



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

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.



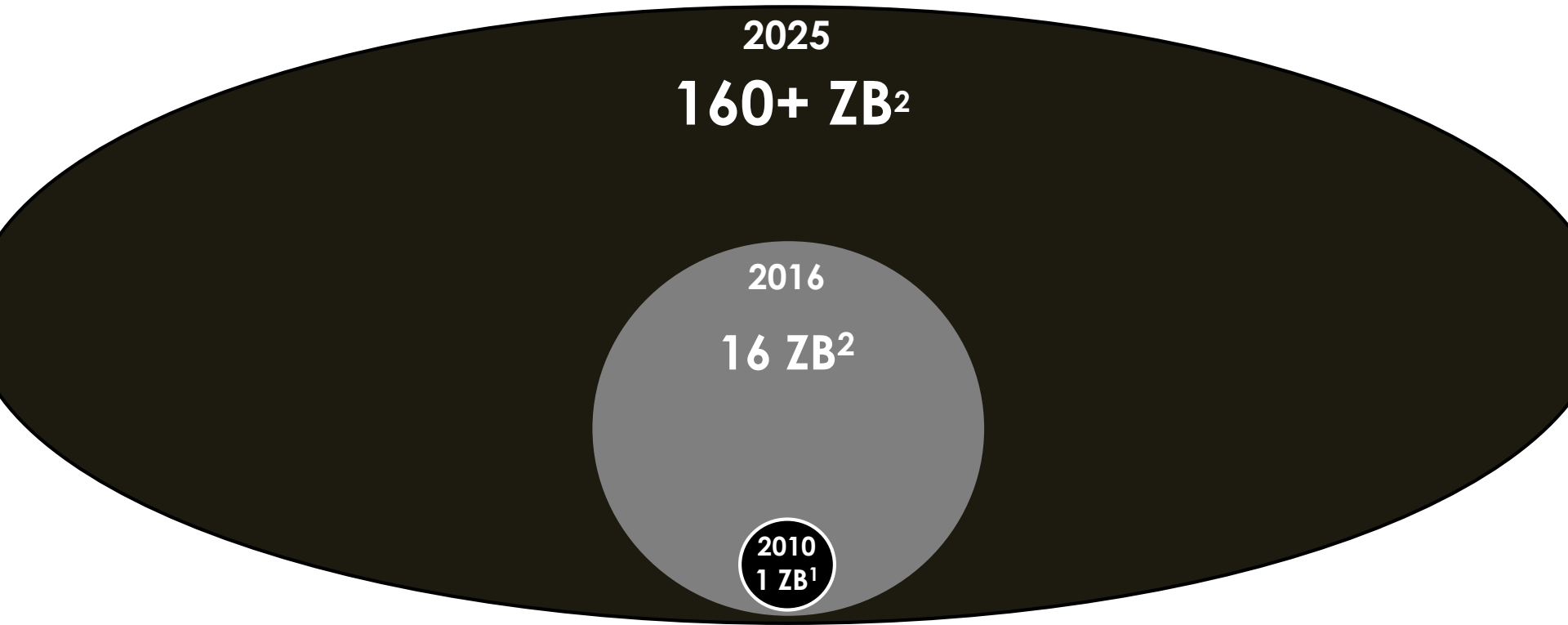
05

Robotics

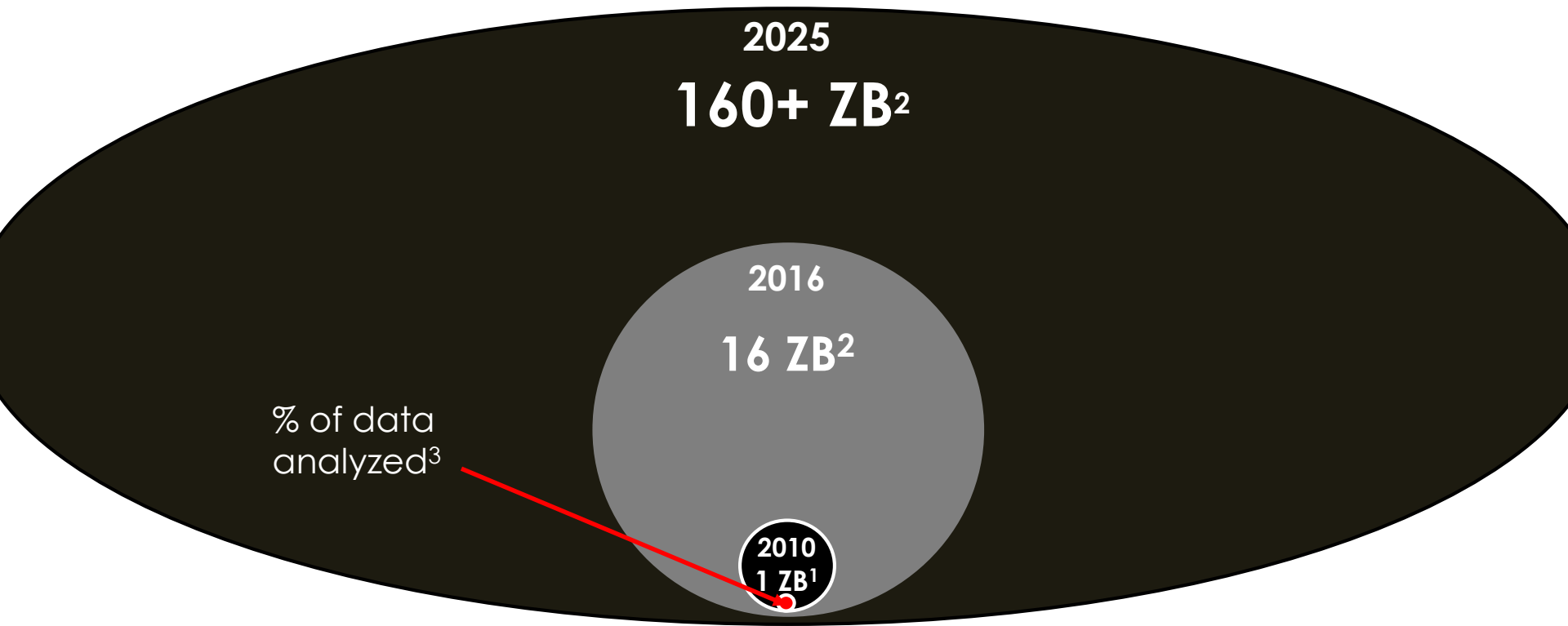
Rising of decentralized technologies and protocols like Blockchain.



