




Going Exponential: Bottoms-Up Transformations & Our Exponential Era Ahead


[@fcc_cio](#)



#ChangeAgents = Leaders who
“illuminate the way” manage friction
of stepping outside the status quo



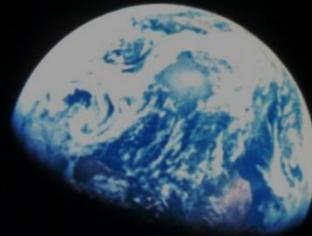
This is our home
3.7 billion miles away

The background is a dark, grainy image of a celestial body, likely a planet or moon, with a small blue arrow pointing upwards to a tiny white dot.

This is our home
3.7 billion miles away

a “Pale Blue Dot”
sunlight reflected from Earth took
5½ hours to reach Voyager I in 1990

when Voyager I launched in 1977
4.2 billion humans lived on Earth




global GDP = 7.2 trillion USD
and the Apple II went on sale that year
running at 1 MHz w/ 4 KB of RAM

Voyager I traveled 3.7 billion miles by 1990
5.3 billion humans lived on Earth

global GDP = 22 trillion USD
Windows 3.0 released and CERN sets up
the first web server at info.cern.ch

by 2013 >850 million web servers online
7.1 billion humans lived on Earth

global GDP = 75 trillion USD
7 billion global networked devices
4 ZB (billion TB) of digital content globally





by 2022, 75-300 billion networked devices
8 billion humans will live on Earth

global GDP = ?? trillion USD
7 billion humans online & 96 ZB content
digital content > all human eyes see/year

Turbulent Environments

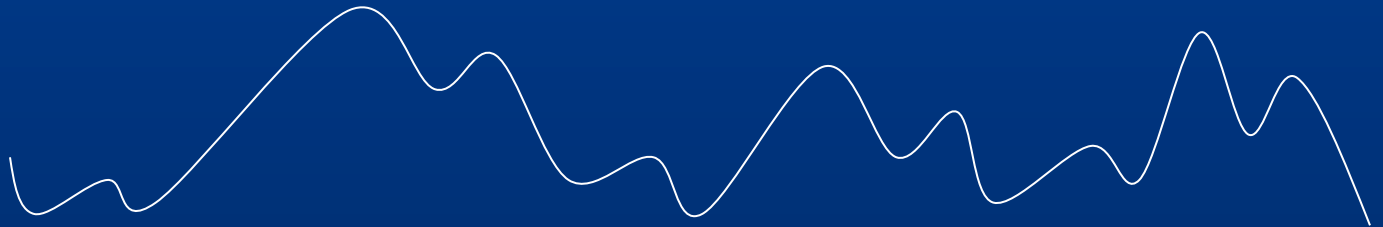
From CIA's "Global Trends: 2015"

- Unrestricted flows of information, ideas... effective governance will increasingly be determined by the ability and agility... to exploit increased information flows
- published in 2000

Turbulent Environments

The challenge of turbulent environments is true for the majority of large organizations as a result of increasing global transactional:

- Velocity
- Volume
- Volatility
- Veracity



(1) Power of Diversity

- With crowds: diversity trumps ability
- Yet clearly there are times when crowds are smart and also times when crowds are dumb, so why does diversity influence outcomes?
- Consider: individuals have particular perspectives on a problem, paying attention to some aspects and filtering out others

(1) Power of Diversity

- Learned perspectives may limit the search space any one individual uses to reach an answer, even for “smart” individuals



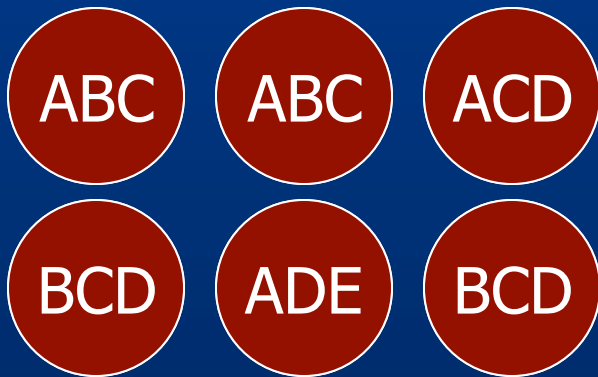
IQ view of the “Alpha” Group



IQ view of the Diverse Group

(1) Power of Diversity

- Multiple individuals with varying perspectives expand the search space employed
- A diverse crowd has more “tools” to apply



