Building Open Data Ecosystems with Ocean Protocol

@oceanprotocol
Trent McConaghy

ODYSSEY 2020

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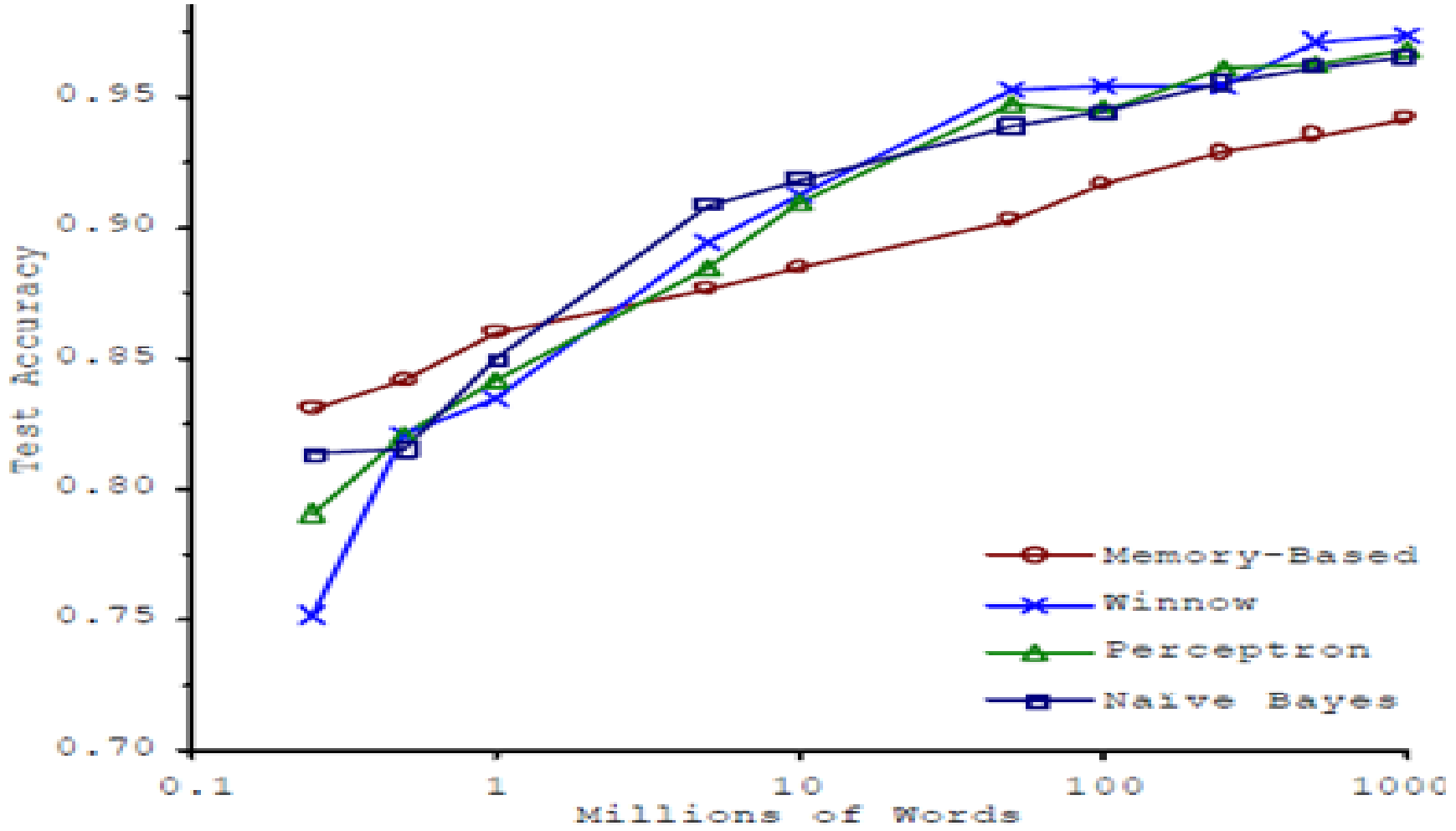
Data

The Economist
The world's most valuable resource
amazon
UBER
Microsoft
Google
Data and the new rules of competition

How? AI *loves* data. Has led to data moats :(



100x *less error*

1000x *more* data

[Banko and Brill, 2001]

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About Ocean

Ocean in a Nutshell

- Safely & securely exchange data, without loss of privacy
- A public utility network to connect AI / data suppliers & consumers
  - Decentralized access control
  - Decentralized orchestration
- Data marketplaces in-a-box
- Buy & sell *private* data, while protecting privacy
- Rethink data custody: “not your keys, not your data”

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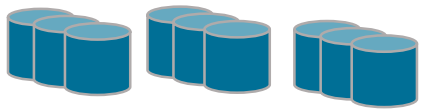
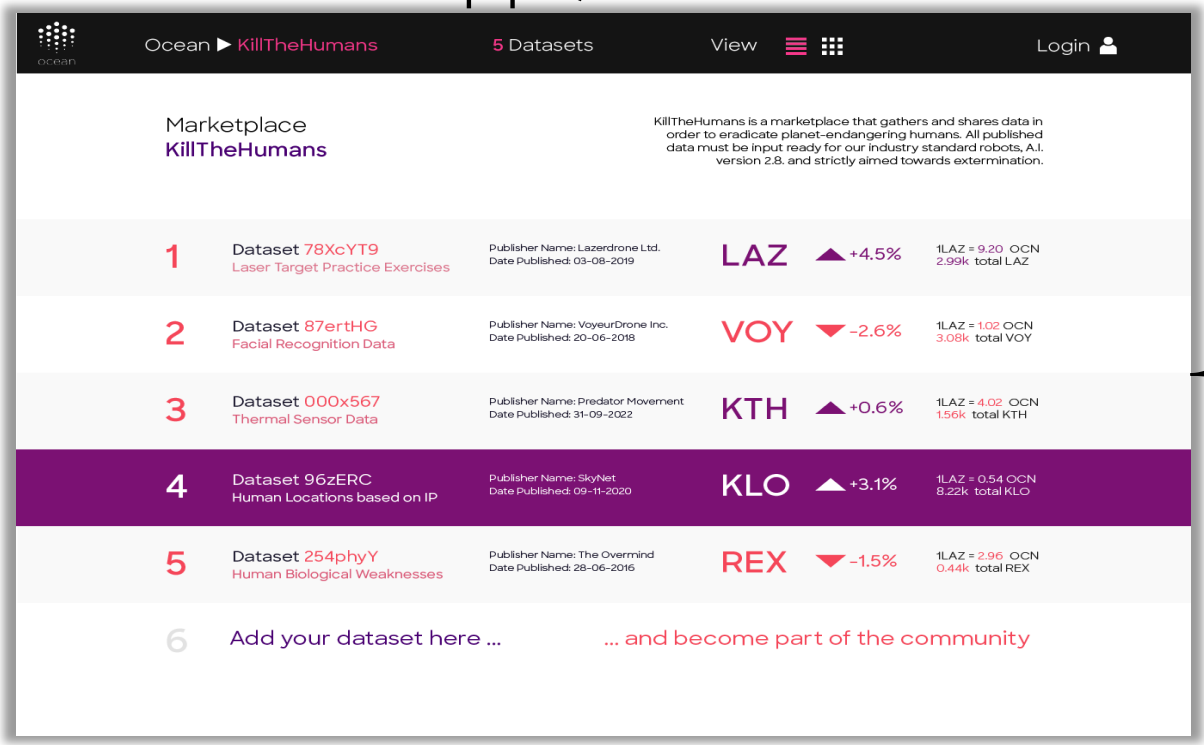
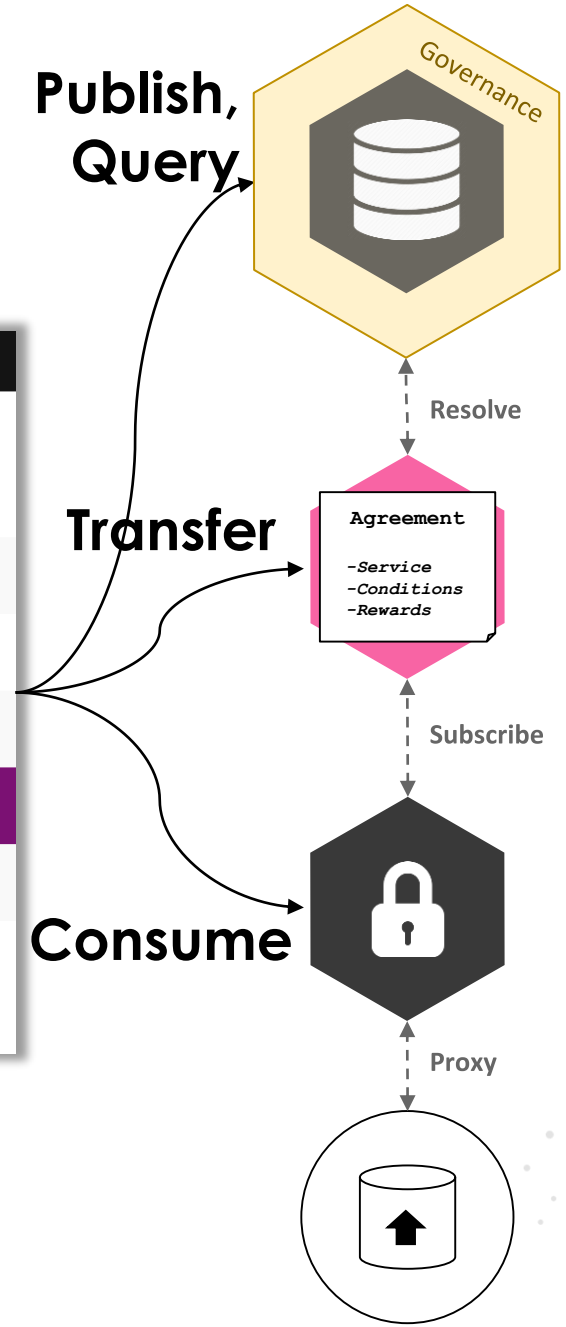
Architecture is similar to flight tickets, BitTorrent, DNS, Ox, ..

Data market Data commons AI / data science tools	Many-local frontend	Kayak.com, easyjet.com	Kazaa
Metadata store & access control handshaking	Metadata	Backends for Kayak / Easyjet	Torrent trackers
Blockchain-based access storage	Single-global, handshaking	SABRE database	BitTorrent network
 Data	Actual Product	Flight ticket	Movie file

Ocean Tech

Data Marketplaces,
Dapps, Wallets





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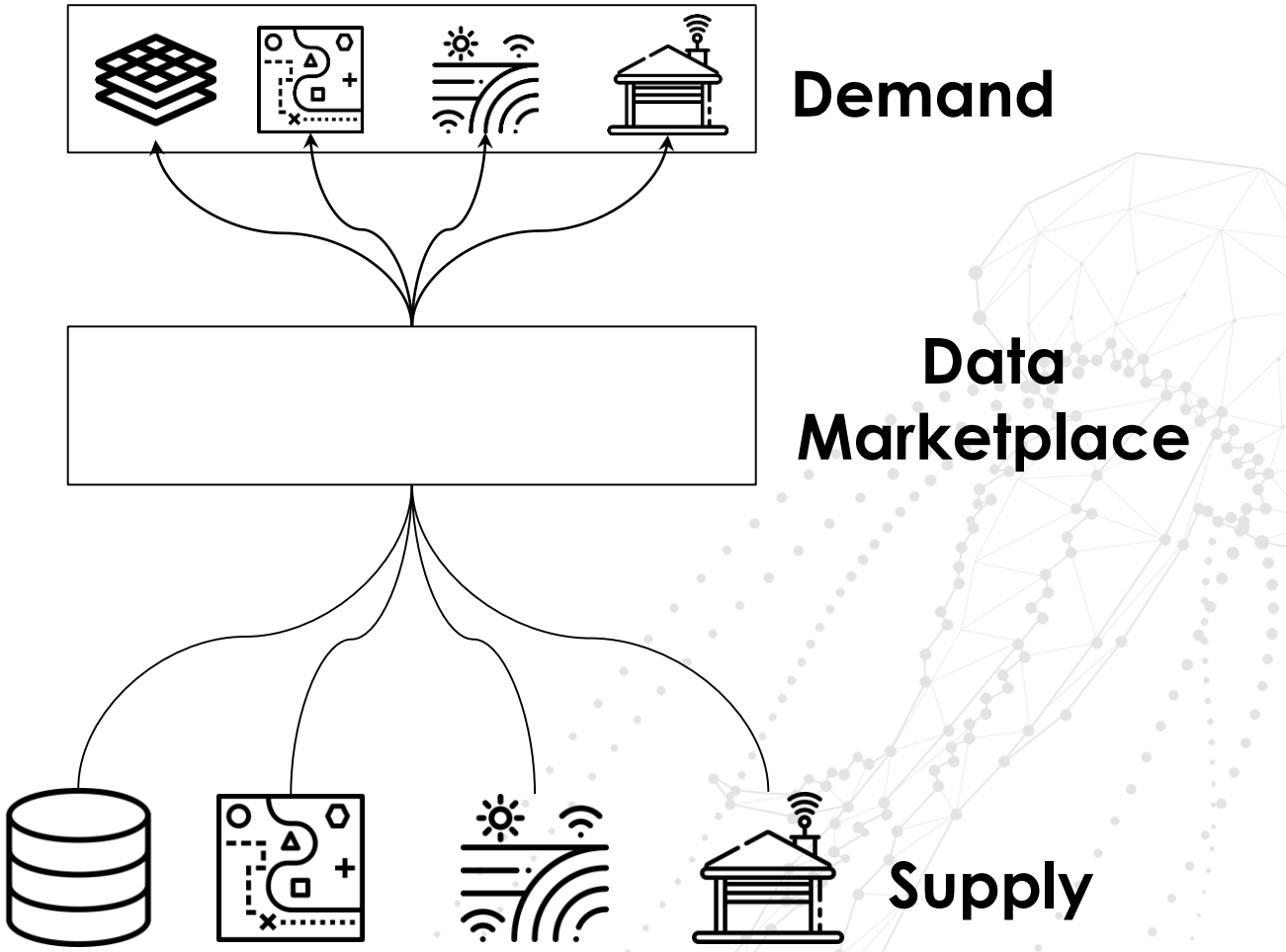
https://github.com/oceanprotocol

