The MIT Deliberatorium: Enabling Large-Scale Deliberation About Complex Problems

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http://cci.mit.edu/klein/

The Center for Collective Intelligence

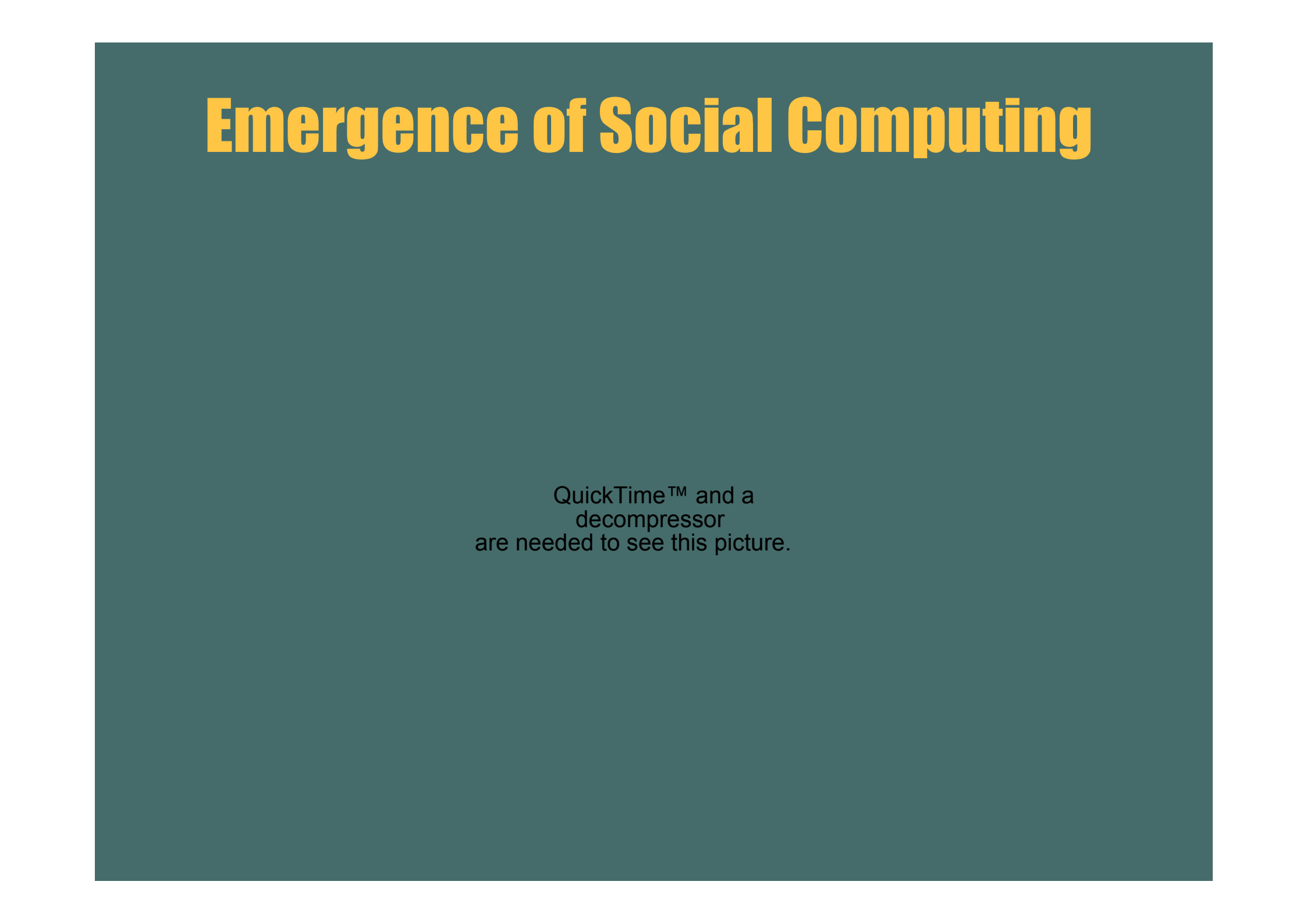
- Founded in 1995, re-named in 2006: http://cci.mit.edu/
  - Creating new examples of collective intelligence
    - The Deliberatorium
    - The Climate CoLab
    - Collective Prediction
  - Studying collective intelligence in today's organizations
    - Distributed Collaboration (surveys)
    - Sensible Organizations (badges)
  - Developing theories of collective intelligence
    - The Handbook of Collective Intelligence
    - Measuring Collective Intelligence

The Challenge: Wicked Problems

- Failure of existing institutions to address pressing "wicked" challenges, despite great technical prowess

> "Upon this gifted age, in its dark hour,
> Rains from the sky a meteoric shower
> Of facts…they lie unquestioned, uncombined.
> Wisdom enough to leech us of our ill
> Is daily spun; but there exists no loom
> To weave it into fabric…"
>
> Edna St Vincent Millay, From Huntsman, What Quarry? (1939)

Emergence of Social Computing



Can Social Computing Help?