Toolbox view of the “Alpha” Group



Toolbox view of the Diverse Group

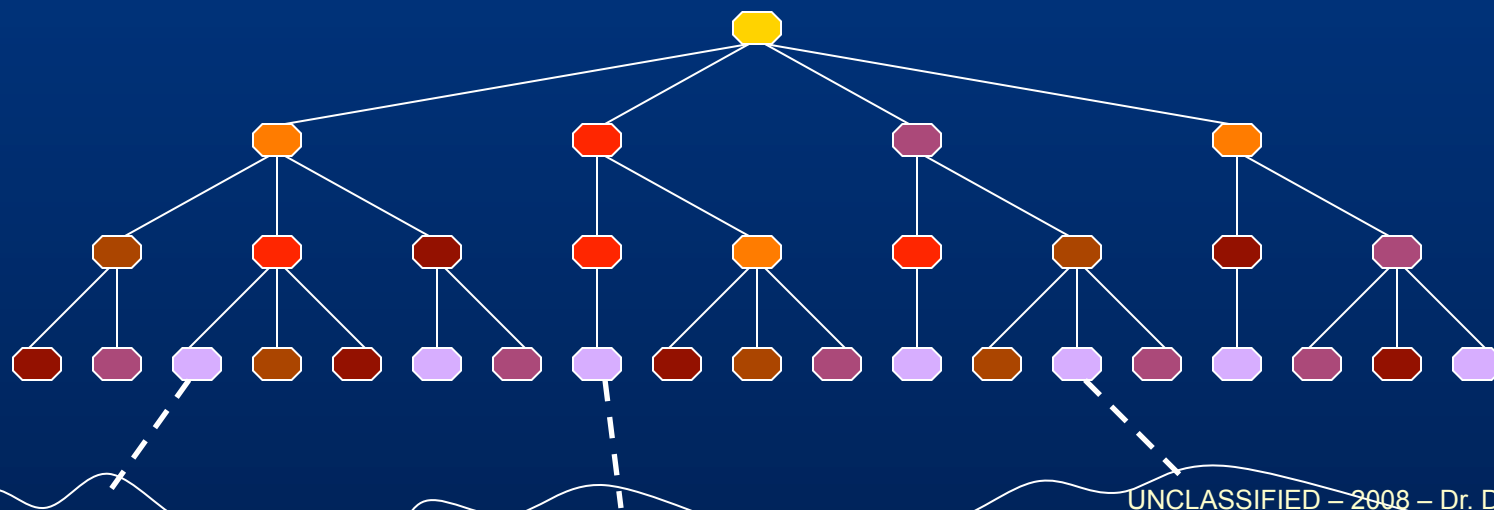
(1) Power of Diversity

Potential drawbacks:

- Diversity works if everyone has same goal of getting the answer right, and values this goal
- If goal-related values of different groups are not shared, crowd may splinter into factions