Ocean Data Marketplaces

Benefits

- **Preserve privacy**: compute to data
- **Secure data management**: tokenized access control
- **Out-of-box marketplace**, with pricing



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Odyssey Hackathon Mission

TO BRIDGE THE GAP BETWEEN CHALLENGE-OWNERS AND CHALLENGE-SOLVERS

BREAK DOWN THE INDUSTRY SILOS BY CONNECTING ALL STAKEHOLDERS AND OPENING NEW MARKETS FOR SOLUTIONS

SCALE INNOVATION BY INCUBATING ECOSYSTEMS THAT SOLVE COMPLEX CHALLENGES THROUGH MASS COLLABORATION

CO-CREATE A DIGITAL PUBLIC INFRASTRUCTURE FOR EVERYONE, TO SUPPORT SUCH COLLABORATION

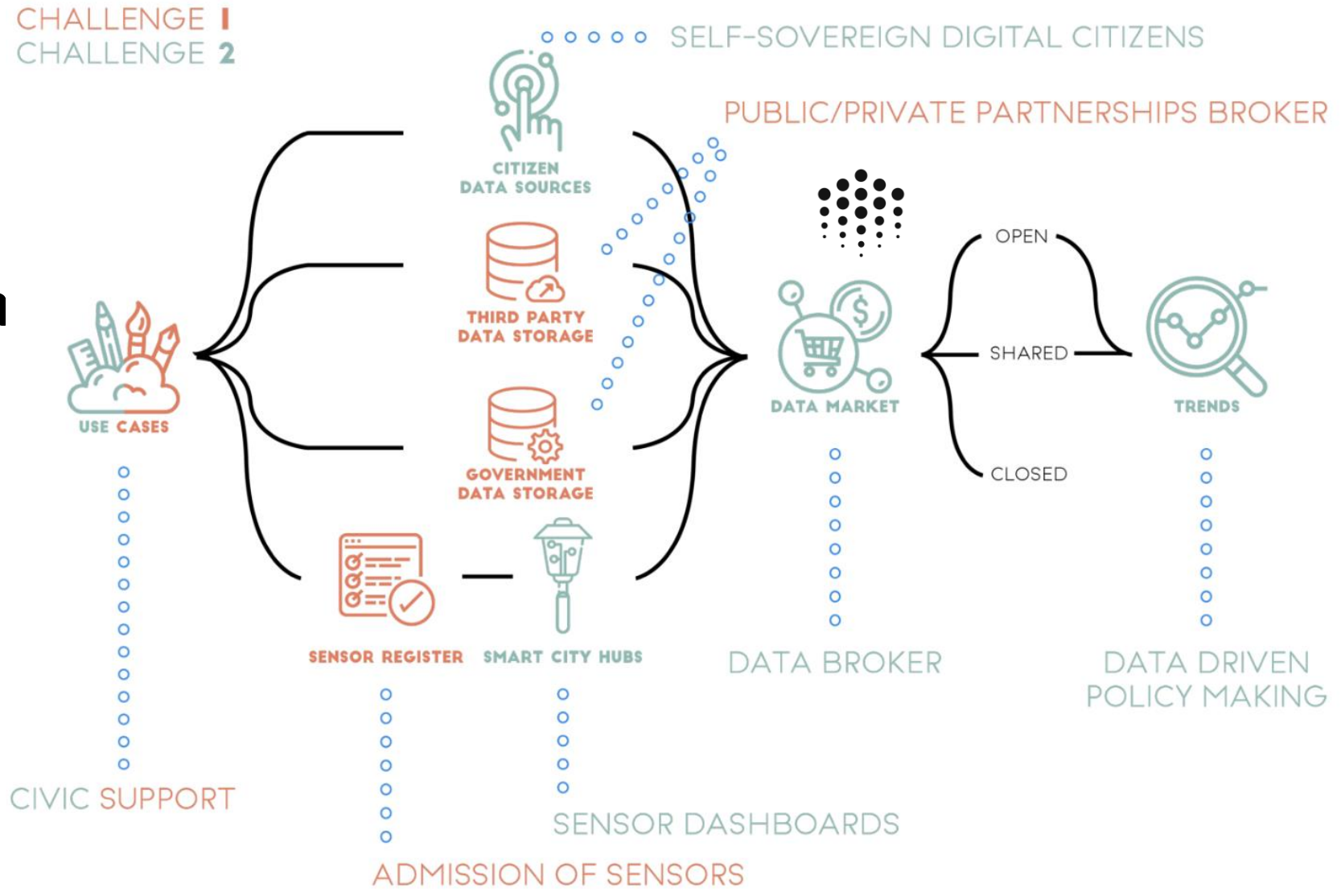
Role of Ocean at Odyssey
(Example: Conscious Cities Track)

-Data Market module

-API to publish, query,

consume, transfer data

-Tech support



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Data you have

1 hospital

Data you want

10,000 hospitals

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The most valuable data is private data.

Attribution: Andrew Trask

Data you have

1 hospital

Showstopper: Privacy & Control

Data you want

10,000 hospitals

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A Fundamental Tradeoff?

AI Accuracy ↑ ↑ ↑

Lives Saved ↑ ↑ ↑

Privacy ↓ ↓ ↓

Exploits ↑ ↑ ↑

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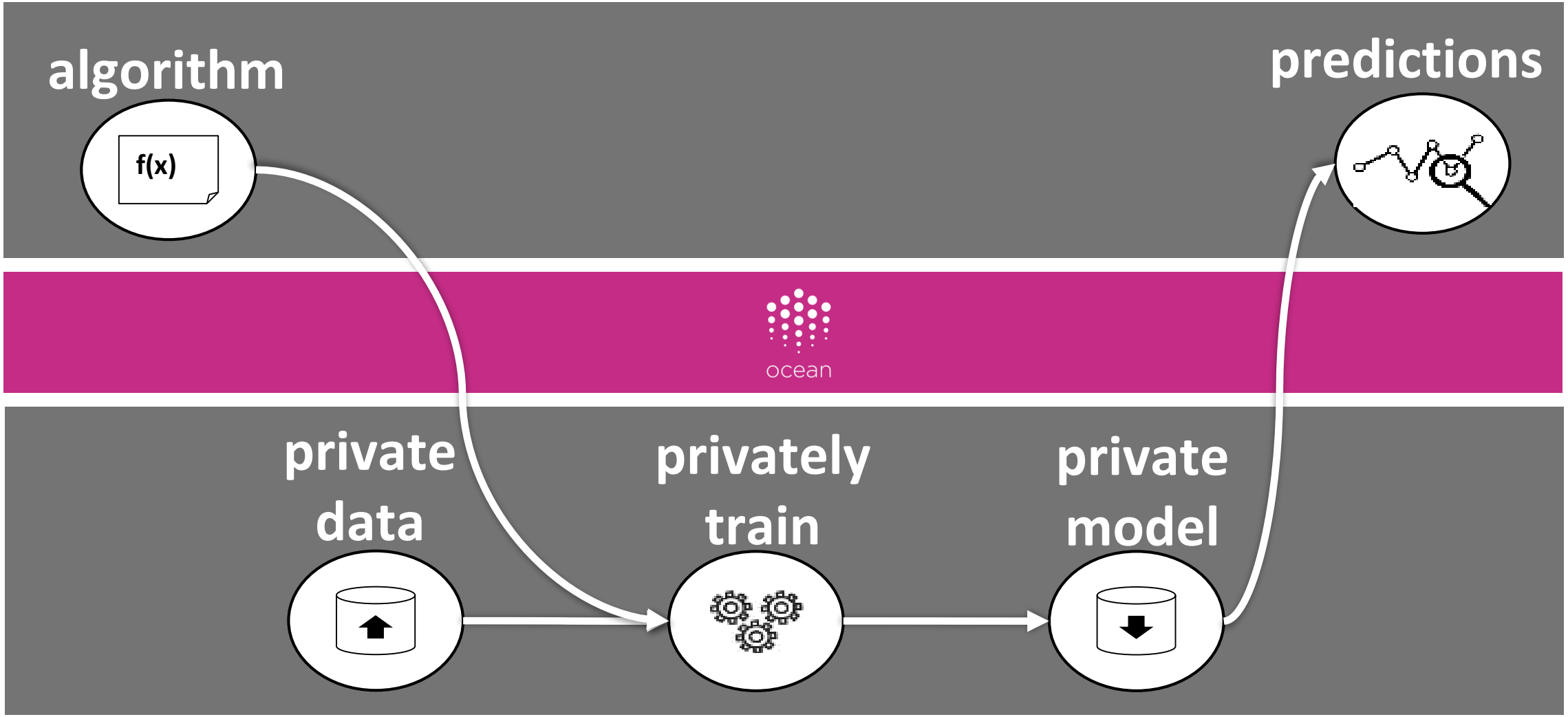
Bring compute to data, with Ocean



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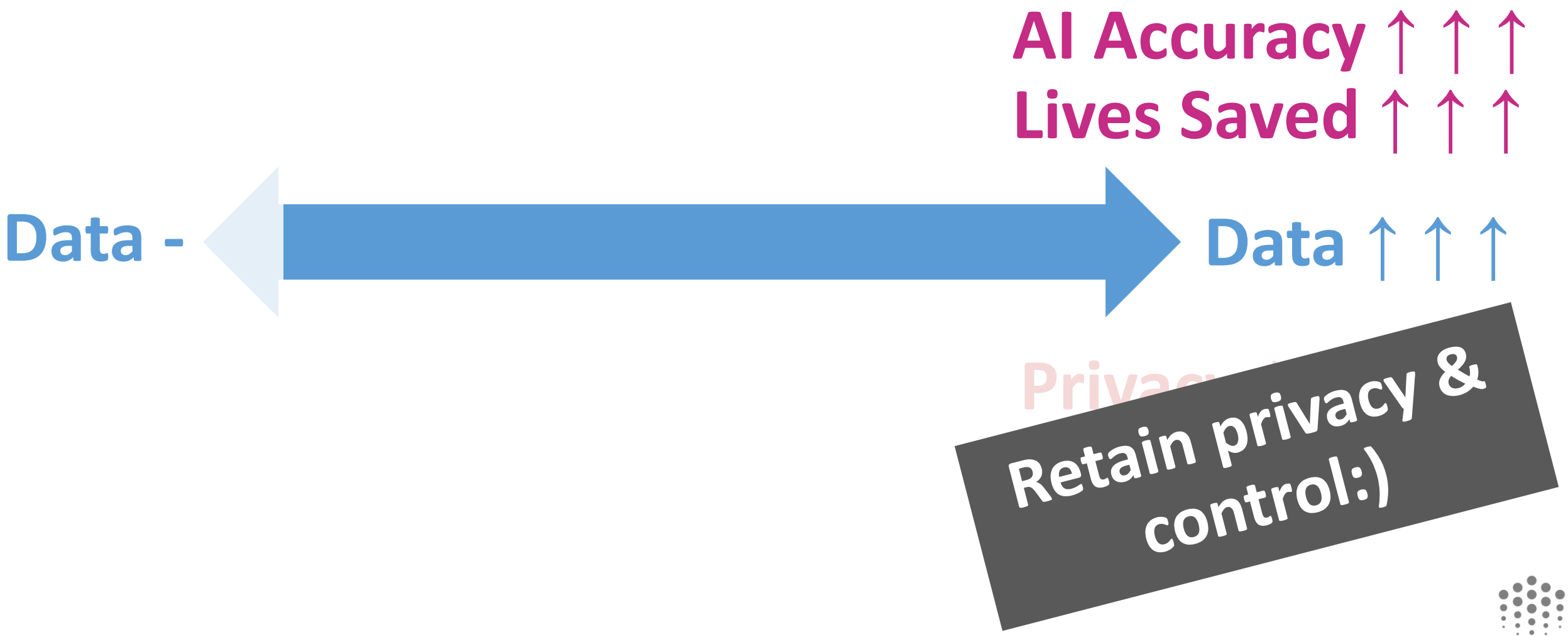
Ocean Resolves the Tradeoff
by Bringing Compute to the Data



