

# A New Data Economy with Power to the People

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BIGCHAIN<sup>DB</sup>

iPDB | INTERPLANETARY  
DATABASE



ocean



# The Dream



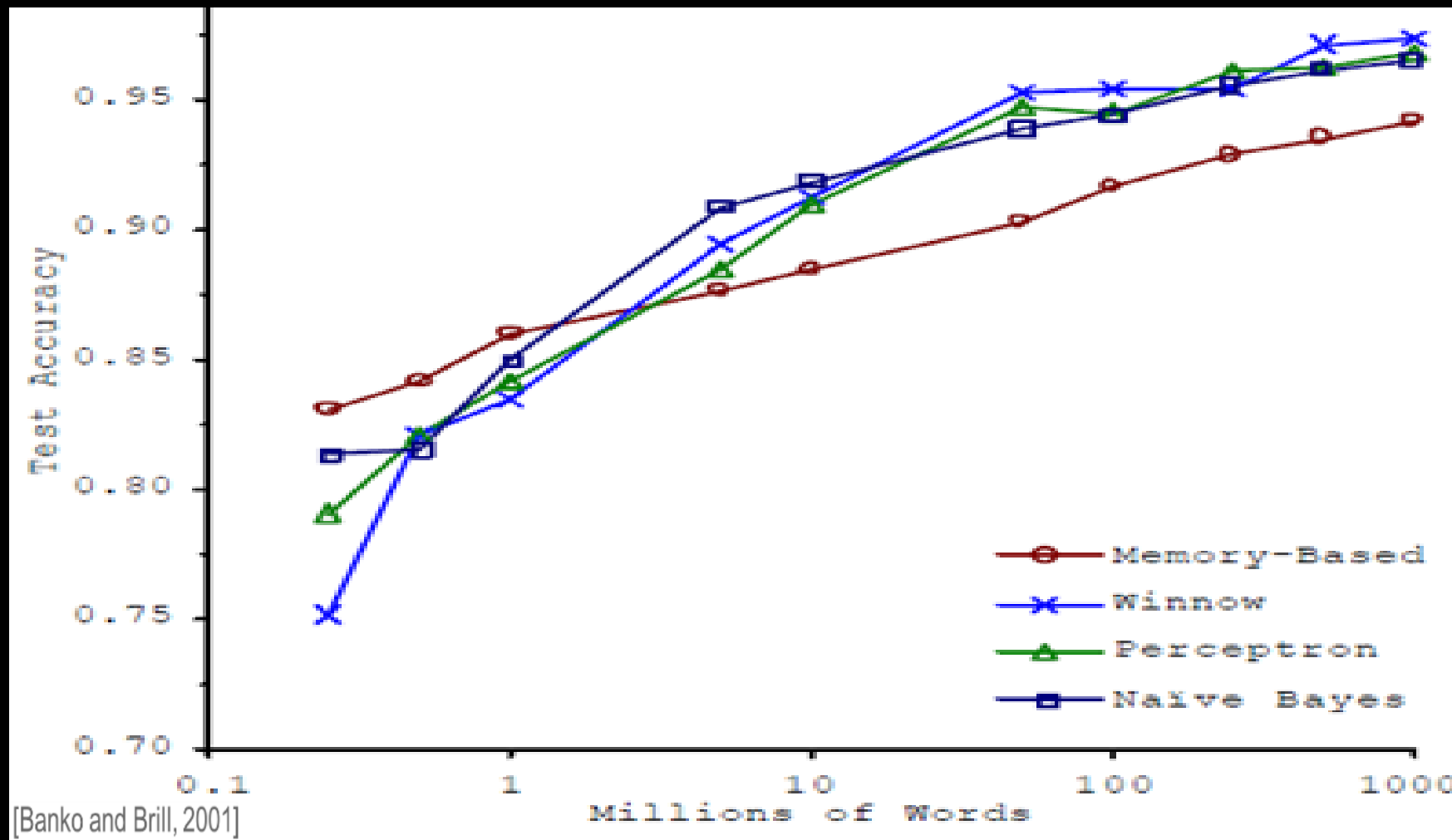
Decentralized, open, free  
flow of data!





# The Problem

# The Unreasonable Effectiveness of Data



1000x more data

1000%  
less  
error!



# Status quo



Mo' Data  
(and mo' compute)



Mo' accuracy



Mo' \$

# Status quo



*Silo* Mo' Data  
(and mo' compute)



Mo' accuracy



Mo' \$

**“GOOG and FB now have direct influence  
over 70%+ of internet traffic.”**

**In “The Web Began Dying in 2014”  
by Andrew Staltz**



The image shows four large, cylindrical industrial silos made of corrugated metal, standing in a row. Above them is a blue metal walkway or bridge structure. In the background, there is a large, light-colored industrial building with a flat roof. To the right, a multi-story building with many windows is visible. The sky is clear and blue.

