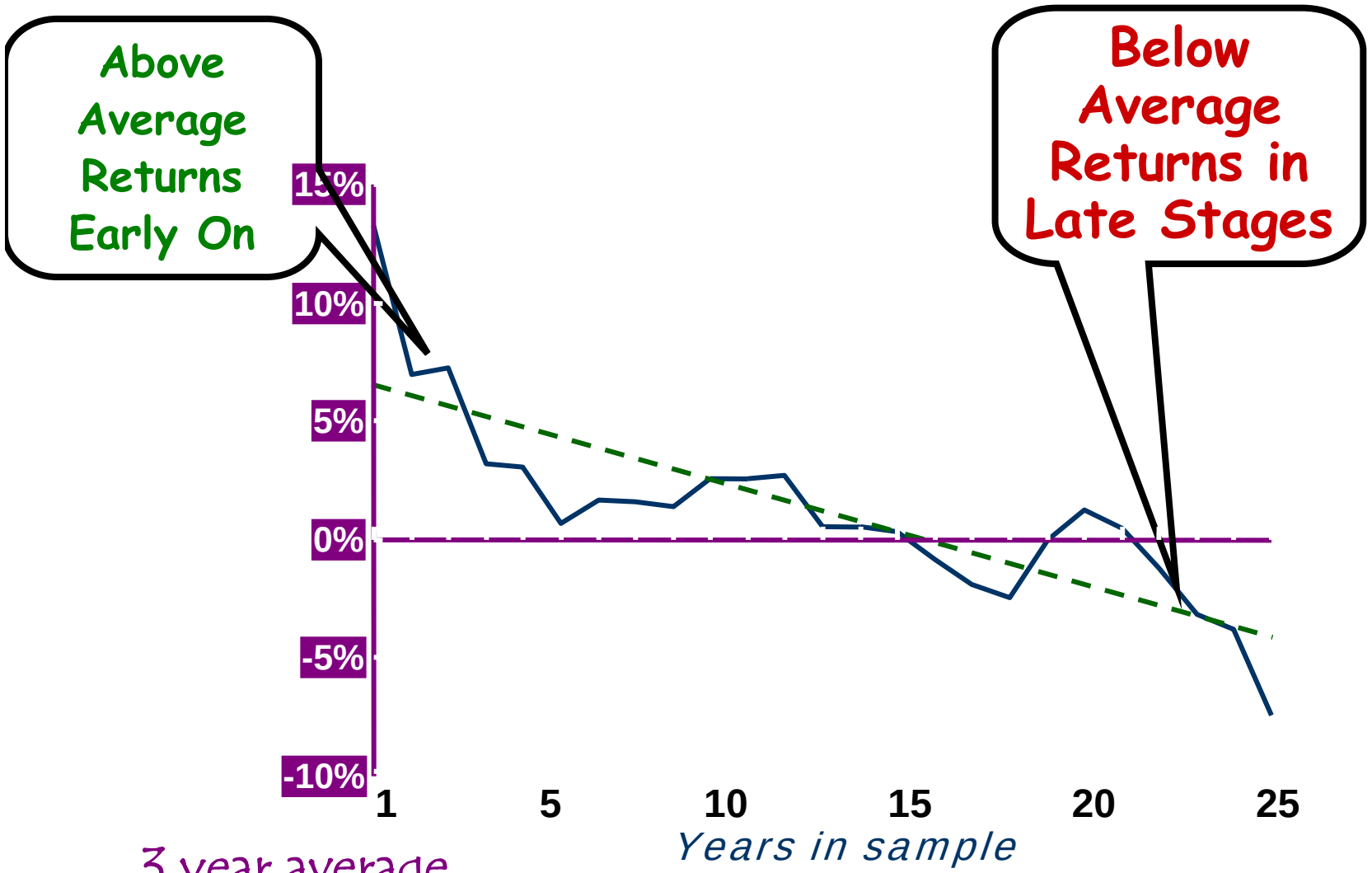
Reflections on Industrial Research

But didn't you guys always mess up at PARC???

Not really, but i made some huge mistakes..

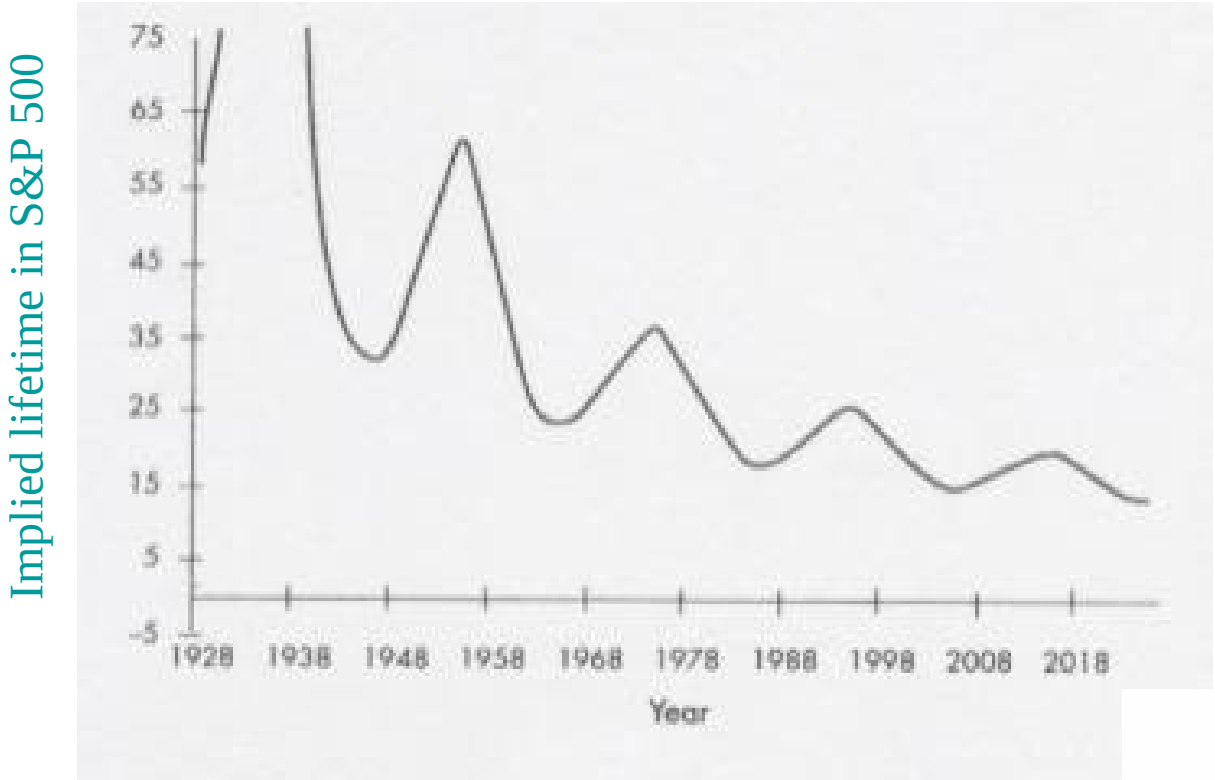
The Survivor's Curse –
rolling average in S&P 500