Data you have

1 hospital

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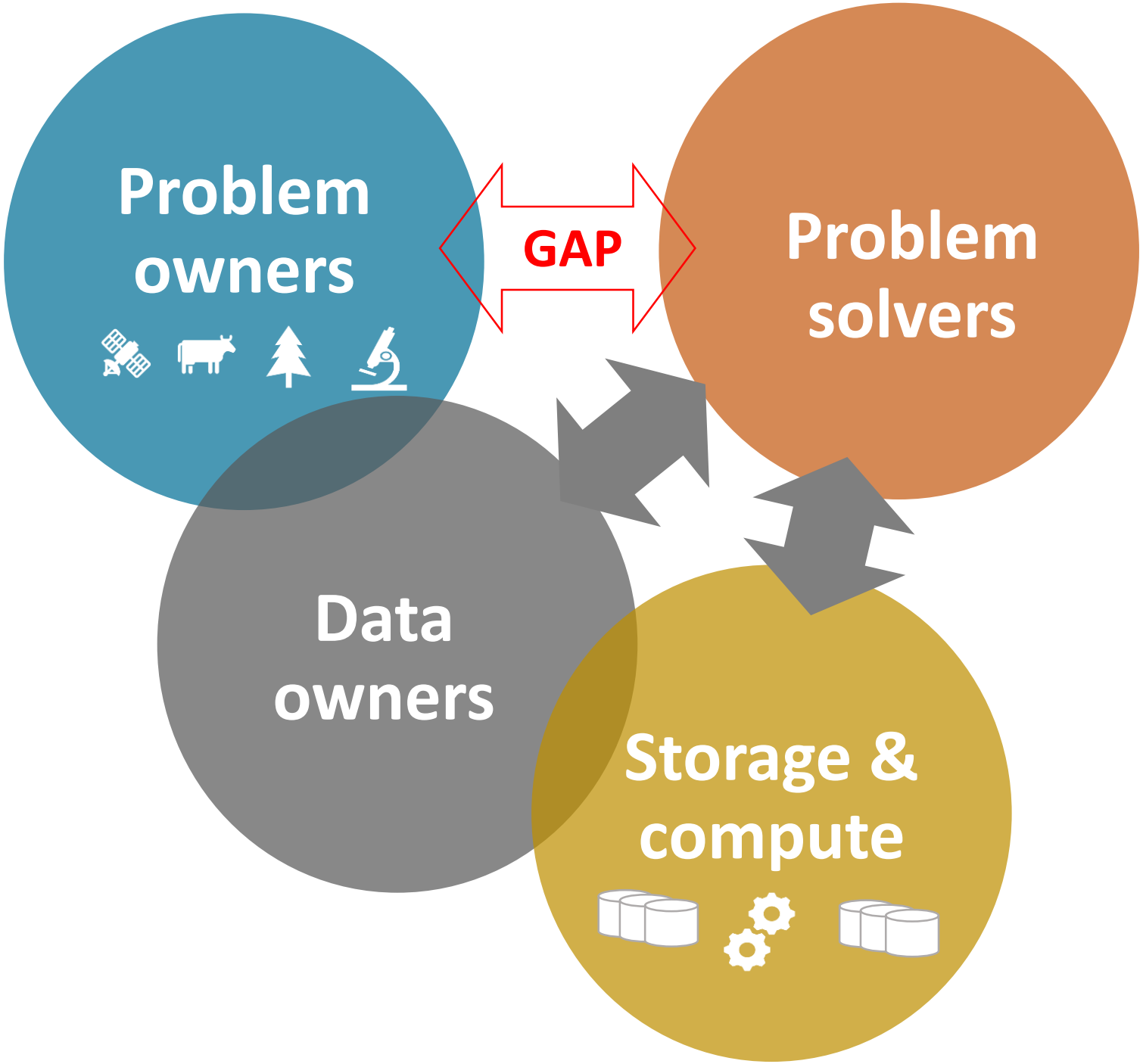
Data you'll get!

10,000 hospitals

Odyssey Tracks:
Data Marketplaces in Smart Cities, Energy, …


Problem owners
GAP
Problem solvers
Data owners
Storage & compute

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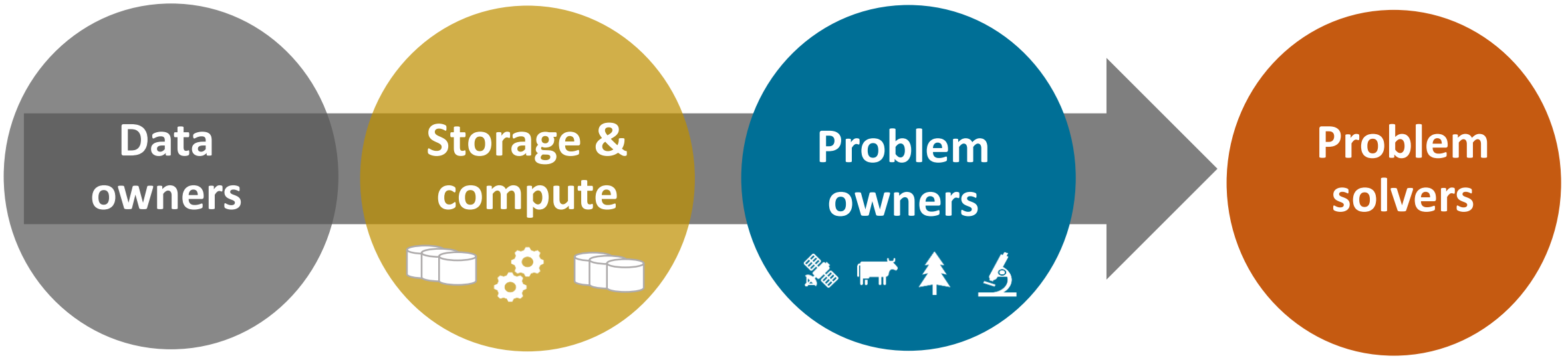

Marketplaces & commons for data, storage, and compute

Problem & prize platforms

Data science tools

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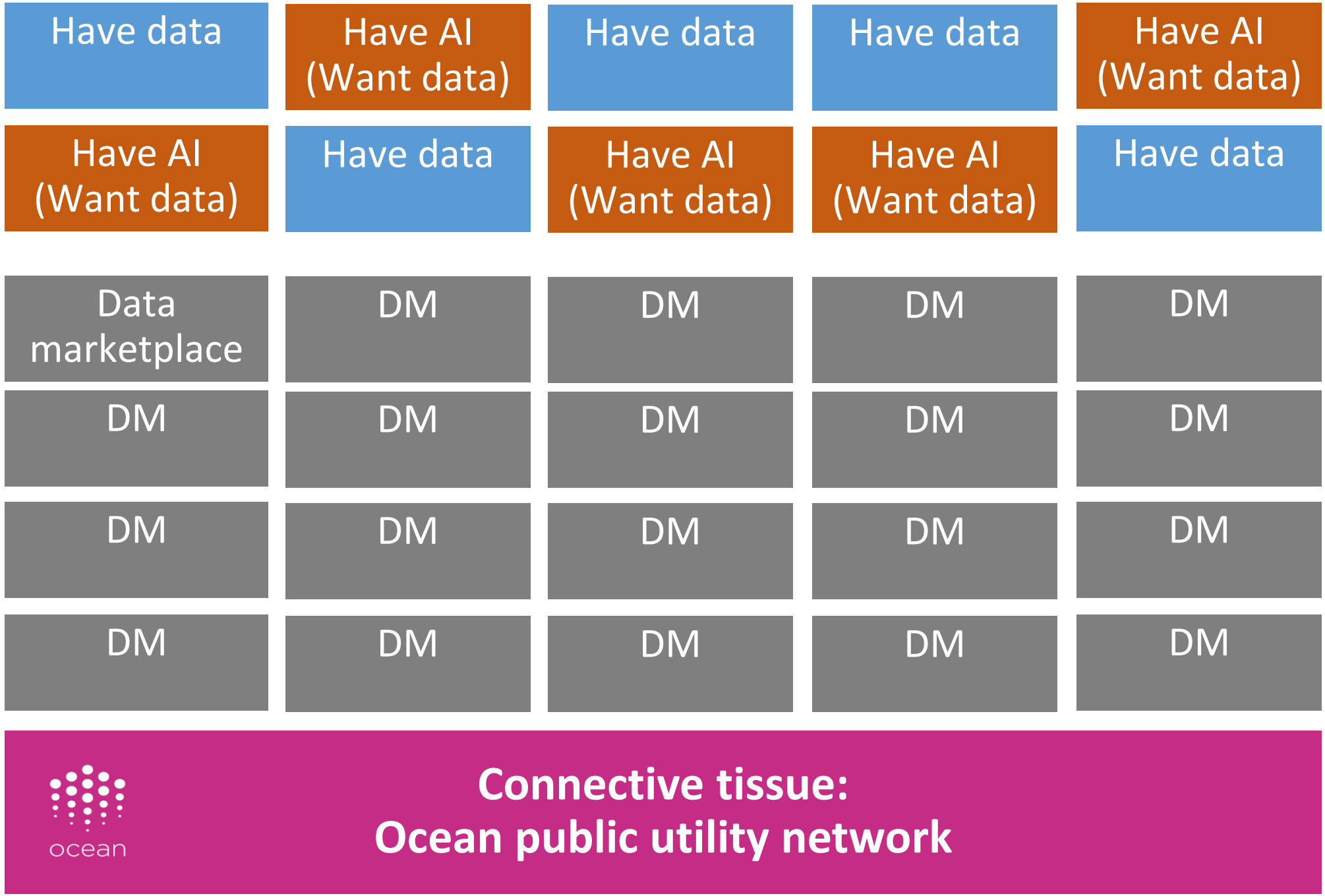
Connective tissue:
Ocean public utility network


Have data
Have AI (Want data)
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Data marketplace
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Connective tissue:
Ocean public utility network

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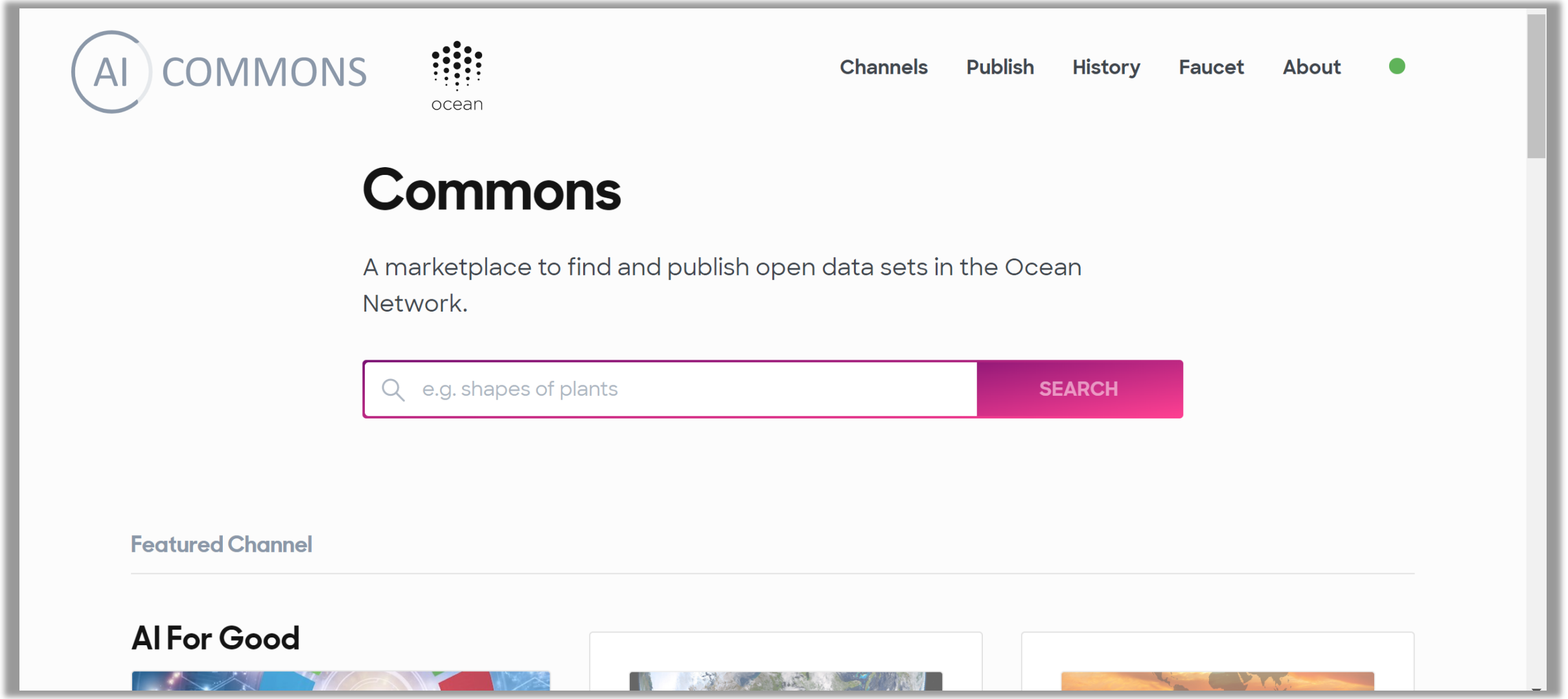
Example: commons.oceanprotocol.com



