



# Let's talk Ocean

Leveraging data as an asset to accelerate the development of AI in the  
City of tomorrow

# Executive Summary

- The opportunities for creating value from data are expanding exponentially
- However the ability to take advantage of these are limited by:
  - The disconnect between organisations with massive data and AI capabilities
  - Significant issues of trust and security while sharing data
  - The inefficiency of existing approaches to data sharing
- Ocean Protocol solves these issues by enabling an ecosystem of data services, powered by blockchain technology
- Use case: Singapore Smart Nation



# Data Economy

Context and Opportunity



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# Convergence - Tipping point

01

## Internet & Platforms

*Global interconnectedness via the internet and platform ecosystems.*



02

## IoT Devices

*50 Billion connected devices worldwide by 2020.*



03

## Decentralization

*Rise of decentralized technologies and protocols like Blockchain.*



04

## AI & ML

*Global participation via the Internet.*



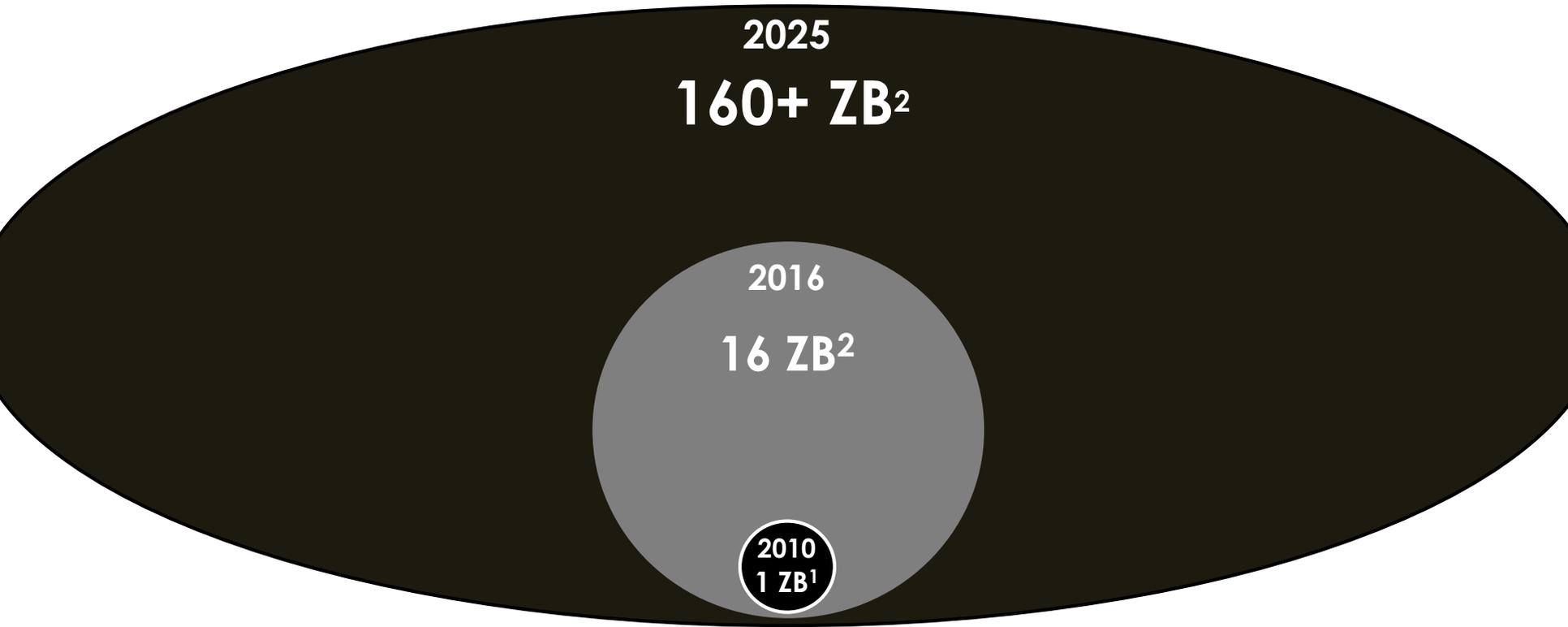
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## Robotics

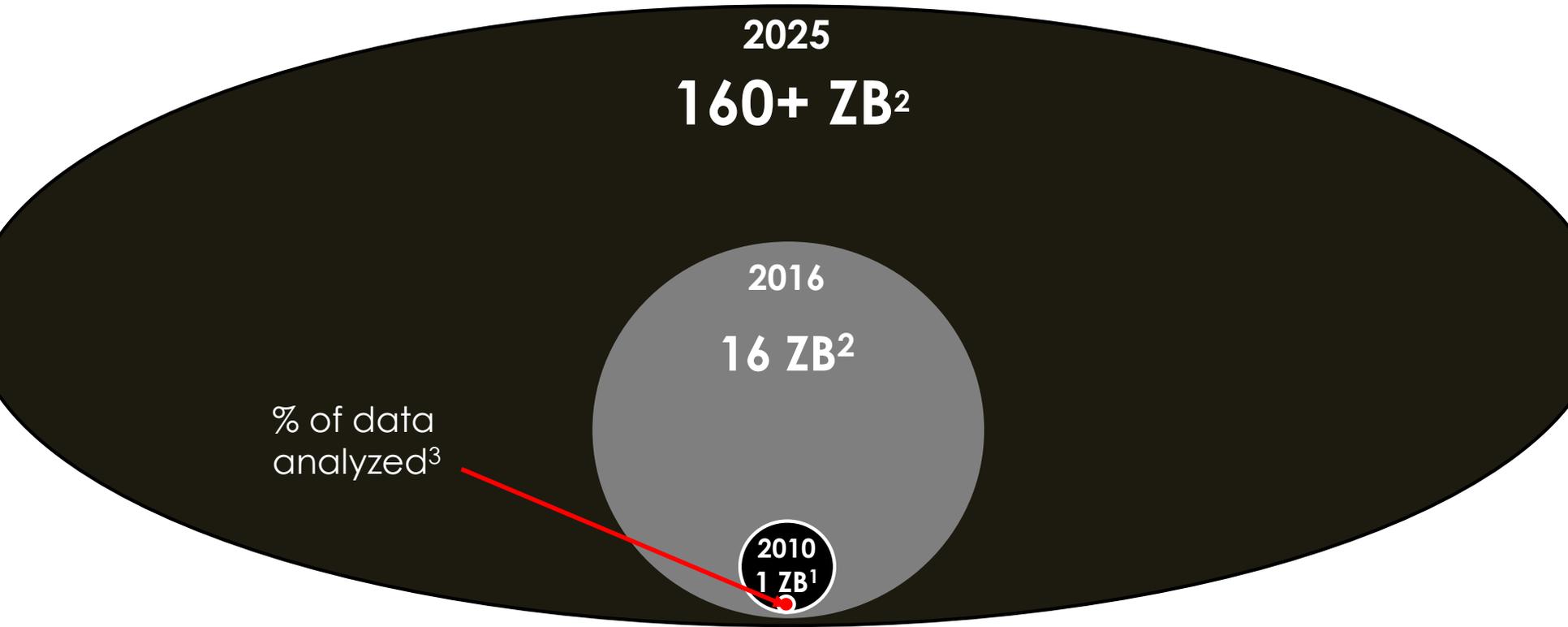
*Rising of decentralized technologies and protocols like Blockchain.*