3 year average rolling average

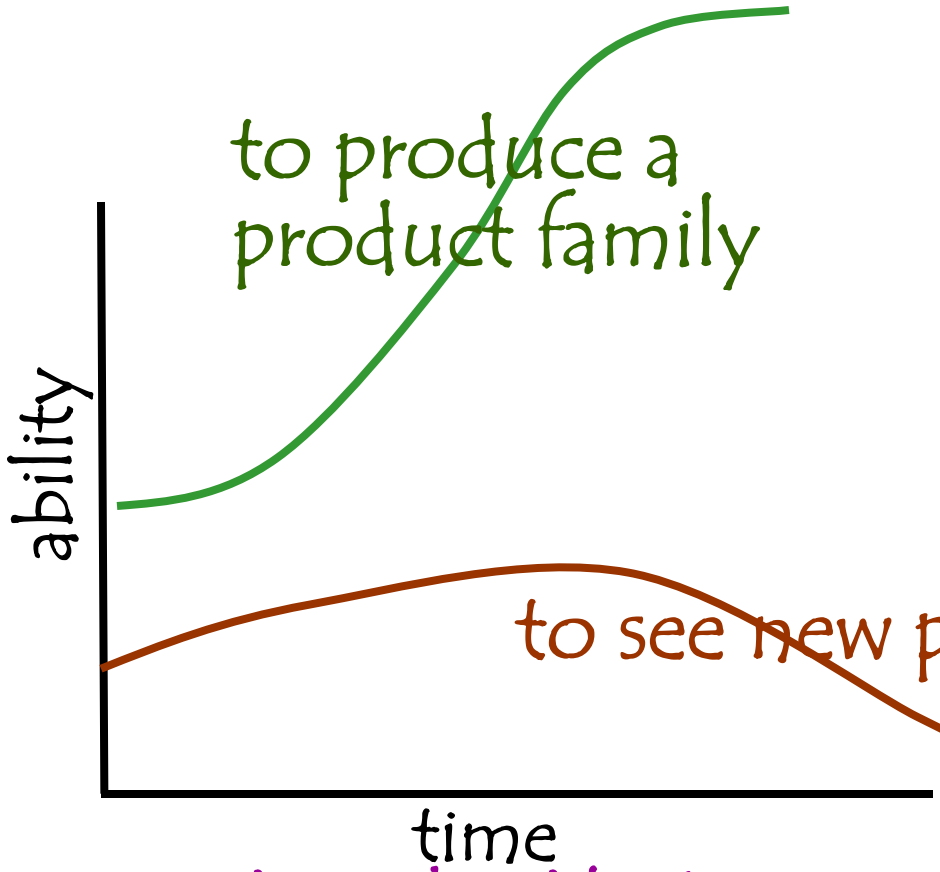
Dick Foster – Creative Destruction

Average Lifetime of S&P 500 Companies



Incredible – can this really be true?

The Innovation Challenge –
Sense making on the edge



but what blocks you
from seeing new patterns?

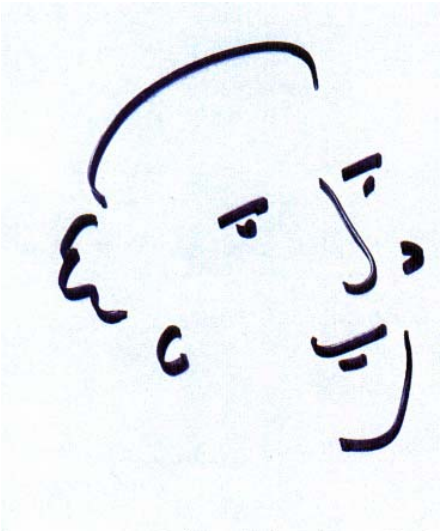
Mental models, institutional and social practices
and path dependencies

Additional Barriers to innovation

Wisdom – been there, tried that, didn't work

Innovator's dilemma – brand, channels, new business model (changing the architecture of revenue), cannibalization of current businesses

Denial – world doesn't really change that fast



Ok, jsb, but is there hope?