- Vast potential resources
  - 2B Internet users, 5B mobile device users, double digit growth
  - Cognitive surplus (US TV Ads: 1 wikipedia/weekend)

- Massive levels of voluntary contribution
  - *Twitter* - 50 million tweets per day (600 / second)
  - *Flickr* - 73 million visitors/month, 700 million photos
  - *Wikipedia* - 15 million articles, 270 languages
  - *Blogs* - 100 million blogs, 1.3 billion blog posts daily
  - *Second life* - 5 million unique residents
  - *Youtube* - 35 hours of video uploaded per minute

Can Social Computing Help?

- *Potential* for emergent super-intelligence

Each of them individually may not be of good quality, but they may surpass, collectively, the quality of the few best. *Aristotle, 300 BC*

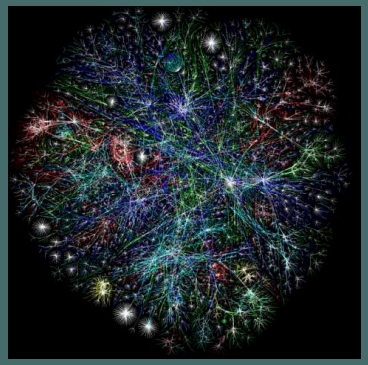
- Idea synergy
- The long tail
- Many eyes
- Wisdom of the crowds
- Many hands
- Quality competition

Anyone taken as an individual is tolerably sensible and reasonable; as a member of the crowd, he at once becomes a blockhead. *Bernard Baruch, 1900 AD*

- Groupthink
- Extremization
- Arrows' Voting Paradoxes
- Strange Attractors
- …

Key Question

Social computing enables unprecedented opportunities for large scale *knowledge sharing* (e.g. via email, newsgroups, chat, forums, blogs, wikis, podcasts, microblogs etc.)



Can it foster *large-scale deliberation* - i.e. the synergistic (additive or even super-additive) channeling of many minds towards solving complex and controversial problems?

What's Wrong with Current Tools?

Most tools (e.g. forums, blogs, email, IM) organize interactions by *time*

scattered & haphazard coverage

balkanization

small voices get drowned out

poor argumentation is common

Incomplete and often flawed content

Hard to make sure your voice is heard

Hard to find the good stuff amongst all the noise

What About Wikis?

It's true: wikis are organized *topically*, one article per topic

But: wiki articles by their nature capture *consensus*. When applied to controversial topics, they:

- produce "least-common-denominator" content
- involve massive time-centric discussions and wasteful "edit wars"
- and thus are prone to the same limitations as other collaboration-support technologies

QuickTime™ and a
decompressor
are needed to see this picture.

Kittur, A., B. Suh, B. A. Pendleton and E. H. Chi (2007). He says, she says: conflict and coordination in Wikipedia. SIGCHI Conference on Human Factors in Computing Systems.

What About Idea Sharing Tools?

Idea sharing tools present questions each linked to collectively generated and rated answers

But: sheer volume undercuts added-value

- Redundancy: most ideas are repetitions or minor variants of each other: Google project10tothe100 generated 150,000 ideas, needed 3,000 volunteers & 9 additional months to sort through
- Lock-in: users tend to rate only the highest-rated ideas, ignoring potentially superior ideas buried below
- Non-collaborativeness: users tend to submit lots of simple ideas, instead of a few detailed ones, because there is no mechanism for collaborative refinement

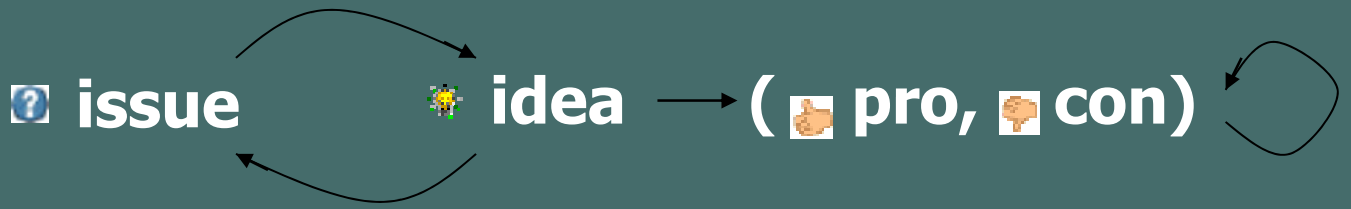
Argument Mapping Can Help!

Argument mapping can address these limitations by the simple but powerful trick of organizing contributions by topic, rather than by time.