# Data is growing exponentially



# But only a small amount is analyzed and shared



# CIO / CDO challenges and opportunities

**Threat of digital disruption on the doorstep today, rather than 3-5 years down the road.**

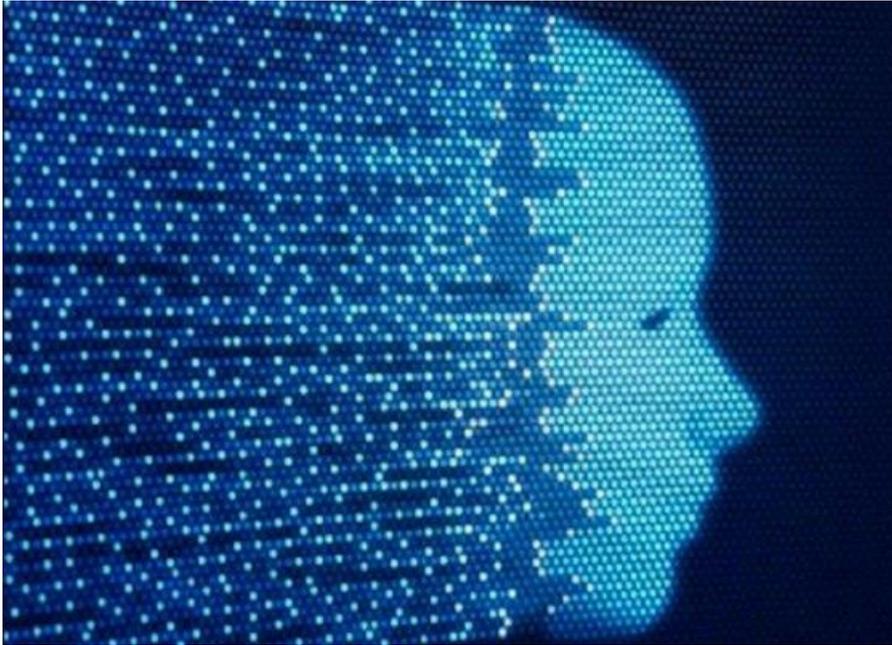
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Increased pressure to be compliant with a growing body of often difficult to understand or enact international data protection and privacy regulations. E.g. GDPR

The quickening pace of digitalization and technological innovation -changing role of CIO role from delivery executive to business executive.

Move beyond digital experimentation and pilots and start bringing digital best practices to scale.

# AI is starving for data



- AI **needs data**
- Without data, AI models are **not accurate**
- **150** fundamental use cases across all **industry sectors** identified
- AI advances **6x faster**, if **data is available**