Data is growing exponentially



But only a small amount is analyzed and shared



CIO / CDO challenges and opportunities

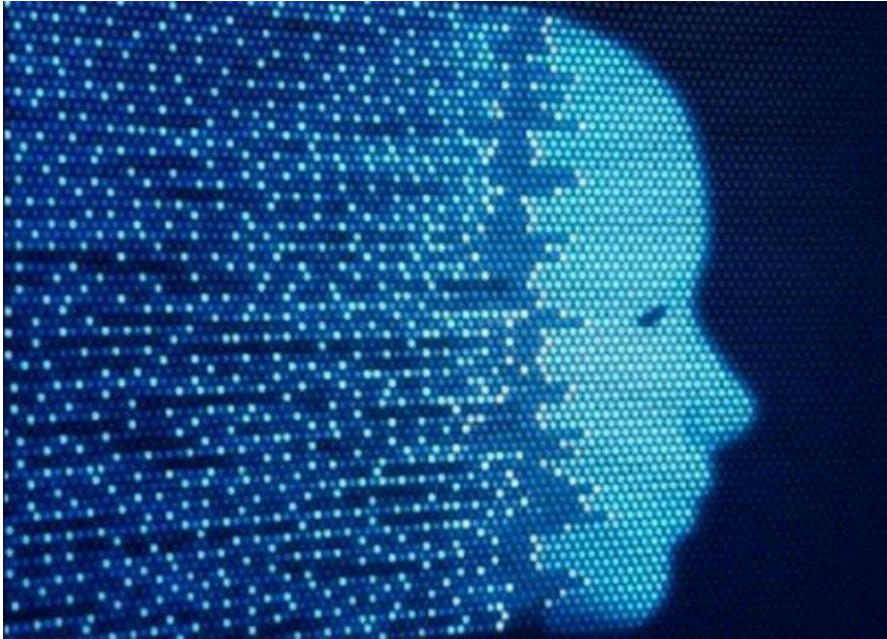
Threat of digital disruption on the doorstep today, rather than 3-5 years down the road.

