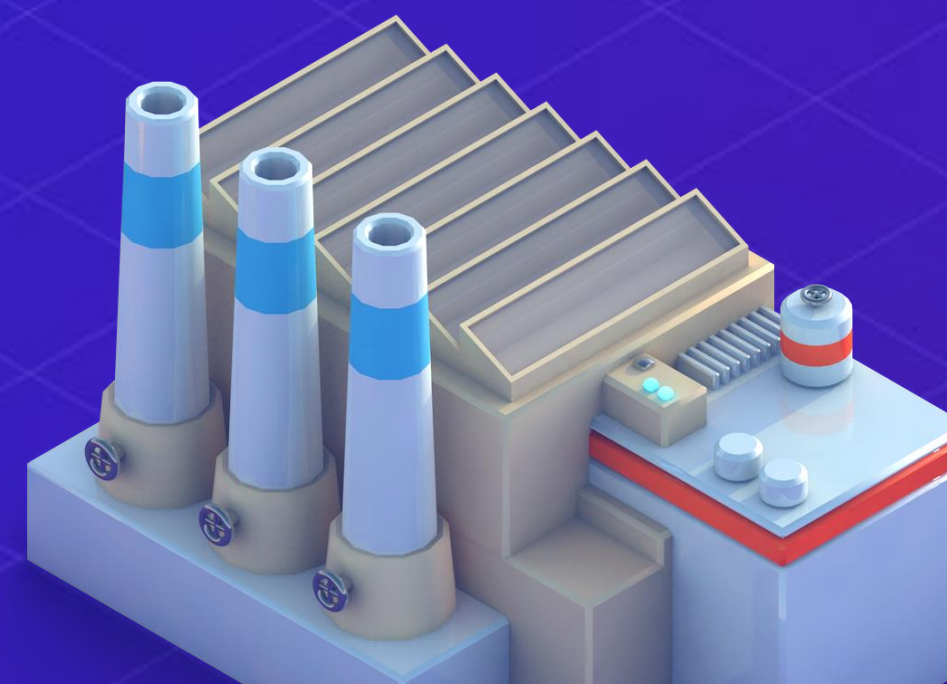# Current state of live data economy

MARTIN MORAVEK – SOLUTIONS ARCHITECT, STREAMR

Smart city data silos

VEHICLE SENSOR DATA

SMART BUILDINGS

ENVIRONMENT DATA

Better access to data will lead not only to safer roads but also higher quality of life and economic growth

Multiple data sources that are unable to interact

- Vehicle data
  Speed | Acceleration | Braking

- User data from smart devices
  Location | Browsing history | Interests

- Smart parking data
  Availability | Price

- Environment data
  Air Quality | Pollution levels
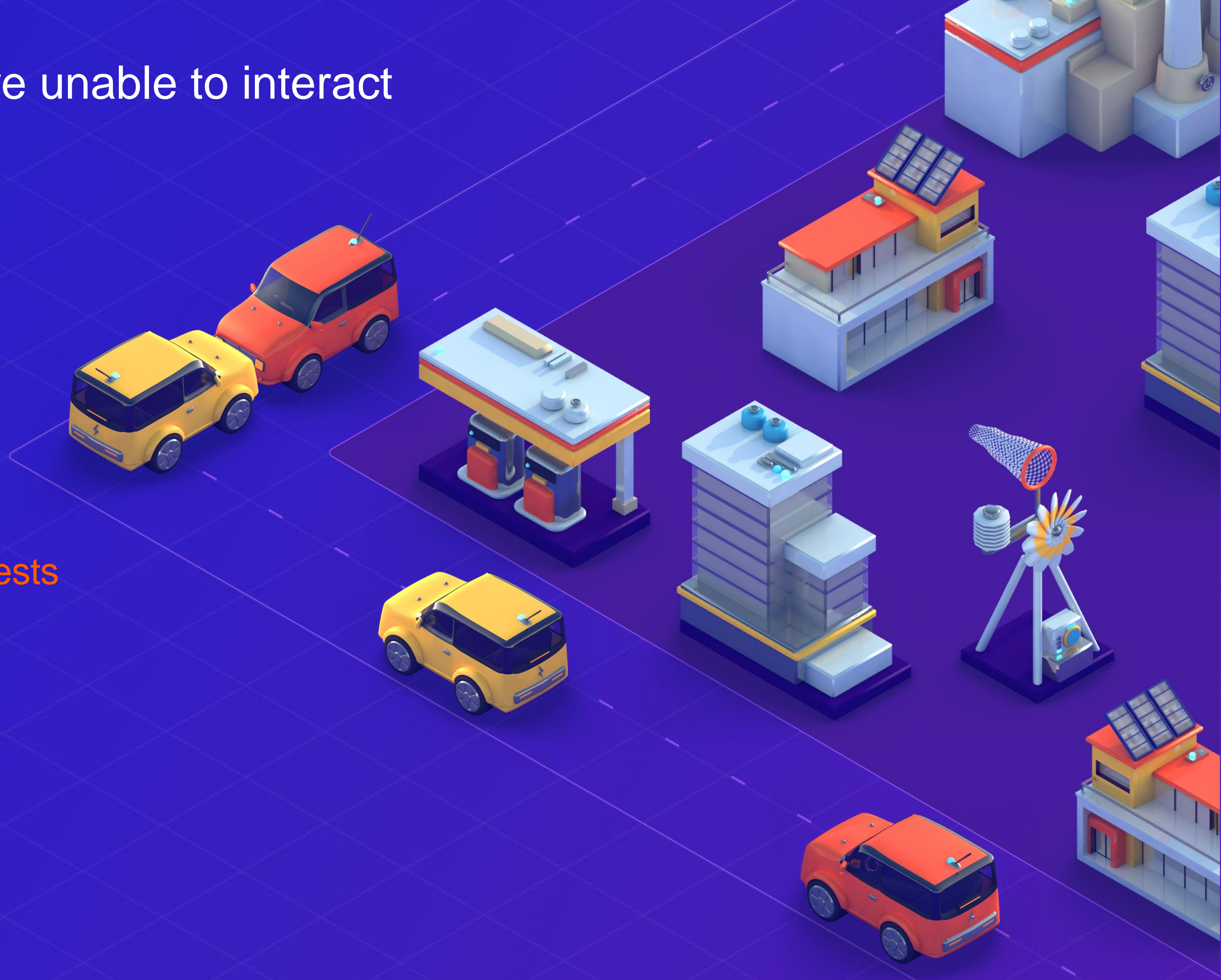
There is an inadequate data infrastructure to connect all of these data points – data silos, vendor lock-in, no open eco-system and interoperability