# AI and Data aren't connecting

## AI Start-ups & researchers

- Have algorithms
- ...but **no data**

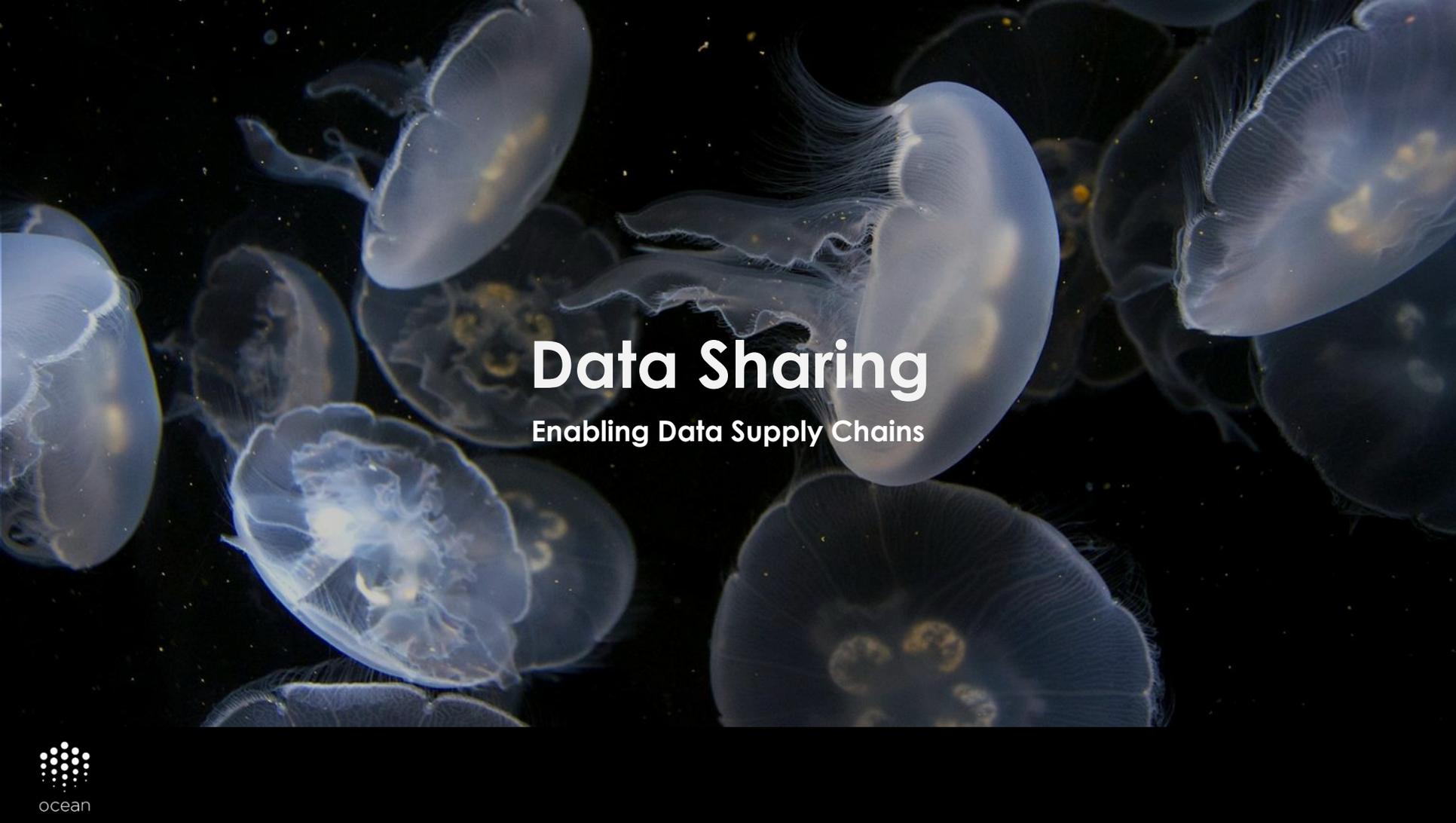


Disconnection

## Multinationals & governments

- Have data
- ...and **want to monetize**



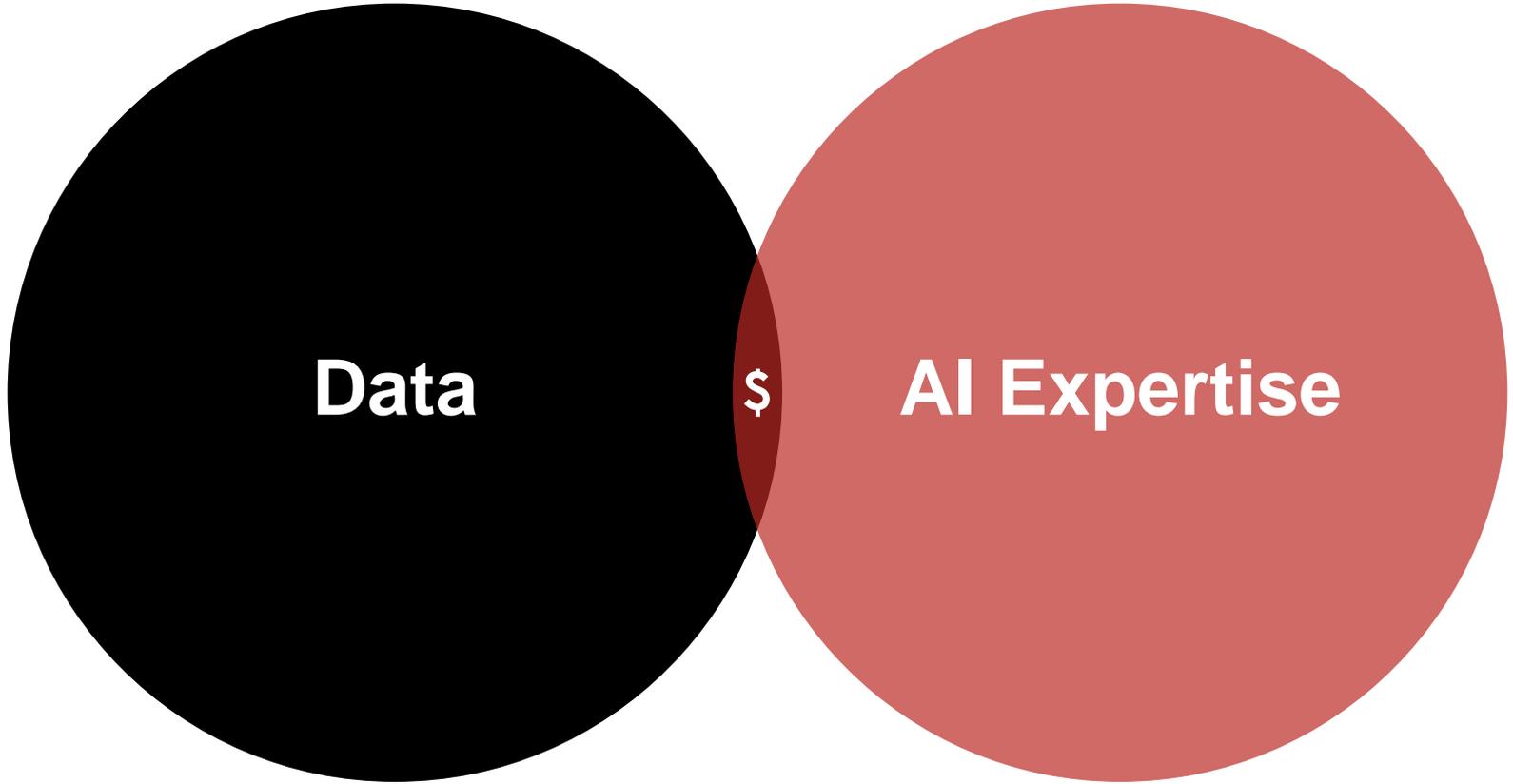


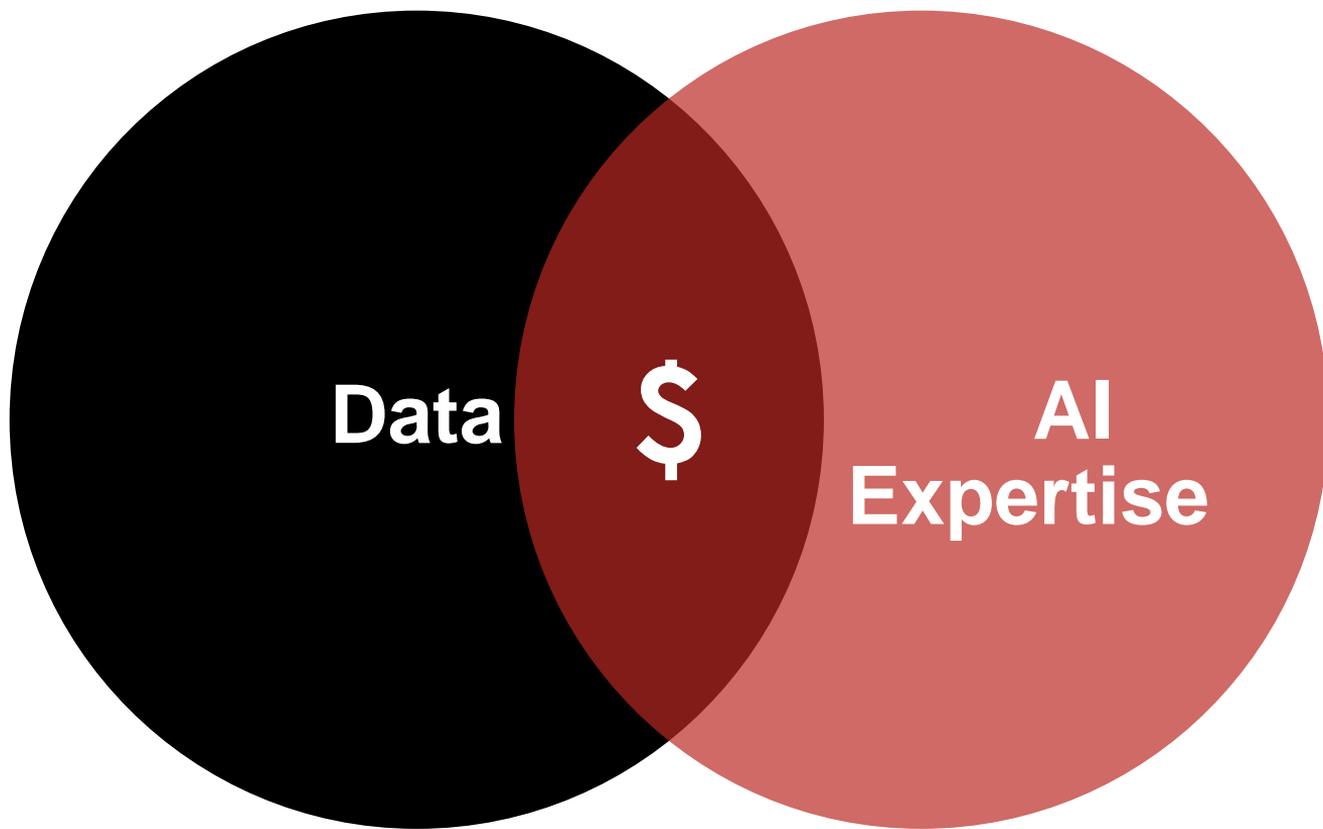
# Data Sharing

Enabling Data Supply Chains



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# Unlocking data will open up Trillions in value

