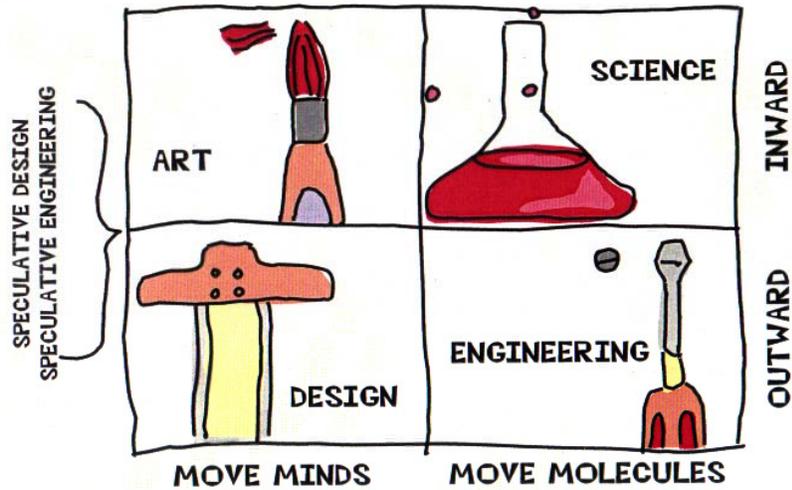
Rich Gold & Anne Balsamo

PAIR: PARC ARTIST IN RESIDENCE PROGRAM
Technologies of Imagination
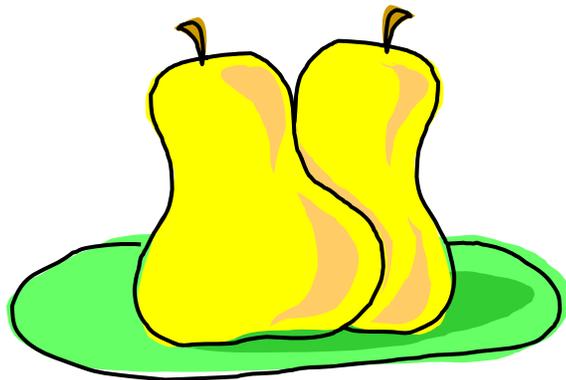
Pairing Artists and Scientists, One on One,
Using Technology as a Common Language.

Inspiration Can Come From Anywhere

Ah, you see art, I see a conformal mapping of a hyperbolic half plane onto a unit circle

Hyperbolic Tree Browser

start

Hyperbolic Comic Browser/Book
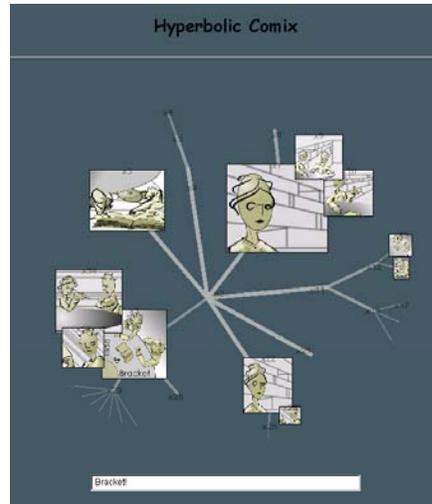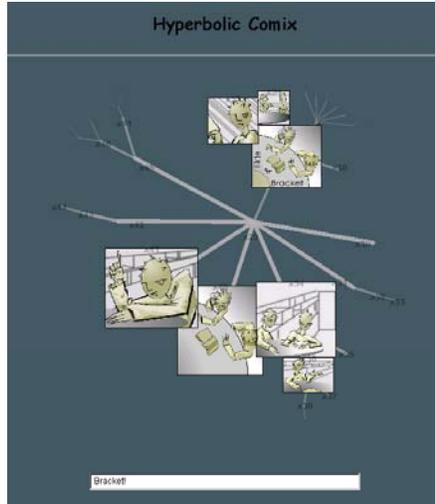
Tunnel Vision Leads To
Tunnel Design

Individuals
Information

Communities
Communication
Context

Honor the Periphery

Metaphors/Images & Stories
help orient the mind
and the organization

A guiding metaphor: The Blind Man & the Cane
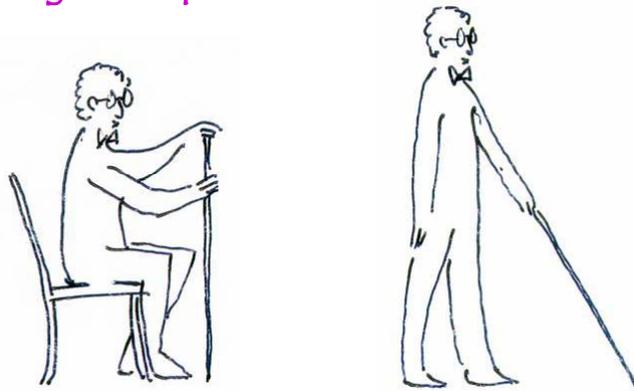
Ready-at-hand: the handle disappears. (Heidegger)

Reaching thru the 'interface' to touch the world directly
almost like a prosthetics – reaching thru the interface to
the subject matter itself..