Data availability and economic growth

MORE DATA COLLECTED

MORE CUSTOMERS

BETTER PRODUCT/SERVICE
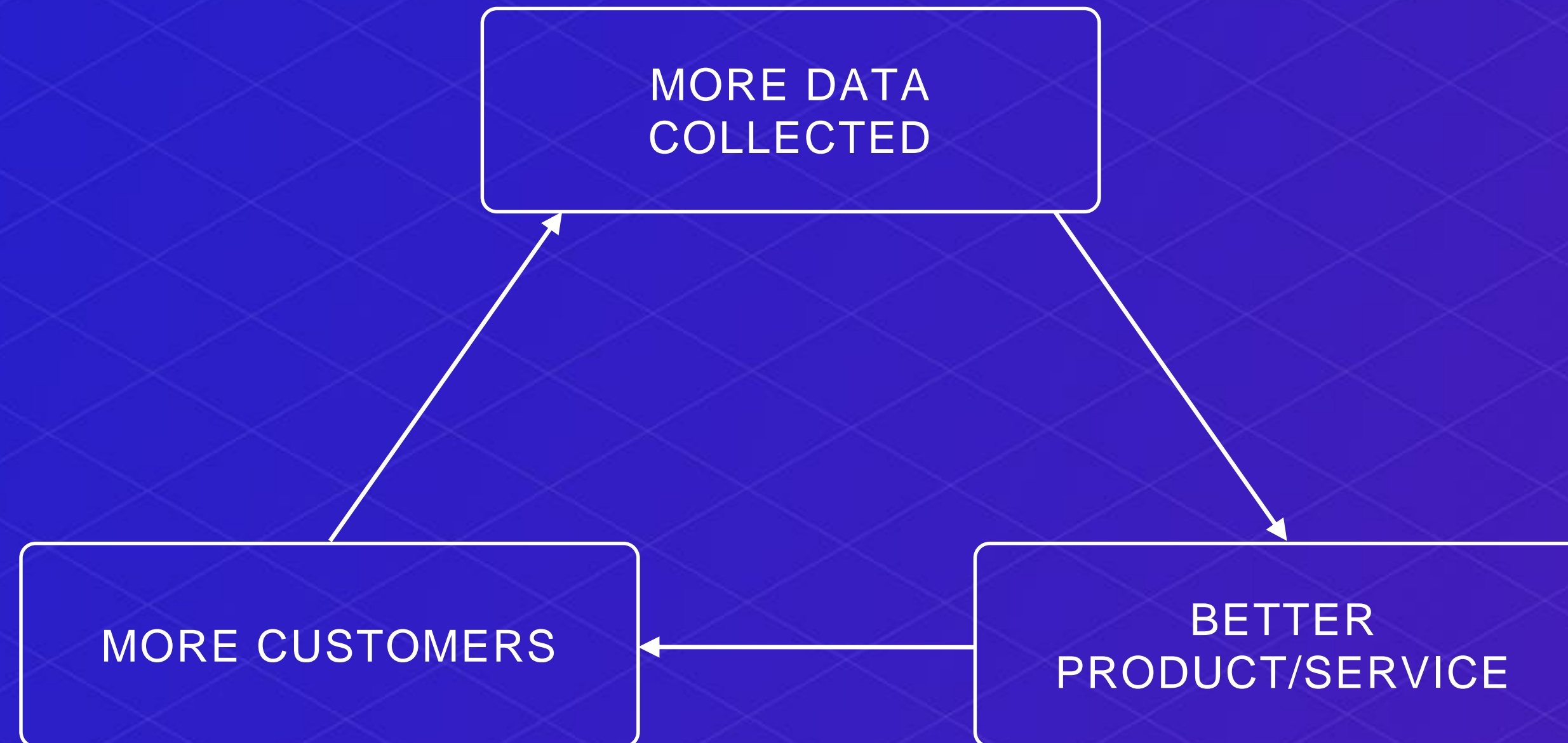
Data enables both development of new products/services/business models as well as improvement of existing ones

Why live data?