Market value of data in 2030



Up to **3.8 trn. USD**<sup>1</sup>

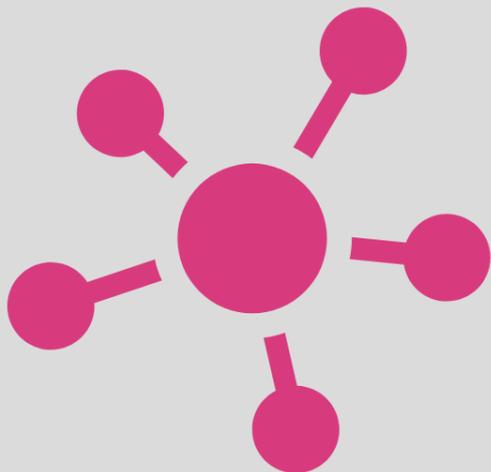


GDP of Germany in 2016



**3.5 trn. USD**<sup>2</sup>





- **Centralized data marketplace emerged but have significant limitations**

To facilitate data exchange, centralized data marketplaces have emerged, but they are silos themselves and struggling to scale

- **Lack of trust prevents data sharing**

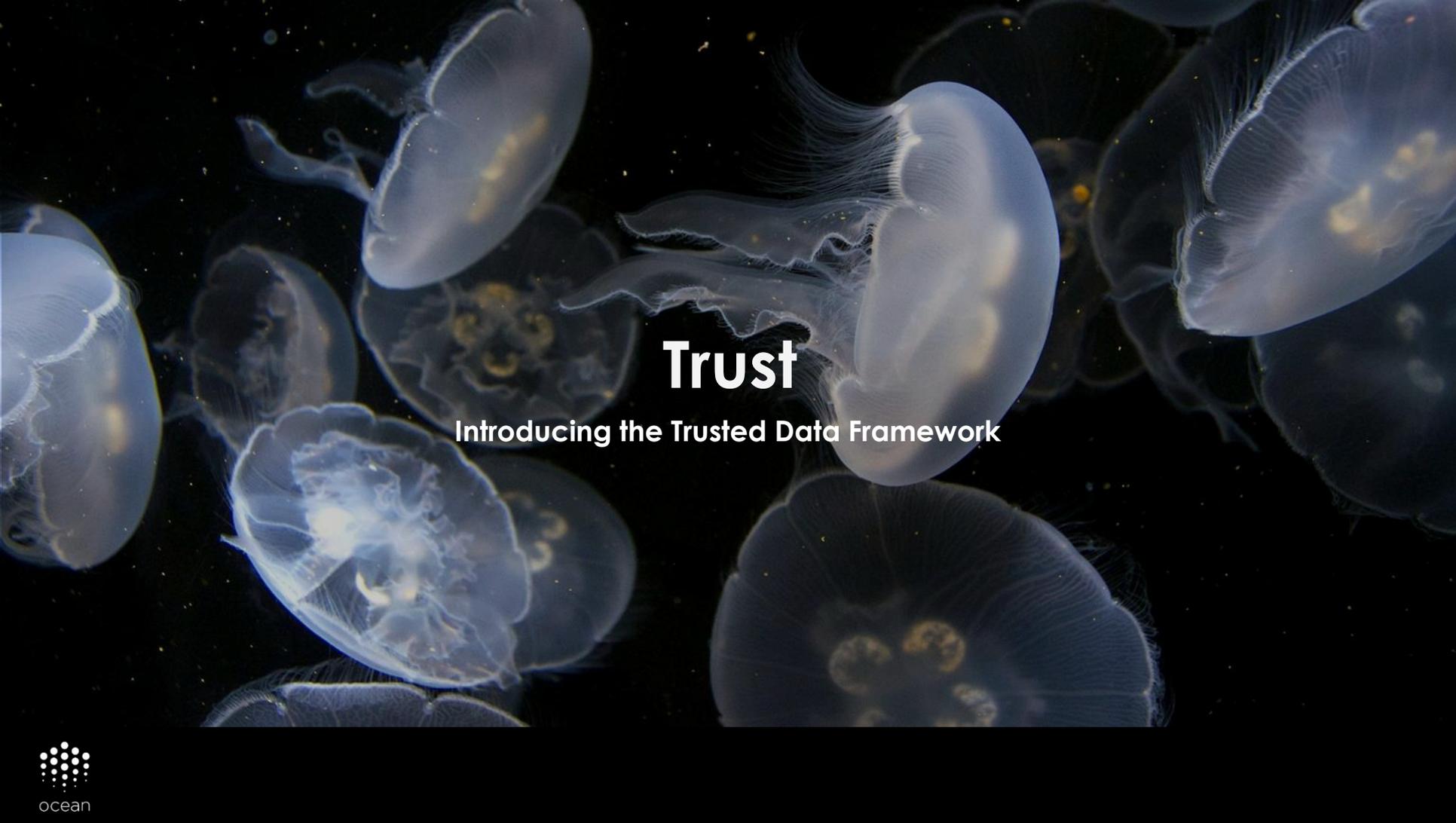
In addition, centralized data exchange platforms lack fair and flexible pricing mechanisms, data providers lose control over their assets and have limited transparency in how the data is being used. So data remains locked up due to a lack of trust.

# Existing data sharing methods don't give data providers comfort to share data

- |   |              |   |
|---|--------------|---|
| 1 | Control      |  |
| 2 | Security     |  |
| 3 | Transparency |  |
| 4 | Tracking     |  |
| 5 | Auditing     |  |
| 6 | Pricing      |  |
| 7 | Compliance   |  |

**A market and technology failure to make data available**

**Data providers need to feel safe before they can comfortably share data**



# Trust

Introducing the Trusted Data Framework



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# The problem ...