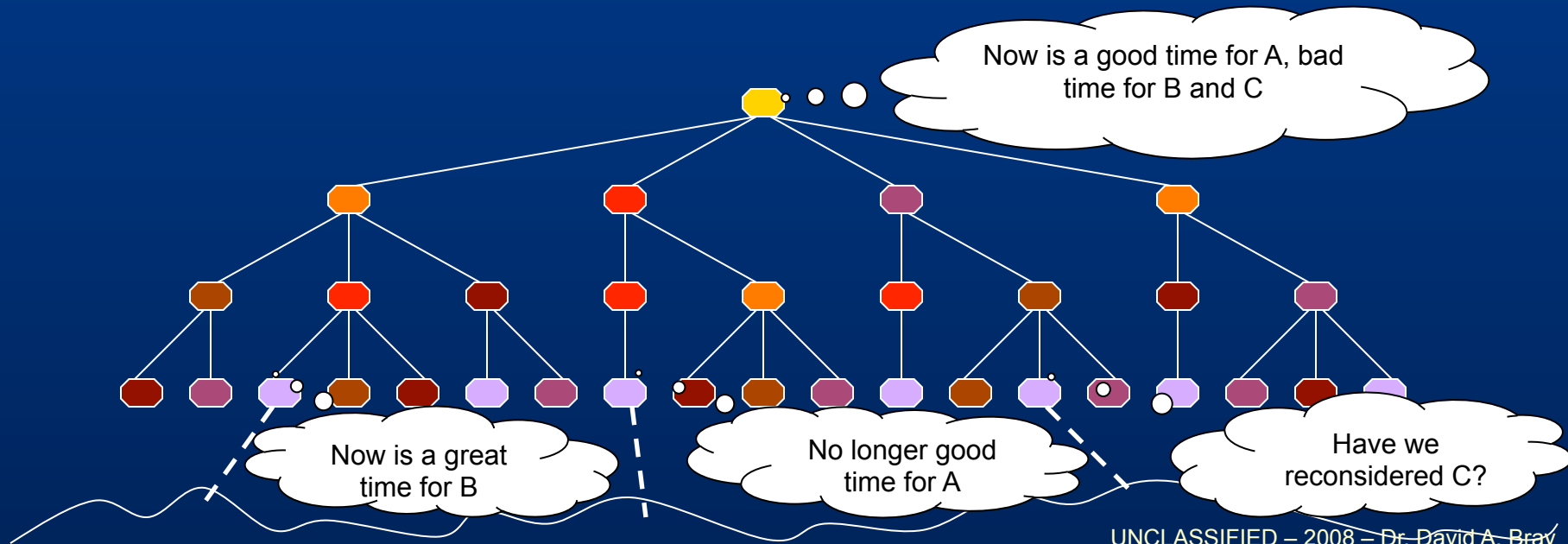
(2) Power of the Edge

- Traditional organizations exist to harness worker output, usually a top-down approach
- Yet top-down hierarchies restrict opportunities for bottom-up information flow; also introduce information flow delays



(2) Power of the Edge

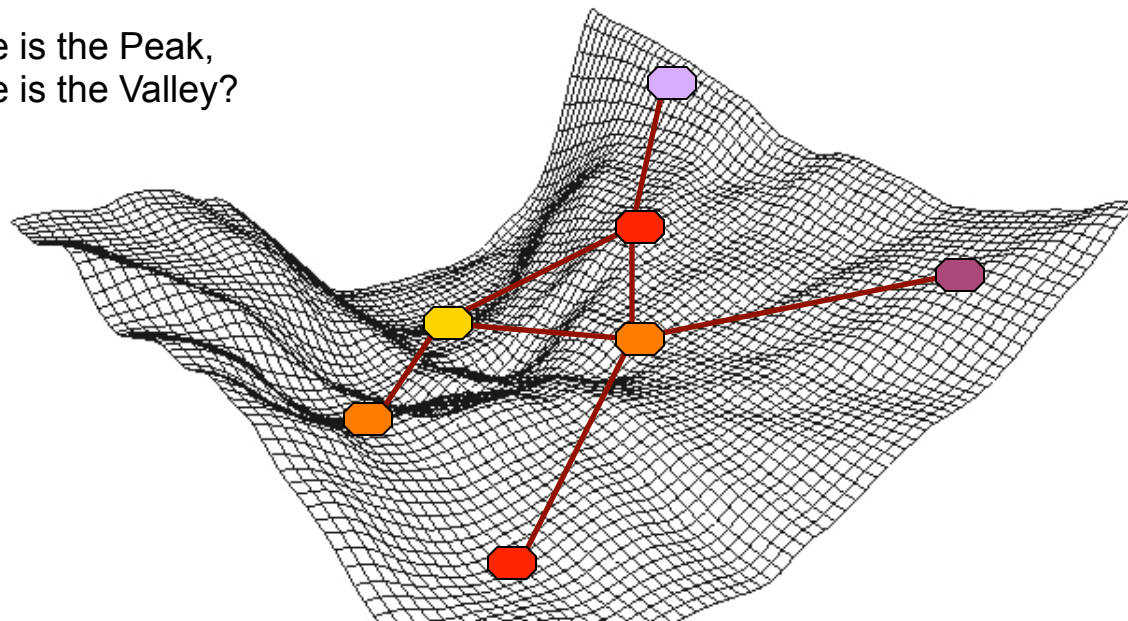
- If the organization doesn't encourage bottom-up percolation of these insights to a changing environment, highly probable that the the top could lose relevancy despite larger scope