- Data has the highest value in the beginning
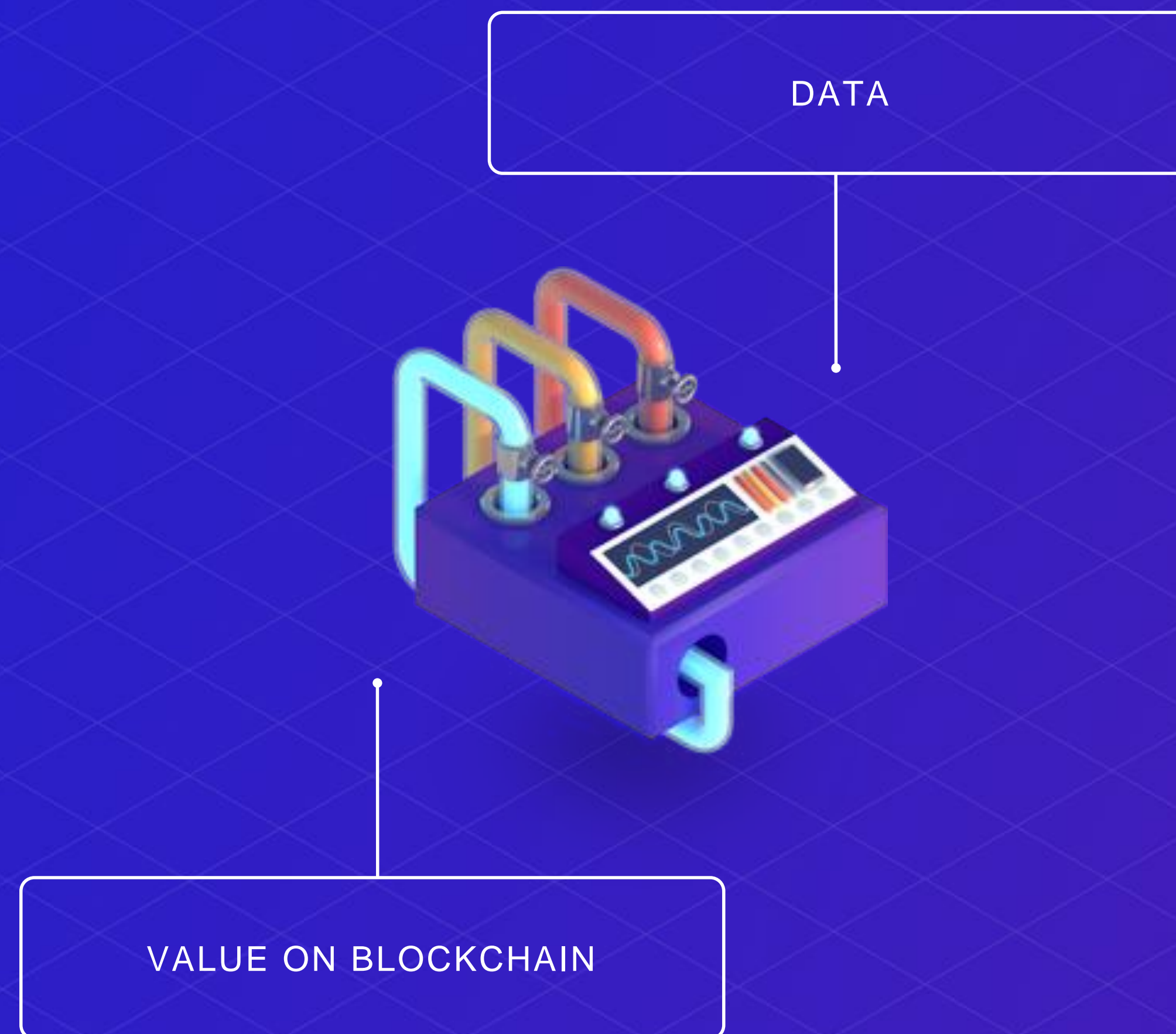
- Value of data decreases over time

Beginning of Internet – Lessons learned

- Computers in separated intranets

- Intranets not interconnected

- Neutral and interoperable protocols had to be developed

Solution to interconnect siloed IoT devices has to be open, permisionless and use neutral protocol and standards

Live data ecosystem

DATA

VALUE ON BLOCKCHAIN

Data globally available in open and secure way.

Solution: The Streamr Network

- Decentralised, peer to peer

- Pub/Sub

- Resilient

- Low latency

- Scale

- Open ecosystem

- Less prone to cyber attacks

The Streamr Network can act as the real-time data delivery pipeline,
connecting IoT devices, data providers, users and data buyers.