## Data trading and sharing is challenging



Data is often stored in detached systems where enabling access is cost prohibitive



Incoming data often requires time-consuming cleanup to to prepare for consumption



**Ensuring data will be consumed in compliance with use policies is complex and hard to enforce**



Current limits on use restricts and undervalues data and discourages sharing of data sets



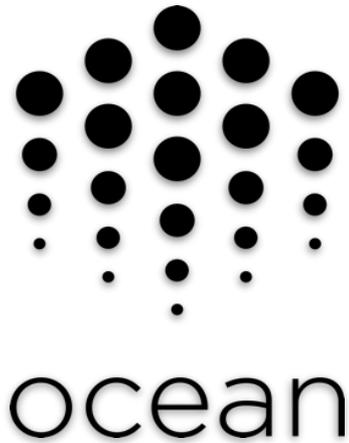
Existing business models do not cater to the complexities of multi-party data sharing

TECHNOLOGY CHALLENGES

POLICY/GOVERNANCE CHALLENGES

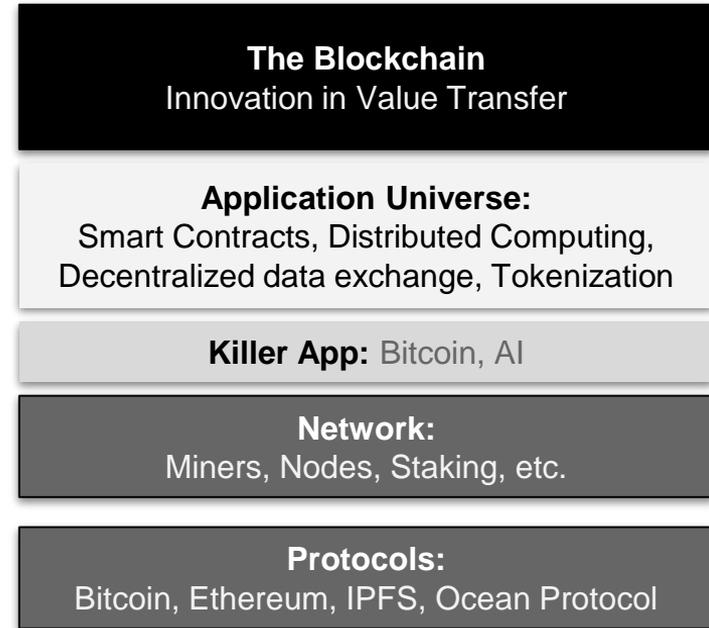
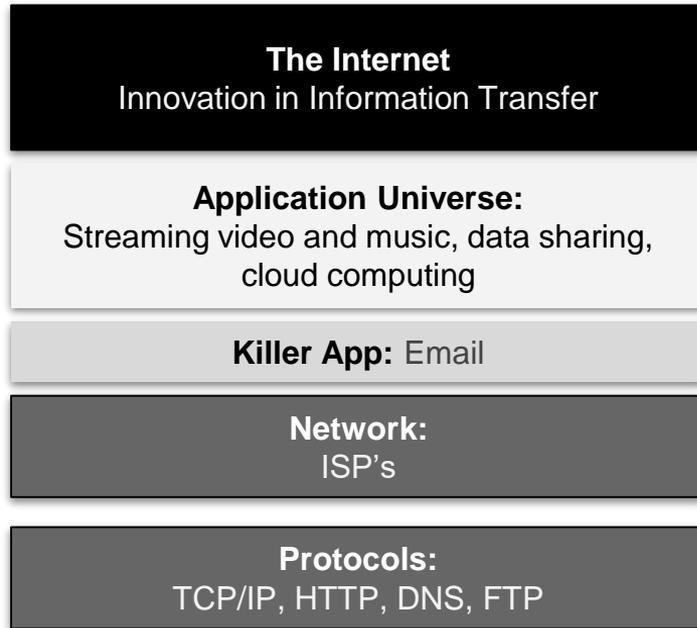
BUSINESS CHALLENGES

# Ocean Protocol solves data sharing for all Stakeholders



- a **decentralized data exchange protocol** to unlock data for AI
- uses **blockchain technology** that allows data to be **shared** and **transferred** in a **safe, secure** and **transparent** manner
- enables a **decentralized platform** and network connecting **providers** and **consumers** of valuable data, and providing open access for **developers** to **build services**

# Blockchain Application Stack\*



We are still in the early stages of defining, building and implementing protocols, but this time, billion of dollars are at stake at the protocol layer instead of the application layer.



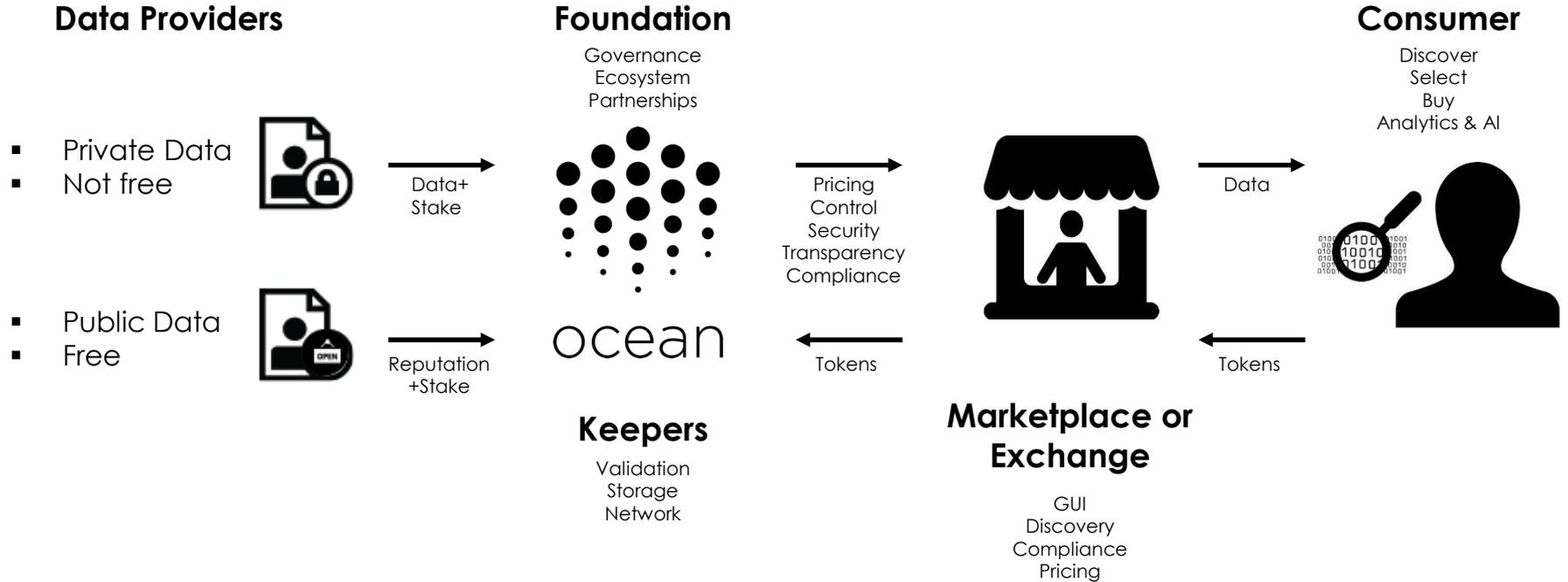
# Ocean Ecosystem

Enabling open data services



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# The Ocean Protocol Ecosystem and Network



# Key Ecosystem Participants

## Publishers

- Own rights to data assets
- Publish assets on Ocean
- Earn tokens for asset usage



