Deploying Innovation

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UNESCO CROSS-CULTURAL AMBASSADORS FOR PEACE

With all we've got…
… why are we so stuck?

- US economic indicators among top in world
  - .. but median income is flat, inequality growing
- US has great history of democracy
  - … but corruption, gridlock, much failure
- Luxuries are necessities
  - … but necessities are luxuries
- Many great educational institutions
  - … but people seem to be ignoring science
- All this great technology
  - … but why do we get surveillance, discrimination, dehumanization?

Self-improving systems

- Designing {political, economic social} systems is hard
  - You can't think of everything at once

- Idea: Adopt a system that has
  - Built-in mechanisms for changing itself
  - That way, you don't have to get everything right the first time

- Self-modifying systems are *heuristics* for improvement

Conventional mechanisms for self-improvement

- Political
  - Voting, Running for office, Writing your representative
  - Writing new laws, Amending the Constitution
  - Protest: Black Lives Matter, Occupy Wall Street, Trump Resistance
- Economic
  - Company management
  - Consumer "voting with your $"
  - Startups and entrepreneurism

Unfortunately, change mechanisms are rusty

- The status quo *competes* against change mechanisms
- Political
  - Money in politics: Lobbying, contributions, kickbacks, corruption
  - Representatives only interested in re-election
  - Political parties and "deals"
- Economic
  - Startup ecosystem selects for copycat incremental change
    - 90% fail – inefficient innovation workforce. No learning.
  - Inequality tilts playing field to rich
  - Bait and switch

Status Quo Bias

Heuristics for self-improvement
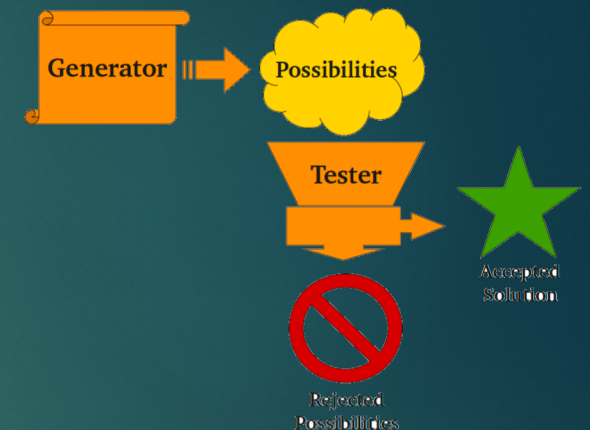
- Goal stacks and heuristics
  - In bureaucracies, goal stack is *frozen* in people hierarchies
    - Can't collaborate, can't replan if things go wrong
    - No "incentive" for innovation
    - Innovation requires *redivide and conquer.* Better car or PRT?
- Innovation can't be evaluated by the standards of "production"

- Generate and Test
- Hill Climbing

Generate and Test

- Two processes:
  - Generate: Outputs a stream of *possibilities*
  - Test: Tests each possibility according to some criterion
- Politics
  - Generate: Run for office, propose law
  - Test: Voting
- Economics
  - Generate: Launch product, launch company, offer job
  - Test: Commercial success of product or company
- G&T doesn't tell you *why* something succeeded or failed

Hill Climbing

- ▶ Wherever you are, you go *up* in the direction of some metric
- ▶ Great for *incremental* change – lowers risk of big change
- ▶ Politics
  - ▶ Increase support of candidate/party/issue according to polls
  - ▶ Each law/change moves "in the right direction"
- ▶ Economics
  - ▶ Invest in whatever has the best ROI

- ▶ Fatal flaw: You get stuck in a *local maximum*
- ▶ Like G&T, doesn't tell you *why* something happens

The Playaz

- Who decides about deploying innovation?

- Big Government
- Little Government
- Big Business
- Little Business
- The people (as citizens, consumers)

Sufficiency of solutions

Proposal	Result
0. Do nothing	Unchecked emissions. Disaster!
-1. Better fuel economy	Reduced acceleration of emissions
-2. Paris Climate Agreement	Limited emissions growth
-3. No fossil fuels. PRT.	Slow decline in emissions.
-5. No emissions. Sequestration.	Radical decline in emissions.

Search by Design

- How do you find innovations?

- First, make a proposed design
- Then search for the specifics of that design

- Allows filtering solutions by design constraints
  - Car efficiency = forward-facing cross section
  - > 2 seats -> Inefficient

The Structure of Scientific Revolutions

- Science has *theories* – goal stack
- Theories tested by experiments, analysis, simulations
- Anomalies motivate change of theory
- You go back up the stack
- You can revise at any level