Contributions are broken down into issues, ideas, and arguments

issue	a problem that needs to be solved

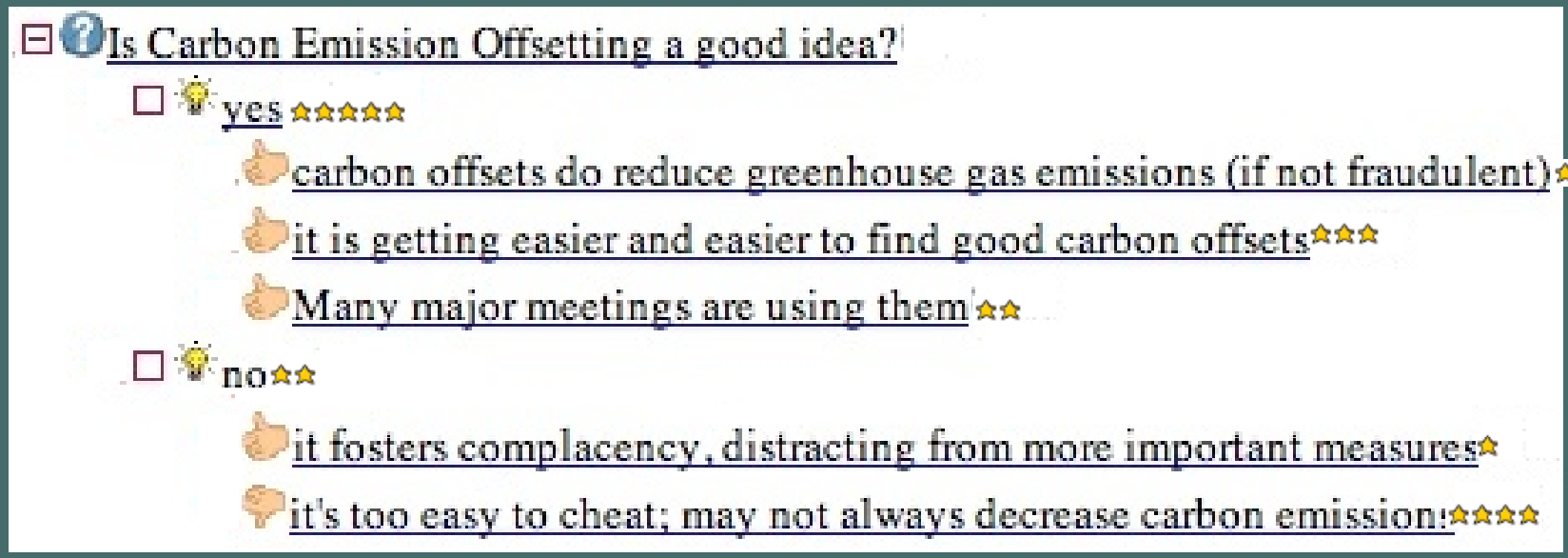
Every point can only appear once and is attached to the point it logically refers to



- What government policy can best meet our targets for reducing greenhouse gas emissions?
  - Use carbon tax
  - Use cap and trade
    - Prone to be gamed by industry
      - You're right - see EU experience
    - How will certificates be distributed?
      - Given away for free by the government
      - Sold to the highest bidder

An Example

Planeta.com (5/1/08) had a 13-page discussion on carbon offsetting pros and cons



***meaningful* rating**

Benefits of Argument Mapping

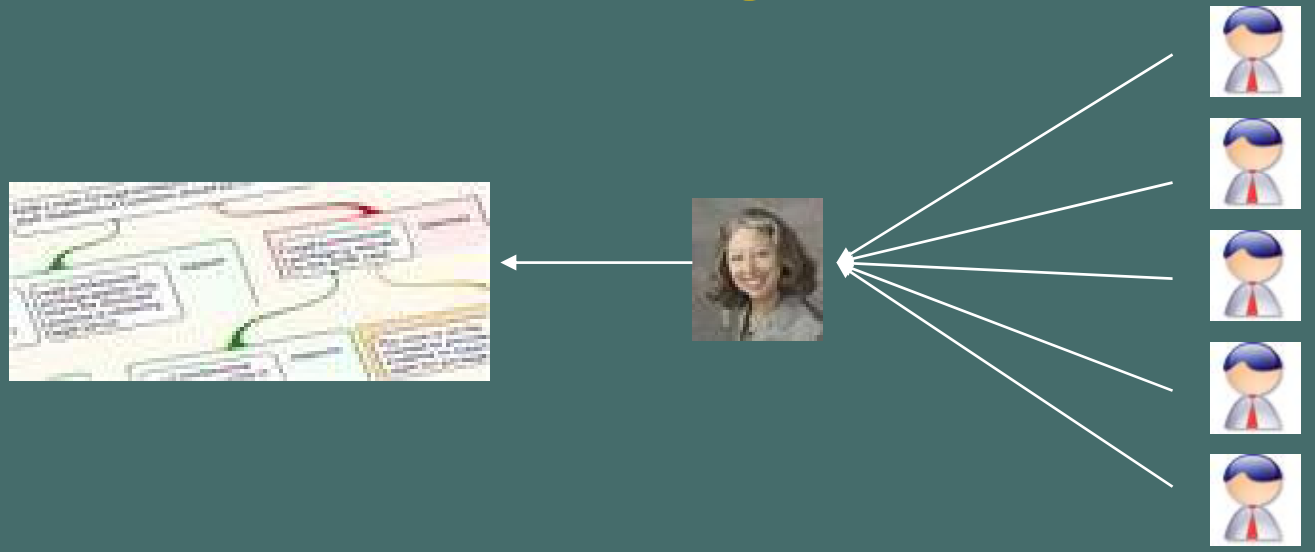
- **No scattering**: all content on a given topic is co-located, so access is quick and balkanization is reduced
- **Better coverage**: easier to find gaps that need to be filled
- **No redundancy:** each unique point can only be made once
- **Bias towards well-founded arguments:** the system makes compelling arguments – or the lack thereof – visible