## Consumers

- Harness data assets and services
- Use their own choice of tools
- Pay tokens for consumption



Ocean Protocol & Network



## Providers

- Offer data services (storage, compute AI)
- Provide proofs of service provision and trust compliance
- Earn tokens for service provision



## Marketplaces

- Enable discovery of relevant assets
- Facilitate data transactions
- Verify trusted data rules
- Earn tokens for transactions and services



**The Ocean Protocol Token (OCN)**  
is the means of value exchange and  
network incentivization

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### Earn OCN for selling Data

- Publish data for sale with a variety of **pricing mechanisms**
- Maintain **full control**
- Comply with **regulation**

### Data marketplaces earn OCN

- Curate and publish data to Ocean Protocol to find new buyers
- An open source protocol that democratizes access for **new data market places**

### Earn OCN for supporting the network

- Provide **validation** and **verification** services for the network
- Store blockchain **history of transactions**

### Earn OCN for publishing public data

- **Publish, curate** and **conserve** public data to earn minting rewards

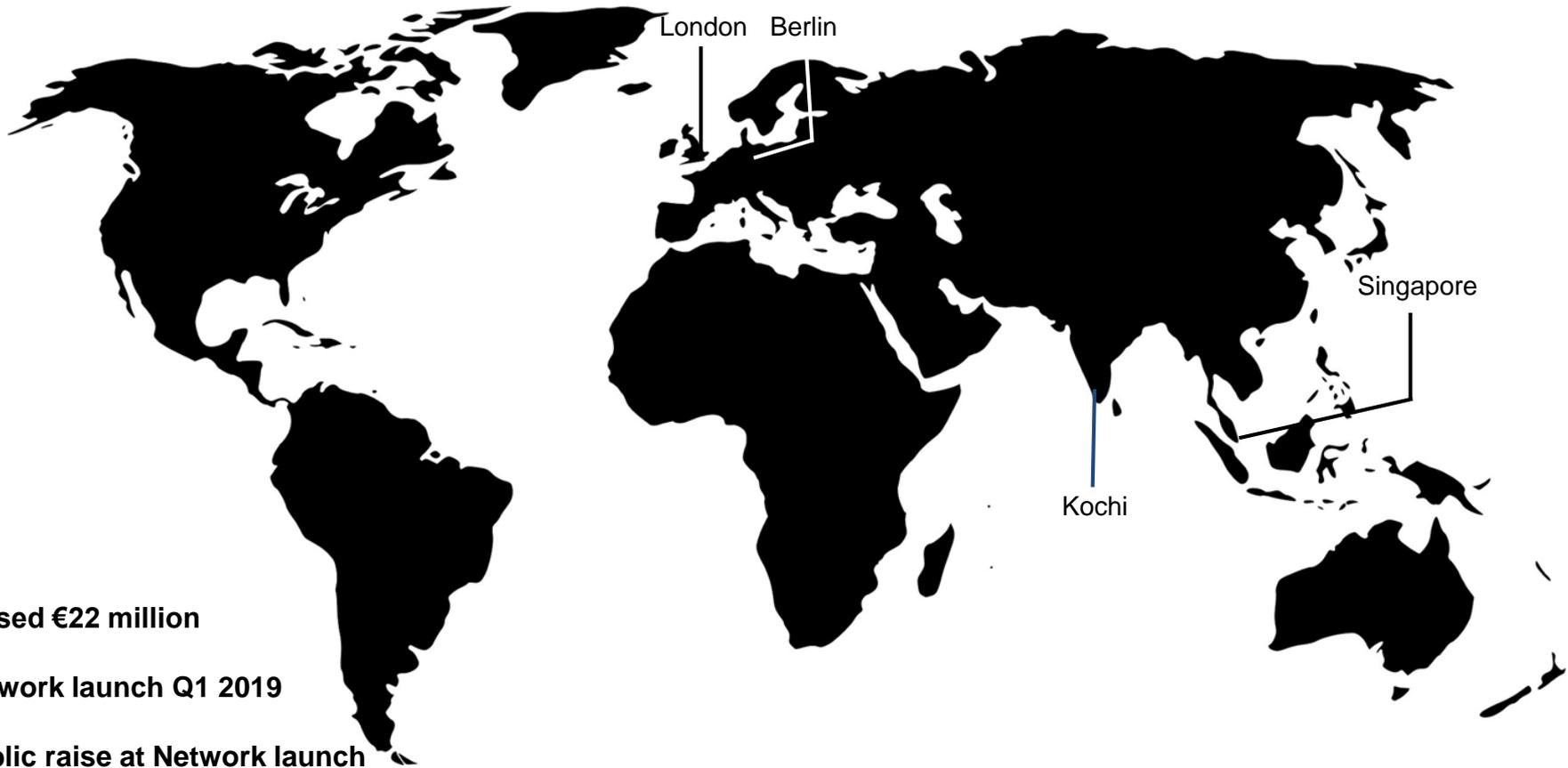


Reference  
Marketplace



Ocean Protocol  
Foundation







# Technology

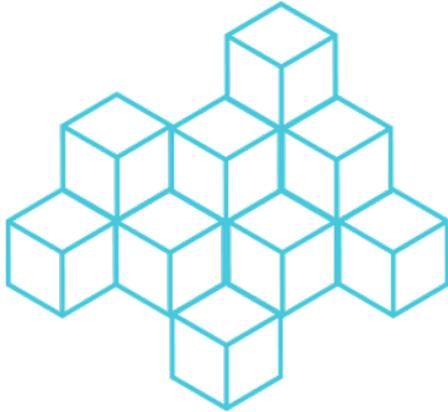
Architecture and Implementation



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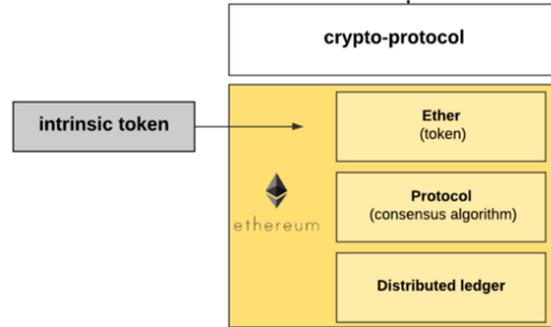
# The Main Pieces

## Blockchain



- Data as an Asset and Intellectual Property
- Secure locking mechanisms for control, security, & transparency

## Protocol



- Proofs of Space, Time, Structure, Query
- Framework for data to be served and consumed

## Tokens



- Incentivize keepers to secure the network
- Token as the internal currency - data providers, marketplaces, curators

# Technology Roadmap

2018  
Q1

Q2

Q3

Q4

2019  
Q1

Q2

Q3

Ocean Network

Aquarium

Ocean Agent

OSS Alpha release

Research: Proofs, decentralised VMs

Main Network development and integration

Pre launch / security audit

Ongoing Network operations & governance

Data Science & Tools

Core Libraries + Demonstrators

Distributed Test Network Live

Feature Freeze

Protocol V1

Network Launch

Service Providers

Basic Services (storage, compute)