Data Marketplace monetises real-time data

ANYONE OR ANYTHING CAN SUBSCRIBE TO DATA STREAMS, VEHICLE OWNERS, COMPANIES OR MACHINES

ANYONE OR ANYTHING CAN PUBLISH DATA STREAMS

INCENTIVISE WIDER PARTICIPATION / DATA SHARING VIA DATA MONETISATION

AUTOMATIC SETTLEMENT OF TOKENISED PAYMENTS VIA SMART CONTRACTS

FREE AND FAIR EXCHANGE OF REAL-TIME DATA WITH NO TRANSACTION FEES

Decentralized data delivery, storage and monetisation

Reference Pilot

TIoTA Machine Witness Use Case

RIDDLE & CODE
HARDWARE IDENTITY
& ID REGISTRY

HAZARDS
DATA

ELECTRICITY
LEVELS DATA

ROAD SURFACE
QUALITY DATA

STREAMR
DATA MARKETPLACE

BLOCKCHAIN
SMART
CONTRACTS

DECENTRALISED
NETWORK
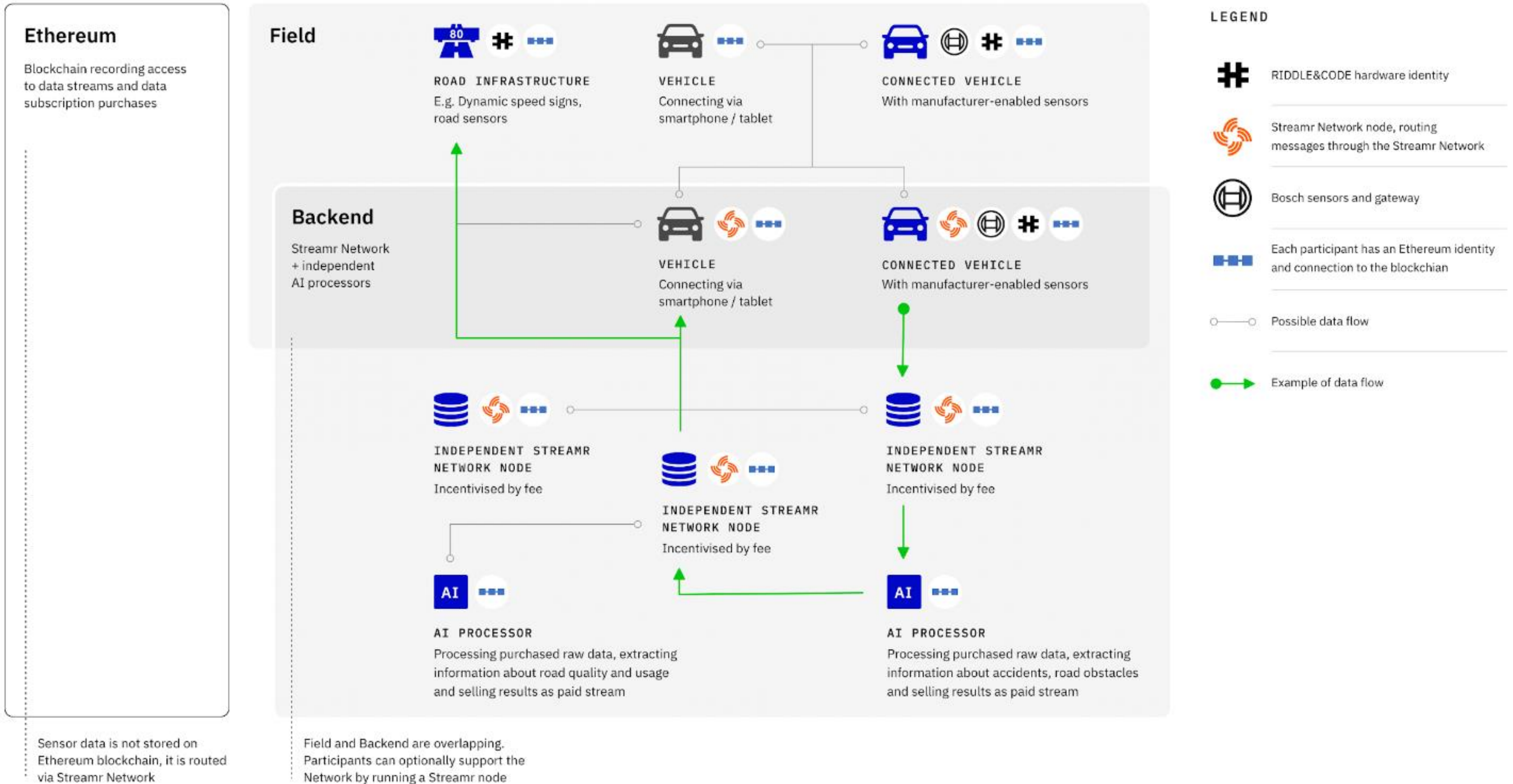
SIGNING OF DATA BY CAR HW IDENTITY MODULE

ADDITIONAL 3RD PARTY
SUBSCRIBERS E.G.
CITIES, OTHER CARS,
HIGHWAY AGENCIES,
ROAD SIDE UNITS

**2019 JAGUAR
I-PACE**

BOSCH
HARDWARE &
SENSORS

Machine Witness Use Case Architecture

Ethereum

Blockchain recording access to data streams and data subscription purchases

Field

ROAD INFRASTRUCTURE
E.g. Dynamic speed signs, road sensors

VEHICLE
Connecting via smartphone / tablet

CONNECTED VEHICLE
With manufacturer-enabled sensors

Backend

Streamr Network + independent AI processors

VEHICLE
Connecting via smartphone / tablet

CONNECTED VEHICLE
With manufacturer-enabled sensors

INDEPENDENT STREAMR NETWORK NODE
Incentivised by fee

INDEPENDENT STREAMR NETWORK NODE
Incentivised by fee

INDEPENDENT STREAMR NETWORK NODE
Incentivised by fee

AI PROCESSOR
Processing purchased raw data, extracting information about road quality and usage and selling results as paid stream

AI PROCESSOR
Processing purchased raw data, extracting information about accidents, road obstacles and selling results as paid stream

Sensor data is not stored on Ethereum blockchain, it is routed via Streamr Network

Field and Backend are overlapping. Participants can optionally support the Network by running a Streamr node.

LEGEND

⌗ RIDDLE&CODE hardware identity

Streamr Network node, routing messages through the Streamr Network

Bosch sensors and gateway

Each participant has an Ethereum identity and connection to the blockchian

○—○ Possible data flow

●—▶ Example of data flow

Streamr nodes operating in vehicles

- The car has the option to utilise its unused resources (CPU and bandwidth) to support the Streamr network. Node runners are also incentivised by a fee from every transaction – this is an additional monetisation for driver.