Better, more complete content

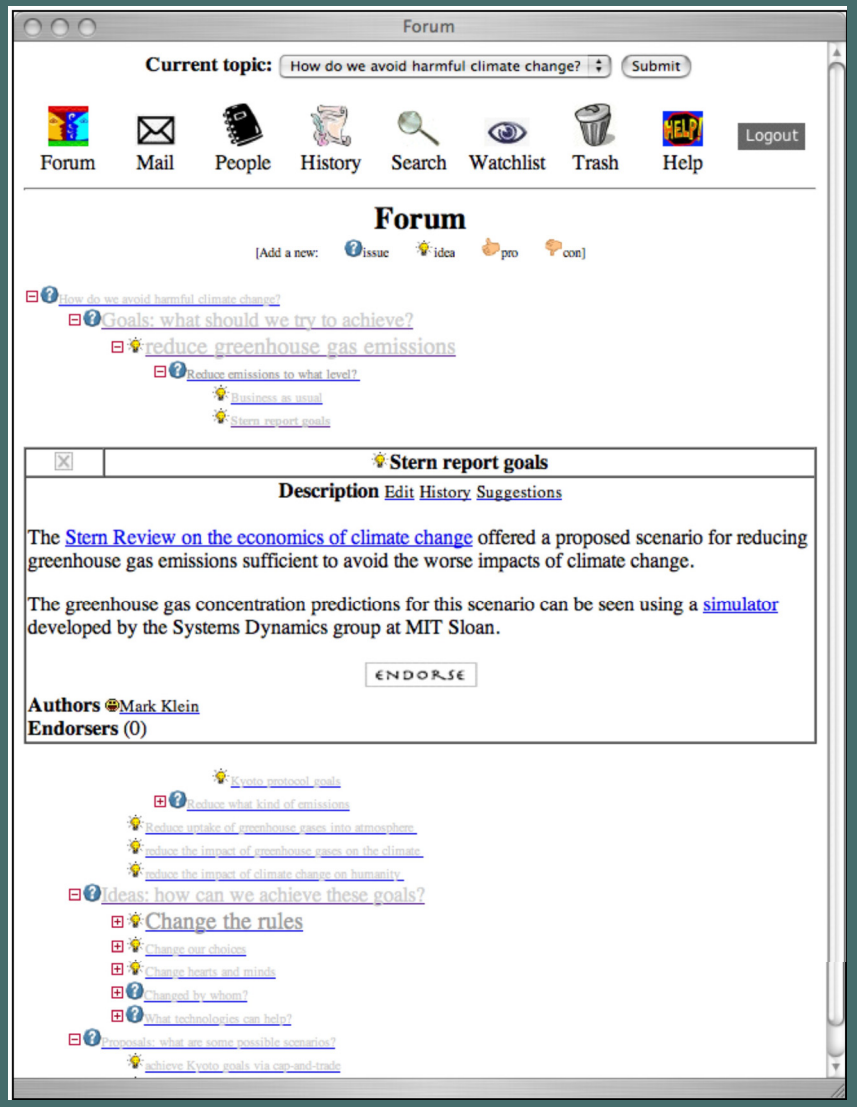
Small voices can be heard

Easier to find the good stuff

The Challenge of Scale

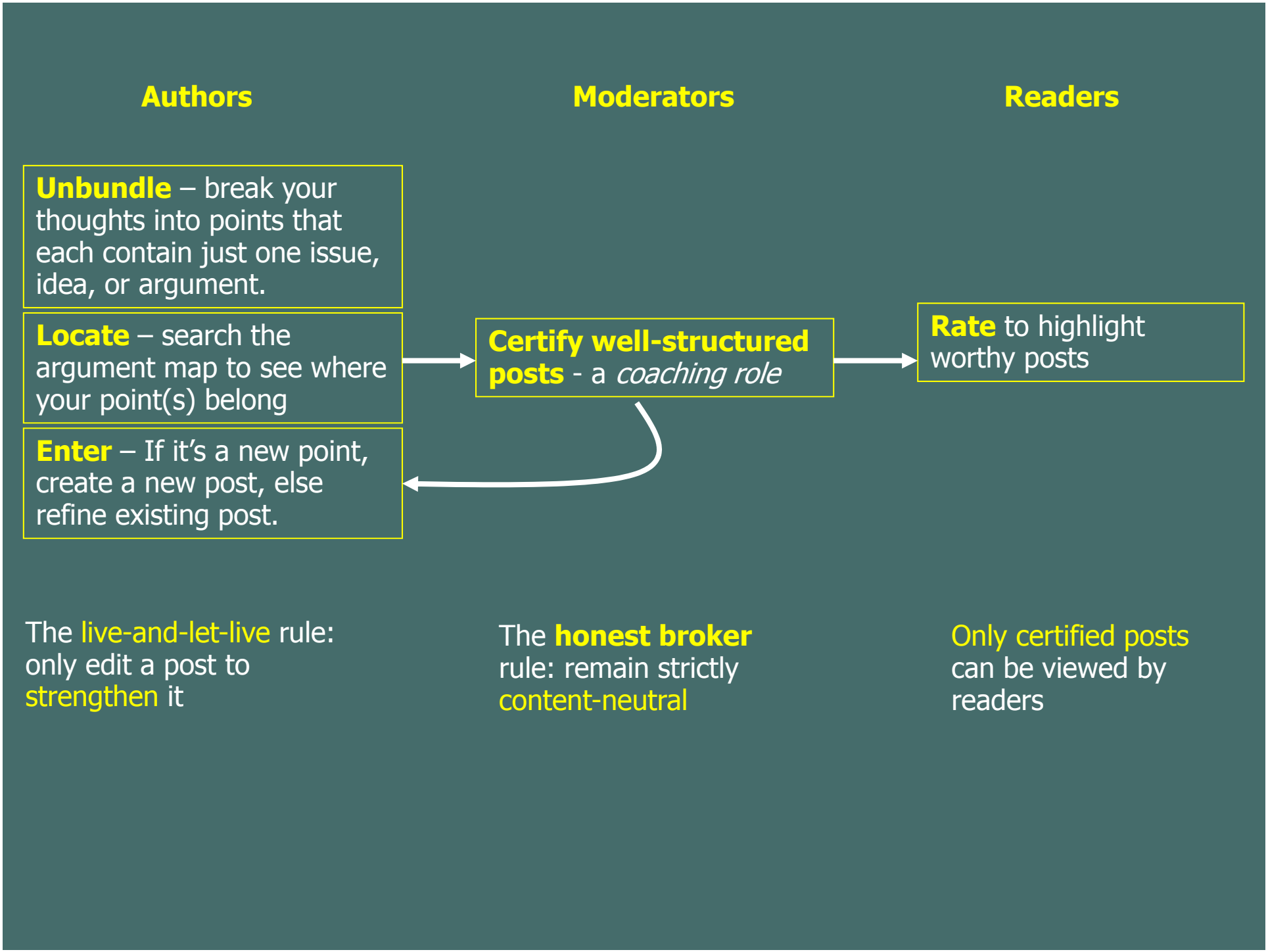


The MIT Deliberatorium

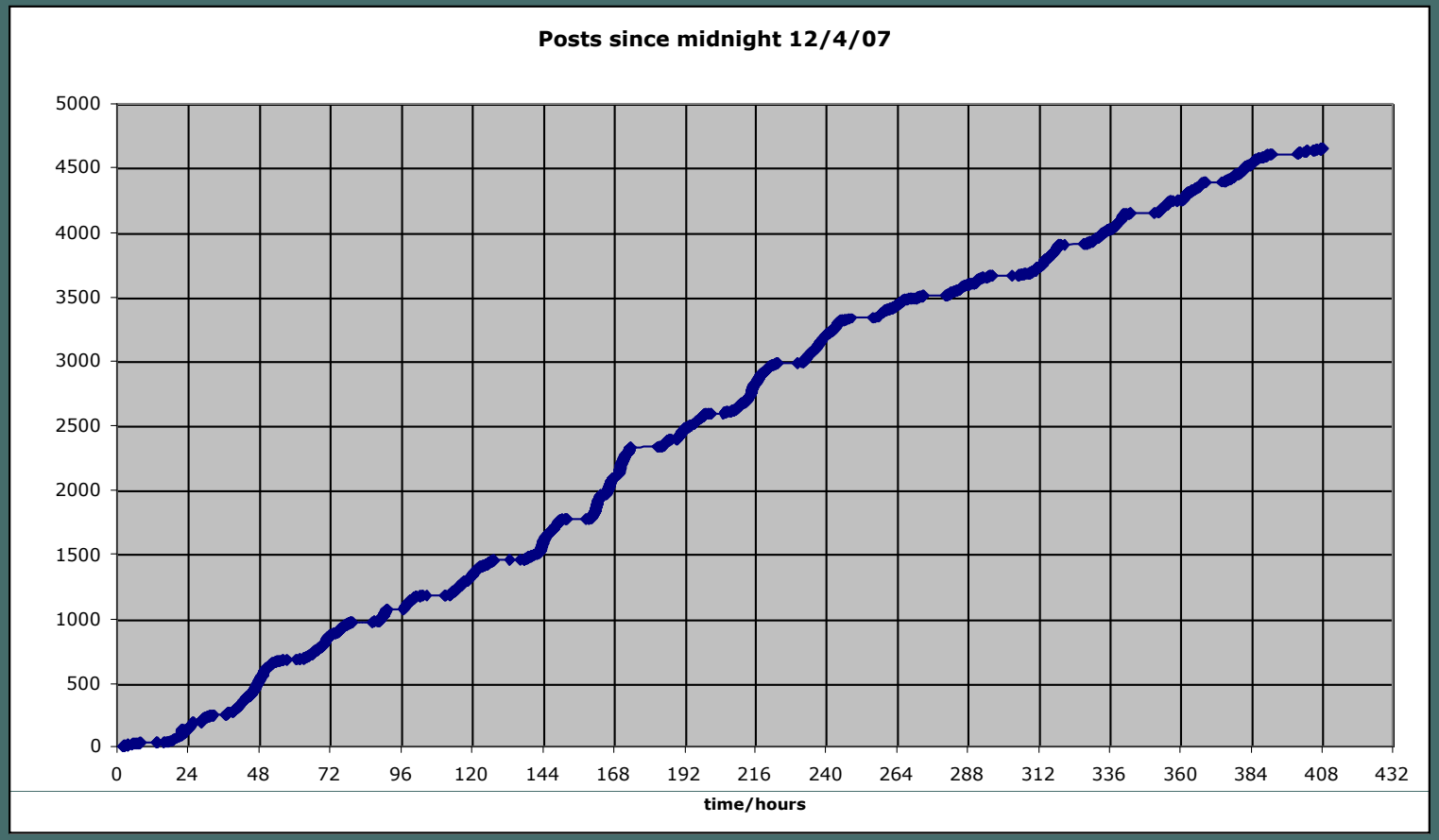


Integrates argumentation theory with large-scale social computing

- Open authoring to enable many eyes/hands effects
