

# Peer to Peer Science

Introduction to an idea

Computationally Active Living Knowledge Network  
Secured by a Science Blockchain

# Agenda

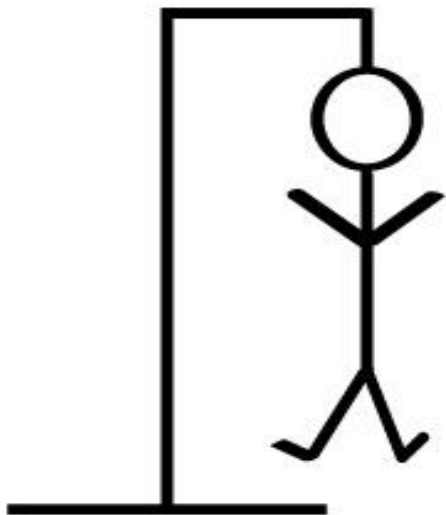
Introduction

Use cases & demos

Get involved

Summary





N T I M P

# Introduction

Blockchain

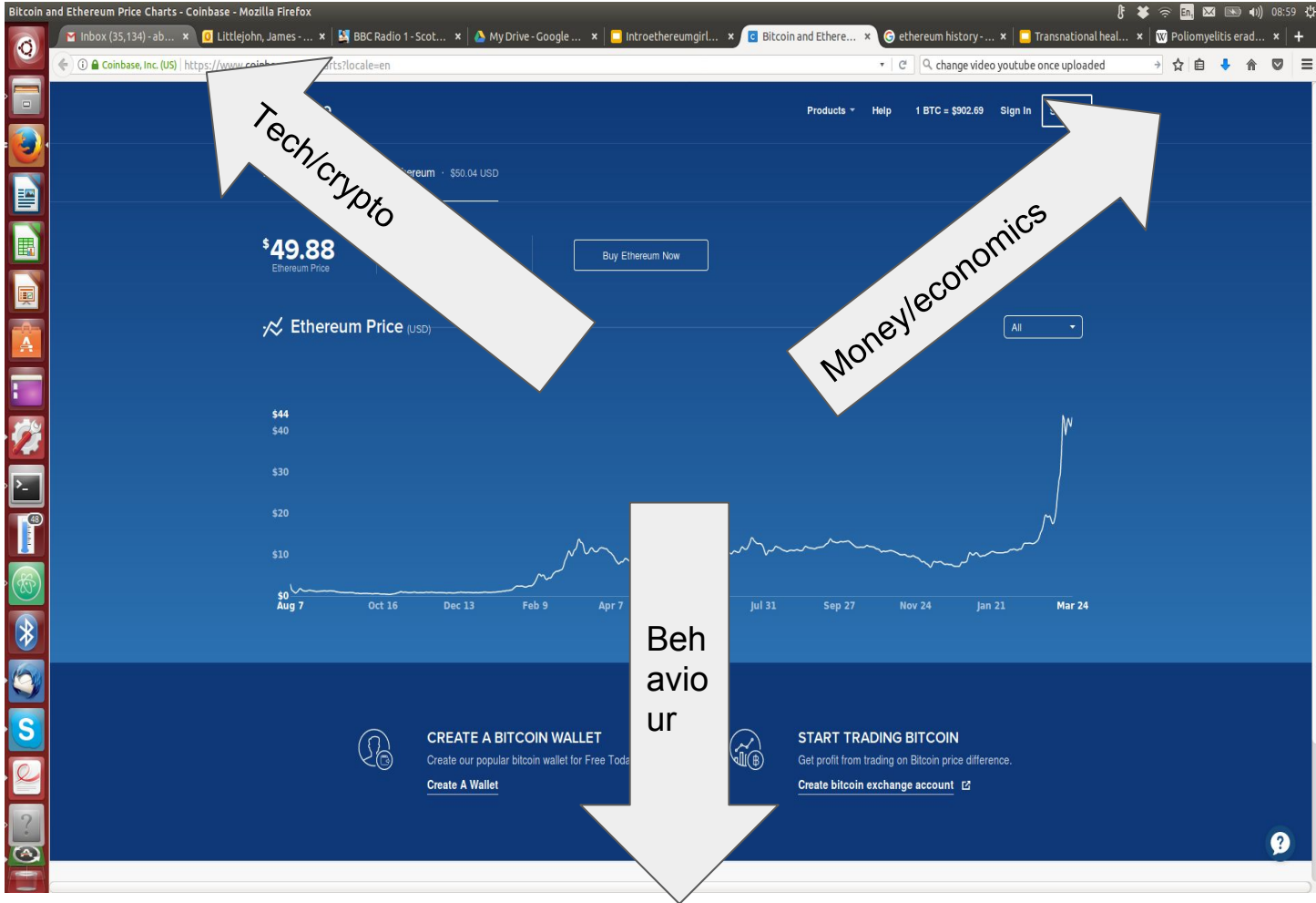
Proof of work

Mining

Merkle Trees

Reward / Incentives

Problems to solve? Double spend, keep Smart contract honest ..



## (data) SCIENCE & EVIDENCE

The practice of **evidence-based decision making** in management (often abbreviated as EBMgt) evolved from medicine and emphasizes a rational, objective, and empirical approach to addressing business issues. **It is analogous to the scientific method which uses experiments and data collection to advance knowledge.**