Some Models Of Industrial Research

primary focus is on internal – classical: IBM, Bell, Xerox, Corning

hybrid (open/closed) model – intensive use of lab-lets: HP, Intel

open market based innovation – InnoCentive (Eli Lilly)

acquisition model - cisco/pharma: balance sheet transactions (+vc)

stand alone – SRI, BBN plus special relationships to VCs

The tyranny of P/L (earnings) in today's world

Some Significant Cultural Shifts at Parc

Invention → Invention ⊕ Innovation

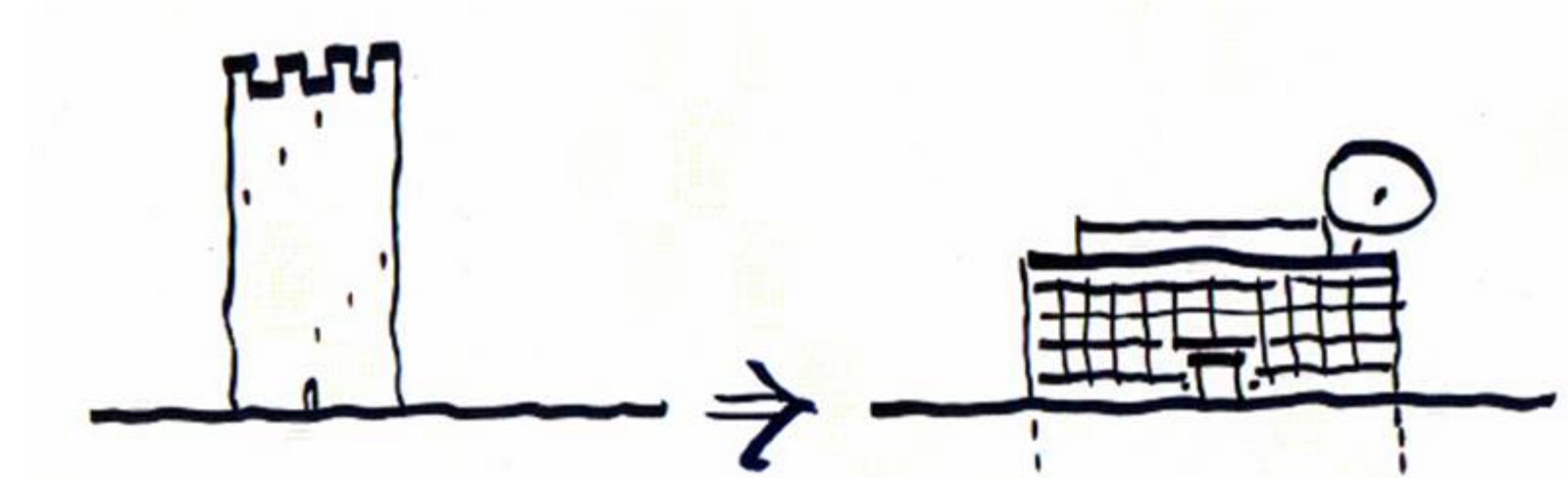
Isolated from business → Deeply aware of business strategies and strategic needs.

Creating new technologies →
- Creating new technologies
- Creating new businesses
- **Creating new business models**
- **Identifying/nurturing new core competencies**
- Creating Intellectual Property

within discipline → between disciplines (white-space)

Ivory tower → Ivory basement

Fundamental knowledge is a byproduct of strategic / speculative explorations

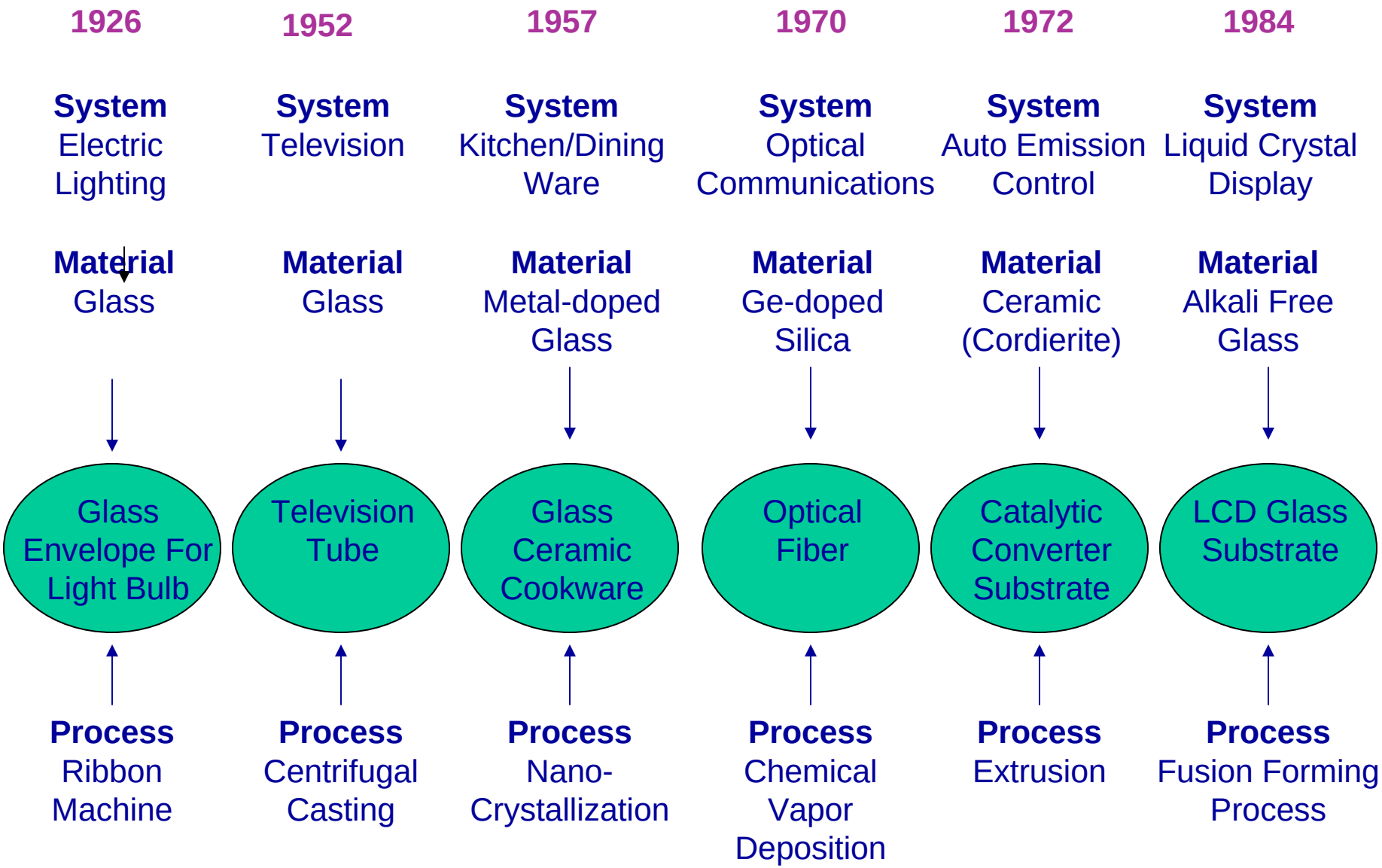


Ivory tower
(open loop explorations)