- Meta-contributors to manage process
- Watchlists/rollbacks for self-healing
- Rating to incent quality contributions
- Social translucence to focus attention

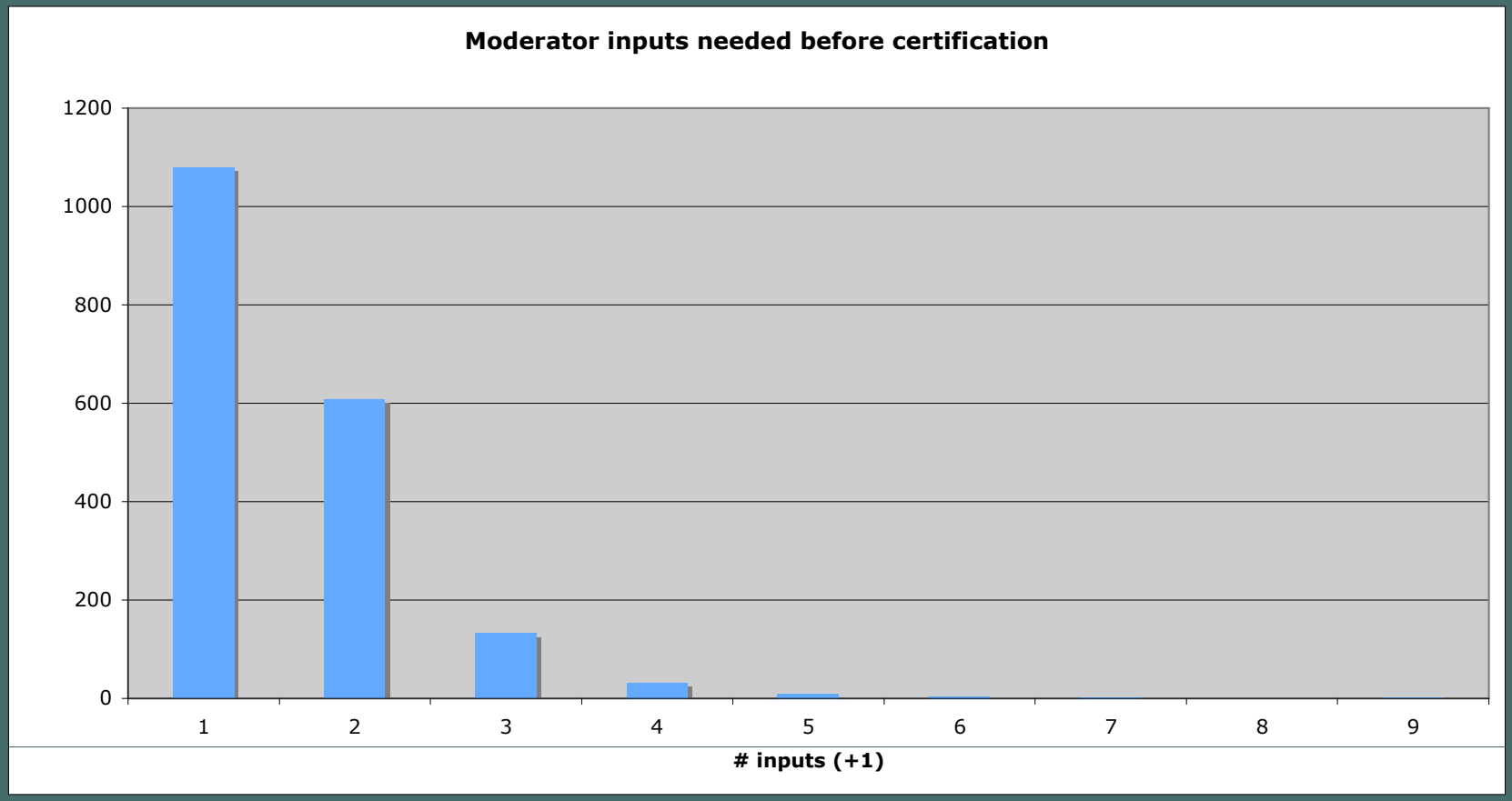

Authors
Moderators
Readers
Unbundle – break your thoughts into points that each contain just one issue, idea, or argument.
Locate – search the argument map to see where your point(s) belong
Enter – If it's a new point, create a new post, else refine existing post.
Certify well-structured posts - a coaching role
Rate to highlight worthy posts
The live-and-let-live rule: only edit a post to strengthen it
The honest broker rule: remain strictly content-neutral
Only certified posts can be viewed by readers