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**



Multinationals & governments

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

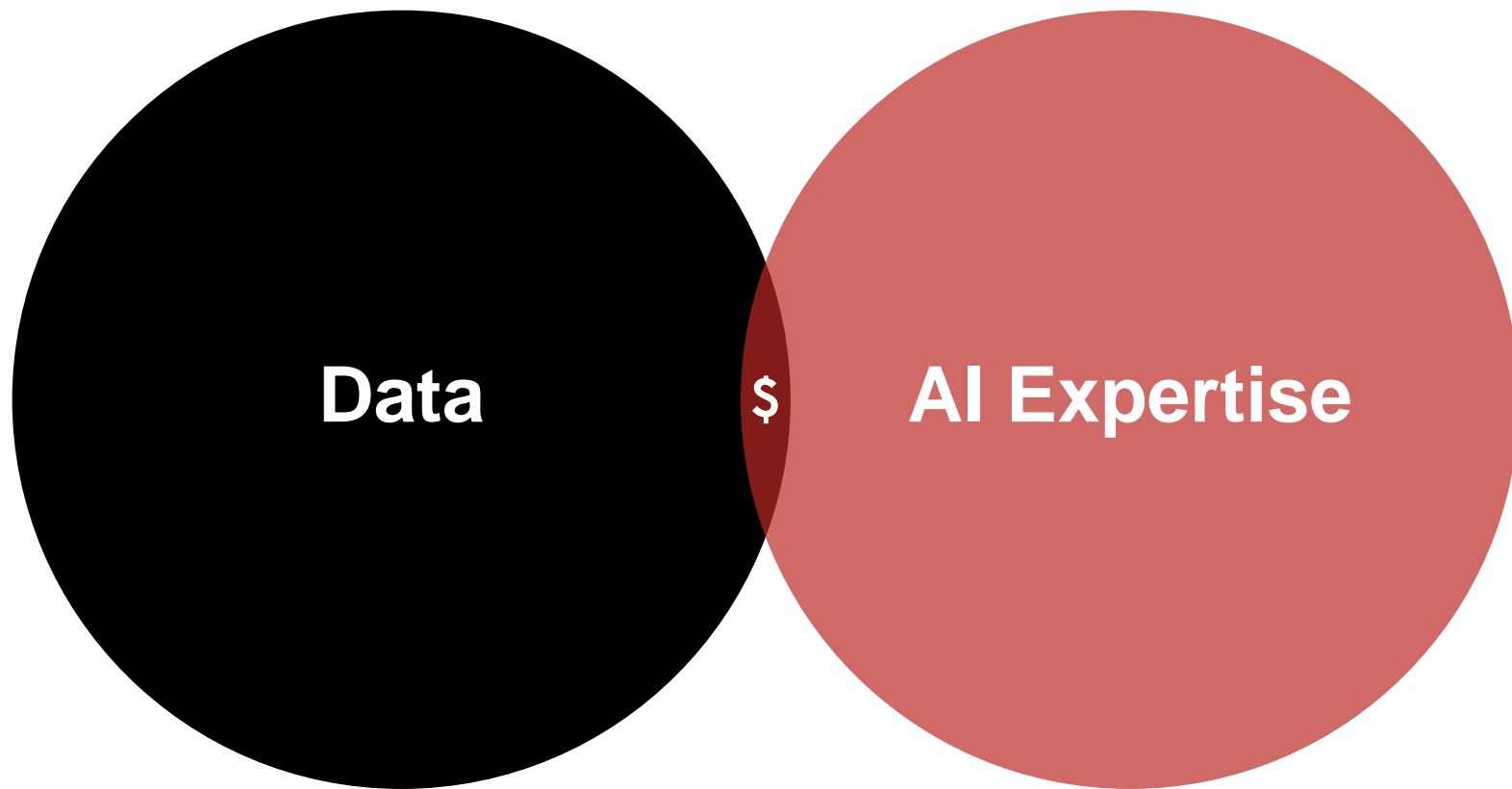


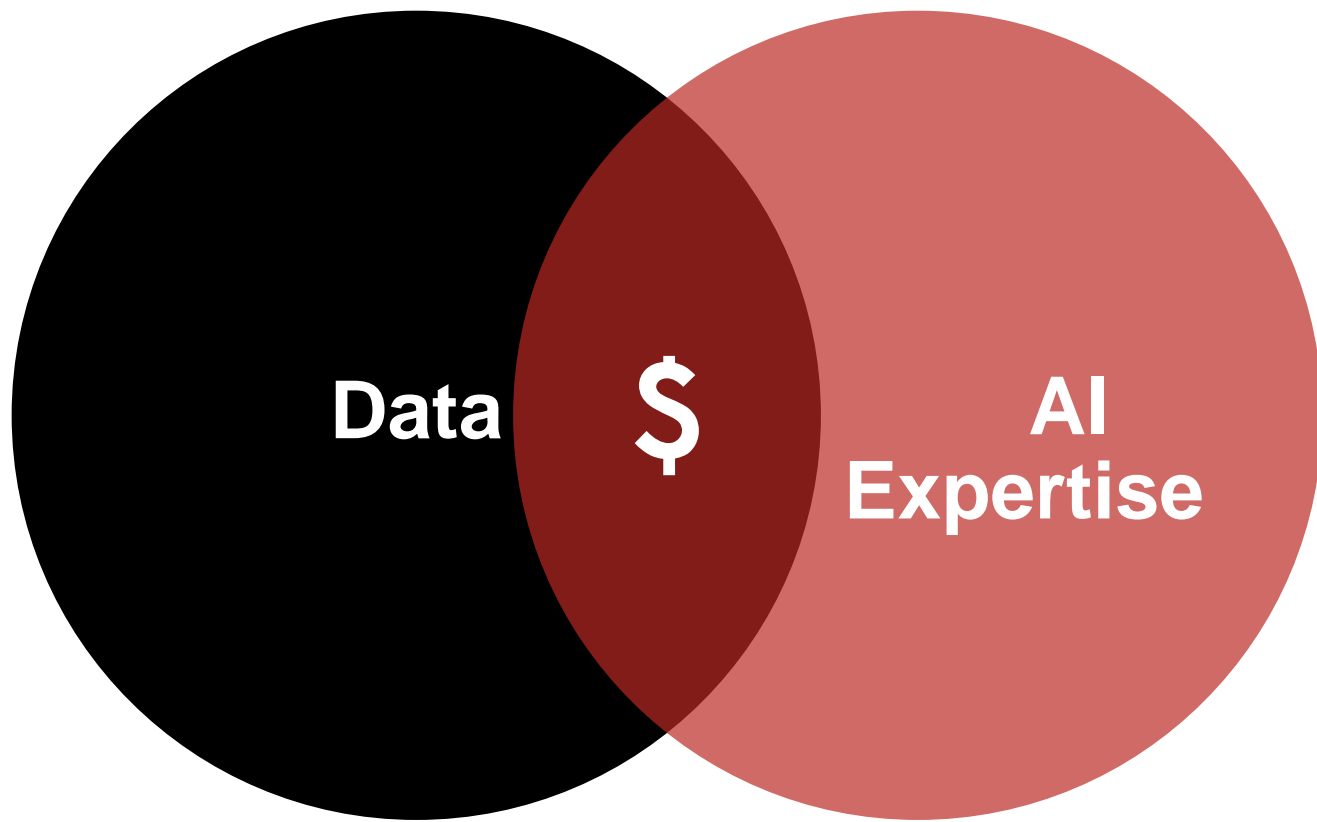
Disconnection

The background of the slide is a dark, deep-sea environment filled with numerous jellyfish. The jellyfish are translucent, with some showing internal organs in shades of yellow and orange. They are scattered across the frame, creating a sense of depth and movement. The lighting is soft, highlighting the delicate structures of the jellyfish.