# Problem to solve

- Make it (near) impossible to validate or cherry pick data sets that support a science theory regardless of having enough money or compute resources to flood the network with data.



# Science



Peer  
review

Experiment  
+ Results

Hypothesis  
Theory  
Law

'too clean'

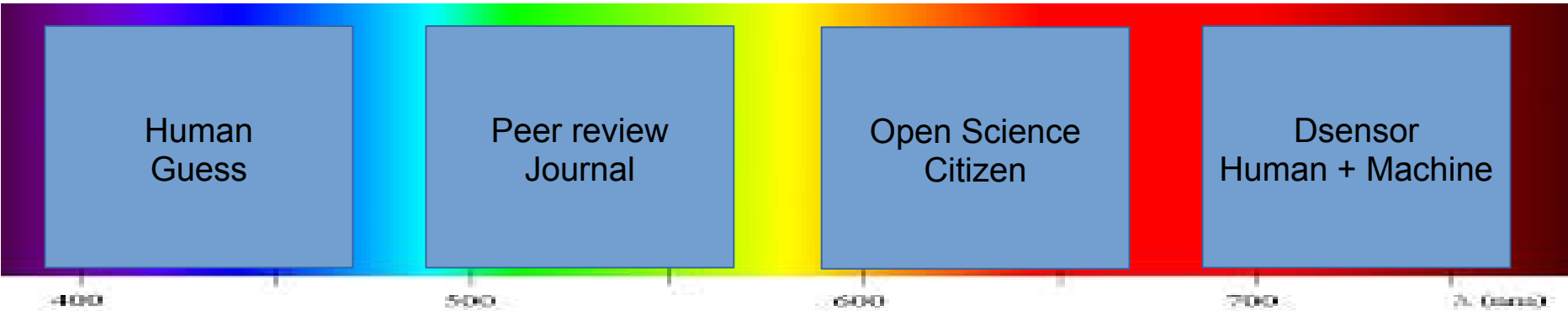


# Future of Science?



• **MESSY**

• **Computational  
v active 24/7**



- Clean context --> Myriad context
- Peer review --> Computational consensus
- Clinical Trials --> Computationally active

# Use case

## **Bring a new pharmaceutical drug to market**

Individuals (peers)

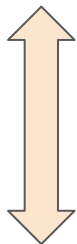
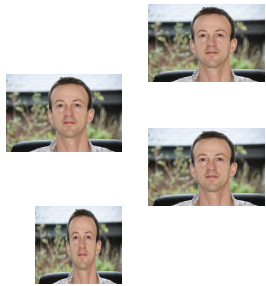
Basic medical science research