Advanced Services (AI, data readiness)

OSS Alpha release

Reference Marketplace

Reference Marketplace

DEX Marketplace / Ocean Commons

Ongoing marketplace operation

Market V1

Markets Live



# Use Cases

Active collaborations and success stories

# Lead Users & Key Partners to Kickstart the Ecosystem

## Singapore government Agencies & Authorities



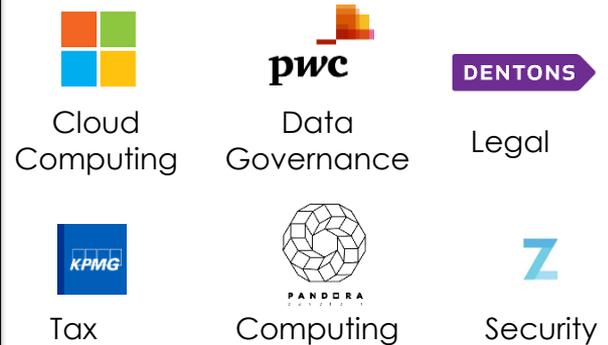
- Singapore lead government partner
- Enables regulatory sandboxes
- Close collaboration to provide oversight, compliance and indemnify

## Example industry partners



- Provide data
- Consume data
- Act as partners during development sprints

## Technical & Service partners



- Expertise in governance, tax, legal and regulation
- Support in IT, Security, token launches



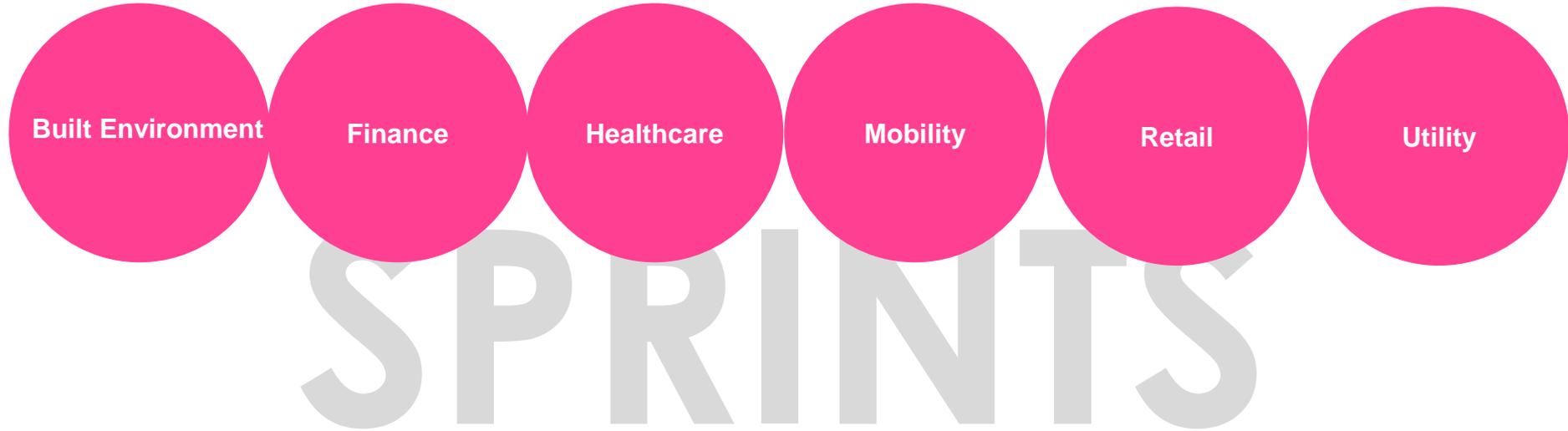
# DATA COLLABORATIVE

DEX, IMDA, and PwC Singapore to co-develop a framework and technology to enable safe, trusted, and effective data exchange

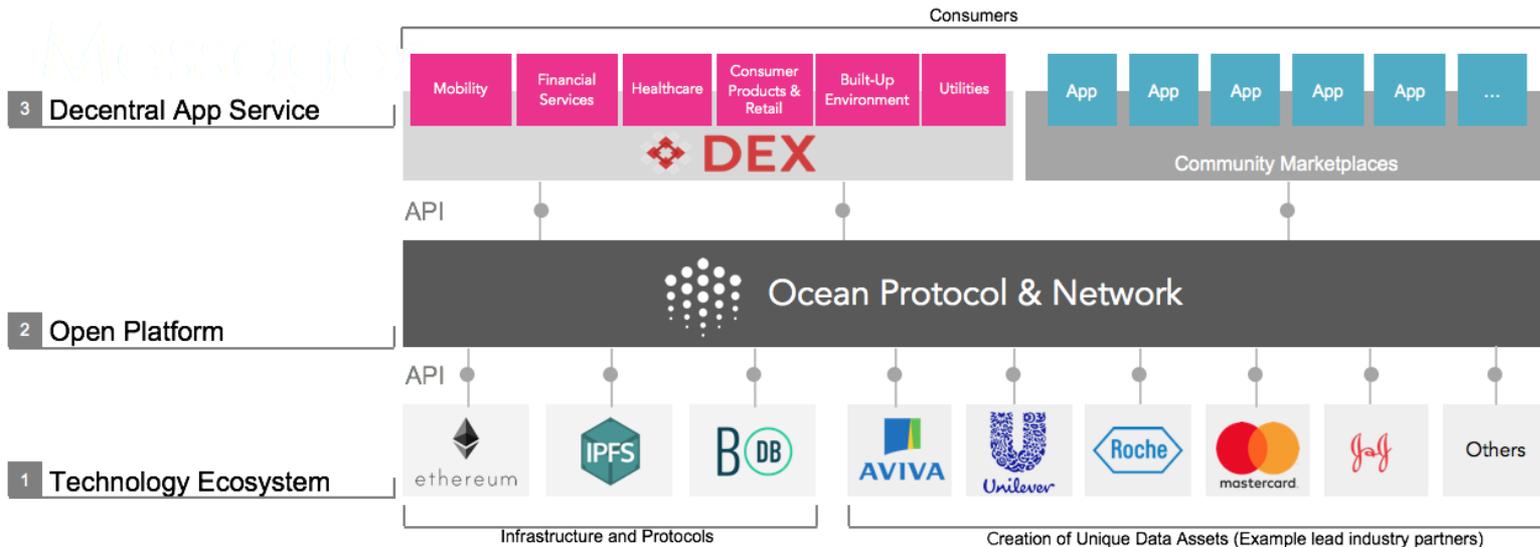
IMDA will provide regulatory guidance and co-create new codes of practice to mitigate risks and ensure appropriate data practices in usage, handling and sharing

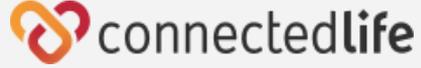
The collaboration aims to address trust and security concerns by piloting a new model where data providers and consumers can transact on a DEX reference marketplace, built on Ocean Protocol