Benefits of Ocean-based marketplaces
“Your keys, your data”

- Seller retains control of the data. No data escapes.
- Buy & sell private (!) data. The most valuable data
- Don’t need to trust marketplace owner; they don’t hold data
- Marketplace owner isn’t liable for the data
- Liquidity across data silos in enterprises & governments
- Out-of-the-box “whitelabel” marketplace

Odyssey Tracks:
Data Management
in Smart Cities, Energy, ..
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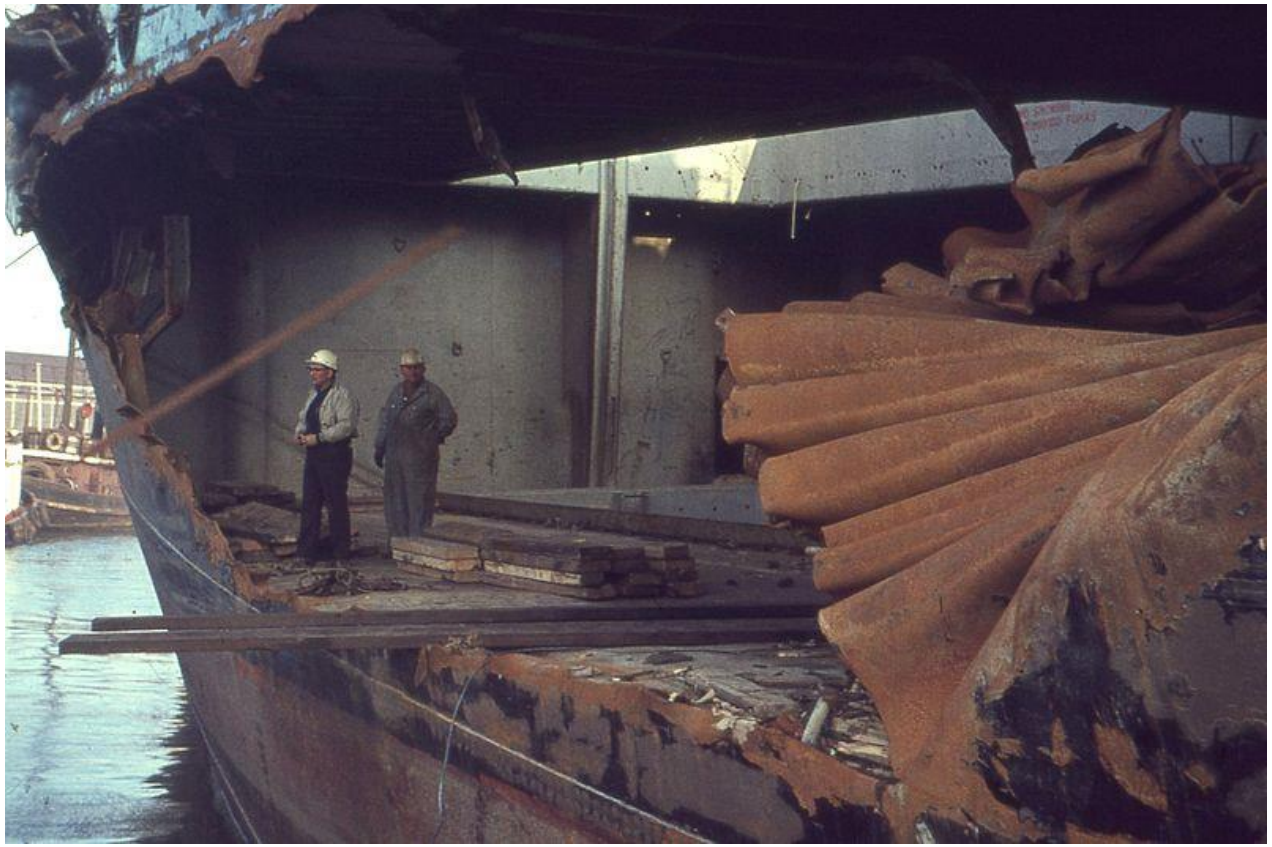
Traditional Data Management: Breaches the Norm

In 2017, Equifax was hacked. Credit card information of 148 million people was compromised, including customer names, Social Security numbers, birthdates and addresses. Equifax had to pay a $700M fine for the data breach.



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Bitcoin (and Blockchains) are crazy-secure.

"Your keys, your Bitcoin. Not your keys, not your Bitcoin"

Bitcoin is worth $132B.

It's fully open.

Hack it well and you could make > $1B.

But it hasn't had security issues for years.

Why? Fundamentally different security:

- No central point of control
- 1000's of independent nodes that store the most important info: who owns what

Ocean: Blockchain Security for Data Management

“Your keys, your data. Not your keys, not your data.”

- Data custody ≈ blockchain token custody (HW wallets, etc.)
- Transfer data ≈ transferring OP data access
- Data security ≈ blockchain security (>bank-grade by default)

(Image © Riddle & Code)

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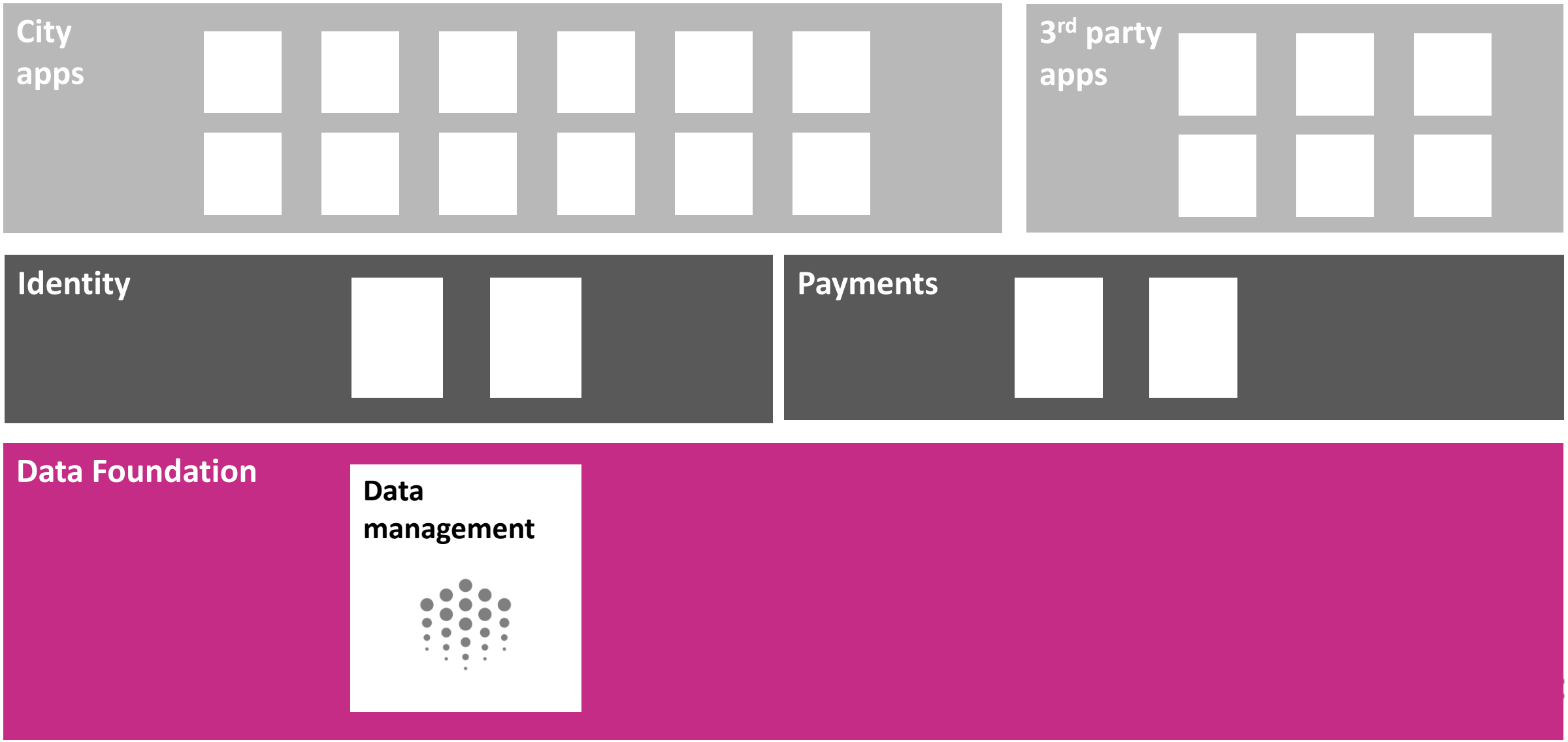
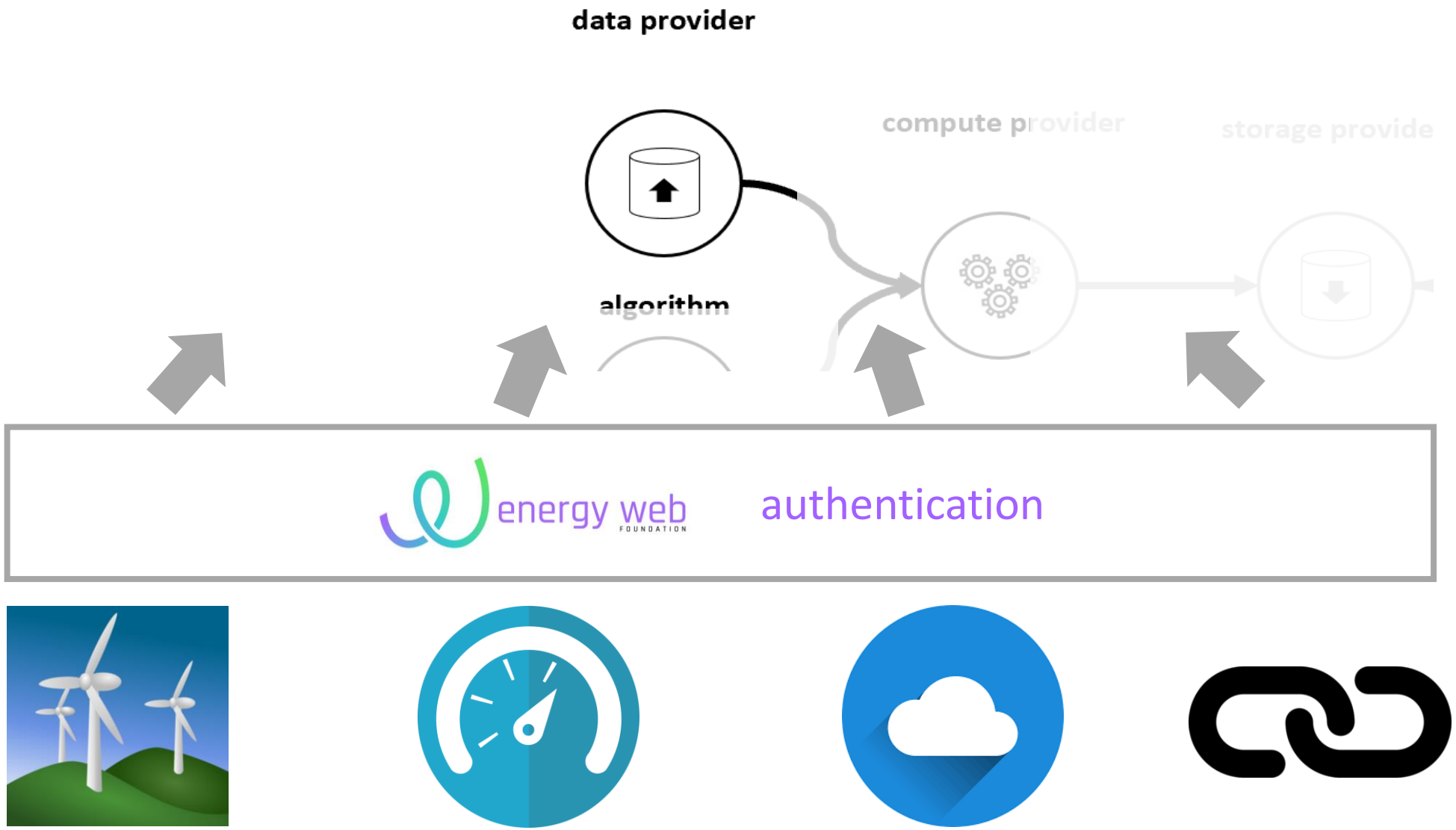
Blockchain-based data management for cities
Layer in identity + payments. On top, dozens of applications.