**Data silos  
Aka people farming**





**Lawrence Lundy-Bryan**

@lawrencelundy

Following



2/ Core problem - Siloed data with no economic incentive to share

2:35 AM - 3 Oct 2017



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# Breaking down silos



Lawrence Lundy-Bryan

@lawrencelundy

Following



2/ Core problem - Siloed data with no economic incentive to share

2:35 AM - 3 Oct 2017





Have lotsa data  
(1000 enterprises)

Have lotsa AI  
(1000 AI startups)

~~Site~~ *Pool* Mo' Data  
(and mo' compute)



Mo' accuracy



Mo' \$



Have lotsa data  
(1000 enterprises)

Have lotsa AI  
(1000 AI startups)

The image features a Venn diagram with two overlapping circles. The left circle is blue and contains the text 'Have lotsa data (1000 enterprises)'. The right circle is orange and contains the text 'Have lotsa AI (1000 AI startups)'. The background of the entire slide is a photograph of a construction site with a large building under construction and a body of water in the foreground.

~~Site~~ *Pool* Mo' Data  
(and mo' compute)



Mo' accuracy



Mo' \$



Have lotsa data  
(1000 enterprises)

Have lotsa AI  
(1000 AI startups)

The diagram features two overlapping circles: a blue one on the left and an orange one on the right. The background is a cityscape with a bridge and water.

Data marketplace	DM	DM	DM
DM	DM	DM	DM

~~Site~~ *Pool* Mo' Data  
(and mo' compute)



Mo' accuracy



Mo' \$

# Change the status quo?

Have lotsa data  
(1000 enterprises)

Have lotsa AI  
(1000 AI startups)



~~Site~~ *Pool* Mo' Data  
(and mo' compute)



Mo' accuracy



Mo' \$



*Ocean = universal data economy*  
Curated data in a decentralized substrate

# Economic incentives: Background






**In the  
beginning**



**There was  
Bitcoin**

# What's the amazing thing about blockchains?

- Decentralized?
- Immutability?
- Aligning incentives?
- Raising \$\$\$\$ off a whitepaper and a dog? 
- **One more...**





**The Not-So-Obvious Blockchain Superpower:**

**You can get people *to do things***

**So, what do you want people to do?**

**Design *economic incentives* for that thing,  
and bake it into the network as *block rewards***





# Economic Incentive for Bitcoin

**Objective: Maximize security of chain**

- Where “security” = compute power
- Therefore, super expensive to roll back changes to the transaction log

$$E(R_i) \propto H_i * T$$

- $E()$  = expected value
- $R_i$  = block rewards
- $H_i$  = hash power of actor
- $T$  = # tokens (BTC) dispensed each block

# Bitcoin Mining Rewards, from Economic Incentive



You get block rewards if:

- You're running a full node
- And you have gobs of compute power



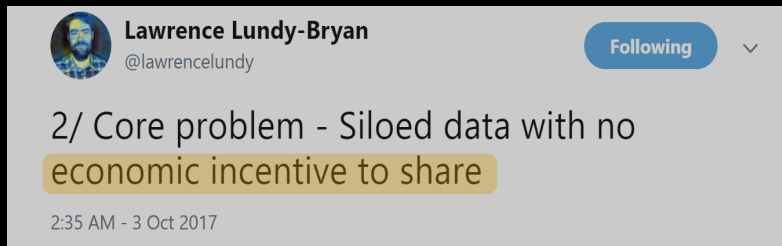
# Design of Tokenized ecosystem

## ≈ Design of EAs (Evolutionary Algorithms)

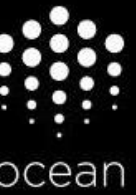
Tokenized ecosystem	Evolutionary Algorithm
<b>Block reward function</b> E.g. “Maximize hash rate”	<b>Objective function</b> E.g. “Minimize error”
<b>Miners &amp; token holders (humans)</b> In a network	<b>Individuals (computer agents)</b> In a population
<b>Block reward interval</b>	<b>Generation</b>
<b>You can’t control human,</b> <b>Just reward: give tokens</b> <b>And punish: slash stake (or hack lol)</b>	<b>You can’t control individual,</b> <b>Just reward: reproduce</b> <b>And punish: kill</b>