Data Sharing

Enabling Data Supply Chains





Unlocking data will open up Trillions in value

Market value of data in 2030



Up to **3.8 trn. USD¹**



GDP of Germany in 2016



3.5 trn. USD²



- **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**

The background of the slide is a dark, deep-sea environment filled with numerous jellyfish. The jellyfish are translucent, with some showing internal organs in shades of yellow and orange. They are scattered across the frame, creating a sense of depth and movement.

Trust

Introducing the Trusted Data Framework

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



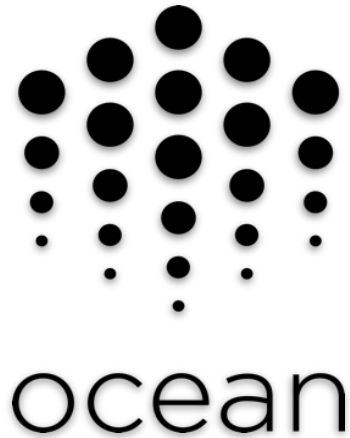
Existing business models do not cater to the complexities of multi-party data sharing

TECHNOLOGY CHALLENGES

POLICY/GOVERNANCE CHALLENGES

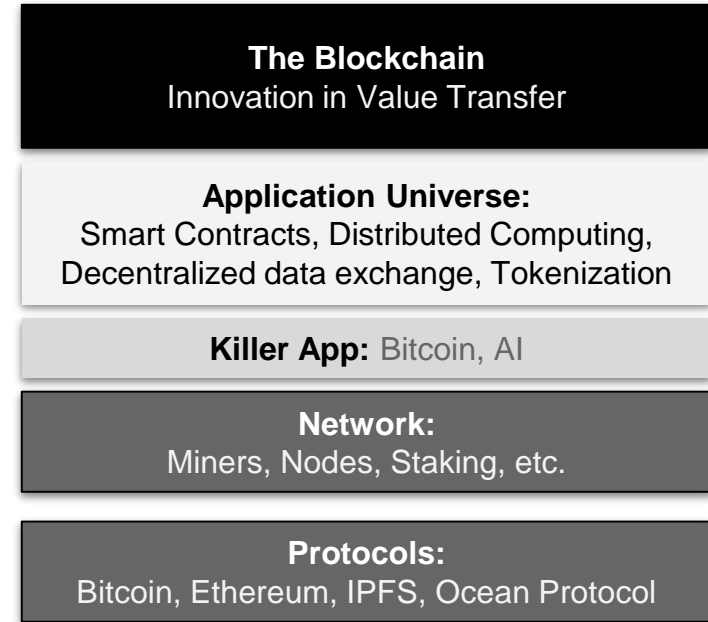
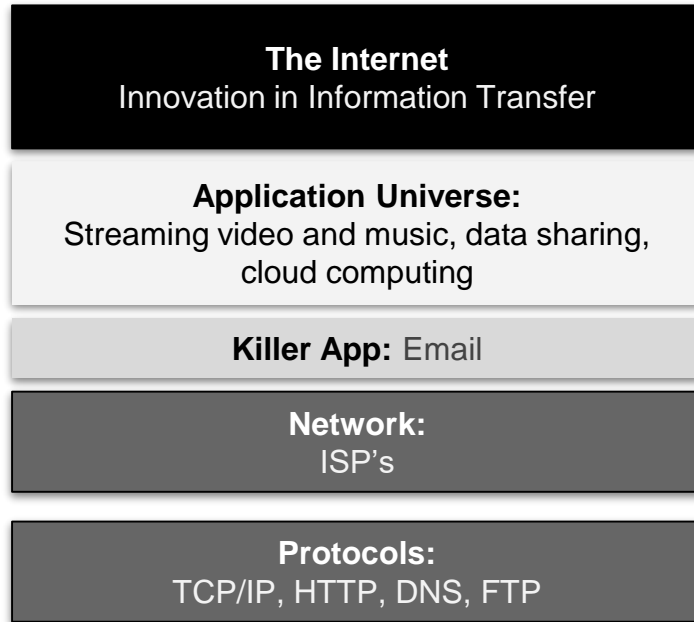
BUSINESS CHALLENGES