Pharmaceutical company

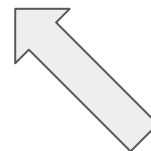
Clinical Trial Organisation / regulator

GP

Chemist Shop



Medicines &  
Healthcare products  
Regulatory Agency



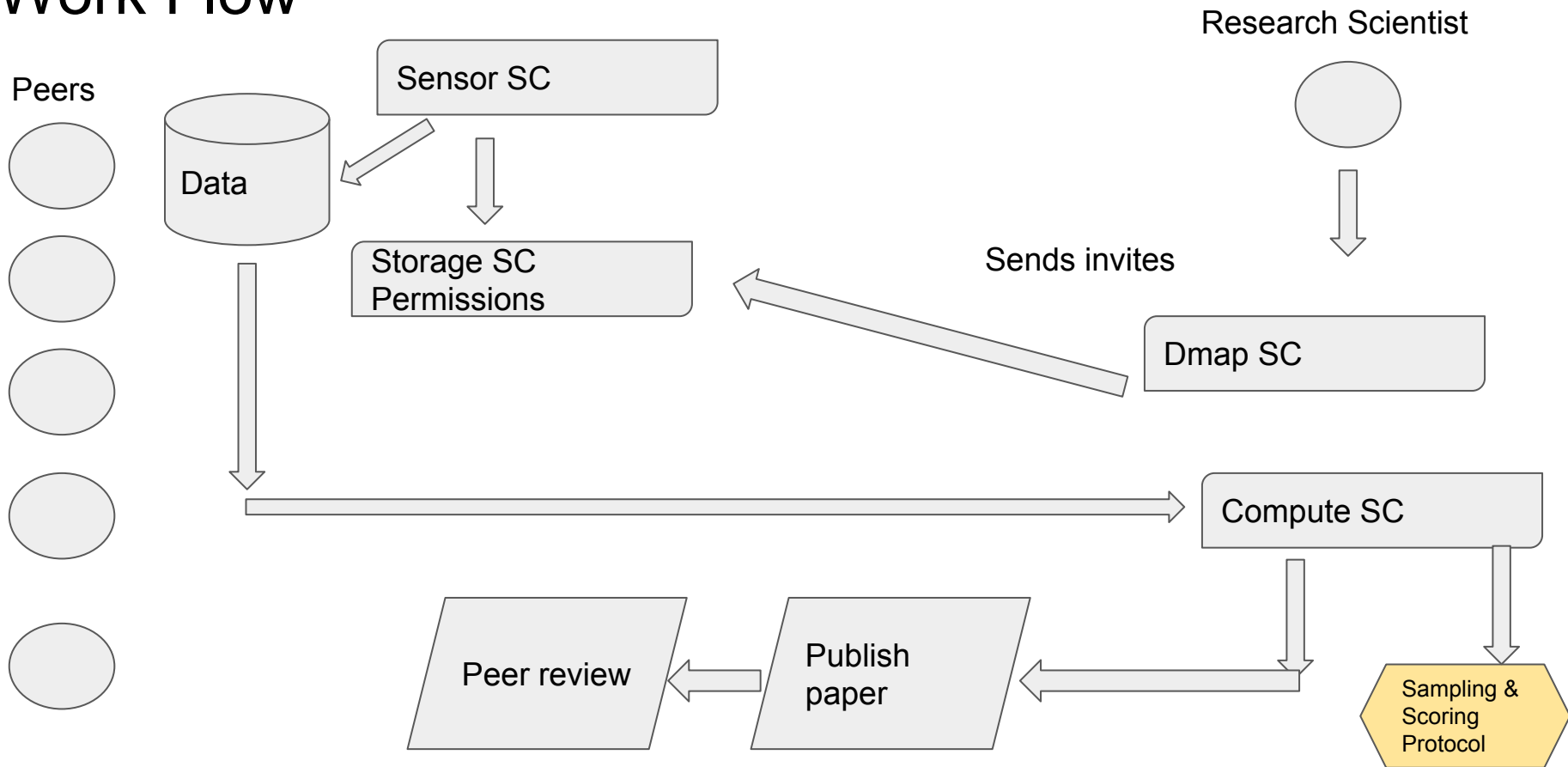
# **Identity & data setup**

Self declared

Explicit 'handshakes' between parties

DEMO

# Work Flow





# Benefits

## Customers

- complete control data and use of
- customer feedback on their participation

## Research science team

Automatic audit trail of analysis

Reproducible evidence

## Regulator/PI/management

Tap in to study at any time

# Data Still Escapes

Down side once data transferred blockchain audit trail broken

Can we solve this?