Ivory basement
(grounded explorations)

- bold <u>but</u> grounded
- radical – to the root

Follow it to the root – where ever it leads you : cross disciplinary

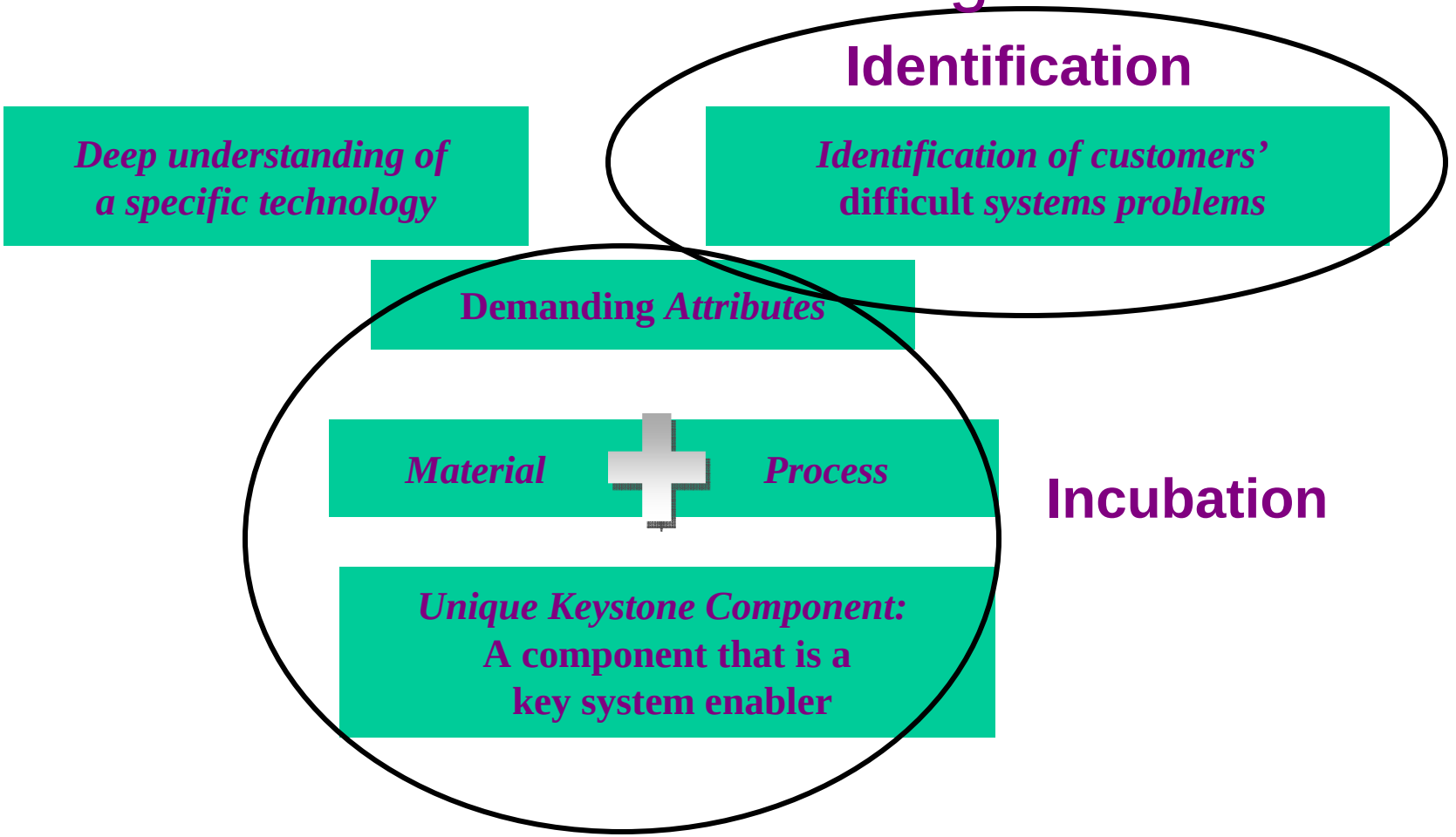


patient money – often 10 plus years for real payoff