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*



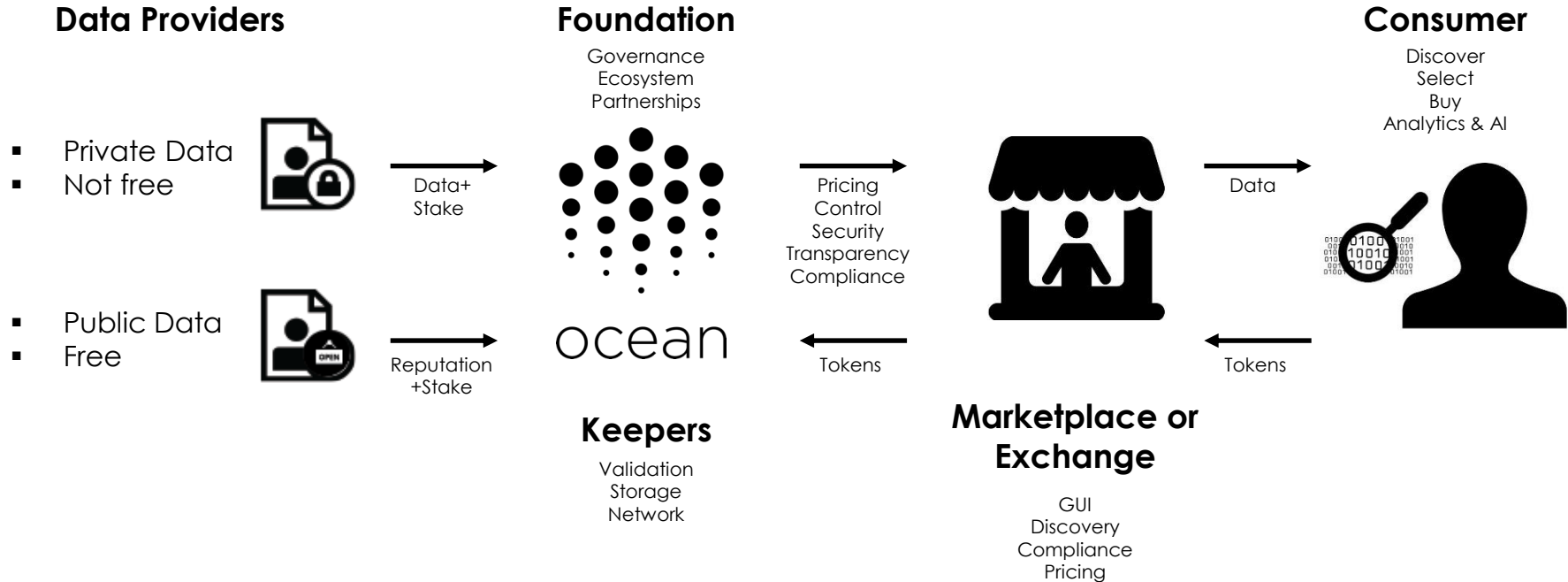
We are still in the early stages of defining, building and implementing protocols, but this time, billion of dollars are at stake at the protocol layer instead of the application layer.

The background of the slide is a dark, deep-sea environment filled with numerous jellyfish. The jellyfish are translucent, with some showing internal organs in shades of yellow and orange. They are scattered across the frame, creating a sense of depth and movement.

Ocean Ecosystem

Enabling open data services

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

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

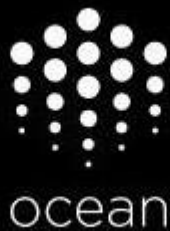
- **Publish, curate** and **conserve** public data to earn minting rewards