(3) Power of an Ecosystem

- Where any one individual (or team) is looking may no longer be relevant; whereas different views can better scan the environment

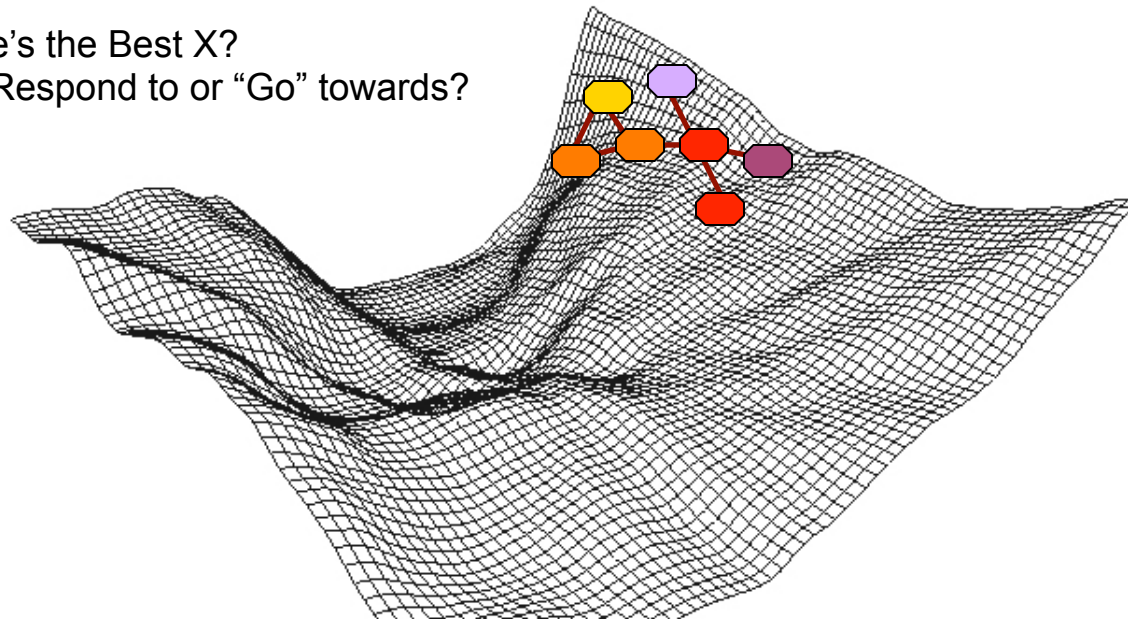
Where is the Peak,
Where is the Valley?



(3) Power of an Ecosystem

- Through chatter and conversation, new threats or opportunities can be addressed through swarming around interesting features

Where's the Best X?
... to Respond to or "Go" towards?

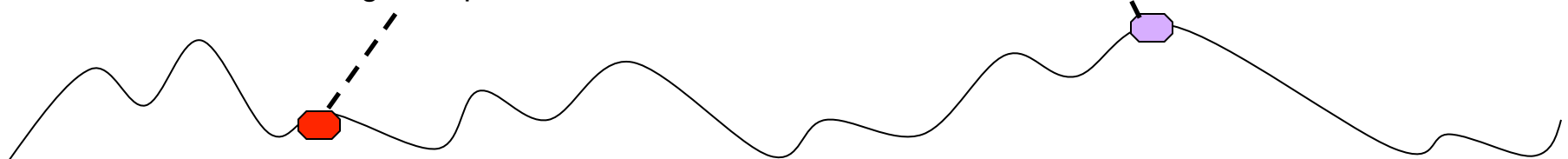


Applying this to the Present Day

- What happens if what your organization should to focus on is dramatically different from what is expected?
- Traditional analysis and data-mining can limit diversity and top-down approaches limit organizational responsiveness

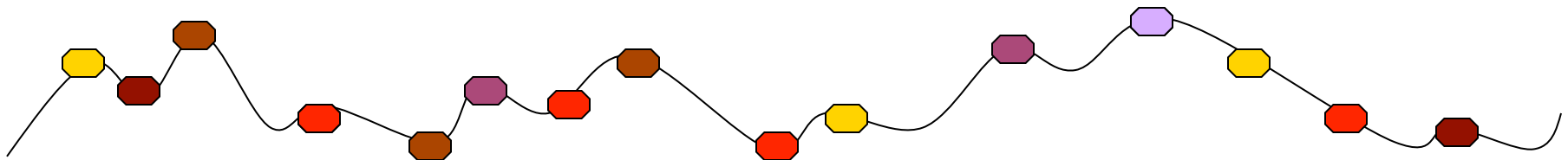
Your analysis efforts are examining this space ...