Bring computation to Data

New Peer to Peer Way

Computationally active

Complete automation

Eliminate Bias

Blockchain secured

# Artificial Scarcity

To ABUNDANCE

Of

KNOWLEDGE

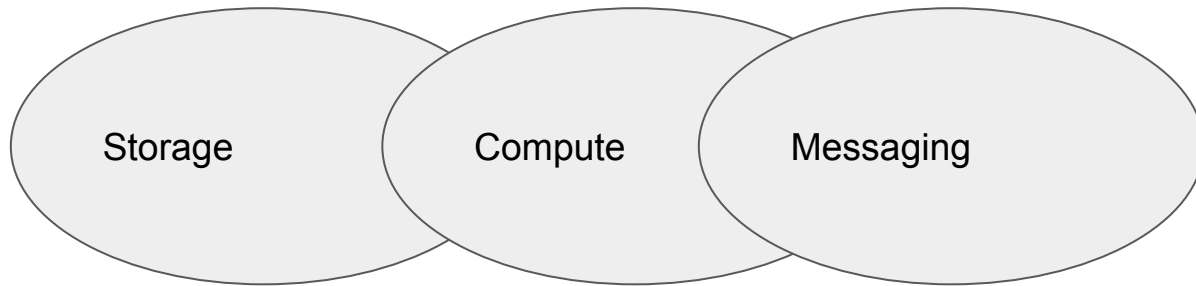
(but still kept secure)

# Triple (b)Lock

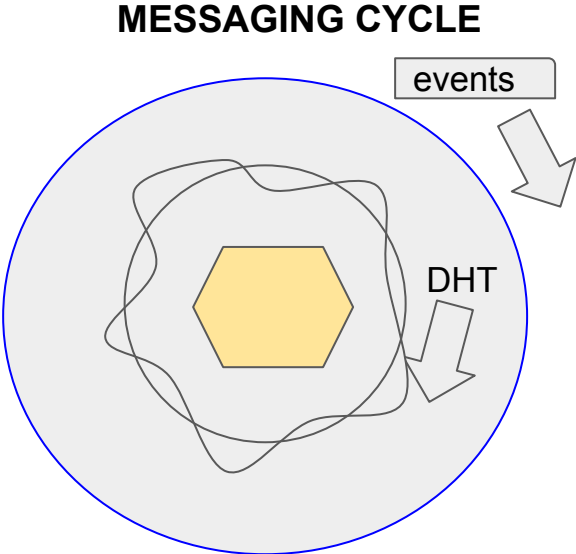
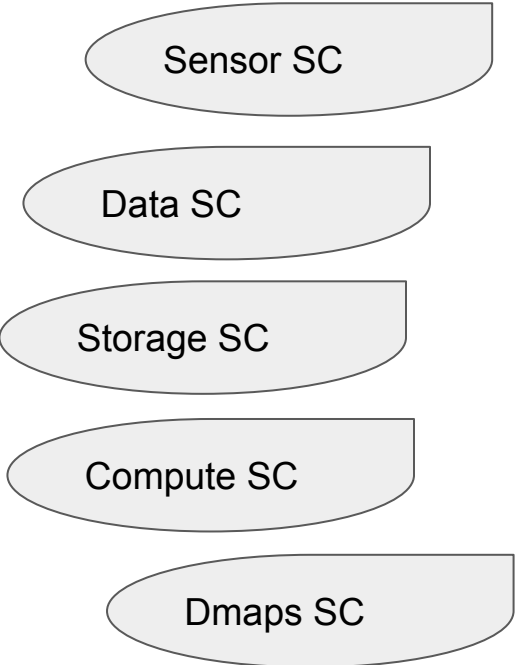
Storage - maidsafe, bigchainDB, swarm, IPFS