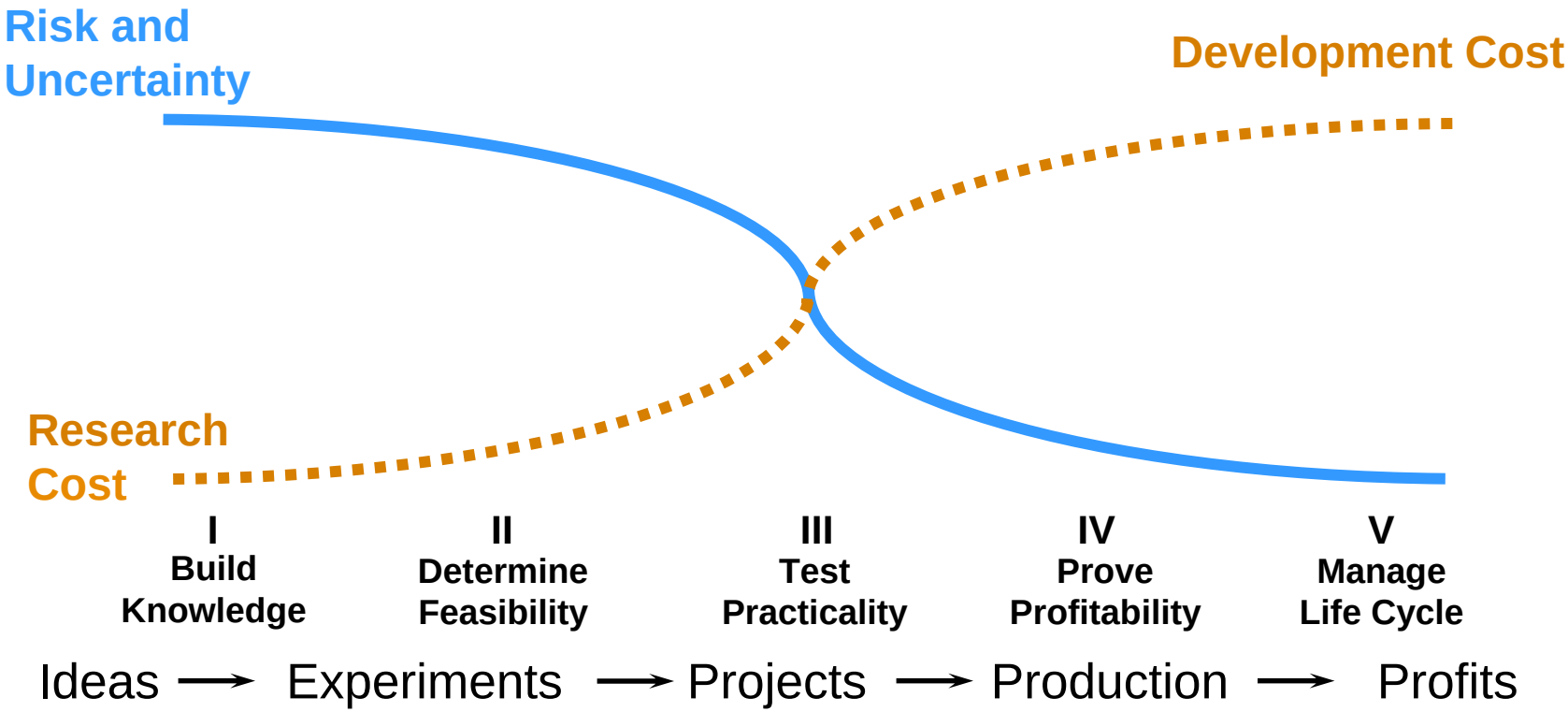
CORNING
Discovering Beyond Imagination

Corning Innovation Recipe

Strategic Growth

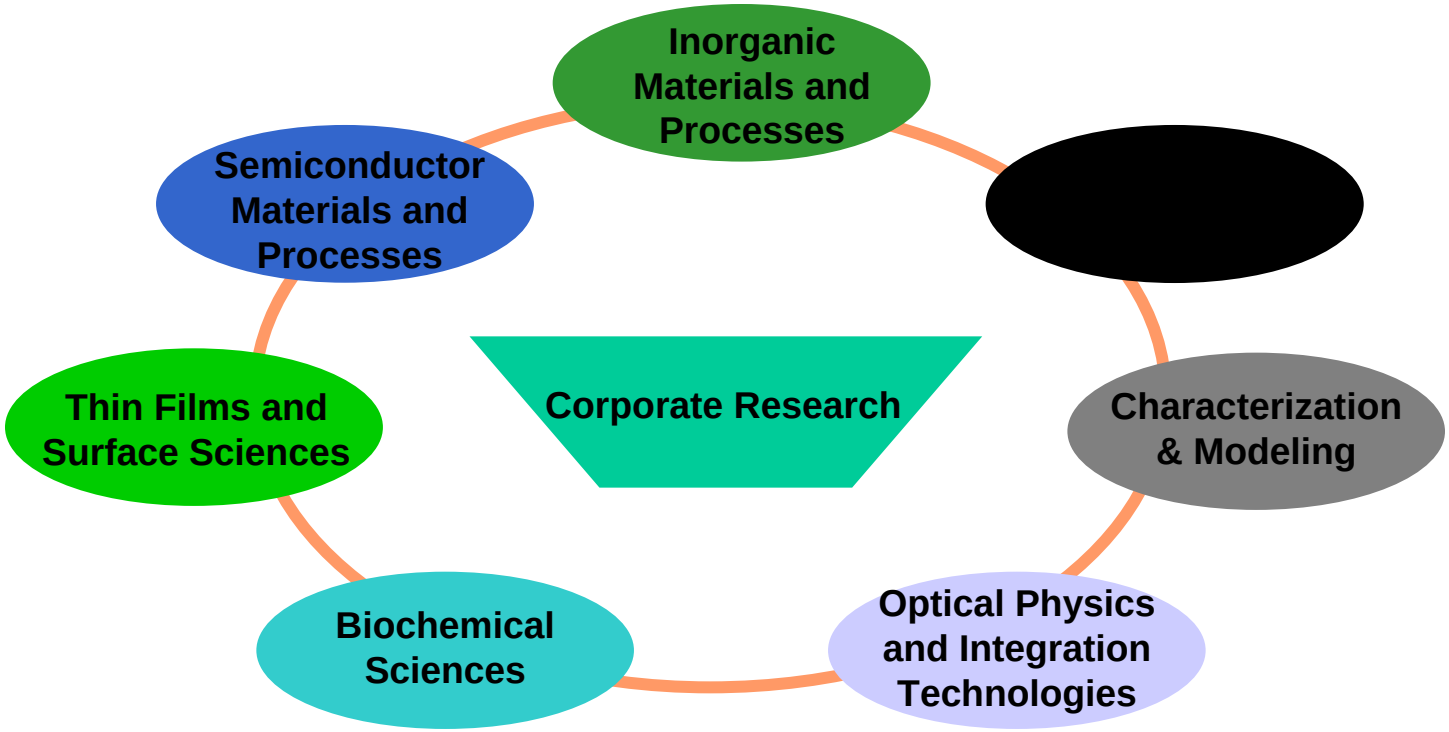


Deep recognition that costs escalate as innovation proceeds ...