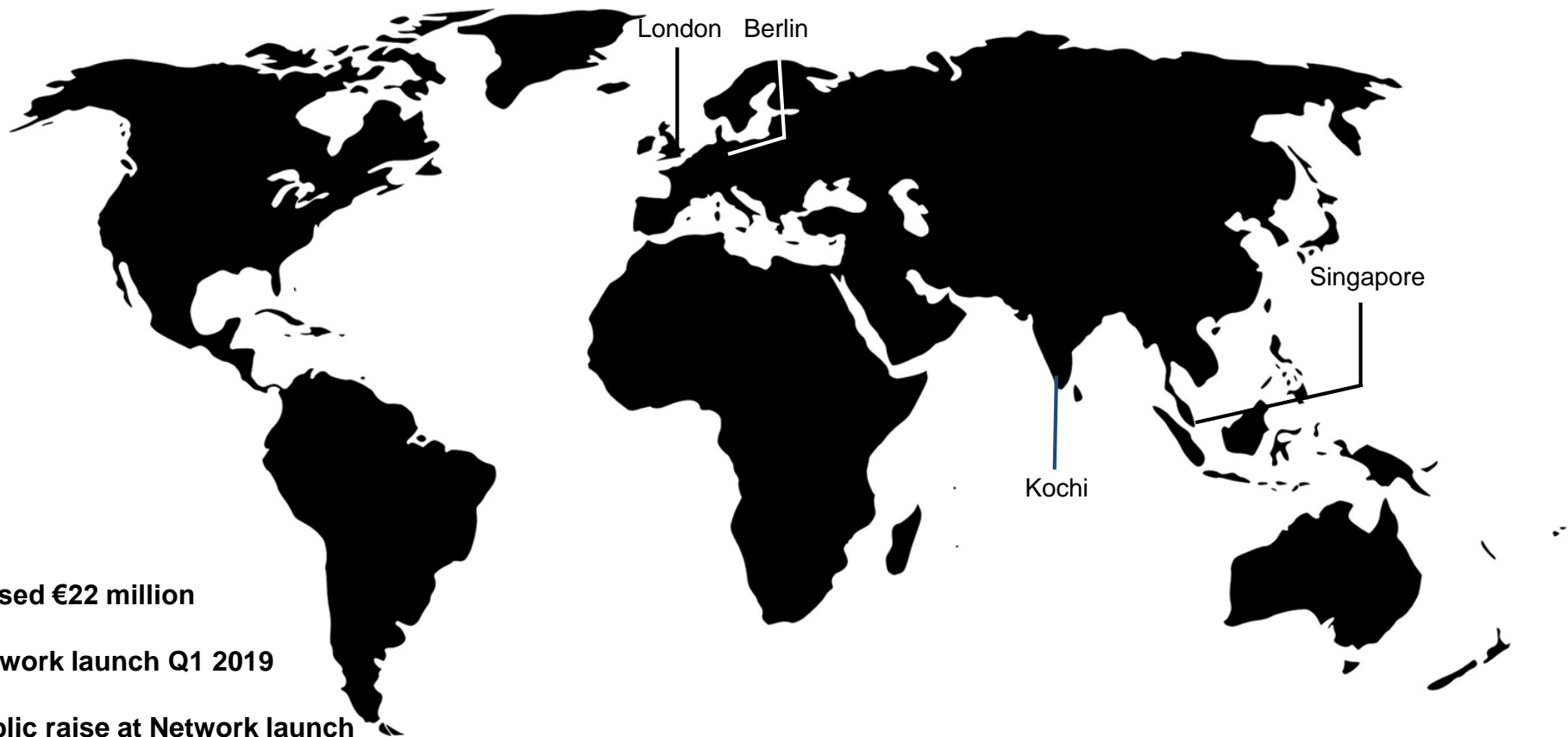


Reference
Marketplace



Ocean Protocol
Foundation





The background of the slide is a dark, deep-sea environment filled with numerous jellyfish. The jellyfish are translucent, with some showing internal organs in shades of yellow and orange. They are scattered across the frame, creating a sense of depth and movement. The lighting is soft, highlighting the delicate structures of the jellyfish.

Technology

Architecture and Implementation

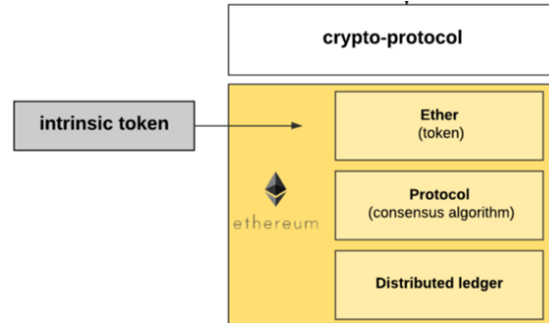
The Main Pieces

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



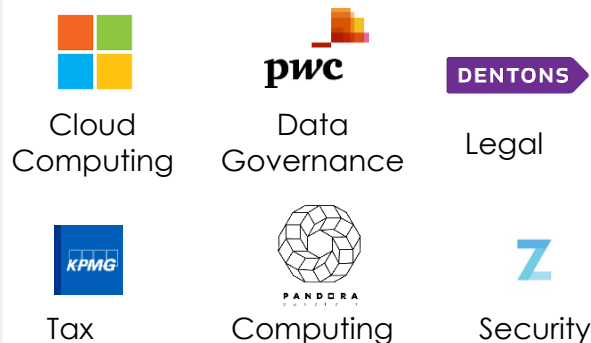
- Singapore lead government partner
- Enables regulatory sandboxes
- Close collaboration to provide oversight, compliance and indemnify