# Economic incentives: Ocean



# Economic Incentive for Ocean



**Objective: Maximize supply of high-quality (curated) data**

- This means: reward curating data + making it available
- Where “curating” = betting on data. Reward taste-making.

$$E(R_{ij}) \propto \log_{10}(S_{ij}) * \log_{10}(D_j) * T * R_i$$

- $E(R_{ij})$  = expected block rewards
- $S_{ij}$  = stake in dataset j
- $D_j$  = popularity = # downloads
- $T$  = # tokens during interval
- $R_i$  = download ratio (prevents some attacks)

# Ocean Mining Rewards, from Economic Incentive



You get block rewards if:

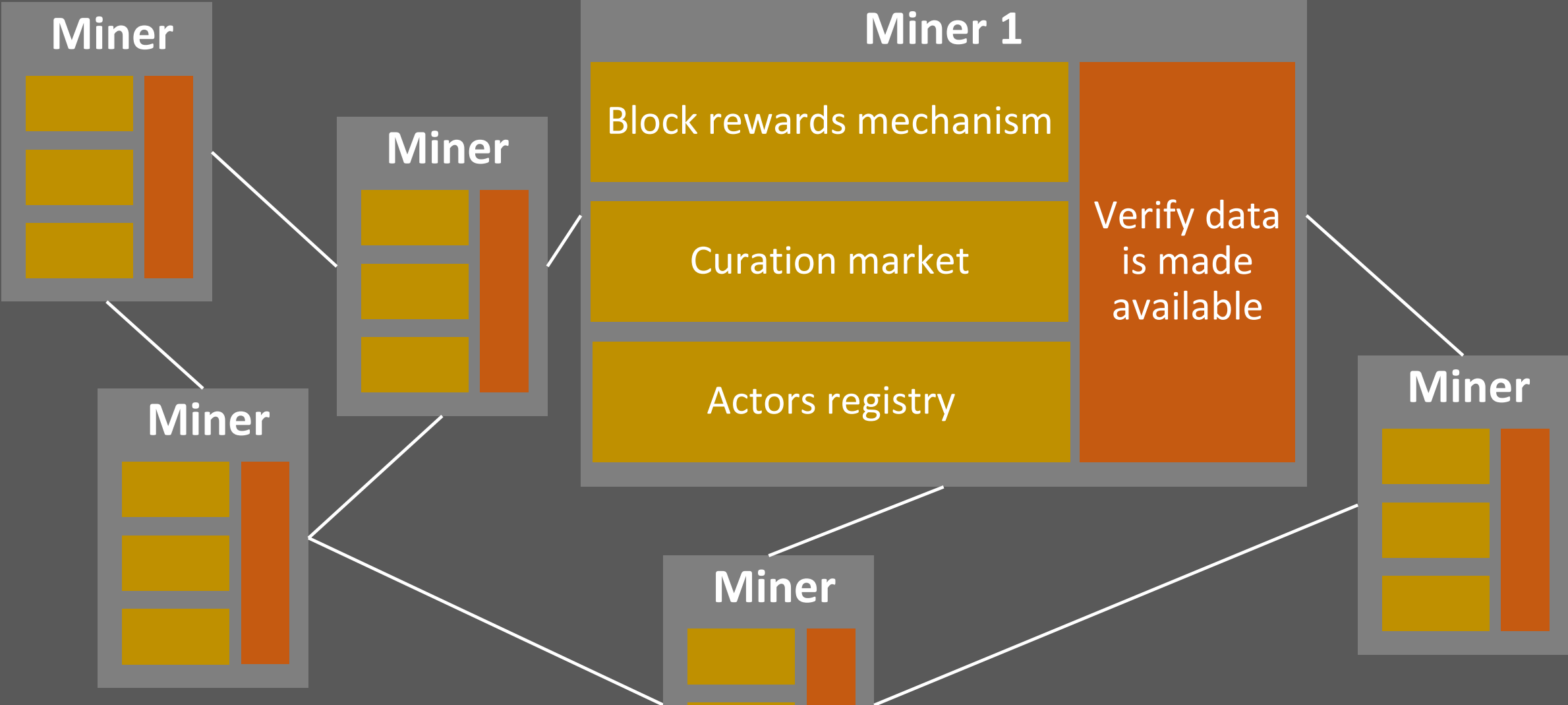
- You've bet on a dataset (i.e. curated)
- And you make it available when asked







Ocean Blockchain Network



# AVDEX // Autonomous Vehicles Data Exchange

AVDEX stands for Autonomous Vehicle Data Exchange. It is a platform for producers and consumers to exchange data-sets in a secure, decentralized, and open manner.