**Taking Computing out of Computers
and embedding it in the world around us**
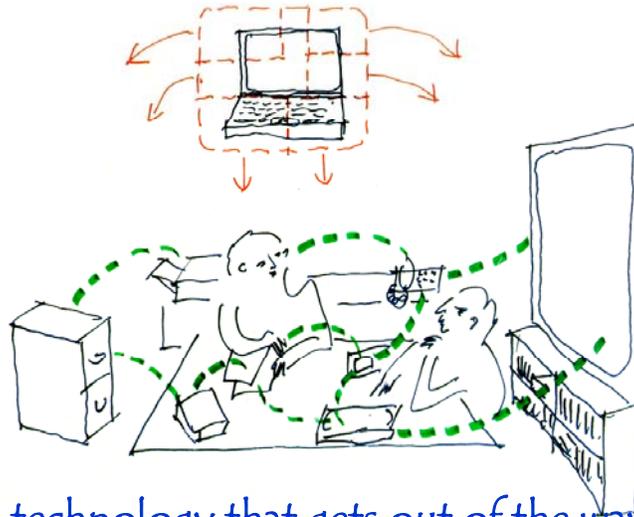
technology that gets out of the way
the essence of the ubiquitous computing movement

Automobile or
4 wheel computational platform?

Dozens of computer – sensor/actuator systems –
all in service of you, sensing when you are in trouble and
seamlessly stepping in to help. The Ultimate Experience??

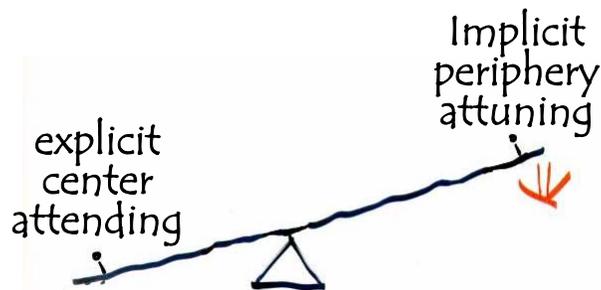# Replacing Mass with Computation using a dynamic auction-based control system
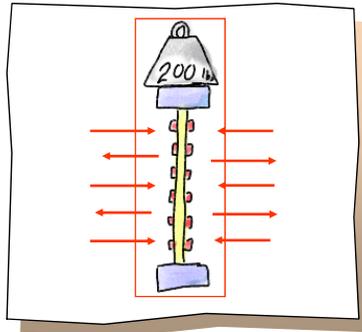
smart column

Hmmm, bringing computation deeply into the physical world.
Beyond PID type controllers – almost mimicking human muscle??

The Need for Balance
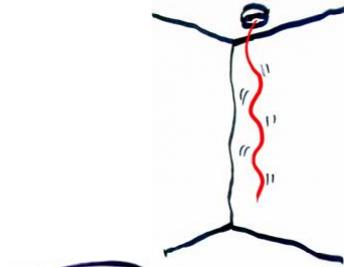## the conscious & the subconscious

Implicit periphery attuning

explicit center attending

Subconscious? This is weird, jsb.

Steps toward attunement

The dangling string
(indicator of ether traffic)

Thanks
Natalie

The water fountain
(indicator of stock prices)

Things that
think want
to link !