... But the interesting event is here ...



Applying this to the Present Day

- Leverage the crowd
- The crowd can be a closed “bottom-up” community of professionals
- The crowd can be partnerships with local, state, and federal organizations
- The crowd can include public input potentially



Examples Exist Already

Sermo.com: individuals vetted as real physicians before gaining access; once online, operate via a pseudonym

- Can ask any question to the community and answer any question; community of peers rank value of questions and answers
- Sermo also provides incentives to post; several say they participate for fun or to learn

Examples Exist Already

Healthmap.org: sources of disease alerts include ProMED, World Health Organization, Google News

- Anyone can zoom in with the map to view specific areas, or opt to view disease alerts by category or by date
- May not be perfect as it depends on automated indexing of news, but a great start

Embracing Bottom-Up Projects

- Traditional top-down structure → Bottom-up
Balance knowledge sharing and protection
- Roles of managers → Cultivators
Position and reward boundary spanners

“No matter who you are, most of the smartest people work for someone else...”

~ Bill Joy, co-founder Sun Microsystems

**There Is No Textbook For Where
We're Going Next with Technology**

The #Exponential Storm

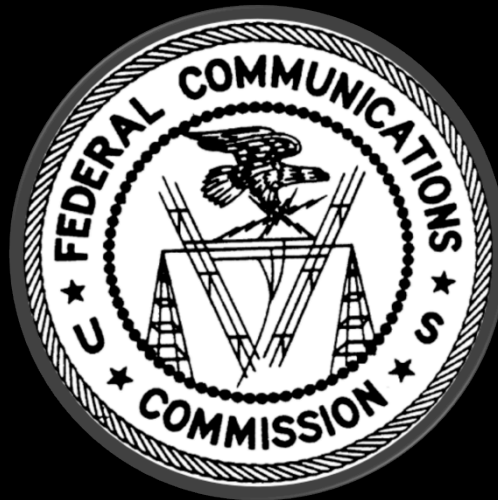
The #Exponential Storm

The **Next 7 Years**
Will See More Change than the
Last 20 Years Combined



Transforming for the Future

Arrived as new FCC CIO in late 2013
FCC previously had 9 CIOs in 8 years



FCC IT Transformation Goals

- 1) Agility:** Improve ability to execute FCC mission
Drive FCC innovation with external stakeholders
Increase transparency across FCC activities
- 2) Resiliency:** Improve IT scalability & stability
Reduce system risks & IT attack surface
Increase secure availability across FCC's data activities
- 3) Efficiency:** Reduce cost of IT portfolio & new solutions
Improve user experiences & software re-use across FCC
Decrease time needed to create new IT solutions

