

bytΞM

Scaling to global Data Exchange & Management

LIBΞRBYTΞ
FREE YOUR DATA

Oct 2025

Exponential x^2 pa growth in global data volumes creates various problems:

- **Identifying** (suitable) data **is** increasingly **difficult**
- **Search engines finds fraction (<5%) of the web**
- **>85% of new data is unstructured**
- **No (business) metadata standards**
- **Data stored & “worthless” in silos**
- **Transferring large volumes inefficient**
- **AI repeat of “fractioned app” landscape**
- **Growing DWHs* or LLMs not a solution**

Global data volumes in Zettabyte*



Organisations have simply no or wrong Approach on data products & value extraction, for example:

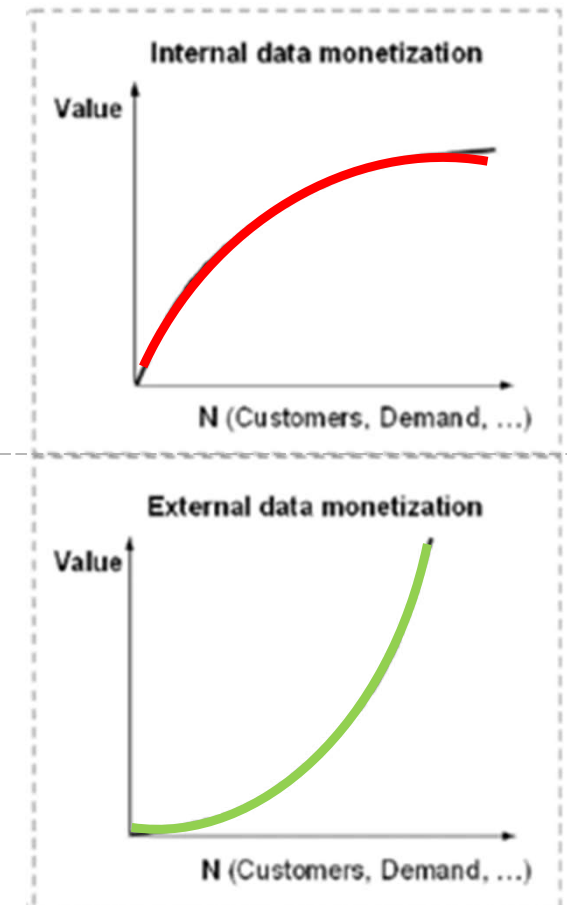
- indirect **internal approach**

providing *diminishing* returns

instead

- indirect **external approach**,
- **direct external approach**

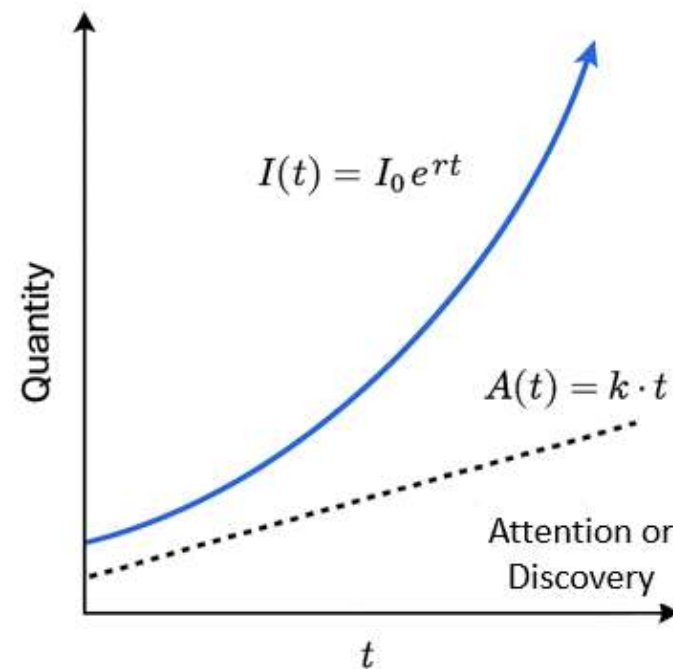
which provide *increasing* returns



Data exchange capabilities enable demand driven value extraction

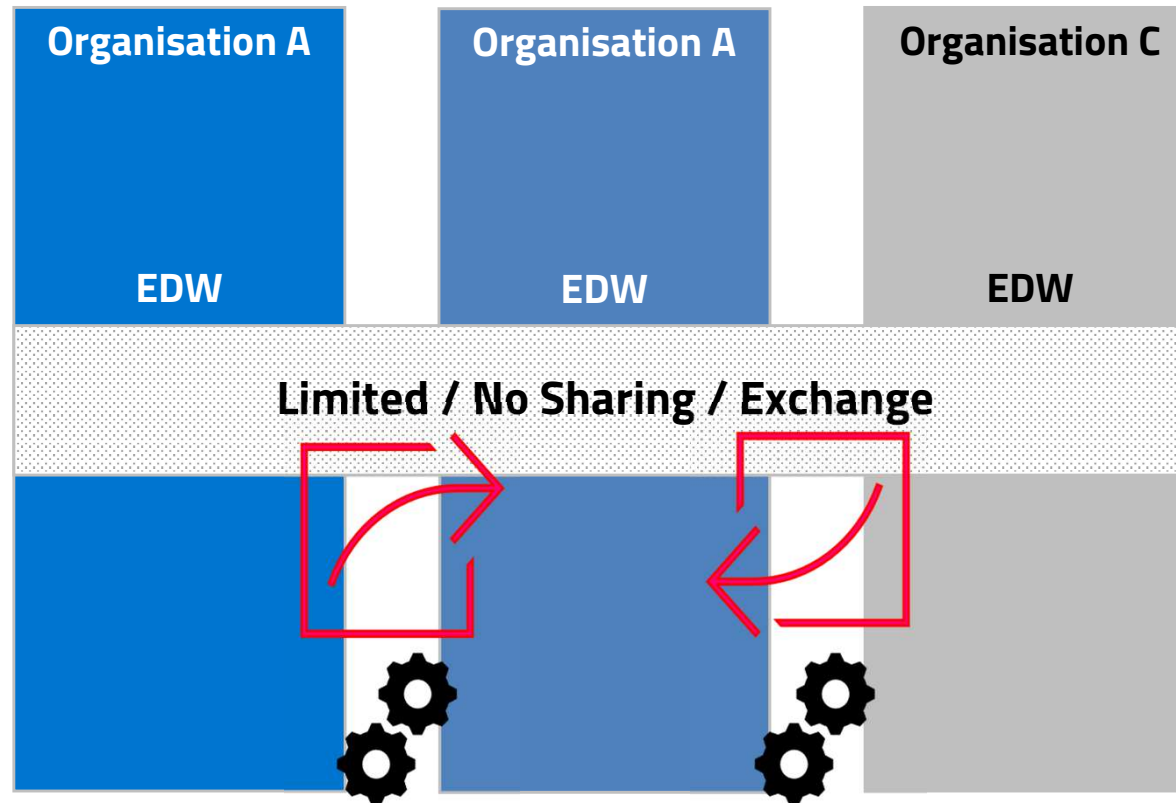
“Asymmetric information creates inefficiencies that markets strive to overcome.”

— George A. Akerlof, *The Market for Lemons* (1970)