- When EV is parked and charging all its computing resources are unused. These do not have to remain wasted and can instead be monetised.
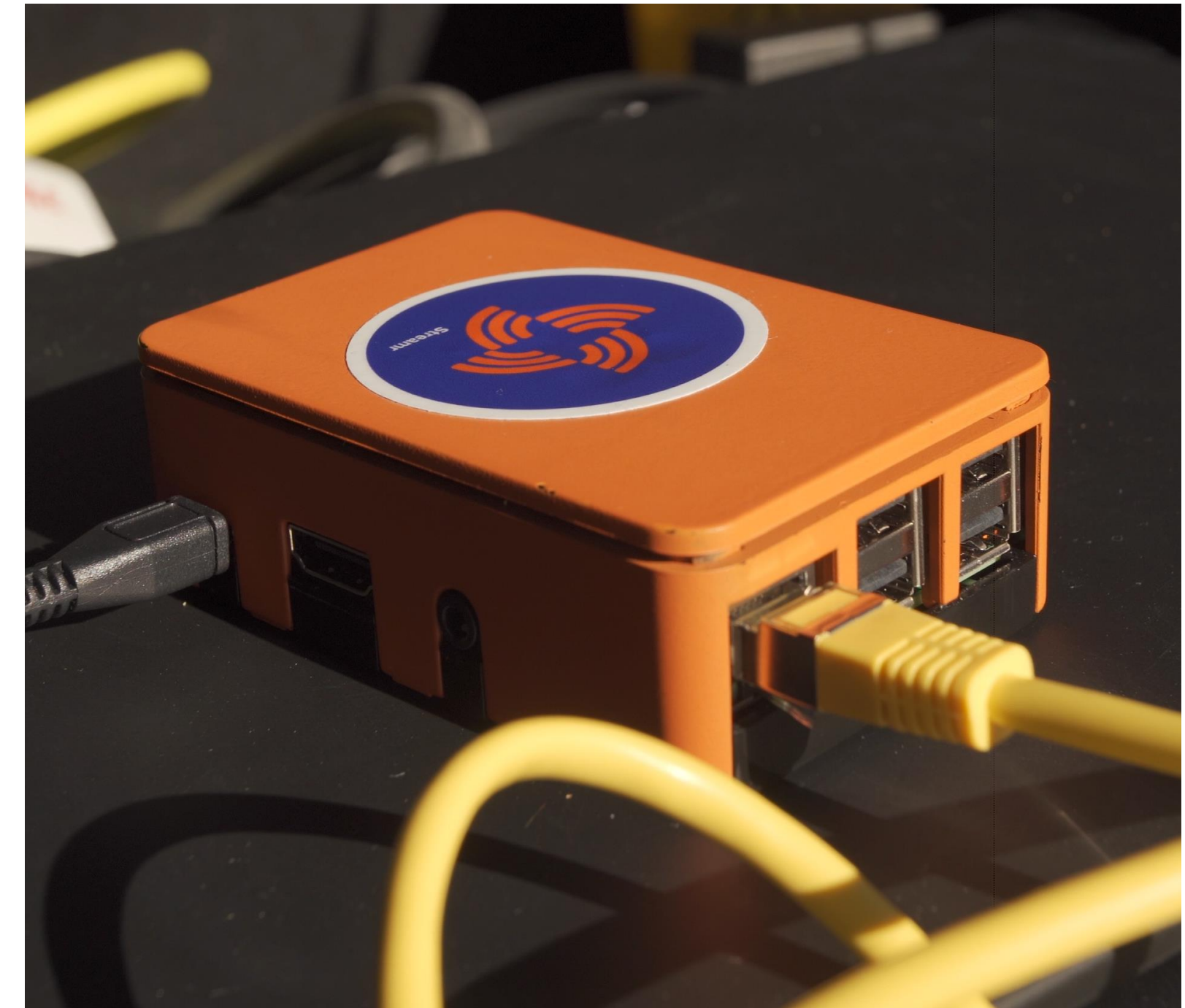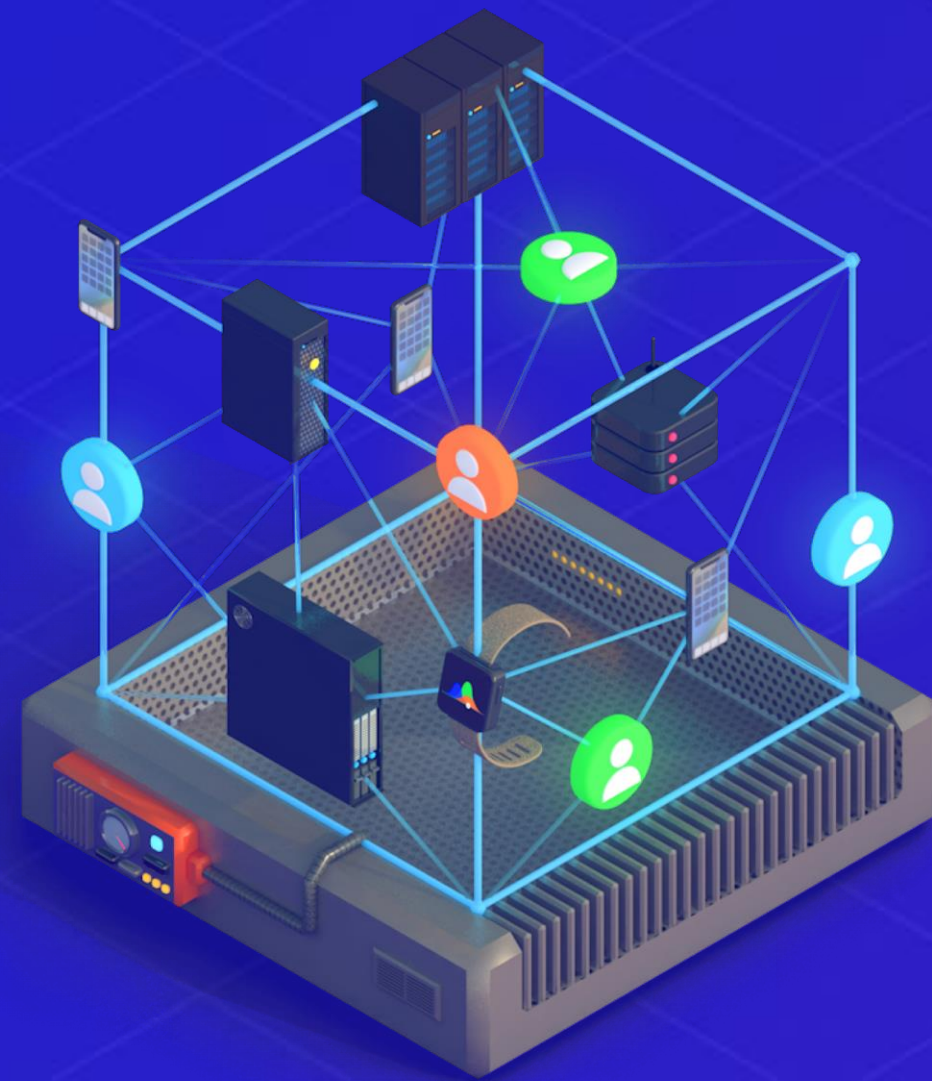
User data monetization