Some guiding metaphors for designing CALM technology
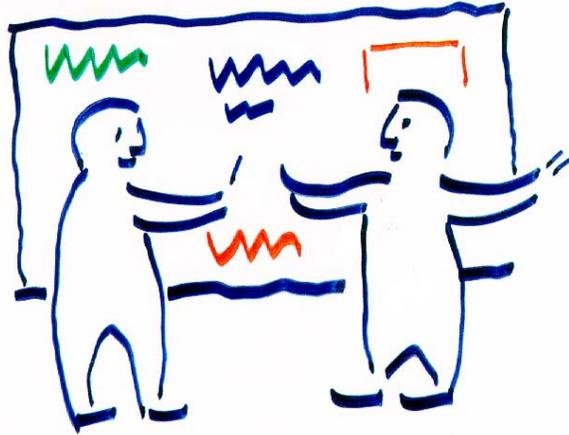

technical   aesthetic

contextual
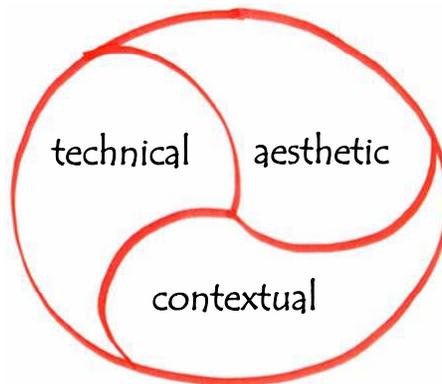
The key is the
rich interplay of
3 domains.

Taste
matters!!

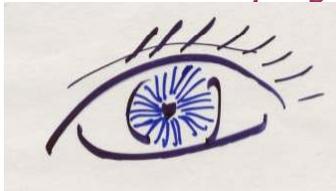# Shoulder to Shoulder Computing

Might this help to explain SL's apparent success?

Turning a constraint into a resource?

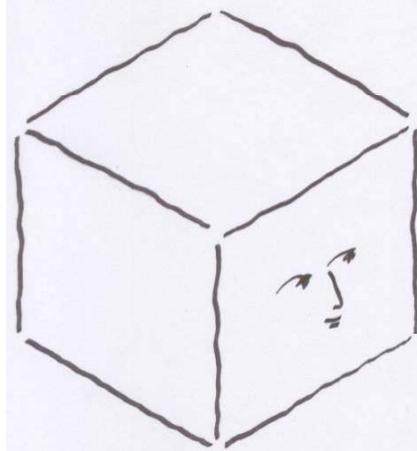Reconceptualizing how to scan documents.

Leverage slop rather than trying to eliminate it

Learning: We can learn bunches from natural systems

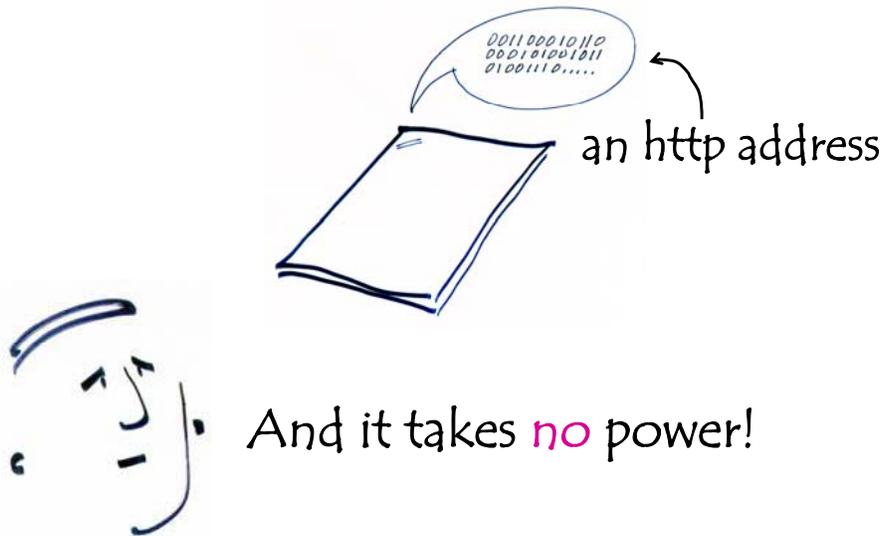If god were a Xerox engineer what would people look like?

Guides to the Unknown

The way ahead is to look around, not just ahead.
jsb/pd

The future is already here just not evenly distributed
William Gibson

Fortune favors the prepared mind
Louis Pasteur

Smart Staples -- eTags

an http address

And it takes no power!

Keys to Innovation

"Thus, the task is not so much to see
what no one yet has seen
but to think
what nobody yet has thought
about that
which everybody sees."

Arthur Schopenhauer 1788-1860

Beware

"The real difficulty in changing any enterprise
lies not in developing new ideas,
but in escaping from the old ones"
John Mayand Keynes:

Wisdom can stultify innovation. The more
experience you have the more you know why
something can't be done.

Why did Xerox not grok the significance of the PC?

Steve Jobs got it in a nano second.

The Alto

Thank You