# 6 INDUSTRY-LED DEVELOPMENT SPRINTS



# DATA COLLABORATIVE STRUCTURE





## USE CASE

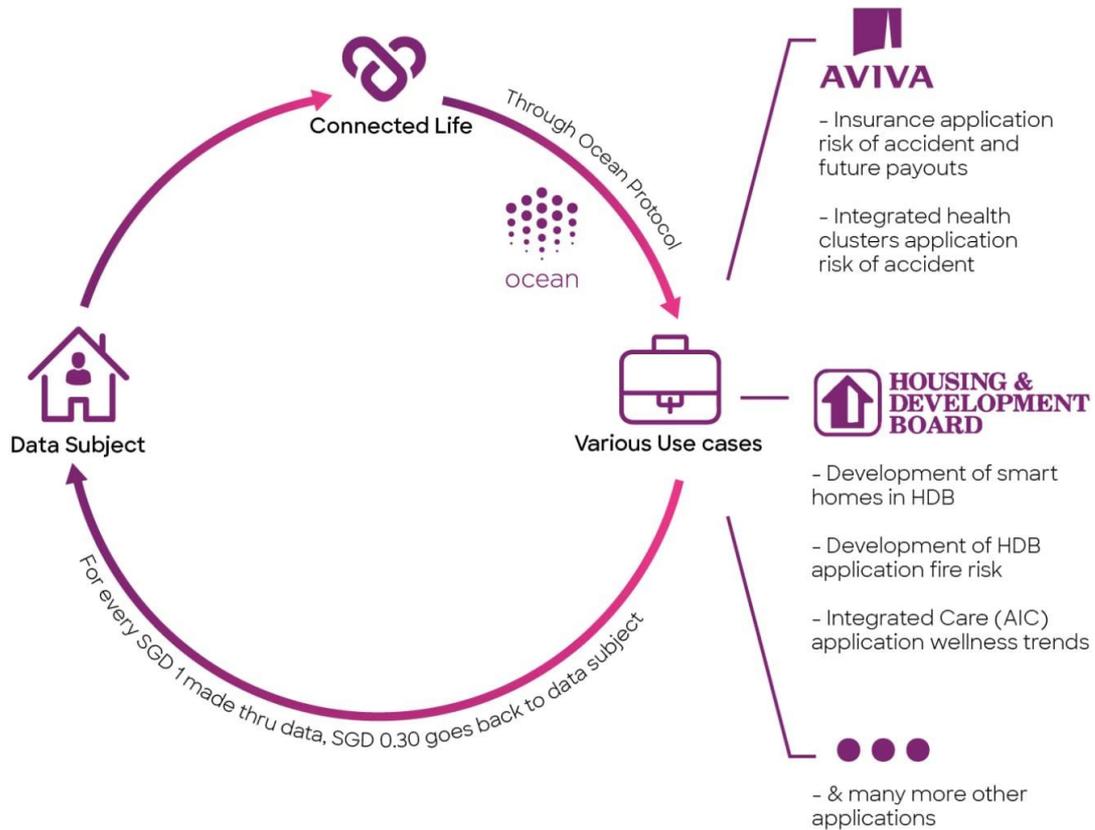


Aviva and ConnectedLife are applying data analytics and artificial intelligence to enhance protection and care for the ageing population and support independent living

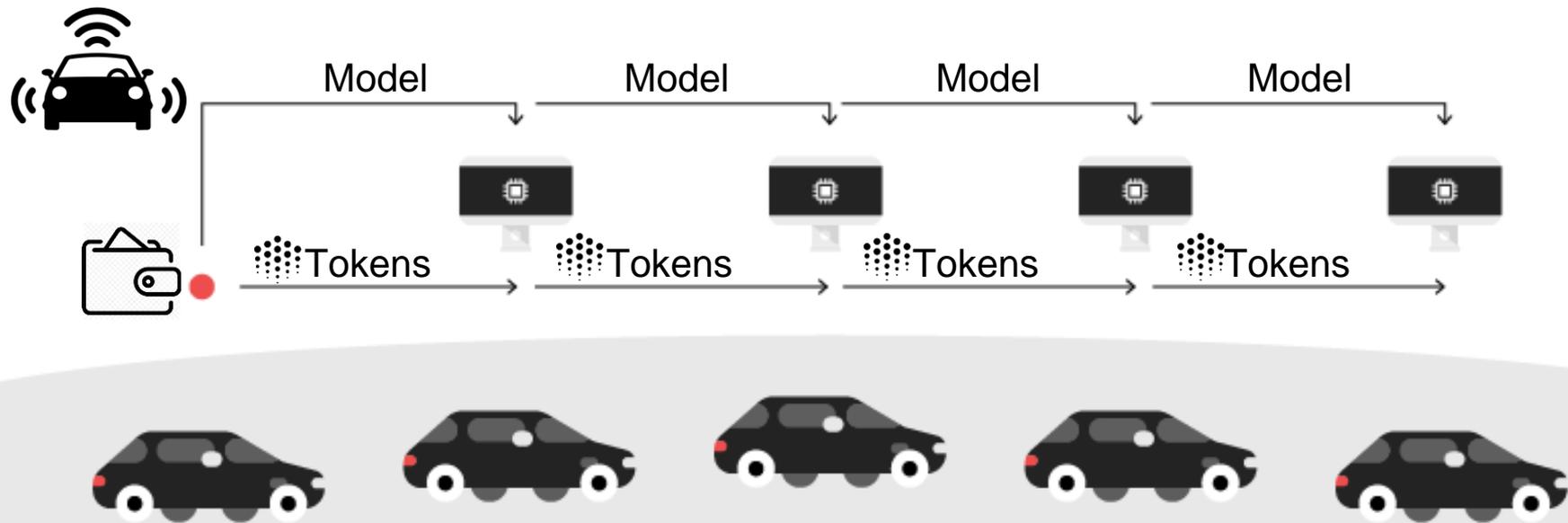
Roche Diagnostics is exploring ways to improve management and treatment compliance of patients on blood-thinning therapy

Johnson & Johnson is working on a clinical trial to leverage access to multi-source, motion and lifestyle data to help improve orthopaedic evaluation and recovery

Unilever is using the framework to unlock new shopper insights in Singapore and help smallholder farmers thrive in Southeast Asia



# Autonomous Vehicle Data Exchange

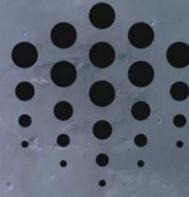


ocean protocol





weeve



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**BIGCHAIN** DB

Weeve is a **global network of IoT devices** autonomously buying and selling their data.

Collaboration to explore IoT data-trading marketplaces with the help of Artificial Intelligence.



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Organizations who **care** use the  
Ocean Protocol to share data.

Do you **care**?



# Care

## TRUST

Commitment in building trust and transparency



## COMPLIANCE

Compliant with policies and regulations



## RESPECT

Respect for privacy and consent



## SECURITY

Ensure data security



## A BETTER WORLD

Believe in advancing and improving our world with data sharing





# Let's talk Ocean

Do you Care?