Streamr data ecosystem

Network

Marketplace

Blockchain

First person selling his data in 2000

- Infrastructure was missing

Has the infrastructure improved since then?
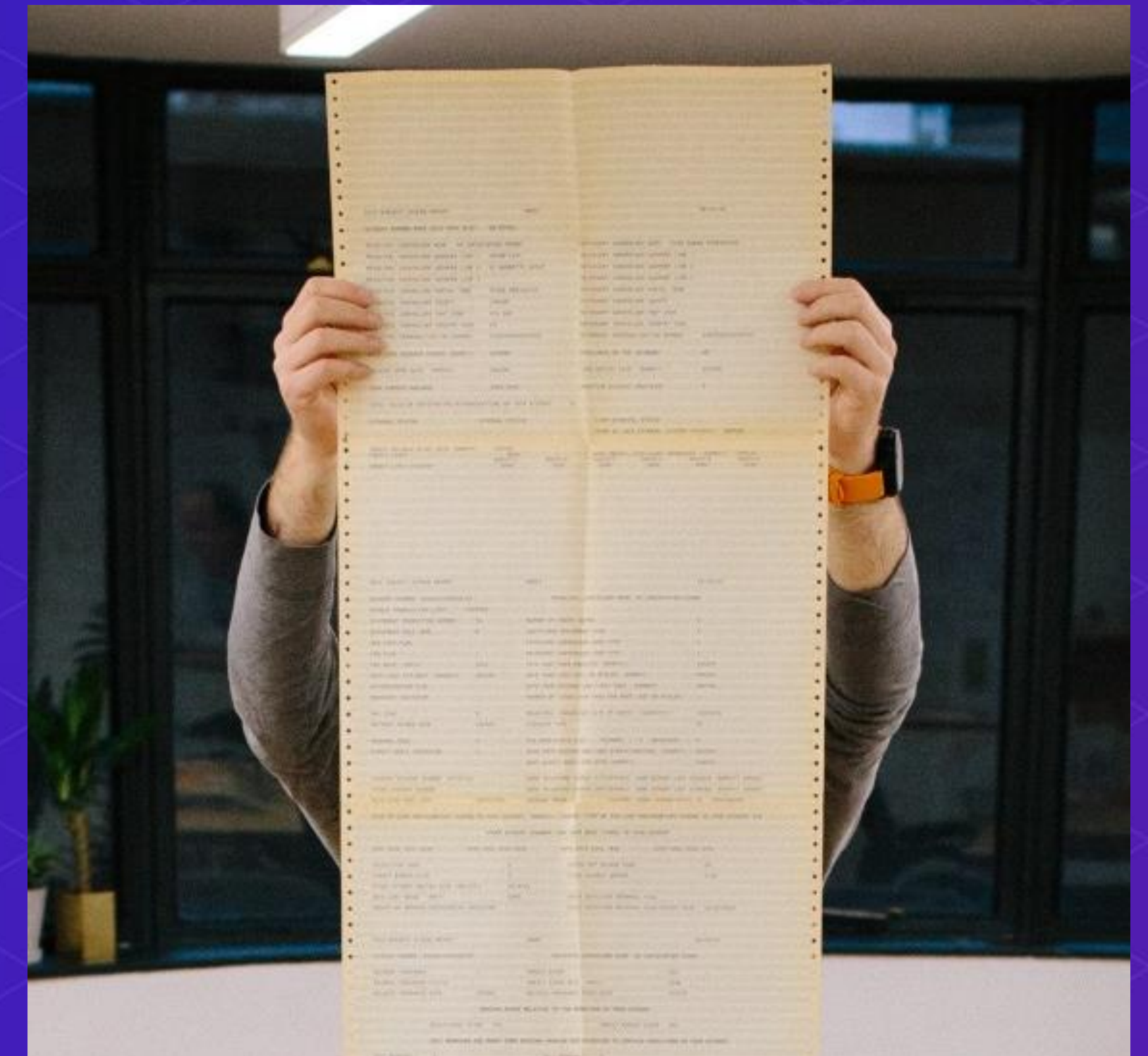
Three key elements

- Users wanting to monetise their data

- Companies in need of user data

- Missing infrastructure for user data monetisation

User data market – connection from user to buyer was missing

We solved it, with Data Unions

- Data Unions allow users to crowdsell their data

- People easily bundle and sell their real-time data and earn revenue

- Companies can develop a Data Union integration for their users and share the revenue from sold data

- Data buyers can buy data from many users at once – in unified quality and format

Data crowdsourcing via
Data Union

Data Union Reference – Fitness Data

PRODUCT ADMIN
Creates product, manages members, receives admin fee in $DATA

COMMUNITY MEMBERS
Join via third party app, contribute realtime data, get paid in $DATA

DATA BUYERS
Subscribe to the product on the Marketplace, pay in $DATA

$DATA FOR ADMIN FEE

MEMBERS ROYALTIES IN $DATA

SUBSCRIPTION PAYMENTS IN $DATA

Fitbot Tokyo Group
Fitbot Japan
25,658 Members

COMMUNITY PRODUCT
Available on the Streamr Marketplace

THIRD PARTY APP
FITBOT
Members join here. Holds private key to receive $DATA payments

REALTIME DATA

REALTIME DATA

Data Union roles for businesses

DATA BUYER CROWDSOURCING DATA

- Buy data from an existing Data Union
- Buy data from a new Data Union
- Use data for your products and services

DATA UNION ADMIN

- Develop integration
- Enable your customer to unlock value of their data
- Share revenue
- Scale your data economy
- Make customers stick with your product

Data Unions helps companies monetise data of their users

User Data Monetisation

BEFORE DATA UNIONS

- No infrastructure ❌

- Limited reach and revenue from data ❌

- Common not so fair data monetisation ❌

WITH DATA UNIONS

- Dedicated neutral infrastructure ✅

- Offering can be publicly marketed and have a wider reach ✅

- Fair monetisation with real user consent and revenue sharing ✅

In some industries, the data can be more lucrative than the original business

Community Product Reference - Swash

- Browser plugin for people to monetize their browsing data (Firefox, Chrome, Microsoft Edge)

