Xerox PARC – an innovation ecology?

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?

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

Learning: Think deeply about network effects.
Growth of Xerox outpaces the growth of Microsoft

![Graph showing Haloid/Xerox revenues 1956-74 (in constant dollars)](image)

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

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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
(atoms to culture)
physics
materials science
electrical engr
computer science
mathematics
psychology
linguistics
anthropology
design
art

Countries
(27 countries)
north america
central america
south america
europe
asia

Universities
(60% Phds)
Stanford
MIT
Berkeley
CMU
Princeton
Harvard
Cornell
Cambridge
UCSB
+many others

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

1995 or so

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paths for creating value

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

new business
- Contentguard
- mobiledoc
- insight
- placeware

intellectual property
- 163 patents
  (up 73% from 1993)

new competencies
- intra, internet
  - new media documents
  - systemic mems

mind share, mind shear
- 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

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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

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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)
War for Talent & Whom We Sought

imagination

Never looked at a transcript

The Innovative Organization:
productively bridging two worlds

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

Applies to a regional advantage as well
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)

The water fountain
(indicator of stock prices)

Thanks Natalie

Things that think want to link!

Some guiding metaphors for designing CALM technology

The key is the rich interplay of 3 domains.

Taste matters!!

Technical

Aesthetic

Contextual
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?

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Guides to the Unknown

The way ahead is to look around, not just ahead.

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The future is already here just not evenly distributed

The future is already here just not evenly distributed

Fortune favors the prepared mind

Fortune favors the prepared mind

William Gibson

Louis Pasteur
Smart Staples -- eTags

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 Maynard 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