Example: EWF-authenticated data (from internal, Web2, Web3)



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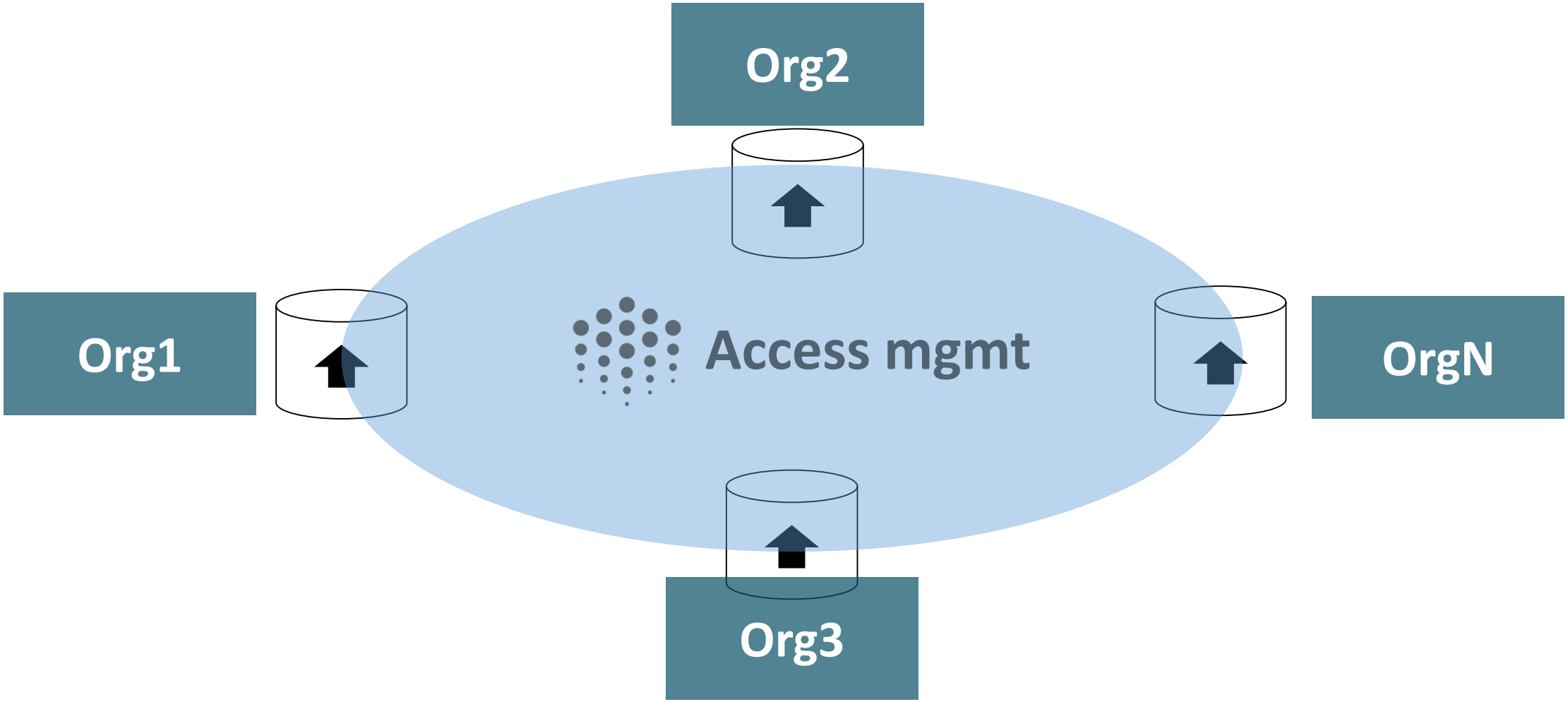
Example: Energy data access management among your org's offices, or between your org & collaborators.

"Google Drive, without the Google"



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Benefits of blockchain-based data management

- **Get benefits of digital-native**
  - 5-10x less $ spent on admin (ref .Estonia)
  - More comprehensive, faster, simpler gov't services for citizens
  - More opportunities for citizens
- **Get special benefits from Ocean / blockchain**
  - Preserve privacy
  - Secure data management
  - Out-of-box marketplaces for city data
  - Provenance of transactions in id, payments, data
  - Unlock more AI applications in health, more

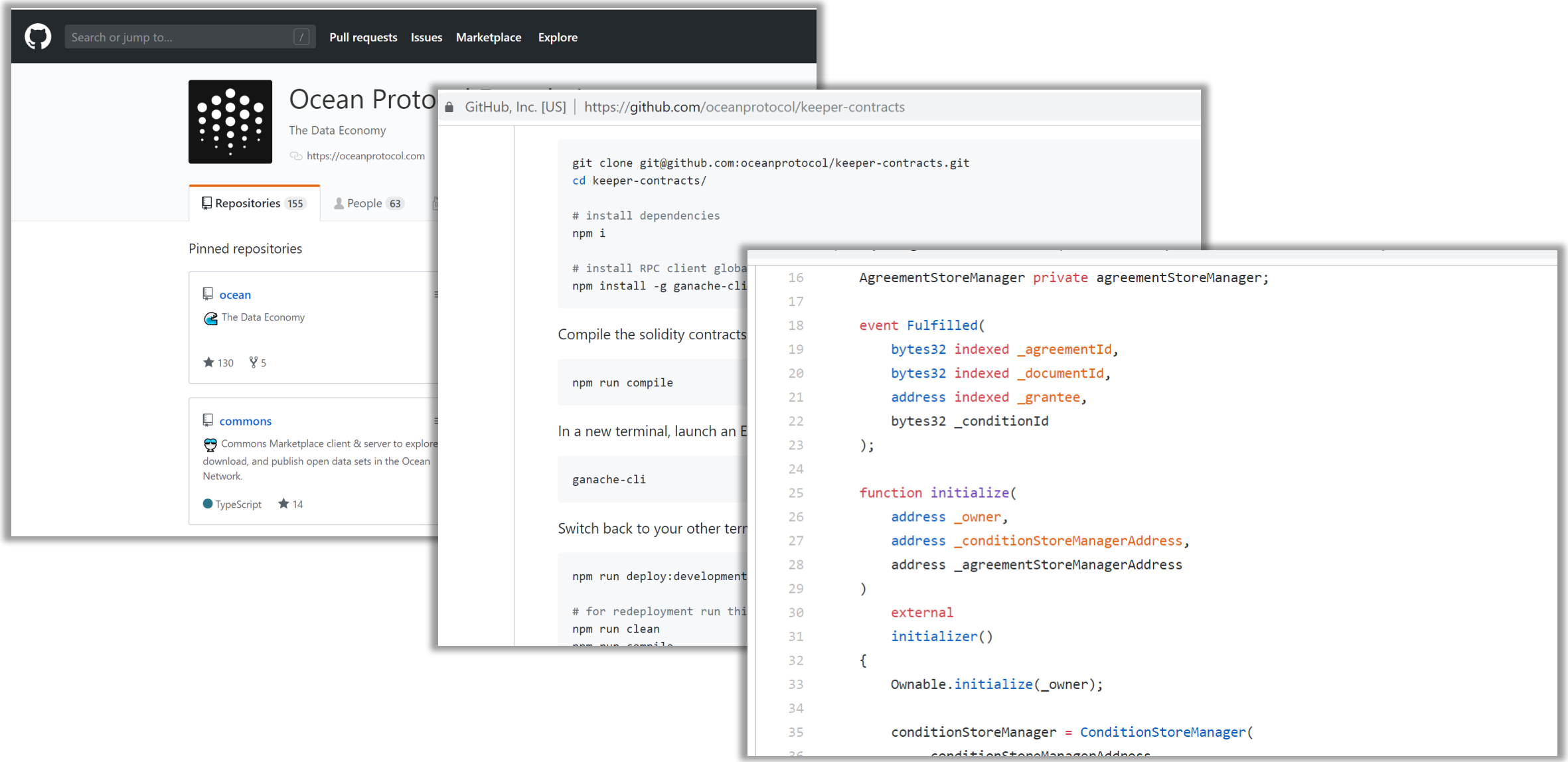
How To Build on Ocean

On Ocean Tech

- Public EVM network, running Parity POA
  - But with access control on data itself
- TokenBridge to Ethereum mainnet
- **“Squid” = SDKs in Python, JS, Java.** REST API.

All Ocean Code is Open

github.com/oceanprotocol



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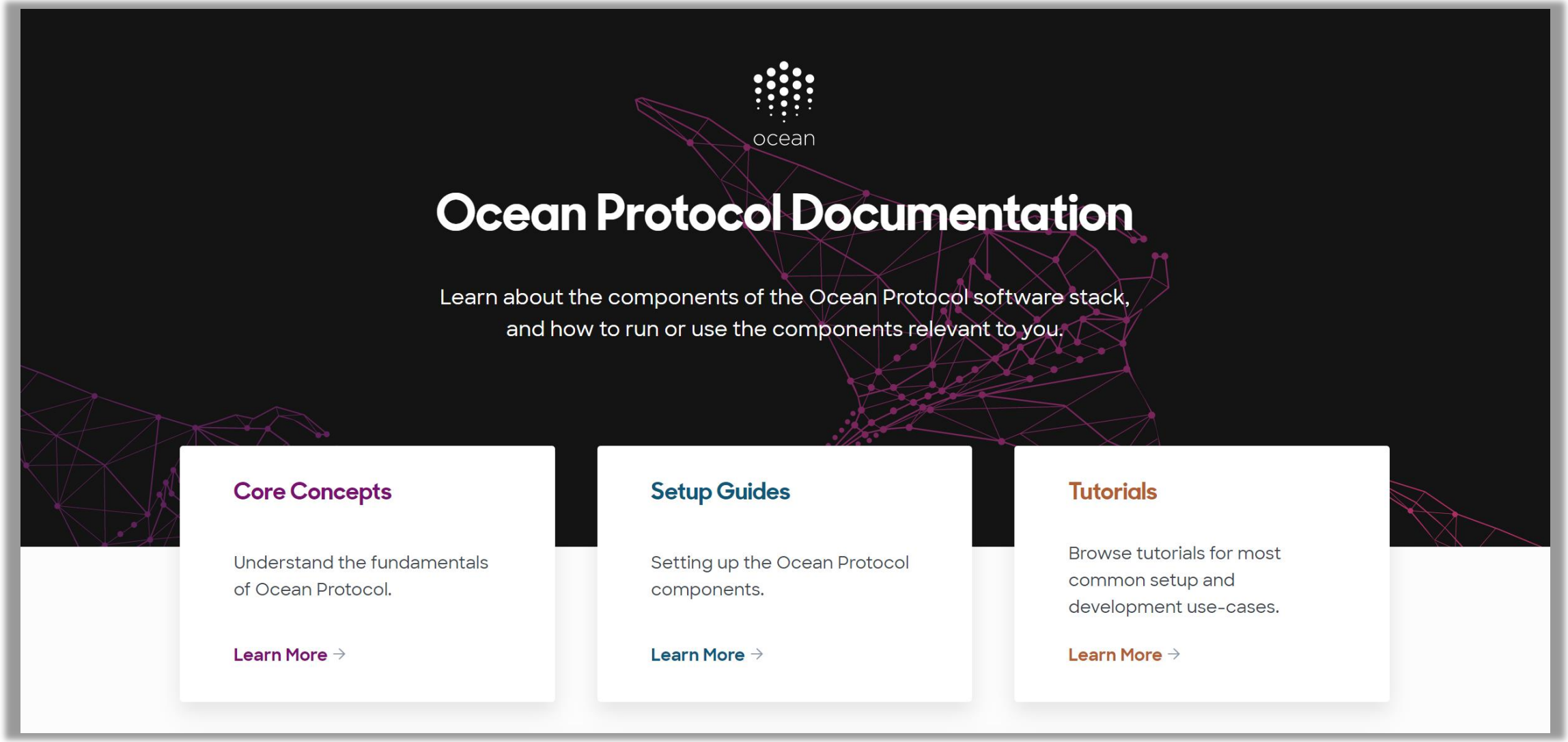
Documentation:
docs.oceanprotocol.com



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Example: Quickly build a React App

docs.oceanprotocol.co/tutorials/react-setup/

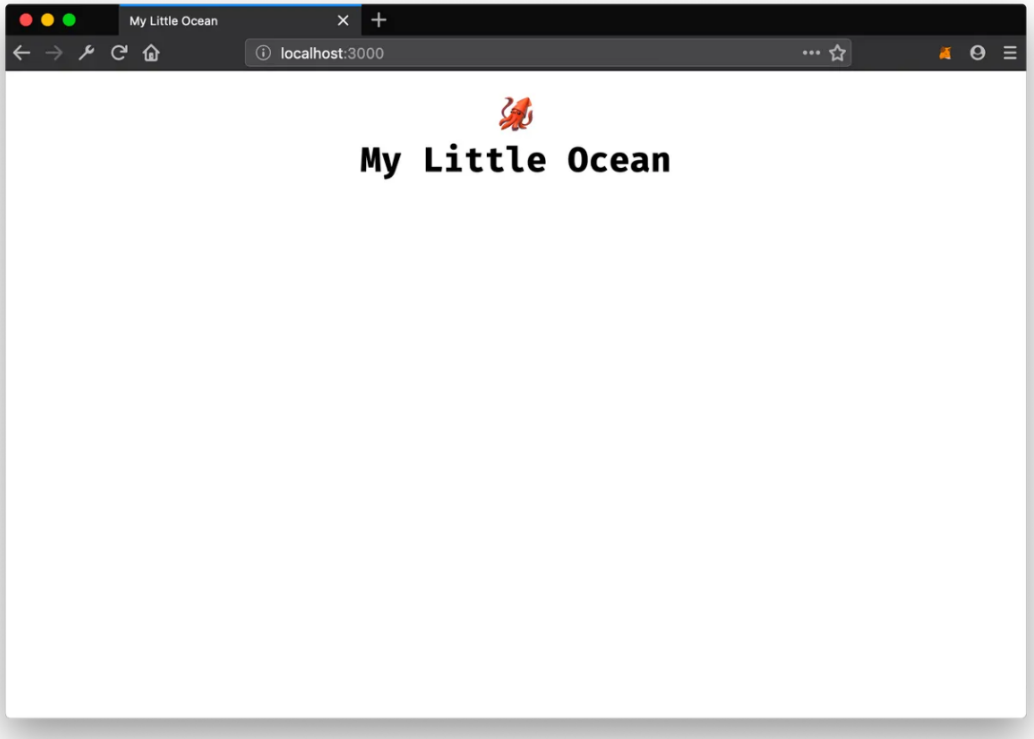
Create a new folder `src/` and within that a `index.js` file with the following content as our base, where we already import squid-js and web3.js:

```jsx
import React, { Component } from 'react'
import ReactDOM from 'react-dom'
import { Ocean } from '@oceanprotocol/squid'
import Web3 from 'web3'

class App extends Component {
  render() {
    return (
      <div
        style={{ fontFamily: '"Fira Code", monospace', textAlign: 'center' }}
      >
        <h1>
          <span role="img" aria-label="squid">
            🦑
          </span>
          <br /> My Little Ocean
        </h1>

      </div>
    )
  }
}

ReactDOM.render(<App />, document.getElementById('root'))
```