For each $1 in the early stage portfolio,
we will need $20 downstream

An Innovation Ecology –
cross pollination and recombination of a set of core technologies:
requires real depth in each of the technologies



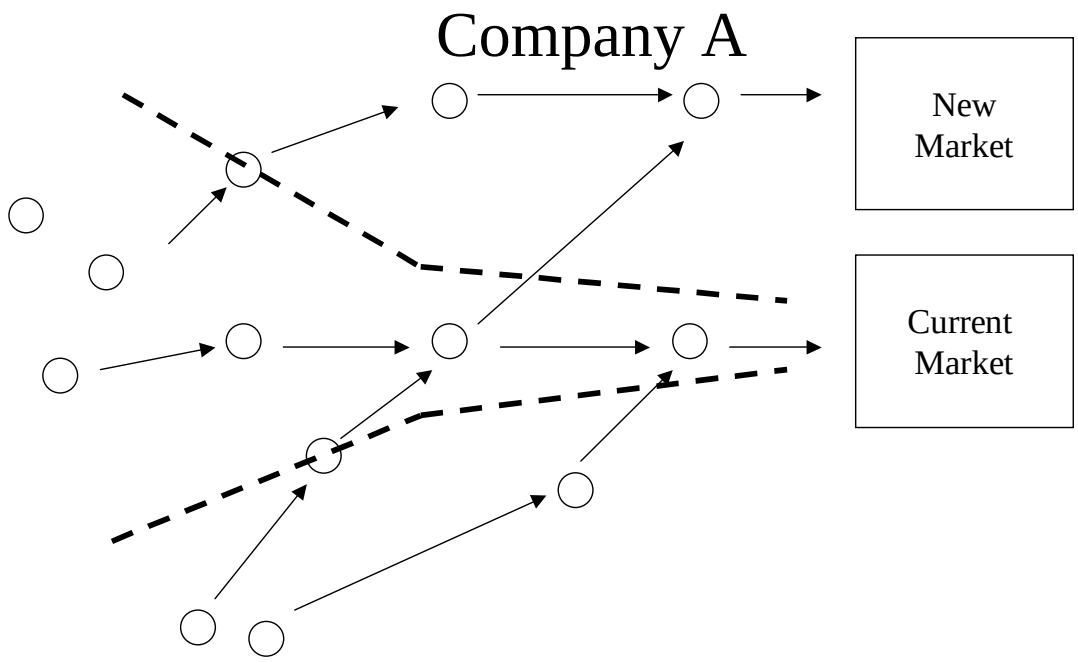
Corning's Core Technologies
the collision of crafts – the collision of ideas

THE NEW LOGIC OF INNOVATION

Closed Innovation Logic	Open Innovation Logic
The smart people in our field work for us	Not all of the smart people in the world work for us.
In order to bring new products and services to the market, we must discover and develop them ourselves	External ideas, when integrated into your architecture, can be as valuable as internal ideas
If we discover it ourselves, we will get it to market first.	We don't have to originate (and own) the research, in order to profit from it.
The company who gets an innovation market first, will usually win.	Building a better business model is better than getting to market first
If you create the most, best ideas in the industry, you will win	If you make the best use of internal and external ideas, you will win
We should control our IP, so that our competitors don't profit from our ideas	We should sell our IP to those who can make good use of it, and we should buy IP whenever it fits with our own business model.

Hank Chesbrough – Open Innovation

The Open Innovation pipeline



Ideas come from inside and from outside.
Ideas go to market inside and outside the firm.

InnoCentive – an open market approach for matching scientists to challenges

Innocentive description

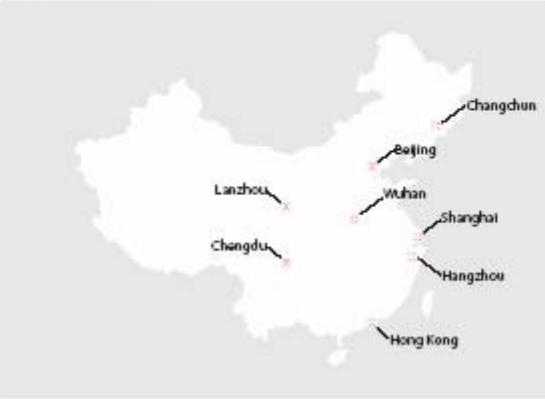
(46 winners since 2001)

Example of challenge list

Encore

Top InnoCentive Solver Networks

1 China



In China, InnoCentive has:

- Established partnerships with major Chinese universities, including:
  - Beijing University of Chemical Technology
  - Fudan University
  - Lanzhou University
  - Peking University
- Established a partnership with the Chinese Academy of Sciences, enabling CAS scientists and researchers to work on InnoCentive Challenges
- Held a landmark symposium on scientific R&D trends at the National Natural Science Foundation of China, including a press event at the People's Grand Hall

2 Russia

In Russia, InnoCentive has:

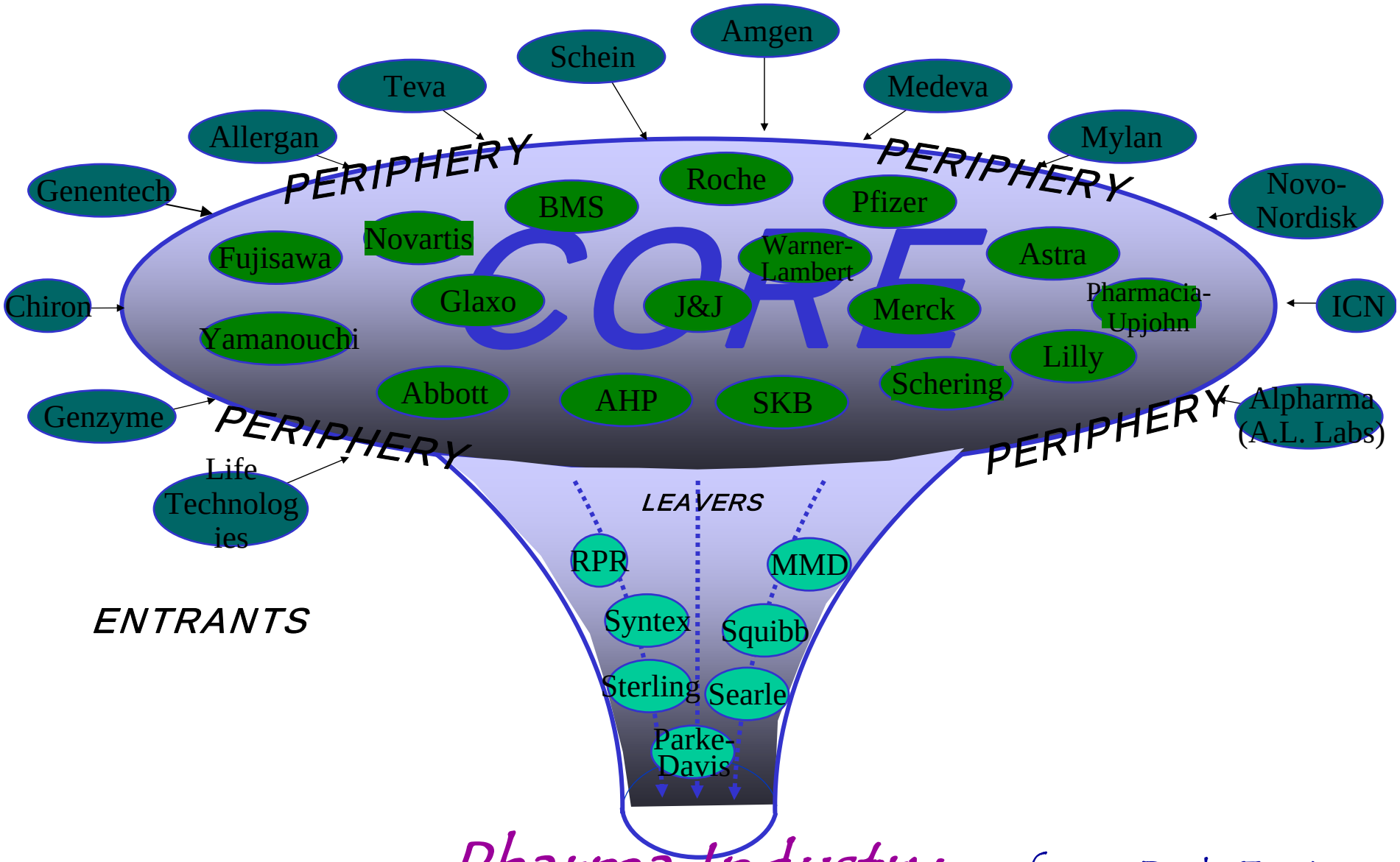
- Established partnerships with leading Russian scientific organizations, such as:
  - Mendeleev University of Chemical Technology
  - Moscow State University
  - St. Petersburg State University
  - Kazan State University
- Hosted scientific conferences at St. Petersburg University and Moscow State University
- Participated in the XVII Mendeleev Congress on General and Applied Chemistry in Kazan
- Sponsored the first virtual scientific competition for Russian chemists with Moscow State University

3 India

In India, InnoCentive has:

- Established cooperation agreements with the Council of Scientific and Industrial Research, National Chemical Laboratory in Pune, and Indian Institute of Chemical Engineers
- Sponsored the 91st Indian Science Congress, held at Panjab University, Chandigarh
- Sponsored the sixth Chemical Research Society of India National Symposium at Kanpur
- Formed an Advisory Board comprising some of India's most well-respected scientists and researchers to enhance global R&D in India

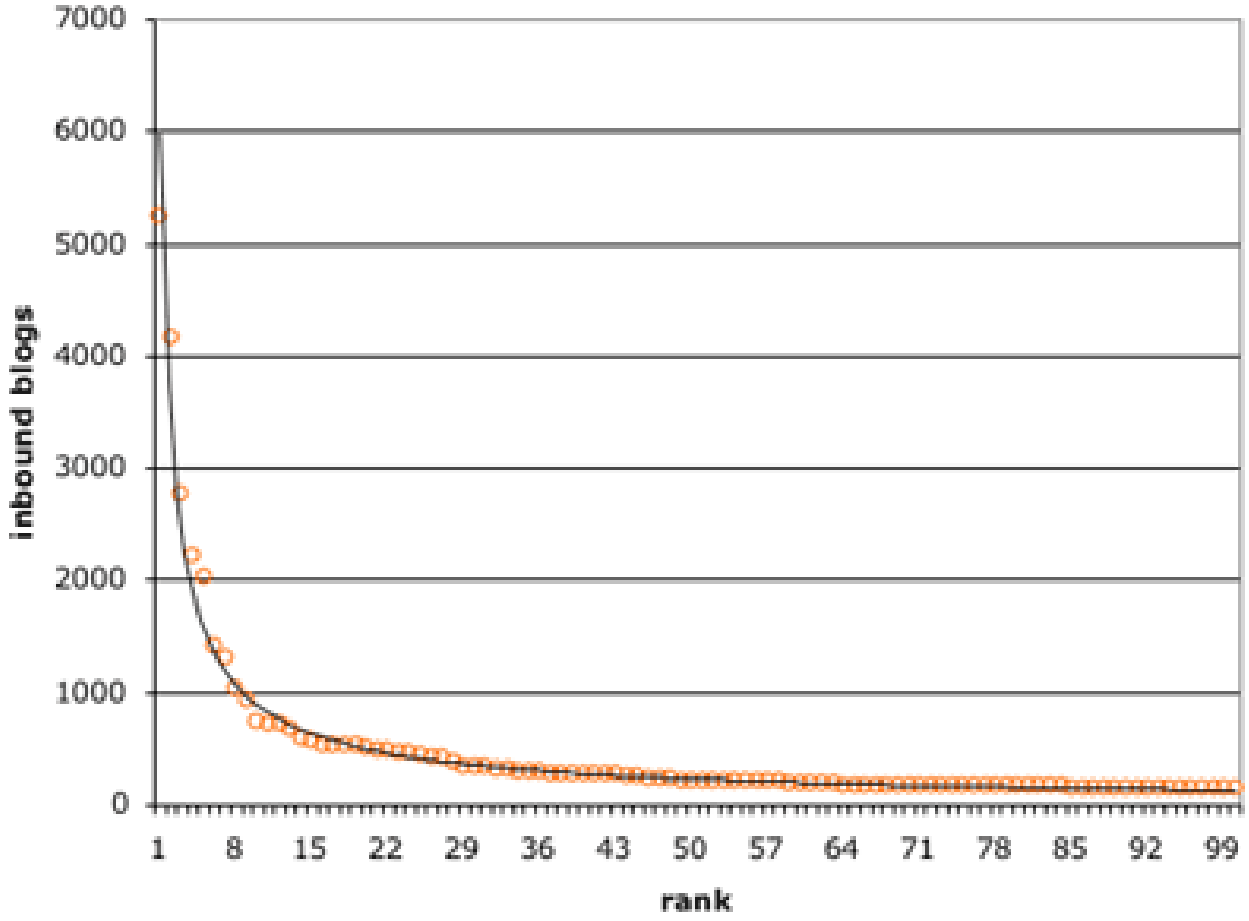
Break the rut –
attend to the periphery of your industry