Compute (smart contract) - Sandbox - blockchain

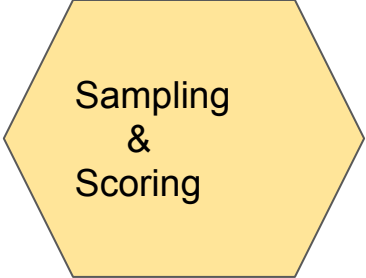
Discovery space messaging



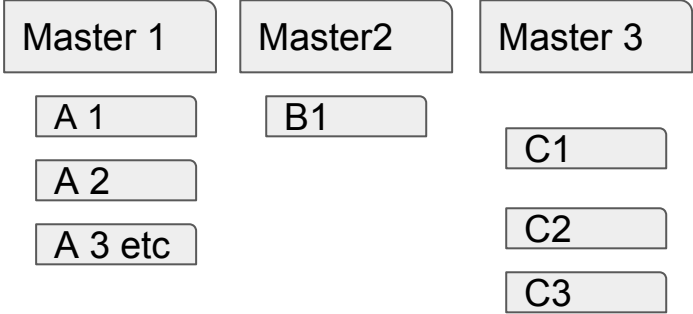
# Process Architecture & Flow



## DSENSOR PROTOCOL



## Blockchain



# Blockchain +

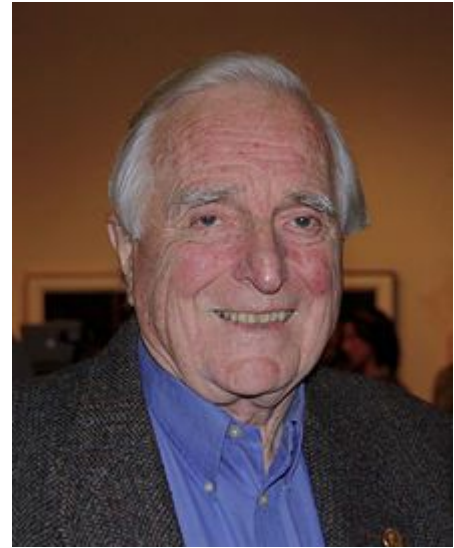
**DISCOVERY SPACE**

Vast uncertainty & complexity

Proof of work Complexity  
**BLOCKCHAIN**

# The Discovery / problem space

“Doug Engelbart reasoned that because the complexity of the world’s problems were increasing, and that any effort to improve the world would require the coordination of groups of people, the most effective way to solve problems was to augment human intelligence and develop ways of building collective intelligence.”