- Community product integration develop by independent team

- Users can choose their privacy level via slider
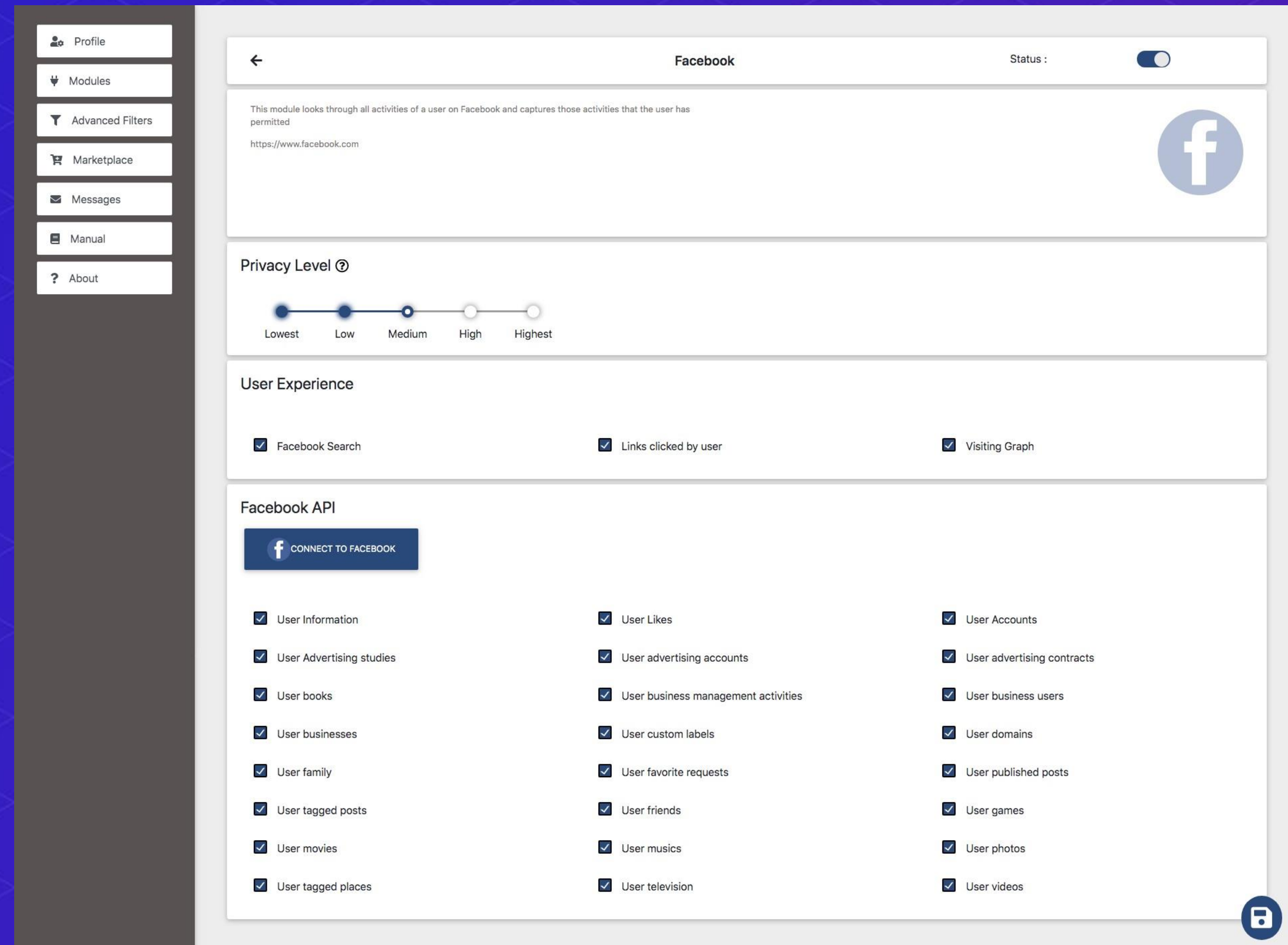
Community Product Reference - Swash
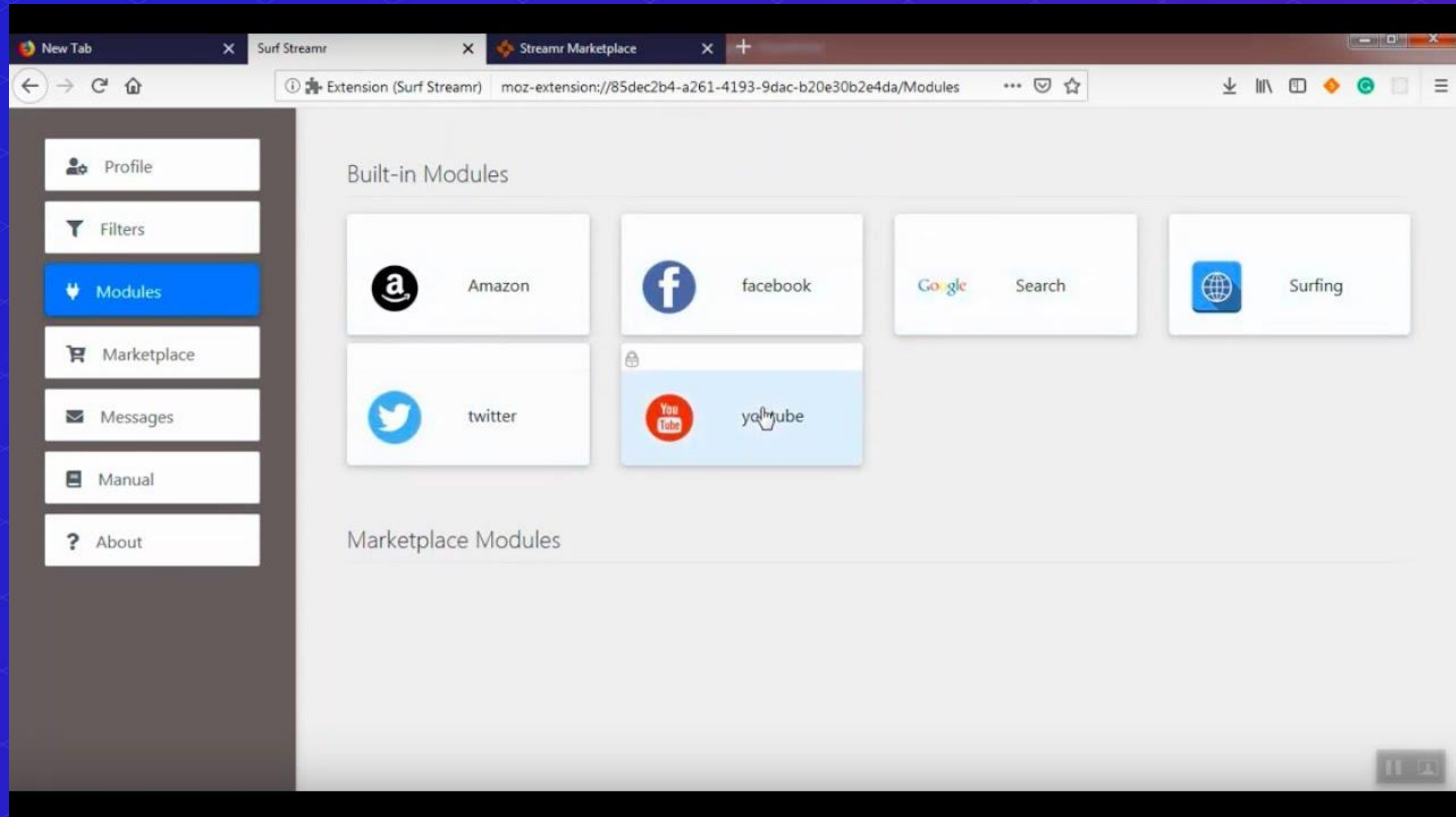
Modules to collect data from different platforms