Pharma Industry

from Dick Foster

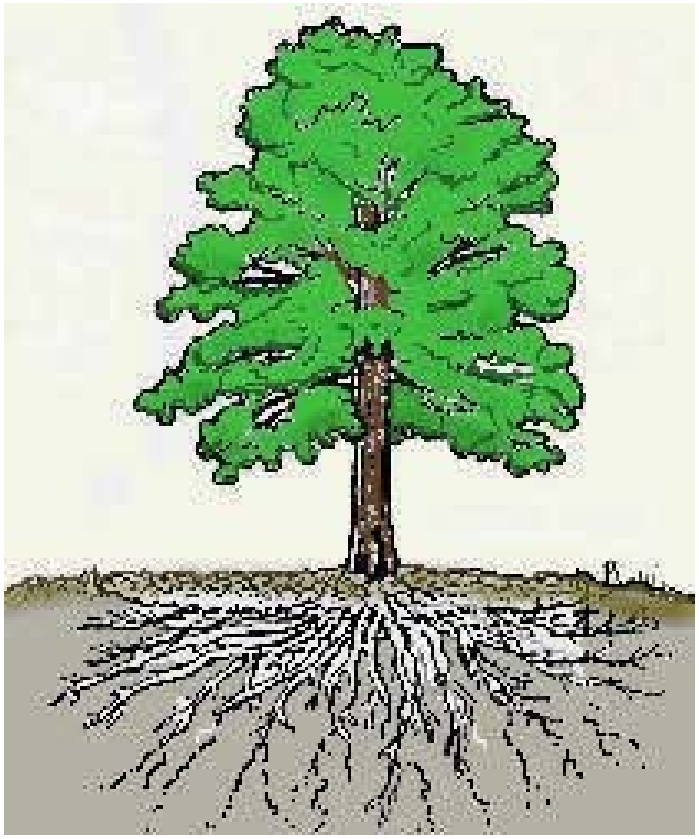
Patent payoffs follow the power law



And patents have a downside besides cost – impeding research collaboration, etc.

Dimensions of knowledge

Explicit/tacit



Tangible assets

Intangible assets

Robustness and adaptability from situated roots.

Knowledge flows on the rails of practice

A Poorly Understood Tenet

Practice provides the rails on which knowledge flows--

facilitating both the:

- shared warrants (trust)
- shared world view underlying beliefs

The world is read thru the lens of practice

So knowledge flows within a cop but sticks (or doesn't flow smoothly) between cops in the value chain.

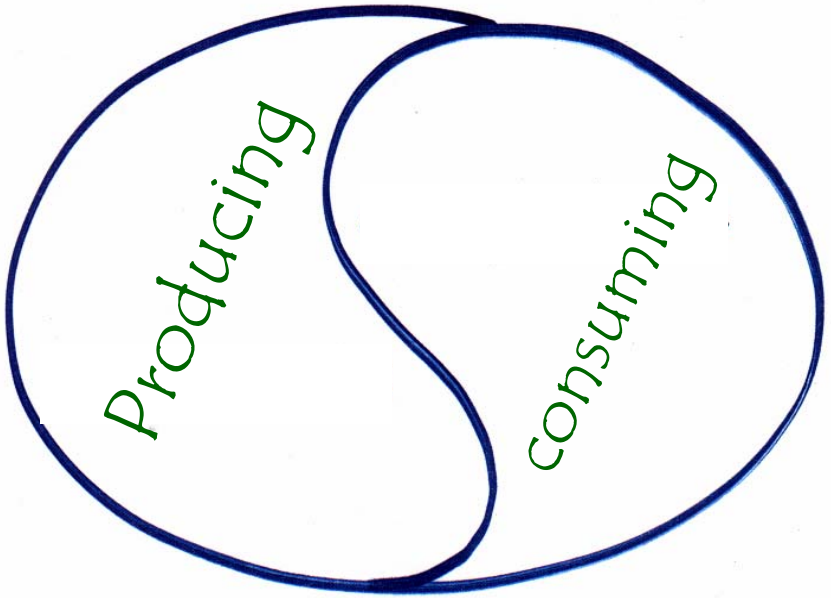
cop – community of practice

From an economic point of view, the easy part is the invention and refinement and standardization of technology. The really hard part is the process of learning what the technology, from a business point of view, is good for.

This is why Schumpeter's insight as to the role of the entrepreneur in turning innovative technology into disruptive economic change retains so much resonance.

William Janeway
Vice Chairman of Warburg Pincus

Leveraging the dynamics of a knowledge/learning/innovation ecology



Ah, the key is realizing that we are all producers and consumers of knowledge & innovation.

Even Stanford Univ learns as much from silicon Valley as it producers knowledge for it.

We can learn with and from each other all the time. Leverage it!!!

My Basis:
If science is a jigsaw puzzle, computation is the grand master.

The accelerating spiral:
Science – New Technological Tools – Deeper Science

a ying yang relationship
science based technology & technology based science

A renaissance of opportunities:

Computational biology
Nano materals
The internet as platform
etc, etc, etc

Thank you