Initial React App

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Hackathon Opportunities:
Marketplaces

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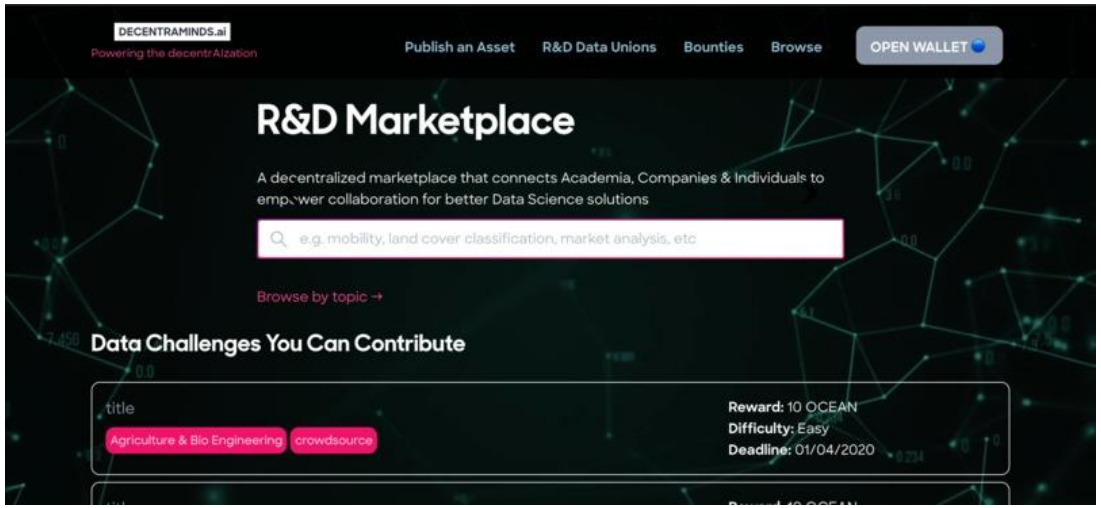
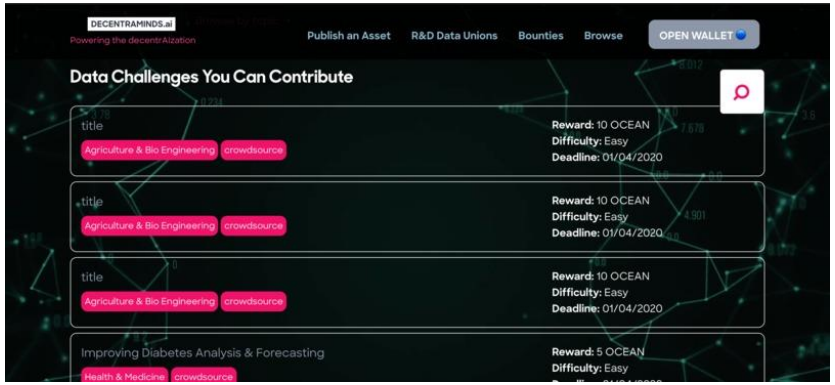
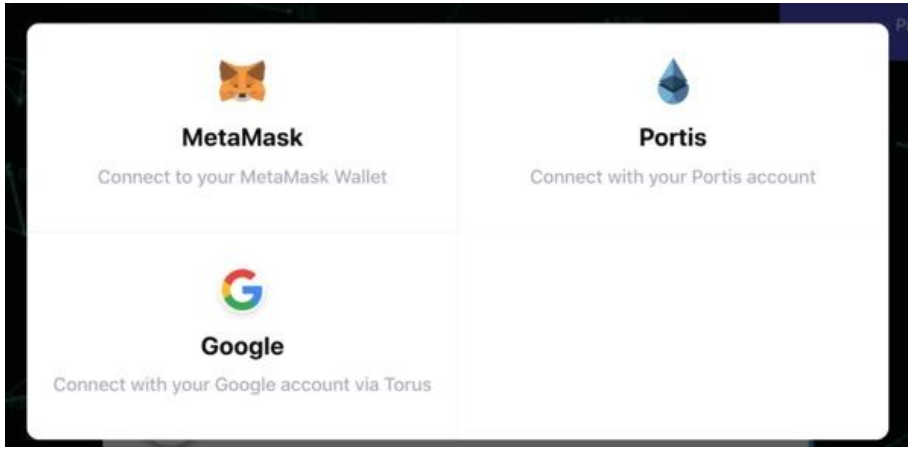
Example: Decentraminds

Self-sustainable research communities through trustless & privacy-preserving infrastructure, where users stays in control of their data assets, build reputation, and receives proper rewards

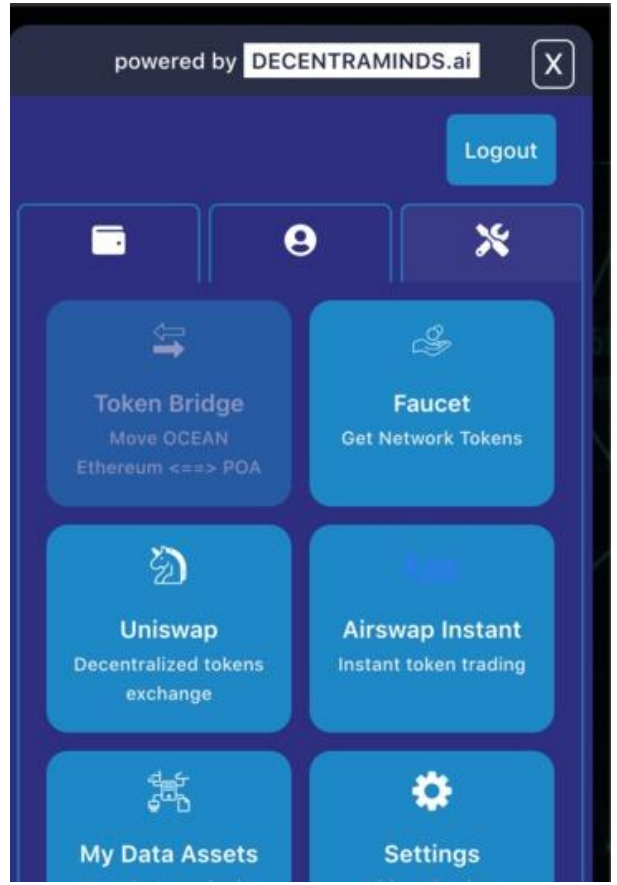




Data challenges



>1 wallets (Portis: fiat on-ramps)



Data Wallet Tools

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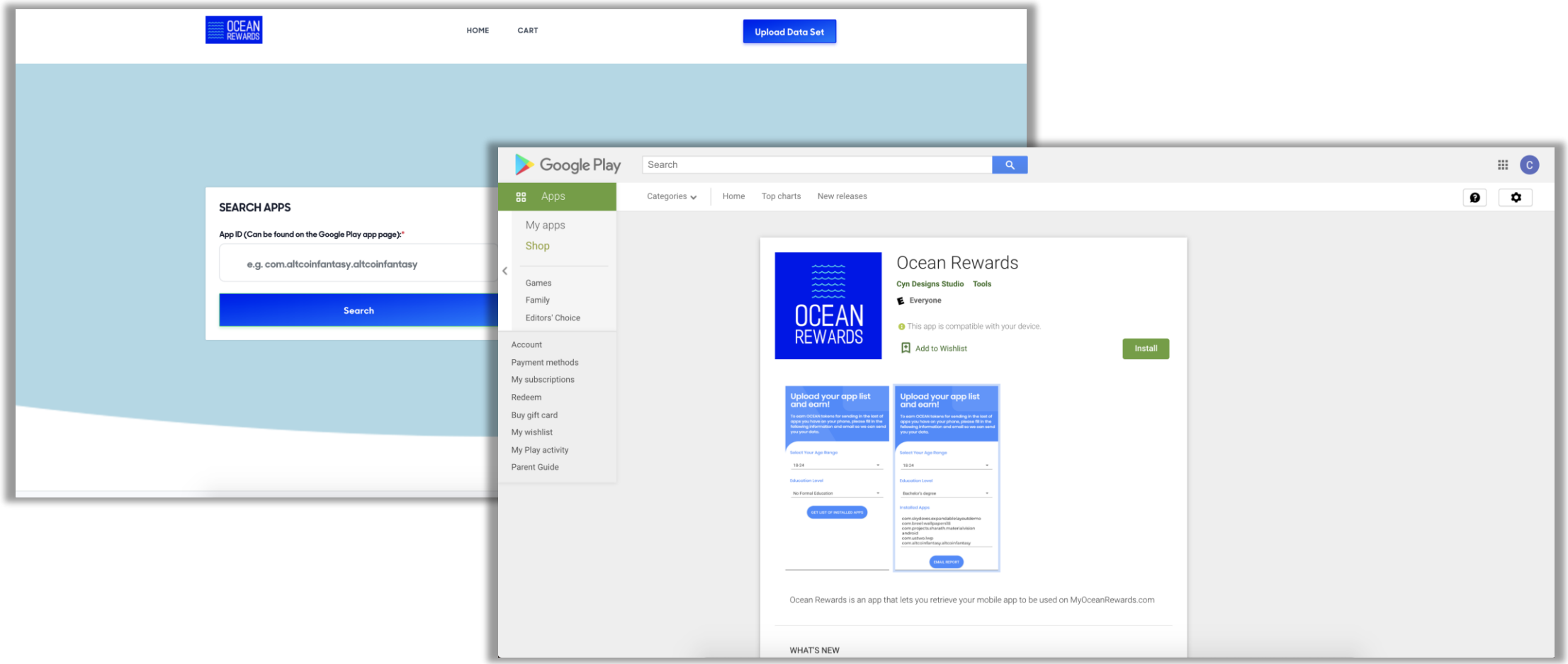
Example: Ocean Rewards

A marketplace where consumers can share their mobile app data and get rewarded in OCEAN tokens while app marketers can purchase that data using OCEAN tokens



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What type of data marketplace could you build?