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



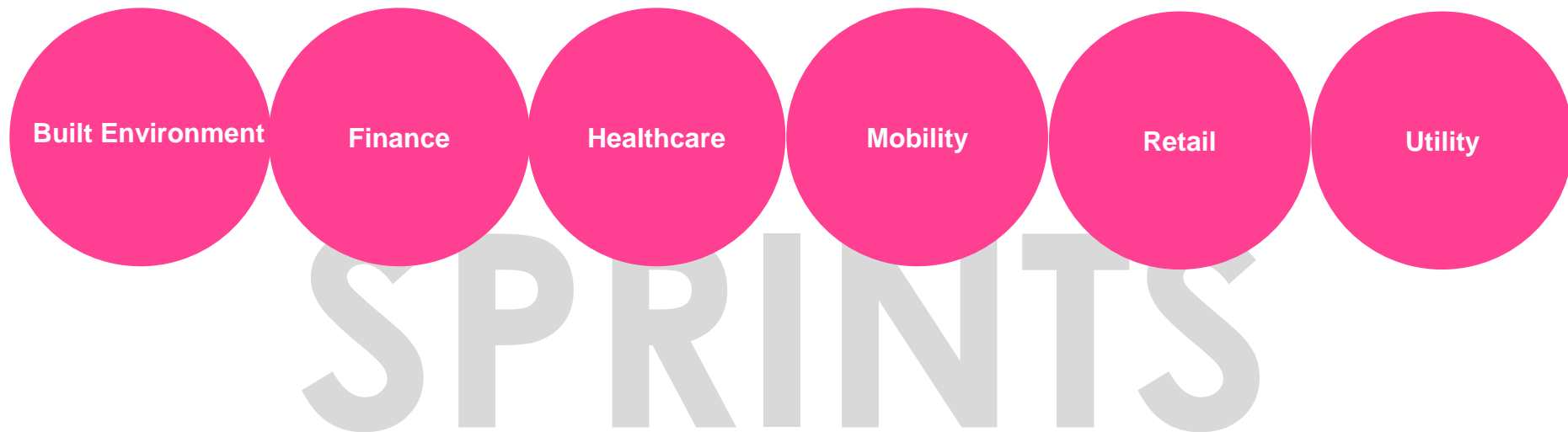
DATA COLLABORATIVE

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

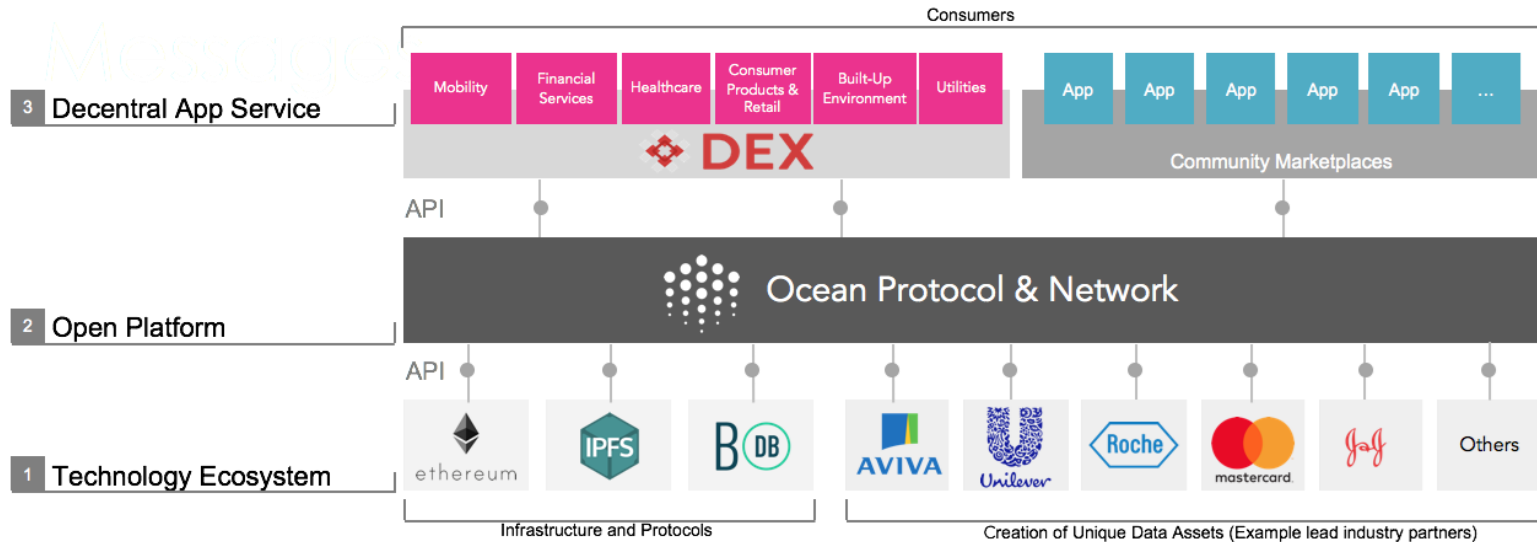
IMDA will provide regulatory guidance and co-create new codes of practice to mitigate risks and ensure appropriate data practices in usage, handling and sharing

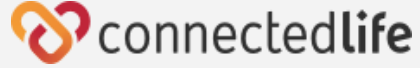
The collaboration aims to address trust and security concerns by piloting a new model where data providers and consumers can transact on a DEX reference marketplace, built on Ocean Protocol