FCC IT Transformation Goals

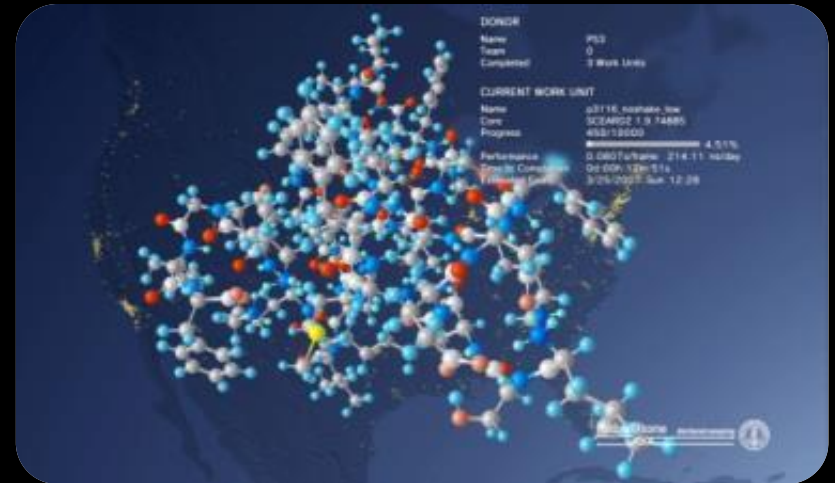
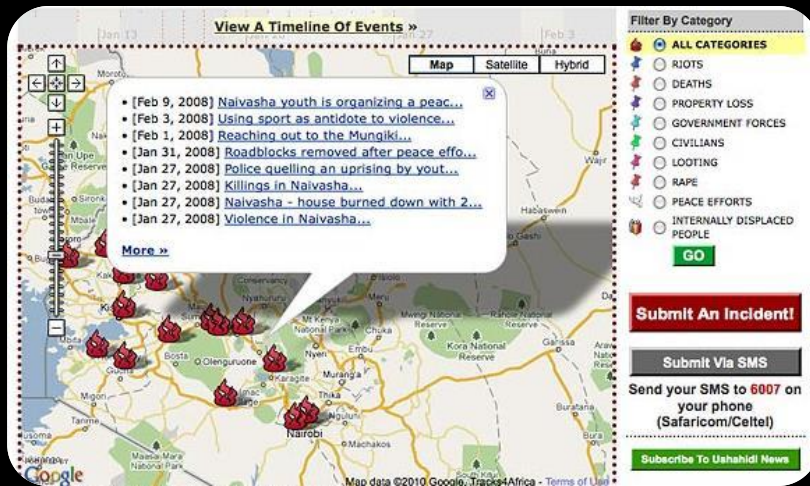
- Launched a cloud-based successor to the FCC Consumer Help Desk www.fcc.gov/complaints
 - improves functionality and user experience dramatically; outside stakeholders rated it one of the “top 5” consumer systems in government
 - reduces estimated 5 year total cost of ownership for the system by approximately 60%
- Achieved at the end of FY2015: FCC HQ now no servers on-site
 - moved either direct to cloud or to commercial service provider, reduces operational costs 85% → <50%

The Importance of #ChangeAgents



mobility + APIs → allow institutions to open
data for greater public interactions,
discussions and citizen-led remixing

The Importance of #ChangeAgents



public can volunteer smartphones as
sensors → collect data to inform policy
or lend computing cycles for hard problems

The Importance of #ChangeAgents

Algorithm appointed board director



The Algorithm Didn't Like My Essay

By RANDALL STROSS
Published: June 9, 2012

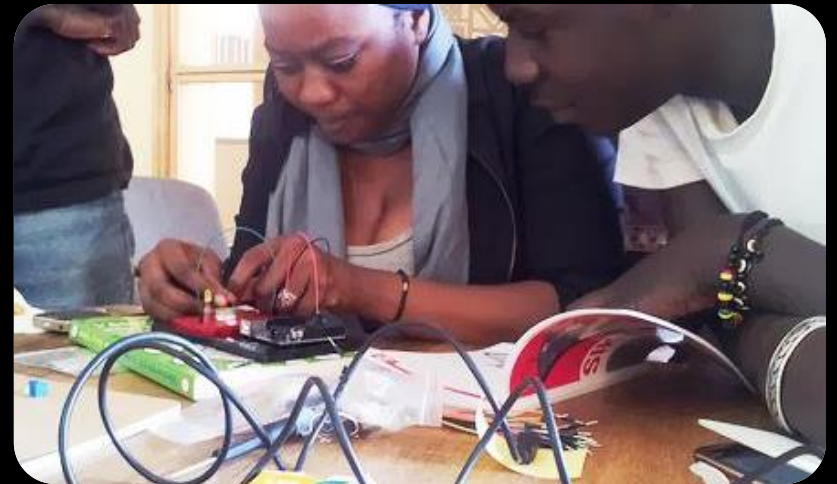
AS a professor and a parent, I have long dreamed of finding software program that helps every student learn to write well. It would serve as a kind of tireless instructor, flagging grammar, punctuation or word-use problems, but also showing the way to greater concision and clarity.



Now, unexpectedly, the desire to automate the grading of tests less laborious. You'll unexpectedly, the desire

machines that learn alongside knowledge
workers → how can machine
recommendations better aid humans?