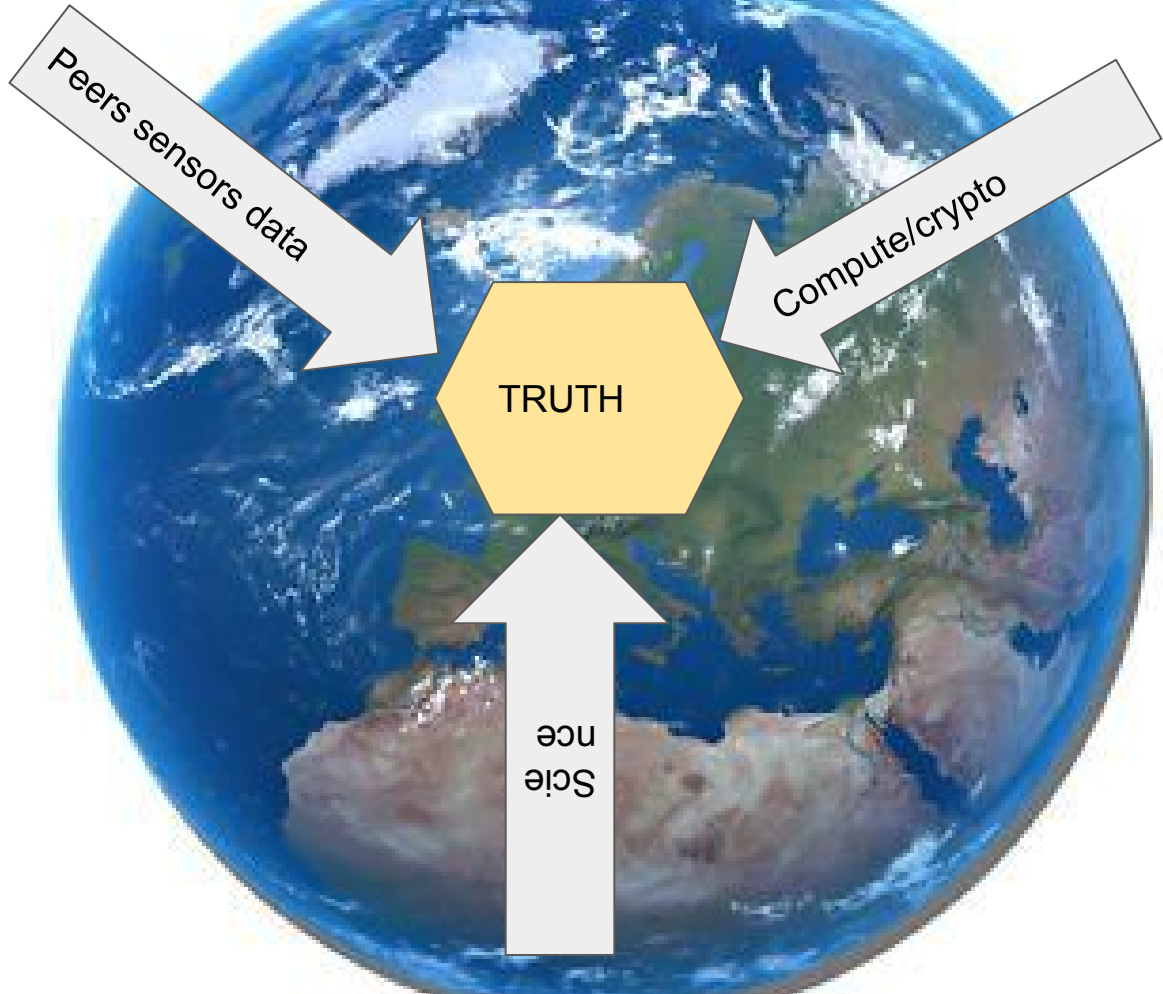
# Computationally active

Get away from trial mind-set

Always on, tap in for outcome validation

[http://uberty.org/wp-content/uploads/2015/12/Paul\\_R.\\_Thagard\\_Computational\\_Philosophy.pdf](http://uberty.org/wp-content/uploads/2015/12/Paul_R._Thagard_Computational_Philosophy.pdf)