Collective Intelligence Doesn't Sleep



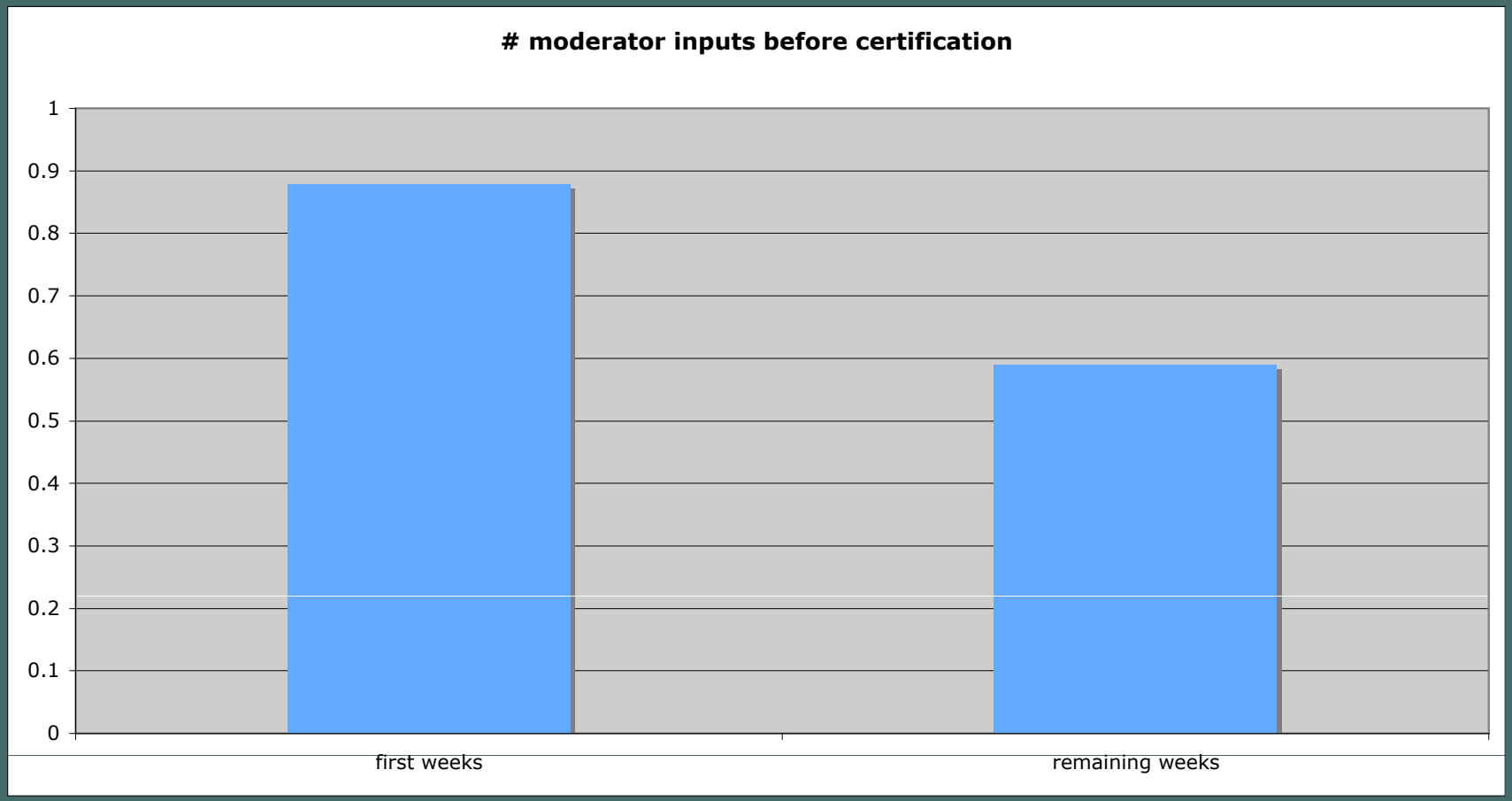
~3000 posts (~1900 certified) plus ~2000 comments

Most Posts Were Well-Mapped from the Start



About 2/3rds required no changes before certification

Users Improved Over Time



 # moderator inputs needed to get certified decreased 35% with time ($p < 10^{-8}$)

Qualitative Observations

a large non-expert community can comprehensively cover a complex contentious topic in just a few days with *no top-down coordination*