The Importance of #ChangeAgents



makers movement → institutions must
encourage & empower “intrapreneurs” to
pioneer civic & social innovation

Your Innovative Spirit Is Needed NOW



Your Innovative Spirit Is Needed NOW

change
isn't easy



leaders don
“flak jackets”

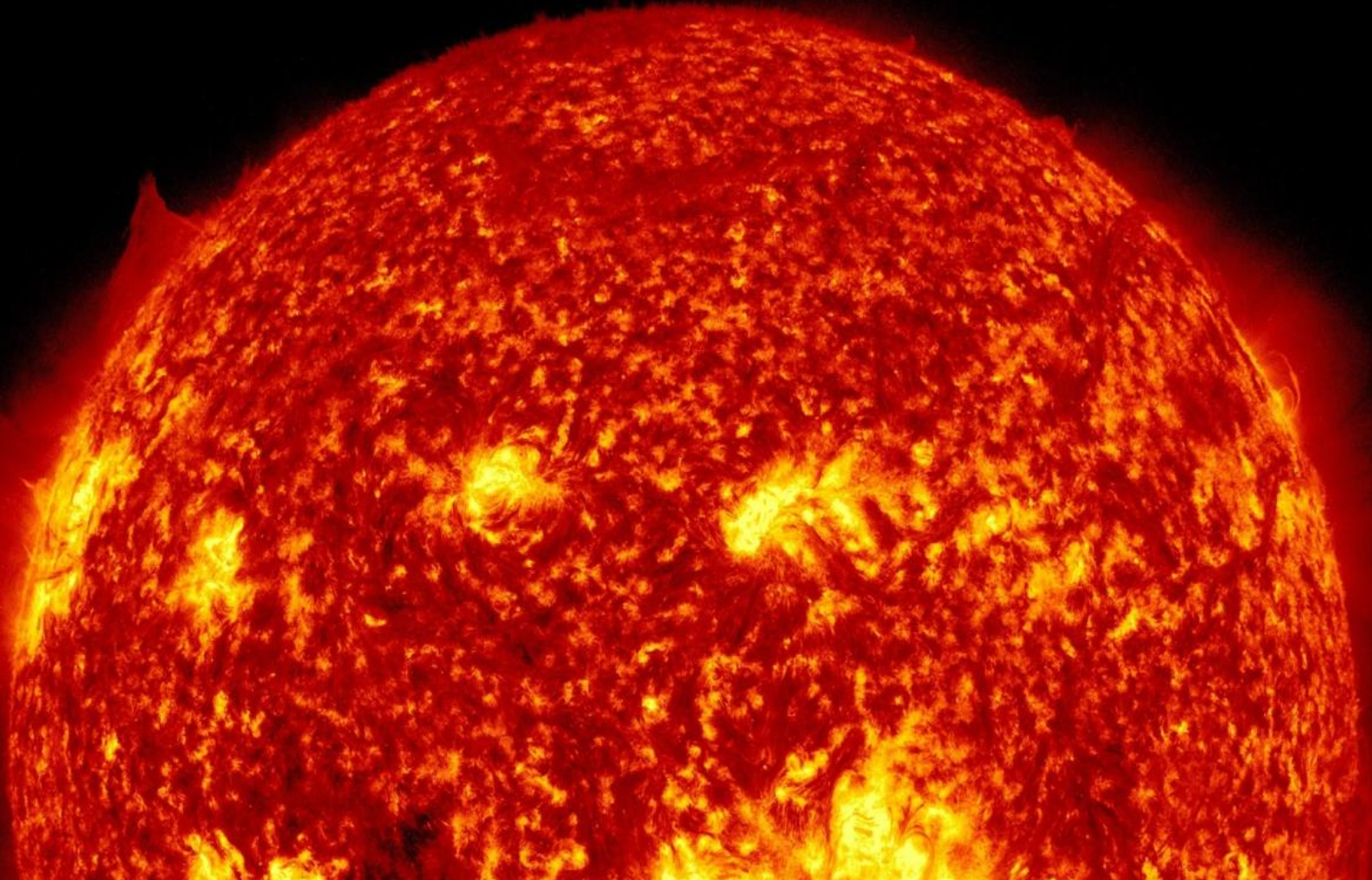
**If We Take the 2^{32} (~4.3 billion)
Numbers Addressable by IPv4
& Put Them Into a Beach Ball**




The 2^{128} (~340 Followed By 36 zeros)

Numbers Addressable by IPv6


= The Volume of Our Sun





Carl Sagan in 1994:
Look again at that dot.
That's here. That's home.

