

Technology Assessment

That Sounds so....

...20th Century

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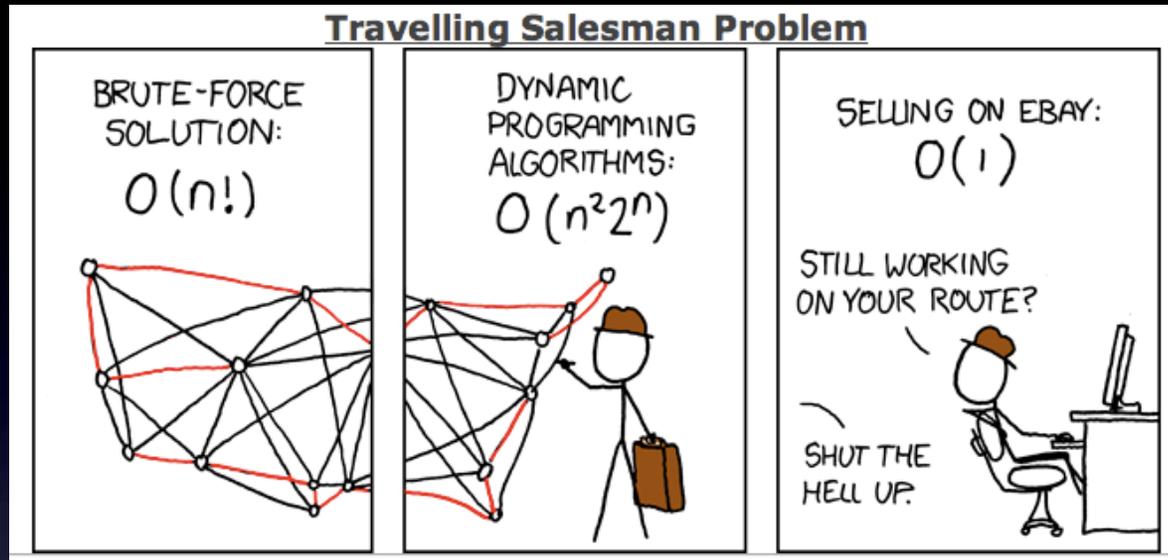
AAAS Forum on Science and Technology Policy
April 30, 2009

Who needs a bricks-and-mortar office devoted to deep thinking about the consequences of technology when technologies have pretty much made the idea of an office obsolete?

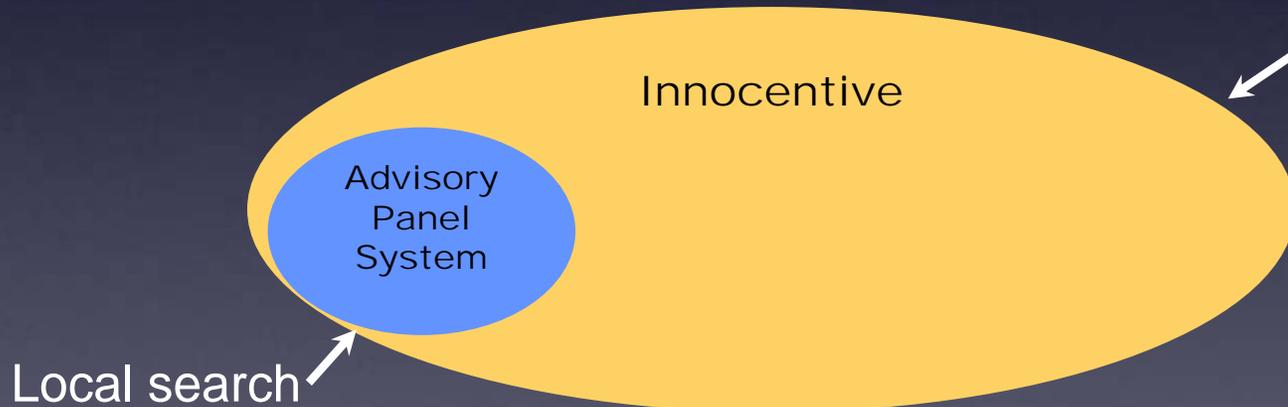


New modes and models of both
interaction and innovation

New Tools for the Technological Frontier



Open-source Innovation Models



“...the further the problem was from the solver’s expertise, the more likely they were to solve it.”

Karim Lakhani, Harvard Business School

With enough eyes, every bug is shallow.

New Tools for the Technological Frontier

Make A Prediction

Buy or sell stock in a possible answer.



administrator: [edit market](#) · [feature market on homepage](#)

When will scientists create a complete living bacterial cell based entirely on a synthetically made genome?

[← back to all possible predictions](#)

SELECTED PREDICTION

Project Completion Day

TIP: A price of \$0.00 means the current projected date is October 15, 2008.

If you think the current date of October 15, 2008 is:

Way too early... Early... Just before... Advanced...