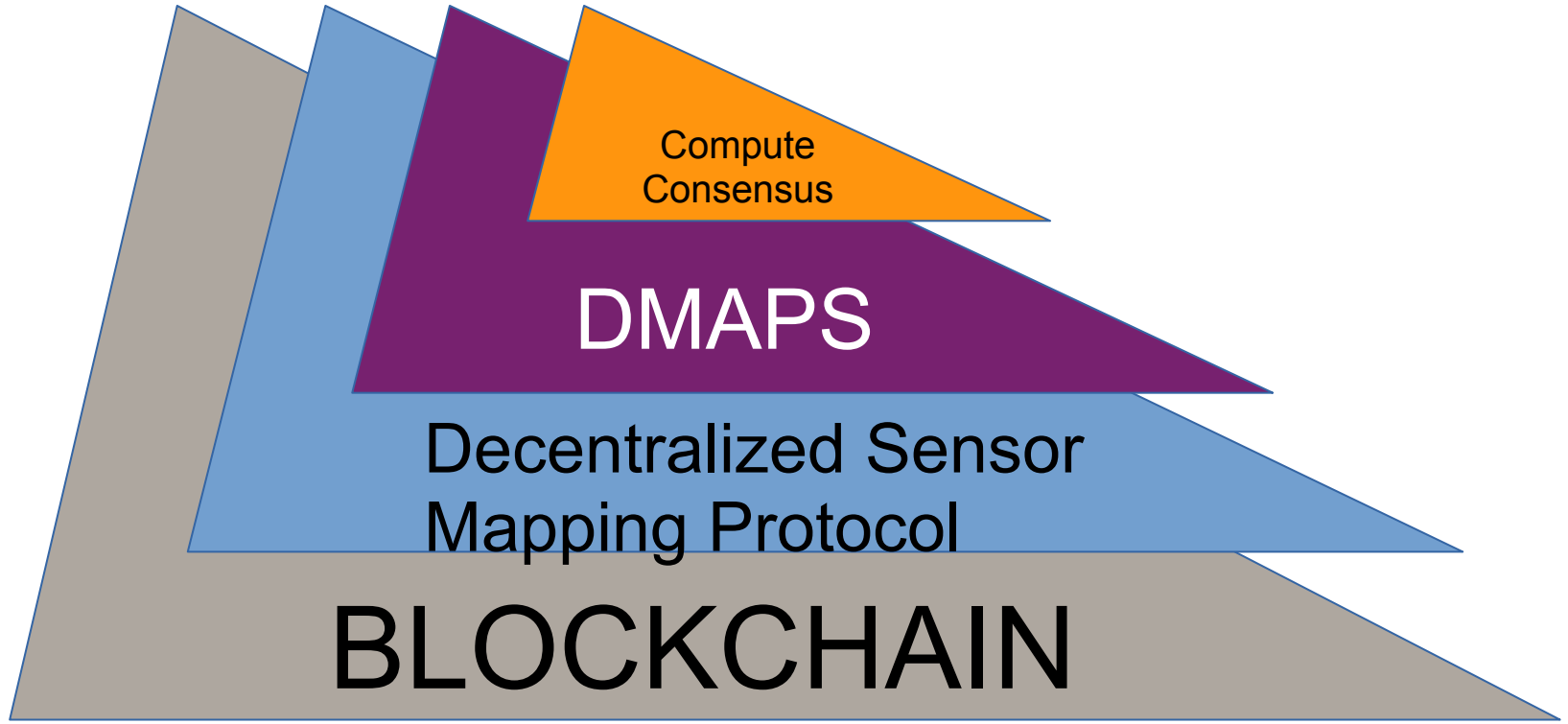
# Demos

Auto sampling <https://youtu.be/YIGwg4fgqil>

Closer look at compute via sampling <https://youtu.be/V3zIQ7xksiE>

Two sensors, much science, many Dapps <https://youtu.be/OjWfdU7tyxU>

# Peer to Peer Science



# Decentralised Sensor Mapping Protocol

- Best science available to all
- 'Scoring' Protocol -prediction complexity context
- Decentralized Sampling Protocol
- Anyone free to put forward Dmaps (scientific computations-how world works)
- Blockchain 'Science Accounting'

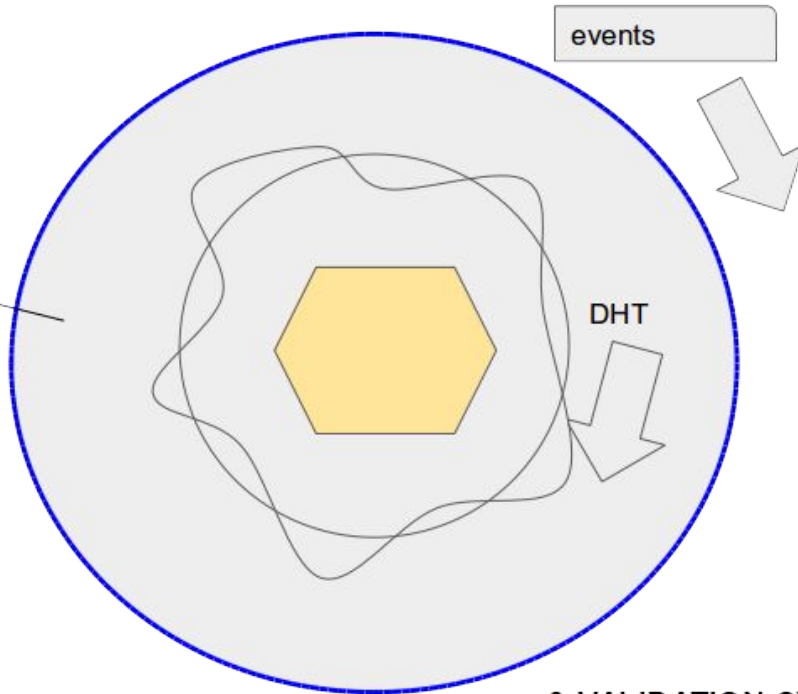
# Dsampling

- Two different DHTs to 'random' walk over
- Estimate network size from structure
- Samples representative of 'reality'
- Auto record – proof of evidence trail