Data Union Reference – Tracey

- Collaboration with Union Bank and WWF in Philippines

- Crowdsourced fish catch data from fisherfolk in the Philippines

- Supports sustainable fishing

- Fisherfolk build accurate credit scores by inputting verified catch and trade data

- Fishermen get access to affordable microloans from Union Bank
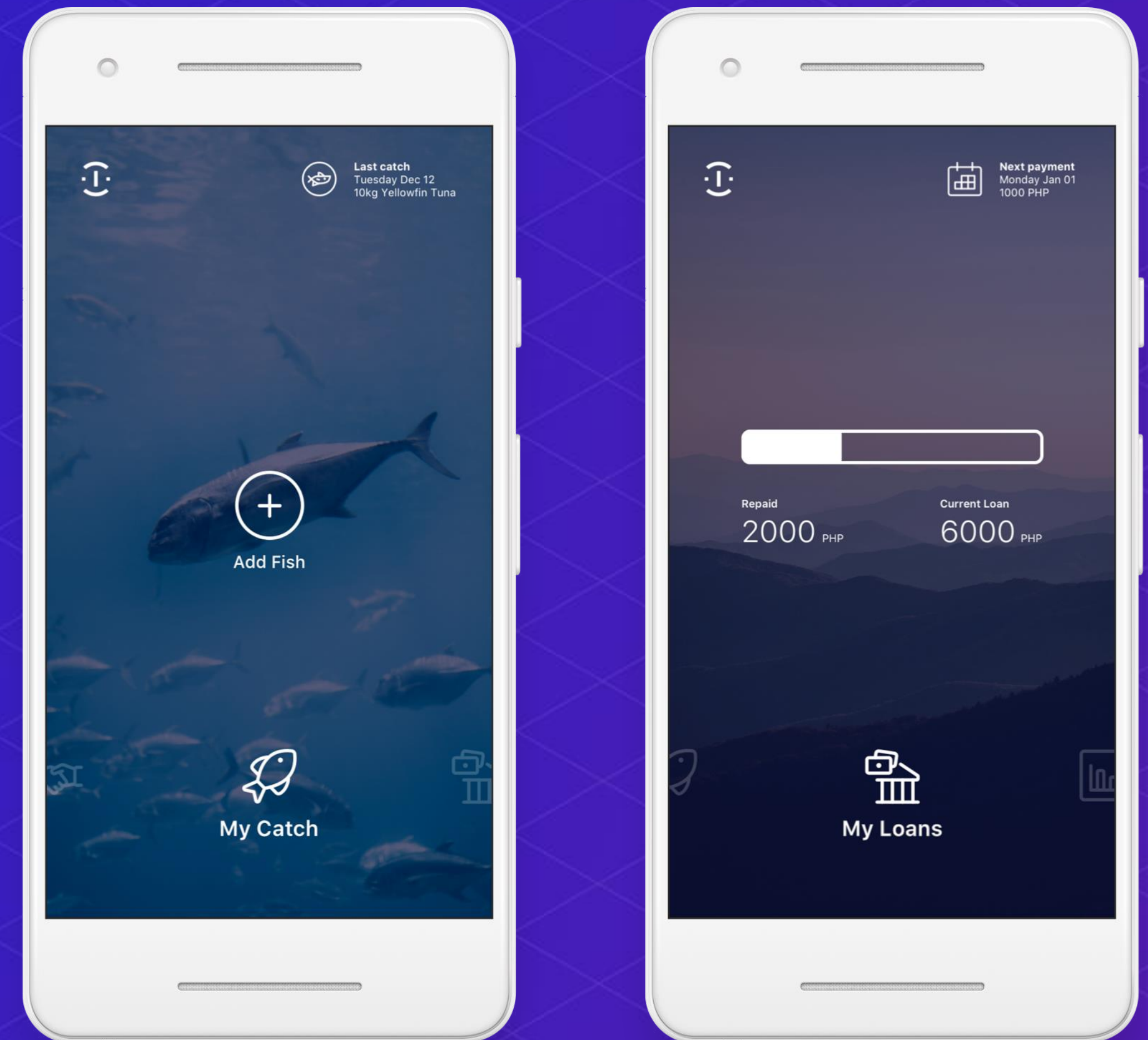
Early UI mockups for the Tracey mobile app

Streamr Marketplace

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