Buy 50 shares estimated new date October 25, 2008 your cost \$250.00	Buy 20 shares estimated new date October 19, 2008 your cost \$40.00	Buy 5 shares estimated new date October 16, 2008 your cost \$2.50	Buy <input type="text"/> shares estimated new date ... your cost ...
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[Click here for more explanation on what to do.](#)

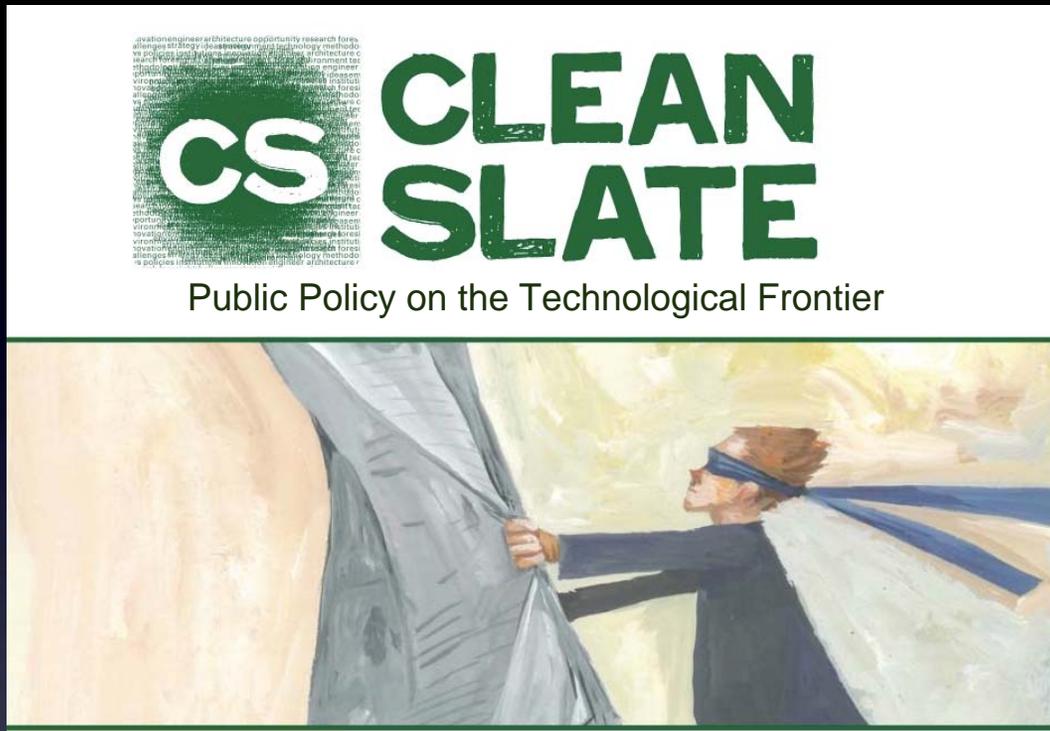
[confirm prediction](#) | [back](#)

On-Line Prediction Markets

A “wisdom of crowds” approach: A large group of laymen can beat a small number of experts.

In January 2008, a team of scientists at the J. Craig Venter Institute created the largest man-made DNA structure by synthesizing and assembling the 582,970 base pair genome of a bacterium, *Mycoplasma genitalium* JCVI-1.0. The next step is to create a complete living bacterial cell based entirely on a synthetically made genome. When do you think this will be accomplished?

What If We Could Start from Scratch



The Premise: An incremental approach to change, built on what some term “backward compatibility” won’t work and what are needed are bold and transformative steps guided by a cohesive vision.

The Key Questions:

- Given what we know now, and if we could start with a clean slate, how would we design policies, practices, and organizations that can deal with rapidly emerging, and potentially disruptive, technologies?
- What would that system look like in 10-15 years?

Some Challenges

DTPs Damn Tough Problems

Rampant novelty (that undermines prediction)

Cognitive biases (that blur our perception)

Framing (that distorts public policies)

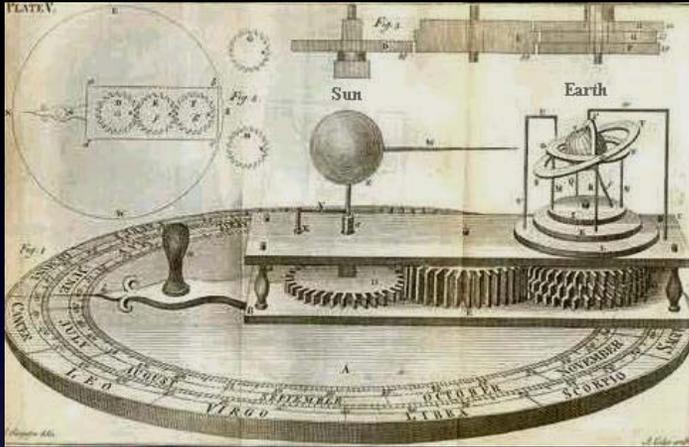
Intractable problems (with too little funding to solve them)