## Secure. Decentralized. Open.

- **Secure:** Every transaction in the system is cryptographically signed.
- **Decentralized:** We run on [BigchainDB](#), a scalable decentralized database.
- **Open:** Everybody can join the exchange.

Connect to your digital wallet.

Welcome back, BigchainDB

[Home](#)

[Create offer](#)

[My Offers \(2\)](#)

[Search Offers](#)

[Logout](#)

## BigchainDB

7KaKEt27hS5wDfPMZmdzQo28BSGJCJK3djR8kLUManKE

<https://www.bigchaindb.com/>



### CH2\_002

\$1500 4.4 GB [transaction](#) ★ ★ ★ ★ ★

Date	Lighting Conditions	Duration	Compressed Size	Direct Download	Torrent	MD5
11/18/2016	Daytime/Shadows	--	4.4GB	None	None	

- HMB\_1: 221 seconds, direct sunlight, many lighting changes. Good turns in beginning, discontinuous shoulder lines, ends in lane merge, divided highway
- HMB\_2: 791 seconds, two lane road, shadows are prevalent, traffic signal (green), very tight turns where center camera can't see much of the road, direct sunlight, fast elevation changes leading to steep gains/losses over summit. Turns into divided highway around 350s, quickly returns to 2 lanes
- HMB\_4: 99 seconds, divided highway segment of return trip over the summit
- HMB\_5: 212 seconds, guardrail and two lane road, shadows in beginning may make training difficult, mostly normalizes towards the end
- HMB\_6: 371 seconds, divided multi-lane highway with a fair amount of traffic

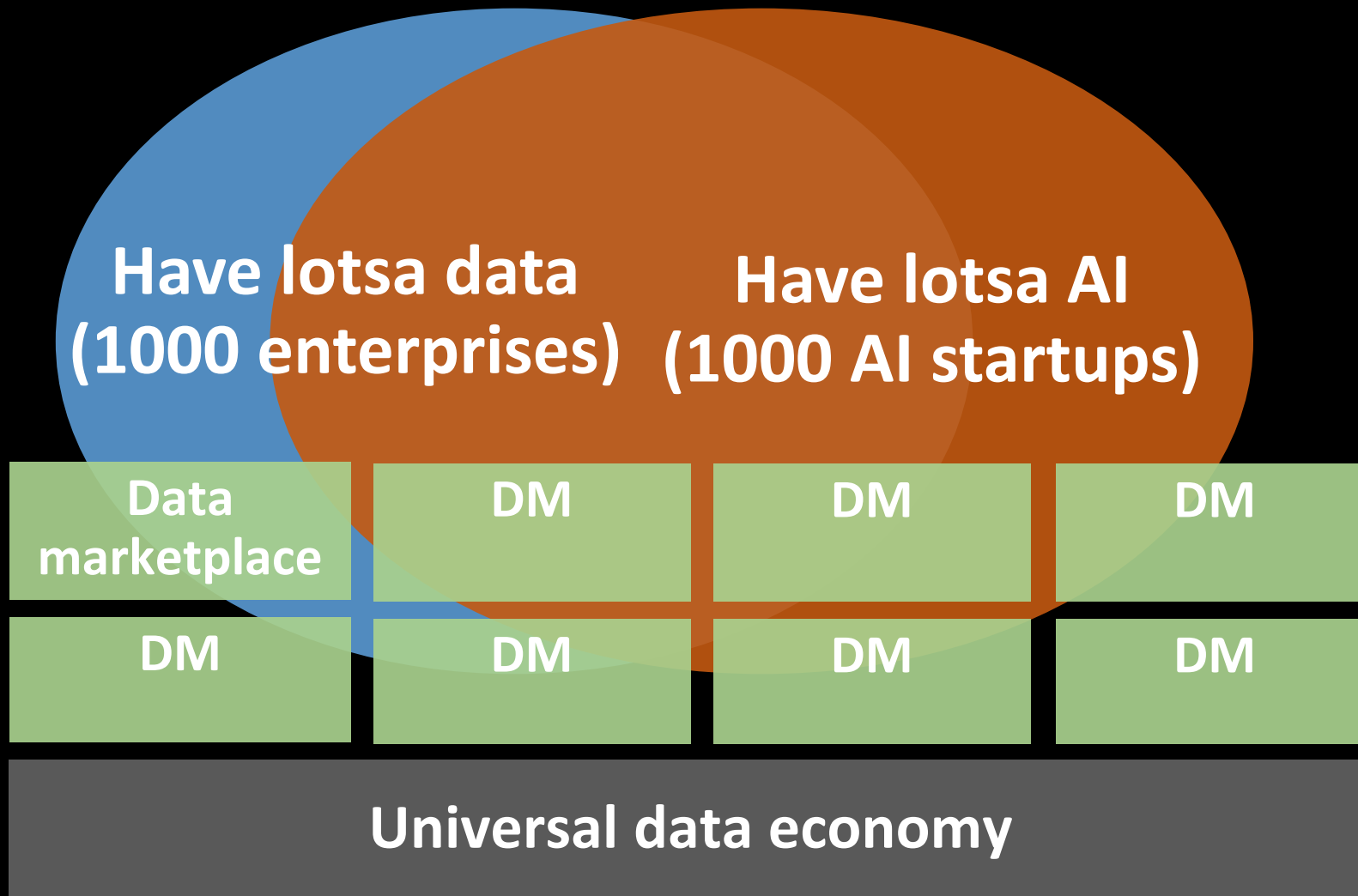
[View >](#)