# Network View

MESSAGING CYCLE

ALL EVENT NEED  
TO PASS OUT VIA A  
SMART CONTRACT



& VALIDATION CYCLE

# Peer view

IF (CHOSEN)

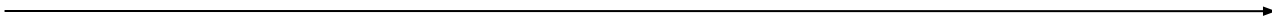


Start COMPUTE



Select A or B  
Random select peer

DHT A



DHT B







# Dscoring(AI)

- Blind Oracle on scientific truth
- Score – predictions, complexity, context
- Learn:
  - Same context – segment 'accuracy'
  - Across different context
  - Aggregate 'network' view 'priors'

# Process

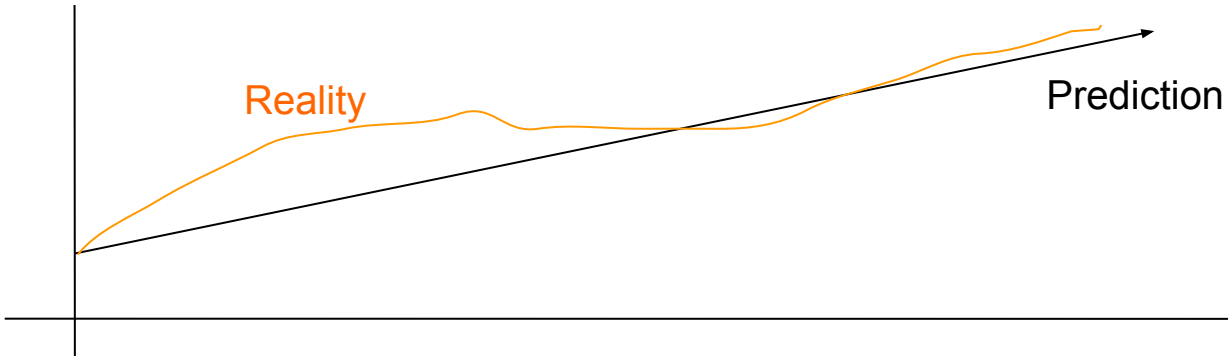
Dmap – computational (knowledge) theory



Samples across network and computes



Returns a prediction path that is locked into blockchain



# Learning(AI)

- Consilience  
Breadth of Explanation  
& Problem Solving
- Smart contract aggregates 'training'

# Outcome validation

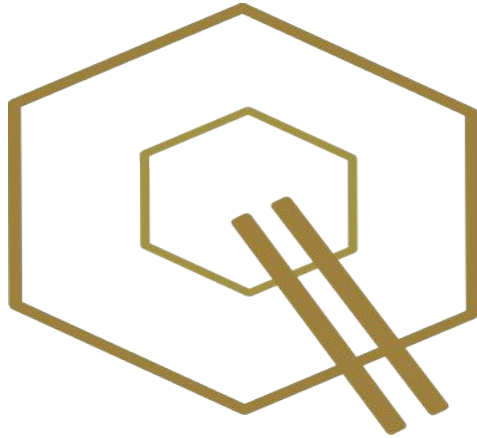
Wearable proves ID of taking drug

Data science keep science honest - research to manufacturing

Real time compliance rather than regulation

# Money to Quotes

1 Quote = A unit of computational knowledge



# Get involved

Think tank

[Scienceblockchainlab.org](https://scienceblockchainlab.org)

Start your own

# Summary

New society fabric to embrace

New foundations for science 21st century

Evidence based unbiased validation

Open permissionless innovation



Q&A

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