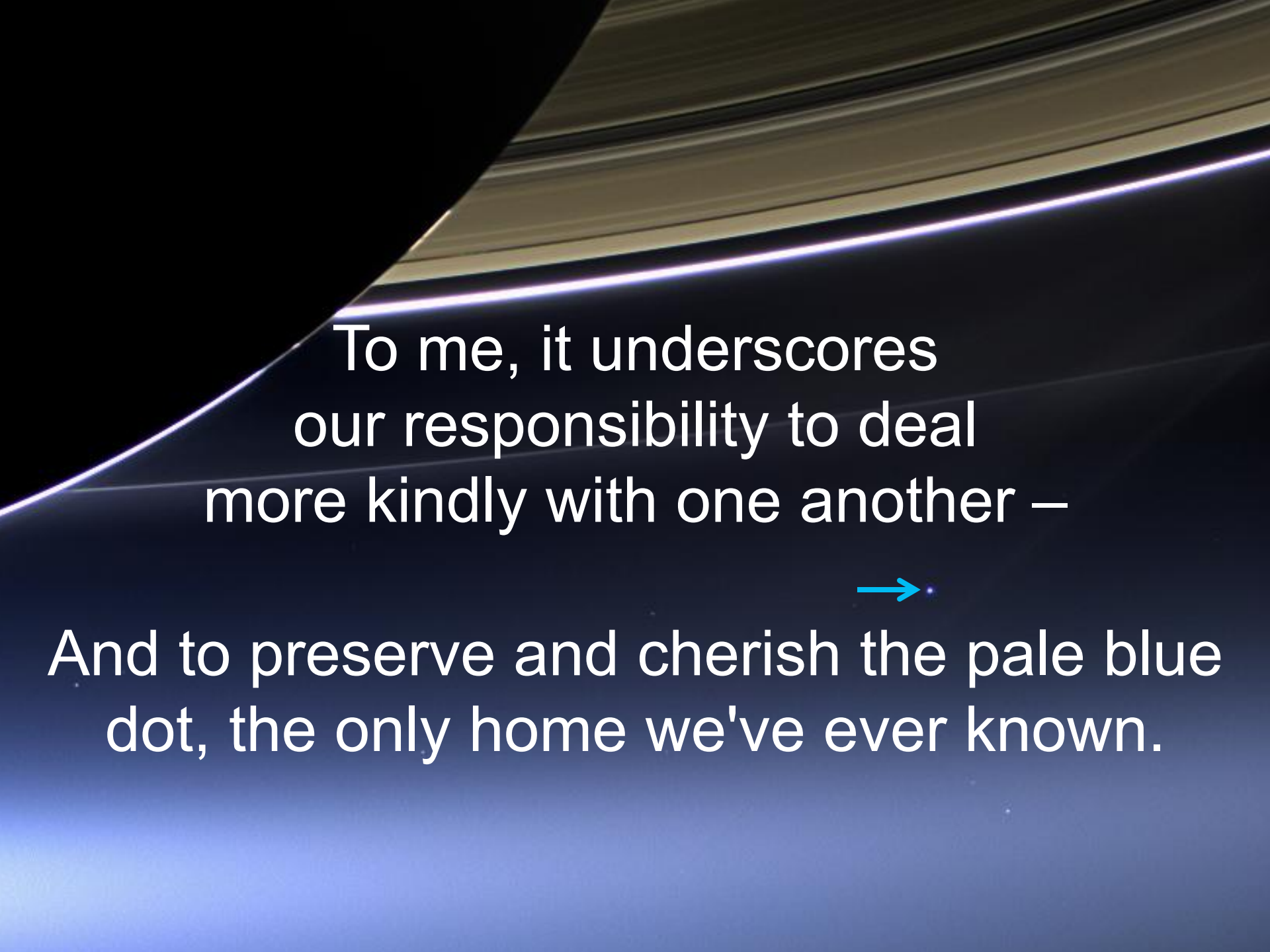




That's us.
On it everyone you love,
everyone you know –



Everyone you ever heard of, every human
being who ever was, lived out their lives.



To me, it underscores
our responsibility to deal
more kindly with one another –



And to preserve and cherish the pale blue
dot, the only home we've ever known.

We Will Need More
#ChangeAgents
for our Exponential
Era Ahead