Known unknowns (that go unaddressed)

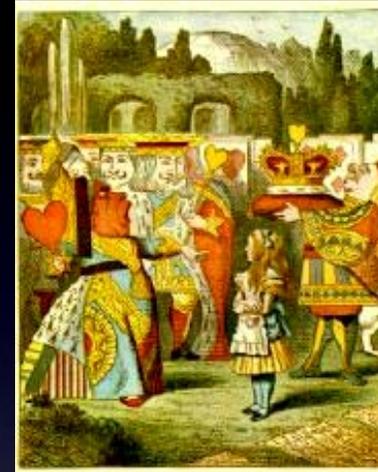
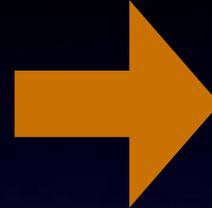
Tempo (that forces government to play catch-up)

Start by Shifting the Metaphor

Red Queen



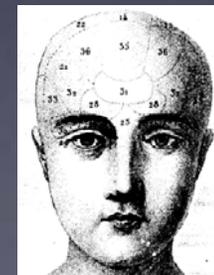
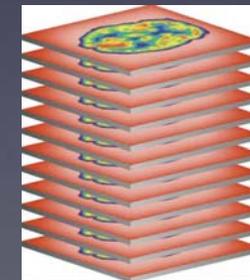
Newtonian
Mechanics



Evolutionary
Biology

“... it takes all the running you can do to keep in the same place.”

L. Carroll, Through the Looking Glass



Serial vs. Parallel Processing

Technology Assessments (1972)
Cost: \$800,000 to \$2.3 million (today's \$s)
Average time: 16 months¹

Technology Assessment (2009)
About the same

1. Coates, V. 1972. "Technology and Public Policy: The Process of Technology Assessment in the Federal Government,"

In A **Red Queen** World:

1. Persistent co-evolution drives behavior.

“The future is not invented, it is we co-evolved with a wide class of players .”

John Seely Brown, former director, Xerox PARC

2. Time matters.

Time affects strategies: Shaping, Adapting, Reserving the Right to Play

Time affects tactics/postures: Place big bets, create options, no-regrets moves¹

3. Change/Learn or die.

Previous behaviors and adaptation do not guarantee continued survival or success in the face of future challenges.²

1. Courtney, H.G. et al 1997. “Strategy Under Uncertainty,” *Harvard Business Review*, November-December.

2. Hoffman, A. 1991. “Testing the Red Queen Hypothesis,” *Journal of Evolutionary Biology*, Volume 4, pp. 1-7

Persistent Co-evolution Approaches

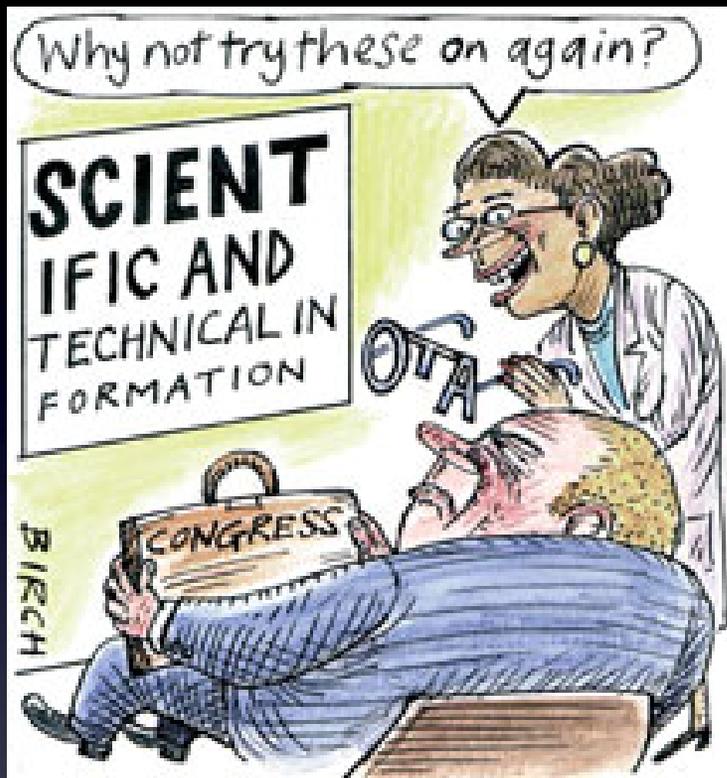
Embed Continual Early Warning

Track Known Unknowns

Focus on Bad Practices

Train for the Frontier

Experiment, Experiment



“Innovation....springs from better recipes, not just more cooking.”

Paul Romer

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