**What unlocking data  
unlocks**





**Equalize the  
opportunity for  
access to data  
and  
benefits of AI**

# Squeeze out the data silos (aka people farming)



**>100x more data for health  
care research**





# Self-driving cars: fewer accidents, more mobility

AVDEX v0.1 - Chromium

AVDEX v0.1

localhost:3000

alberto

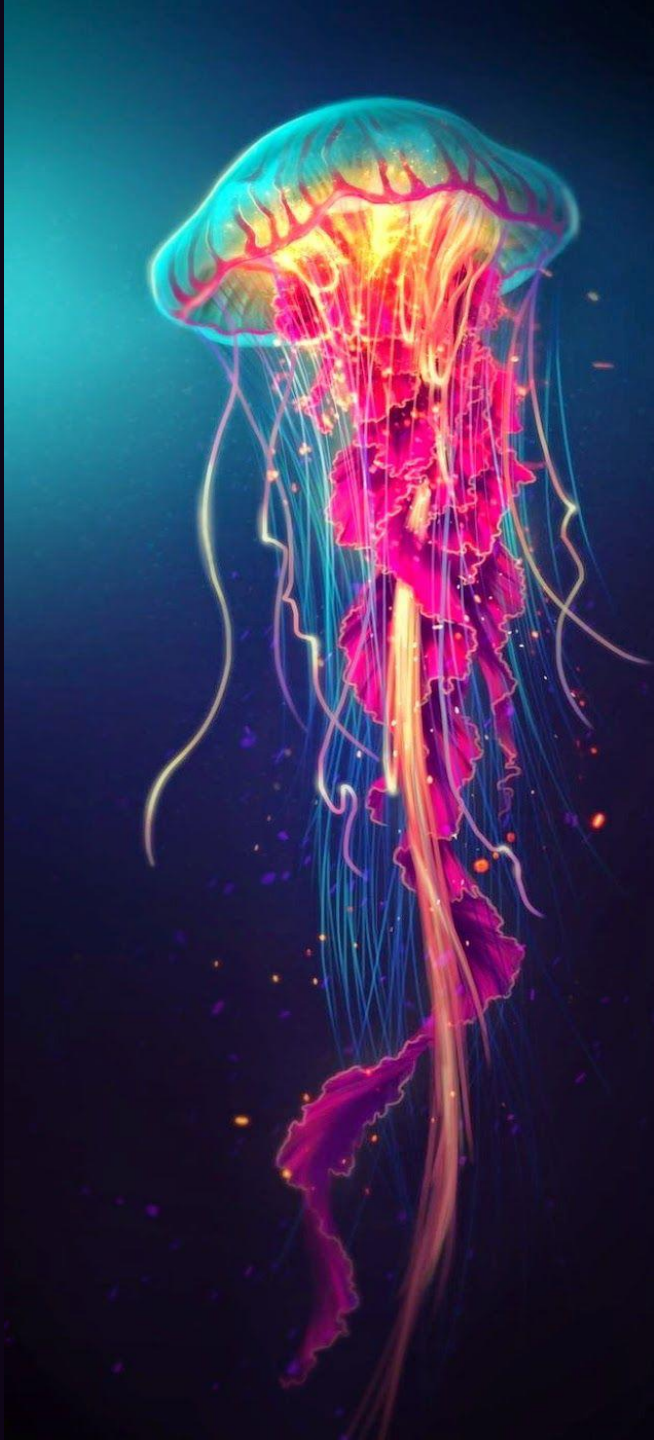
## AVDEX // Autonomous Vehicles Data Exchange

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[Connect to your digital wallet.](#)



**Conclusion**

**We've lost the web.  
Let's reclaim it, better than ever...**

**Let's build a new data economy  
that gives power to the people!**