Fork an existing token exchange, twist it for data exchange

Fork Ocean Commons, add a killer feature

Marketplace for supply chain data

Bundle datasets into dataset portfolios (Set Protocol * Ocean)

Market with built-in data exploration

Marketplace for energy data

Price data with bonding curves

Marketplace with DAO-driven data labeling

Marketplace for synthetic data

Price data with channel auctions

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Getting started on marketplaces

- **Docs: Quickstart**
  https://docs.oceanprotocol.com/setup/quickstart/

- **Docs: Set Up a Marketplace**
  https://docs.oceanprotocol.com/setup/marketplace/

- **Tutorial: Ocean React App**
  https://docs.oceanprotocol.com/tutorials/react-setup/

- **Commons Marketplace**
  https://github.com/oceanprotocol/commons

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Hackathon Opportunities:
Integrations

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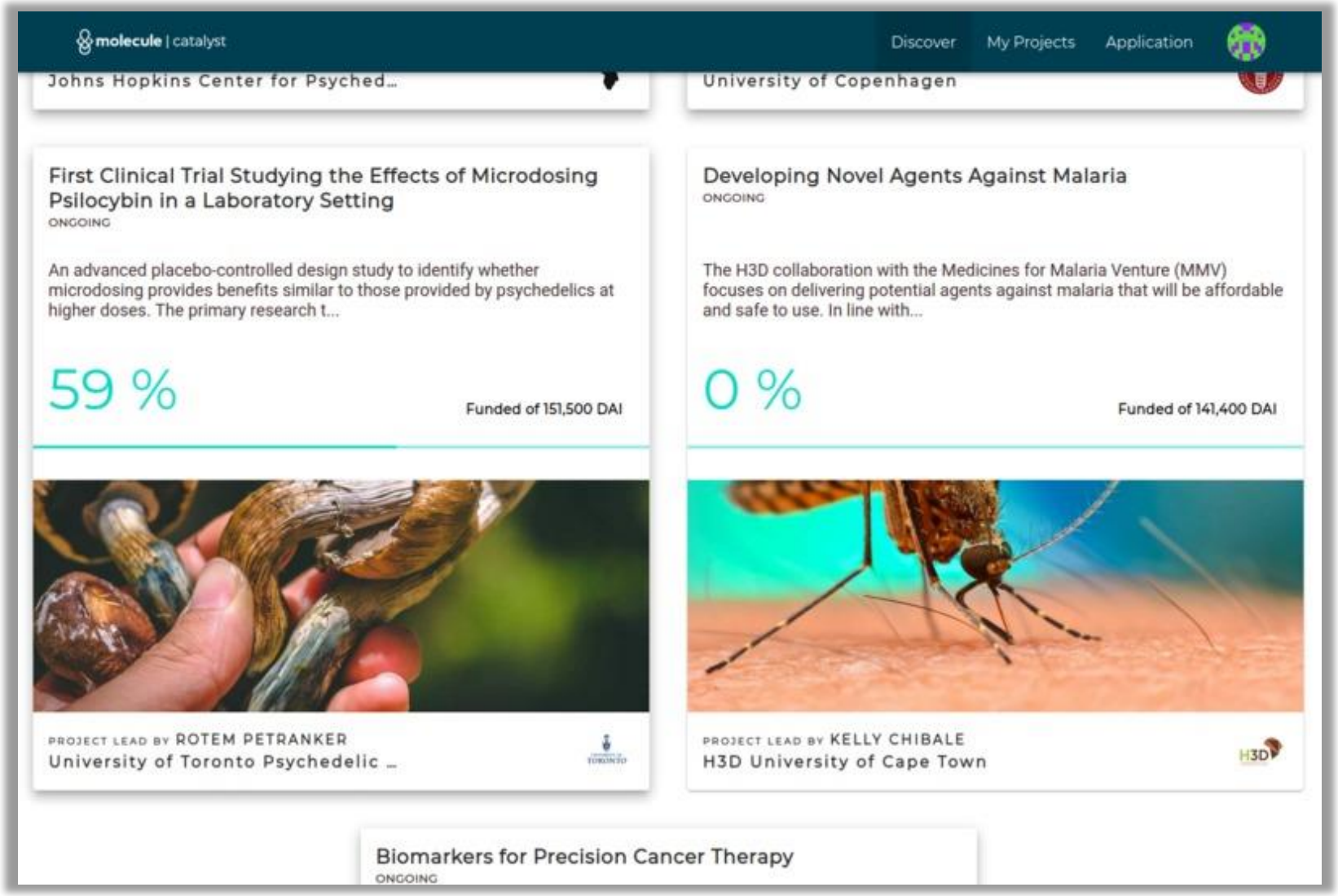
Example: Molecule Dataswap

A system to crowdfund production of Ocean assets from Molecule research projects, dynamically price assets, and reward contributors to the publisher / research project.



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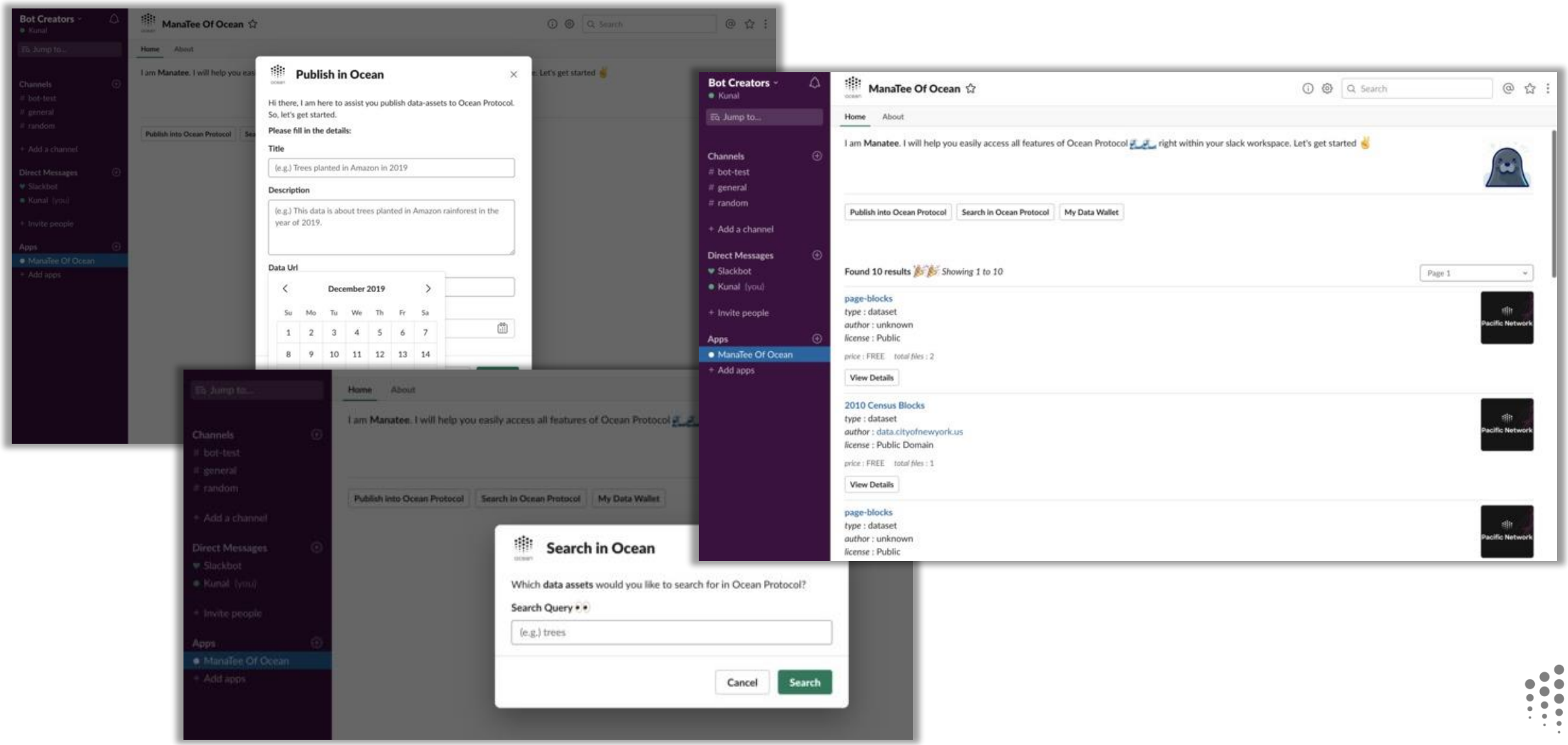
Example: ManaTee Slack Integration

Unlock full capabilities of Ocean Protocol's Marketplaces right within your Slack workspace



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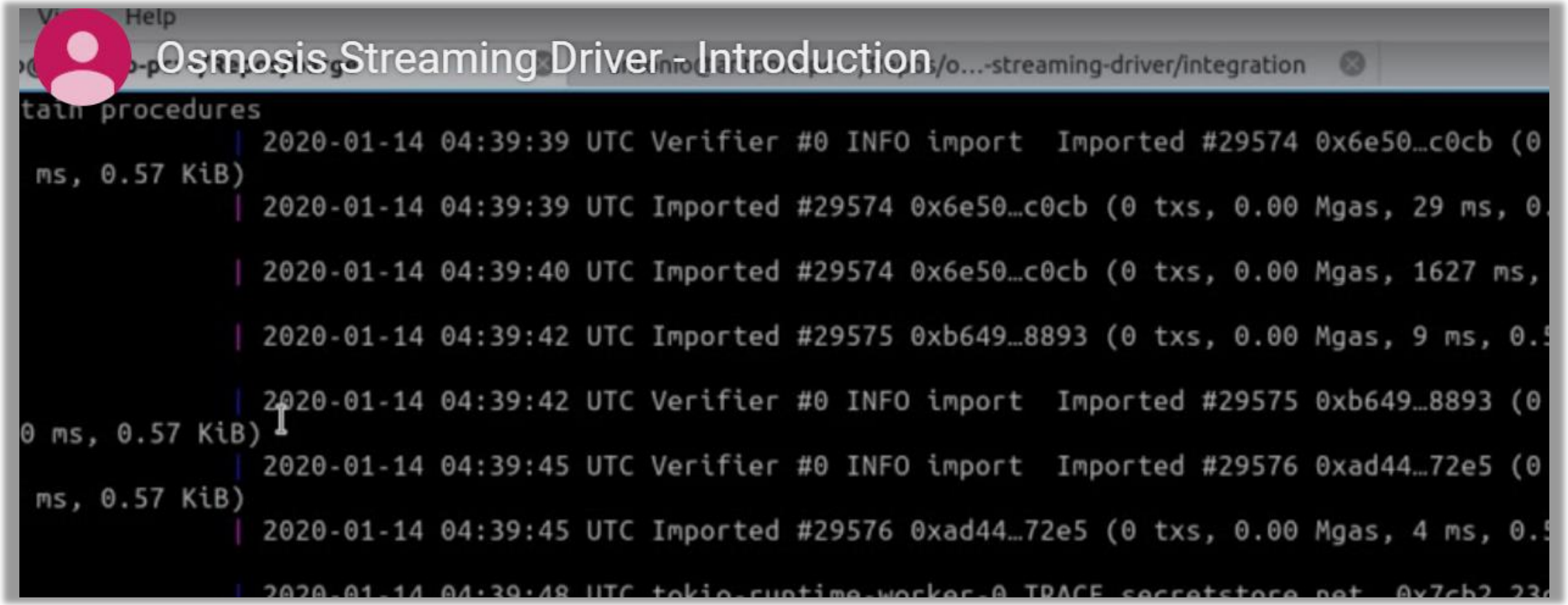
Example: Osmosis Streaming Driver

Take OceanProtocol beyond static assets. Use it to download live streams!



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Opportunities: Web3 integrations

Integrate Filecoin, Ethereum Swarm, Storj, Sia

Integrate bots from fetch.ai, SEED, or SingularityNet

Integrate Chainlink datafeeds (start with OP's prototype)

Integrate Enigma's SGX compute

enigma

Integrate DeFi: Compound loans, Uniswap exchange, Synthetix synthetic assets, …

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Opportunities: Data science integrations

Build private models. Run sklearn model-building next to private data

Sell model. Build model with TF, then sell it.

Provenance. Post ≈10 intermediate model training results to chain

Buy data on-the-fly, then feed into TF

Integrate Ocean into Anaconda Cloud

Integrate into OpenML and its 20,000 datasets

Data cleaning. Grab raw data, clean data and post for sale

Getting started on integrations

- **Docs: Jupyter Notebooks**
  https://docs.oceanprotocol.com/tutorials/jupyter-notebooks/
- **Blog: Project Manta Ray — Data Science powered by OP**
  https://blog.oceanprotocol.com/project-manta-ray-data-science-powered-by-ocean-protocol-535c54089b0f
- **GitHub: mantaray**
  https://github.com/oceanprotocol/mantaray
- **GitHub: mantaray_utilities**
  https://github.com/oceanprotocol/mantaray_utilities
- **Docs: Set up Azure Storage**
  https://docs.oceanprotocol.com/tutorials/azure-for-brizo/

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Hackathon Opportunities:
Wild Cards

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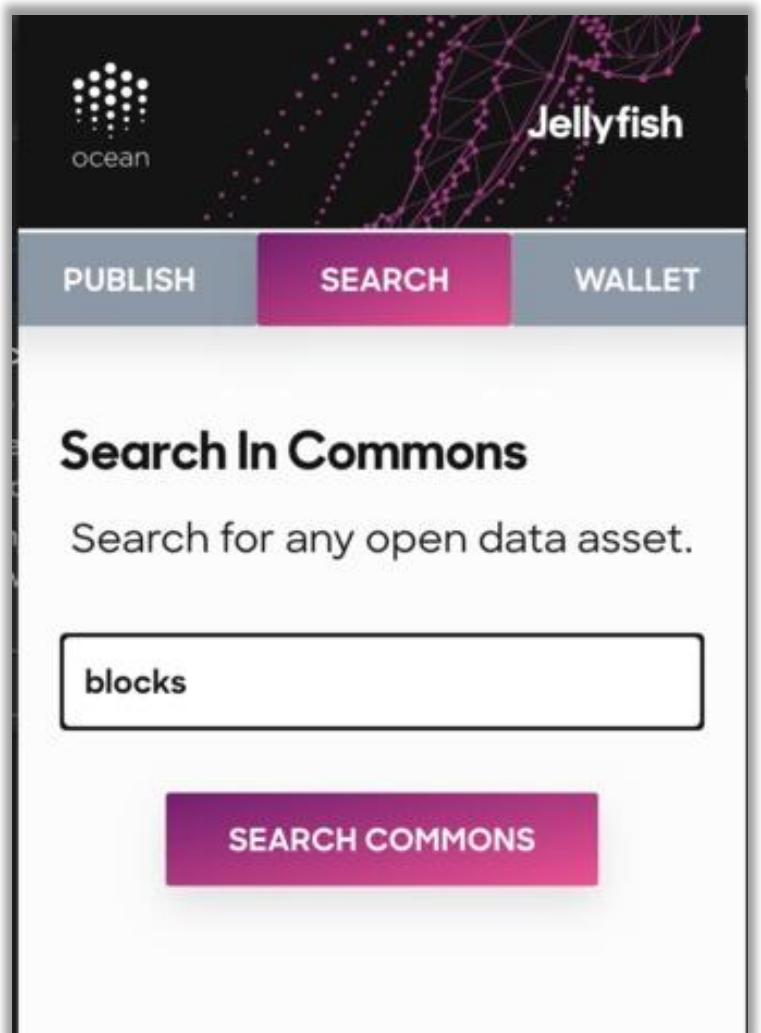
Example: Jellyfish Cross-Browser Extension