Need 1 moderator per 20 active authors

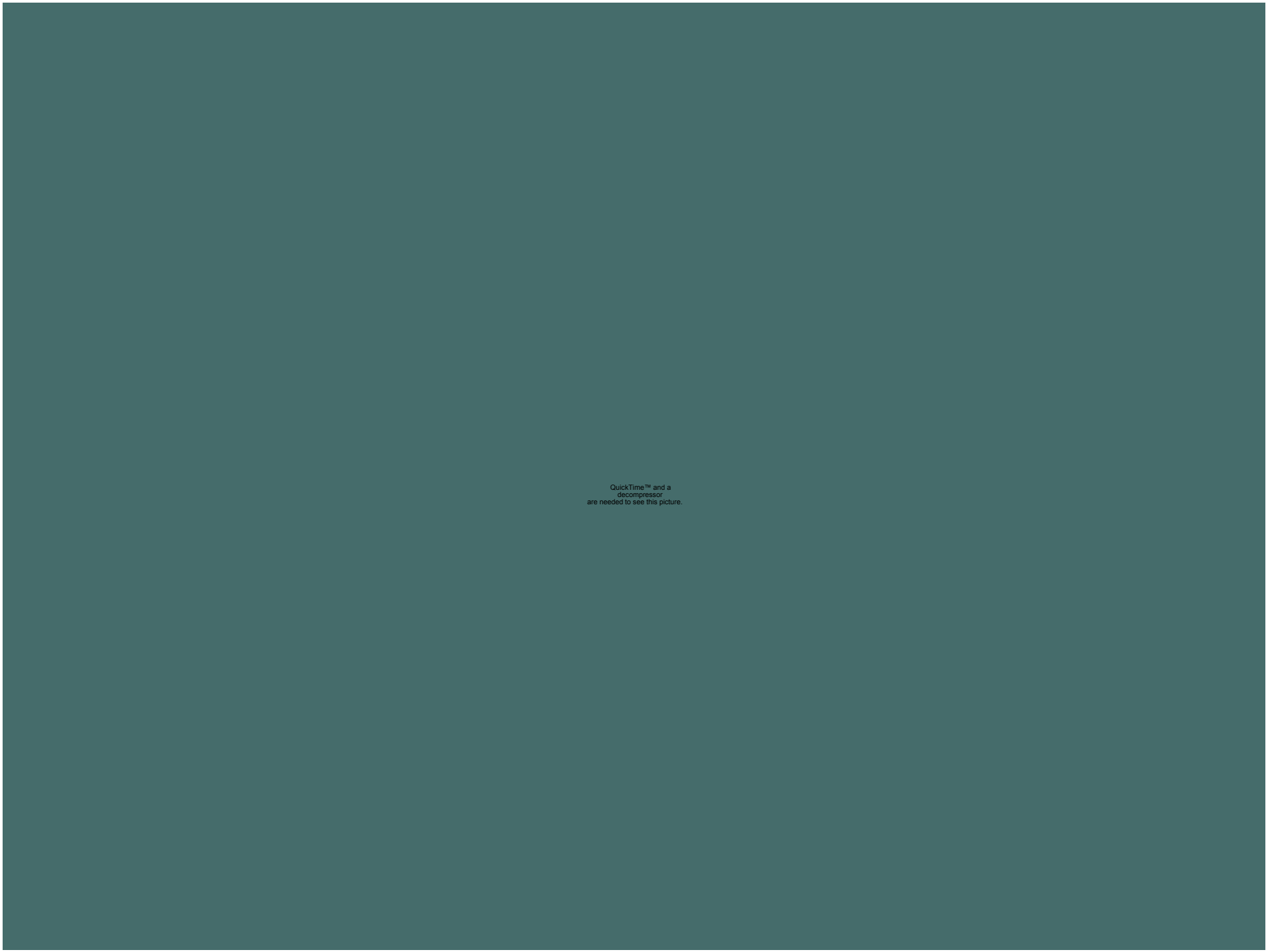
A cheap way to get usable outside input

An Opportunity for AI/Agents

- large-scale argument maps allow *much* more powerful formal reasoning than conventional social media
  - a little formalization goes a long way
    - Balkanization
    - Irrational bias
    - Controversiality
    - Groupthink
  - a little information (per user) in abundance is a lot

Open Challenge: Attention Allocation

- Even moderate-size user communities rapidly generate very large maps when topics are complex
- This problem is hugely exacerbated if issues are *interdependent* (so idea *combinations* matter)
- How can we ensure people *see the forest for the trees?*
  - users know where they can contribute most
  - managers can find areas that need intervention
  - stakeholders can see which branches are ready to “harvest”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Open Challenge: Quality Control

- How do we separate the wheat from the chaff?
  - Wide range of knowledge & expertise
  - Lots of uncertainty
  - Ubiquitous saboteurs
  - But also: lots of redundancy to exploit

Open Challenge: Structuration

- How can we help messy thinkers create well-structured maps?
  - Unbundling and typing is easy
  - Taxonomizing is a skilled art

Open Challenge: Integrating Computation

- How can we seamlessly (& proactively) integrate computational resources within human deliberations?
  - e.g. simulations and other analytics

A General Problem

- Semi-formal social computing systems (the “semantic web”) are probably the wave of the future
  - cf freebase (started by Danny Hillis, now Google’s)