6 INDUSTRY-LED DEVELOPMENT SPRINTS



DATA COLLABORATIVE STRUCTURE





USE CASE

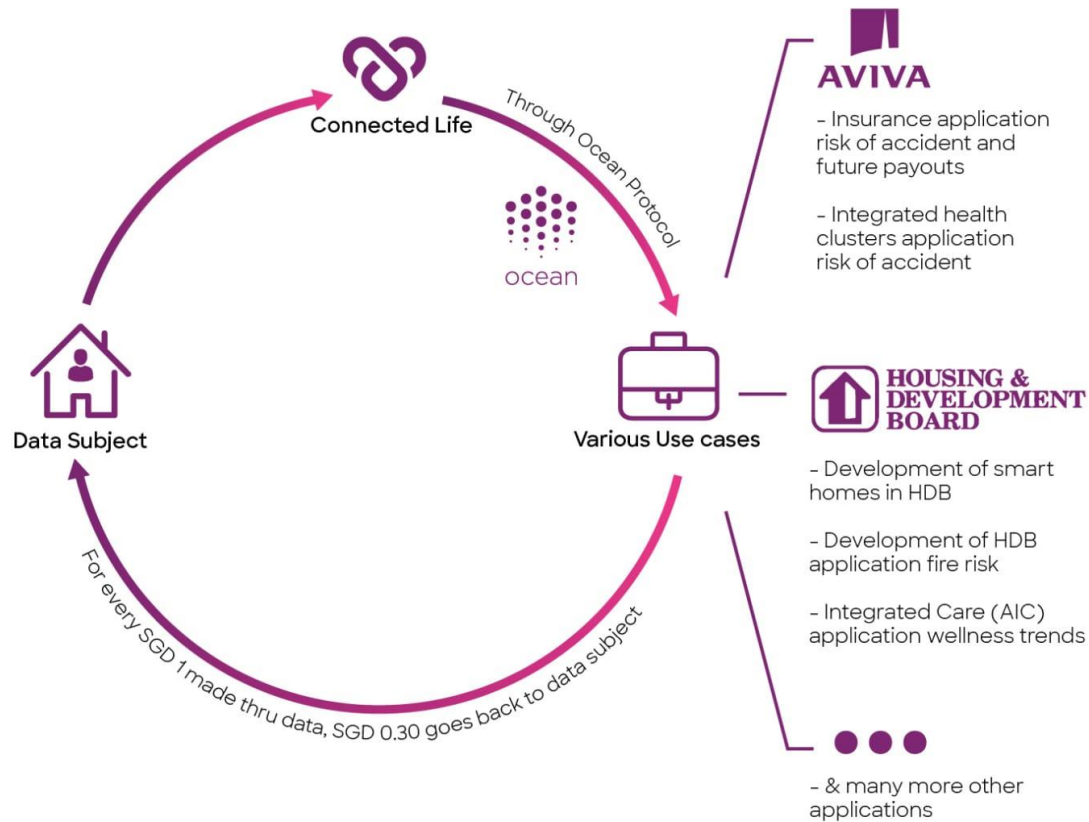


Aviva and ConnectedLife are applying data analytics and artificial intelligence to enhance protection and care for the ageing population and support independent living

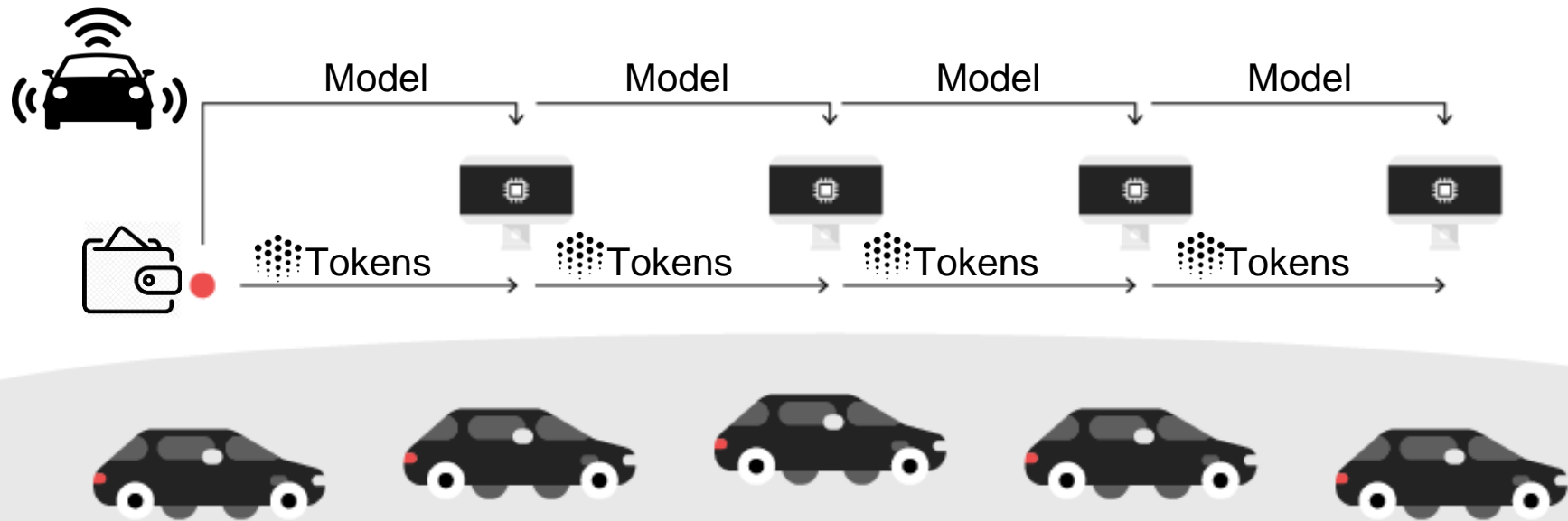
Roche Diagnostics is exploring ways to improve management and treatment compliance of patients on blood-thinning therapy

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

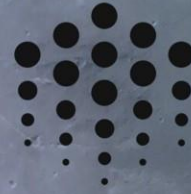


ocean protocol





weeve



ocean

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.

||

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



The background of the entire image is a deep blue, almost black, underwater scene filled with numerous jellyfish. The jellyfish have translucent, bell-shaped bodies with prominent horizontal stripes in shades of orange, red, and white. Their long, thin, white tentacles are spread out in all directions, creating a complex, web-like pattern against the dark background. The lighting is soft, highlighting the delicate structure of the jellyfish.

Let's talk Ocean

Do you Care?