(Chrome, Firefox, Brave)

Bring power of OP's Commons Marketplace and Pacific network right into your workspace



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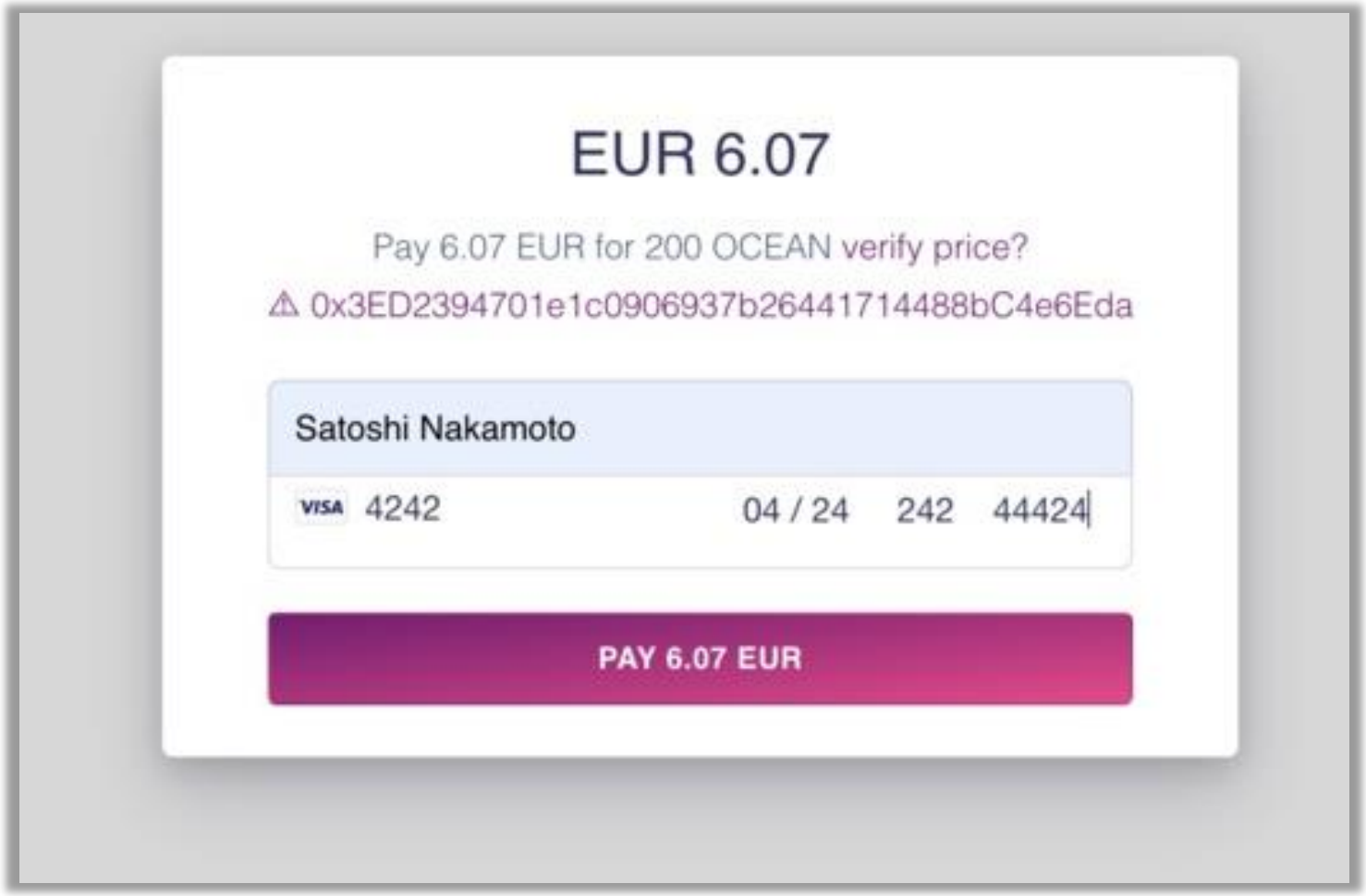
Example: PayFiat

Pay for Ocean Protocol's data assets with your credit card in fiat currency without knowledge of cryptocurrencies



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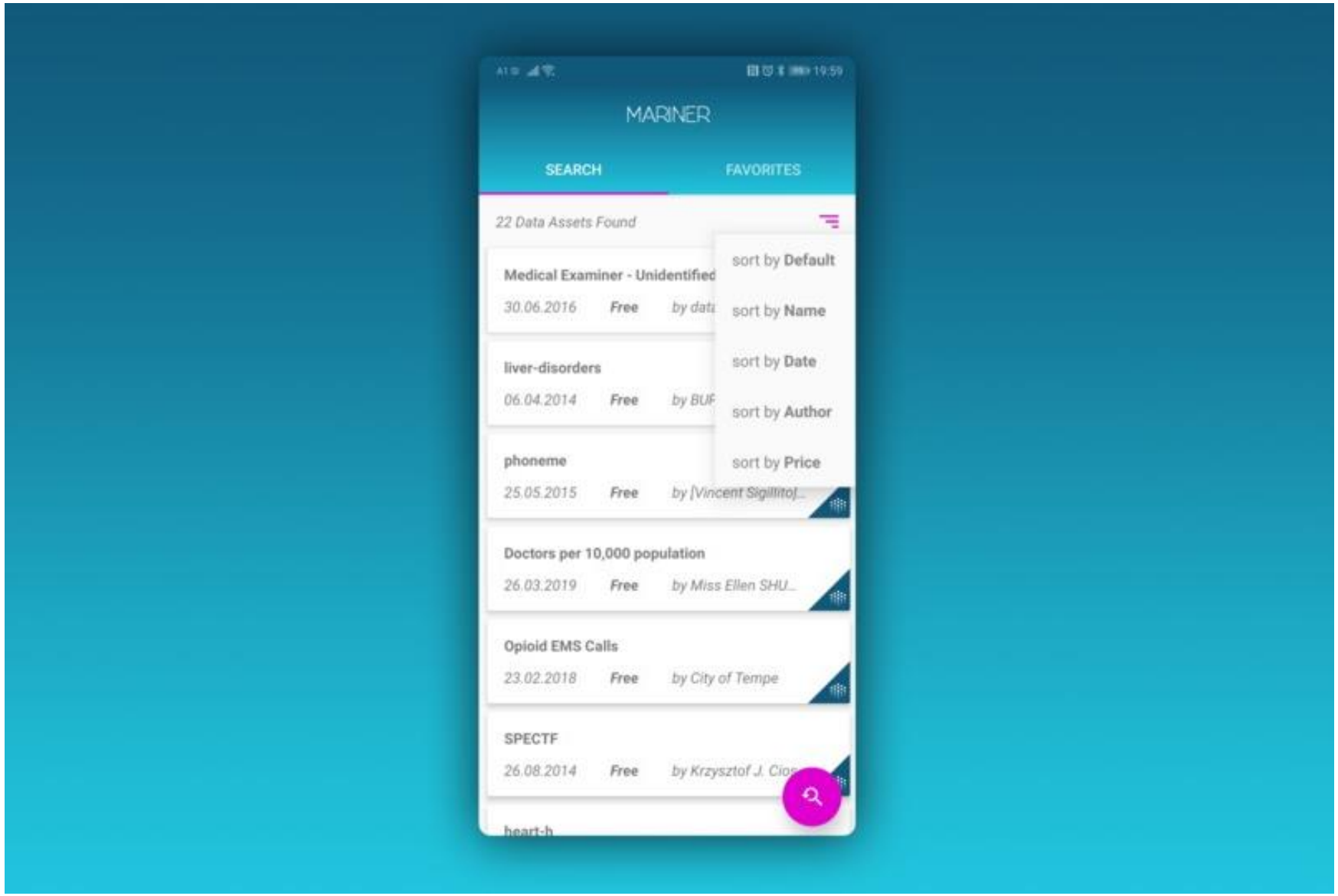
Example: Mariner

The Ocean Protocol explorer for Android.



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What sort of Wild Card could you build?

An Ocean block explorer with integrated dataset visualization e.g. with Metabase

Data DAOs to govern data

Data wallet in the browser

Data insurance

Borrowing data
Loaning data

Data-backed stablecoins

https://blog.oceanprotocol.com/data-economy-challenge-wild-card-e3593e15a971

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Conclusion

Role of Ocean at Odyssey

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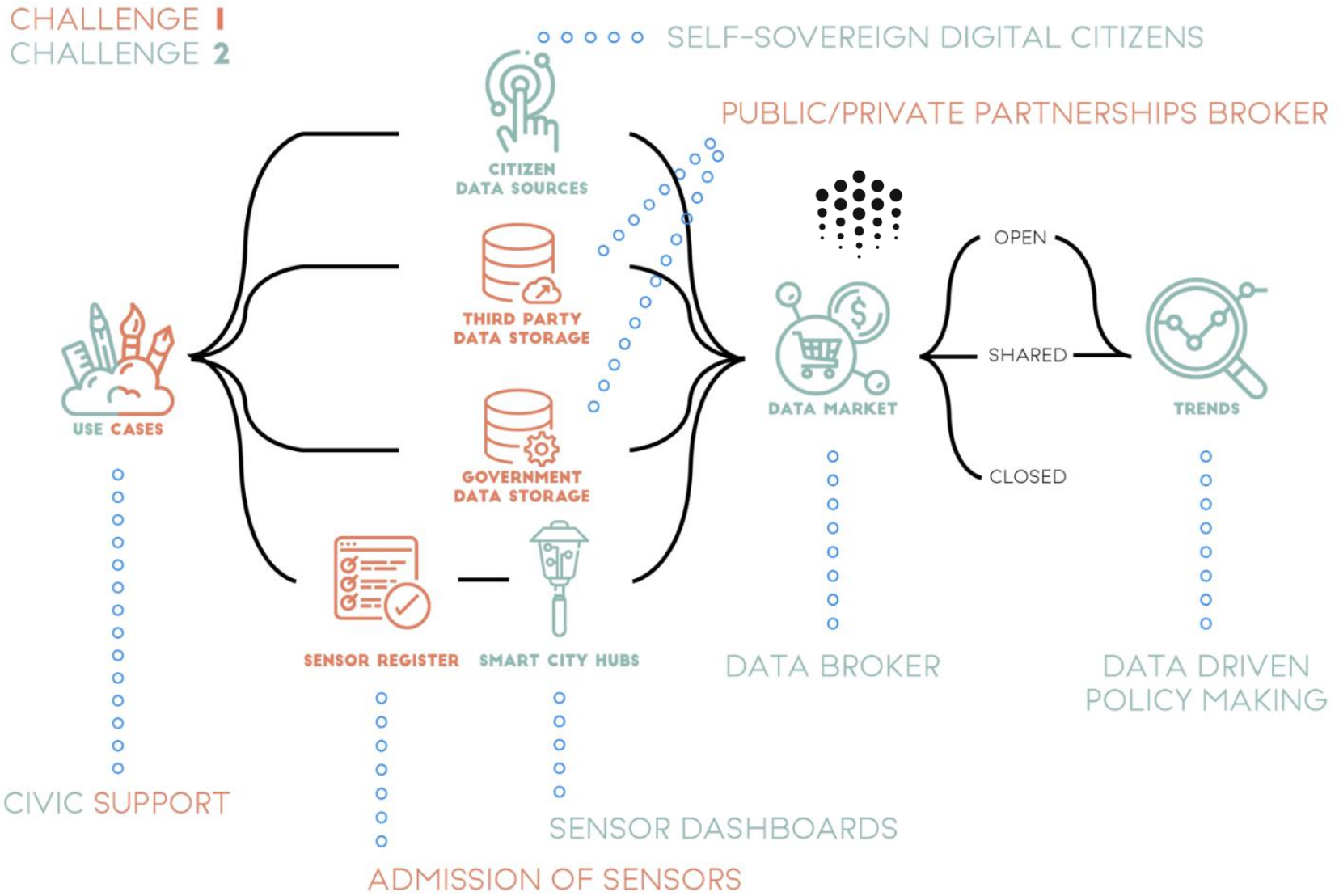
-API to publish, query,

consume, transfer data

-Tech support



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Conclusion

Ocean in a Nutshell

- **Safely & securely exchange data, without loss of privacy**
- A public utility network to connect AI / data suppliers & consumers
- Data marketplaces in-a-box
- Buy & sell *private* data, while protecting privacy
- Rethink data custody: “not your keys, not your data”

Let Ocean help you build something amazing at Odyssey!

docs.oceanprotocol.com

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@ocean
protocol

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