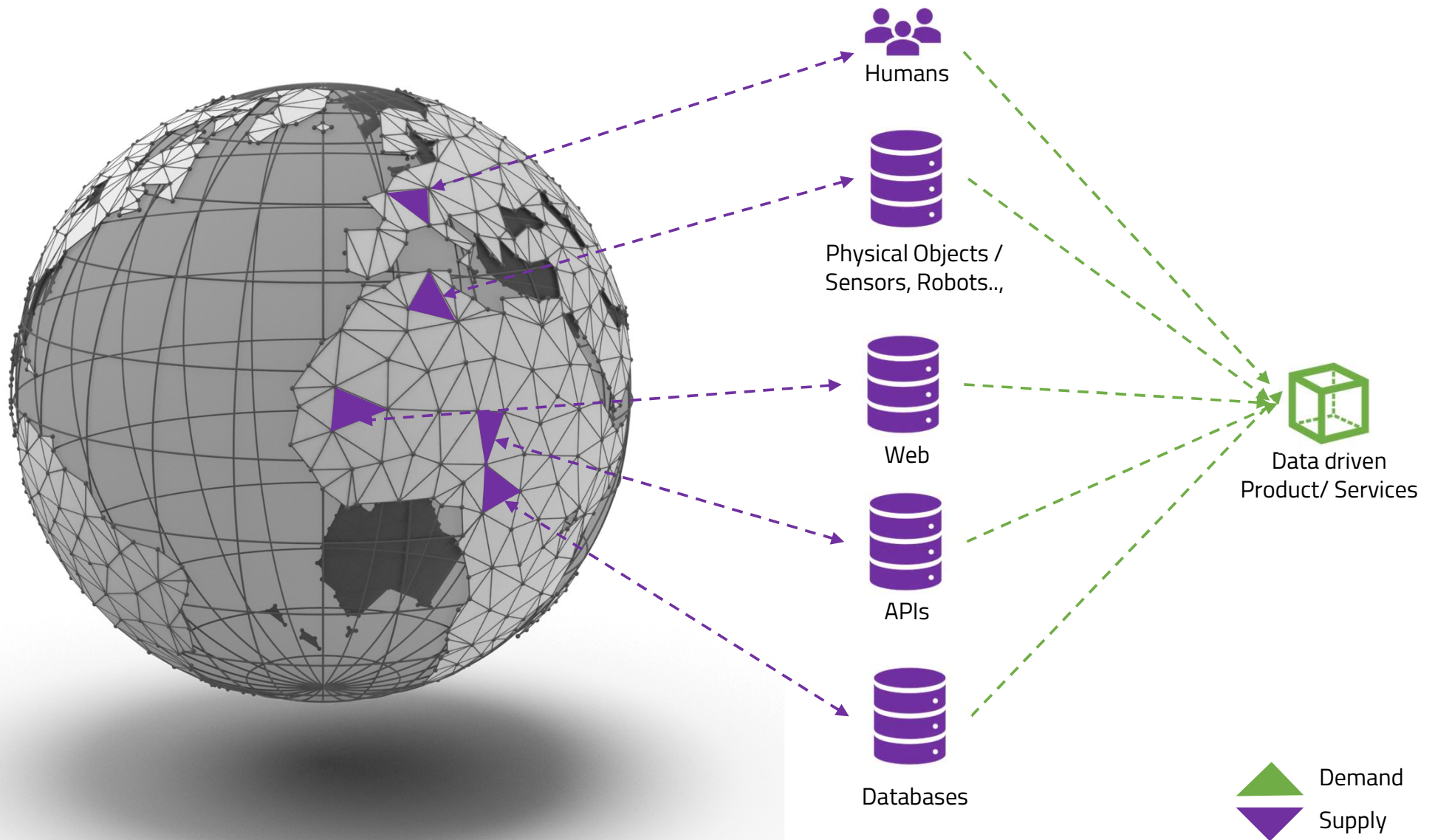
“As time progresses, the amount of data far outpaces our ability to **find, process, or understand** it. Therefore, **information asymmetry isn't a bug—it's a mathematical consequence** of exponential data growth” (*T. Salomaa - Founder Liberbyte*)

Centralised (read in) - platforms have no data sharing / exchange by default

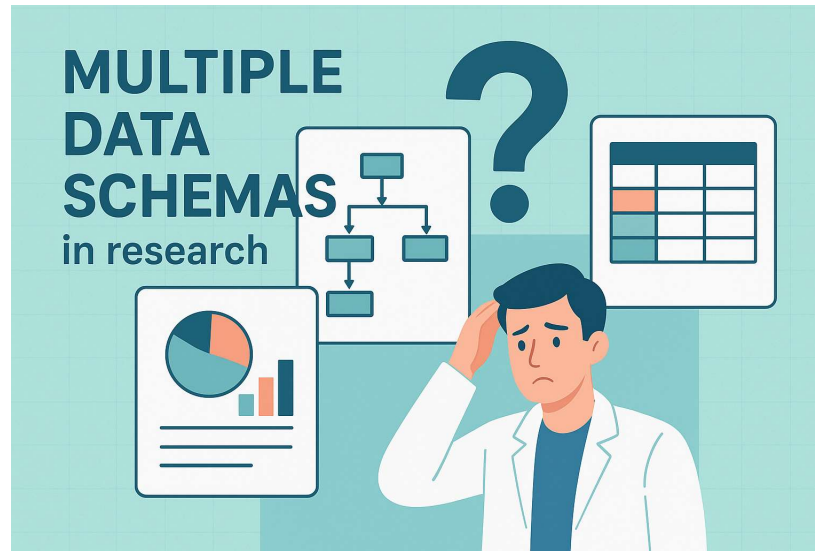


EDW = Enterprise Data Warehouse

Data is „Decentralised“



No Context / Business / Science etc. Domain

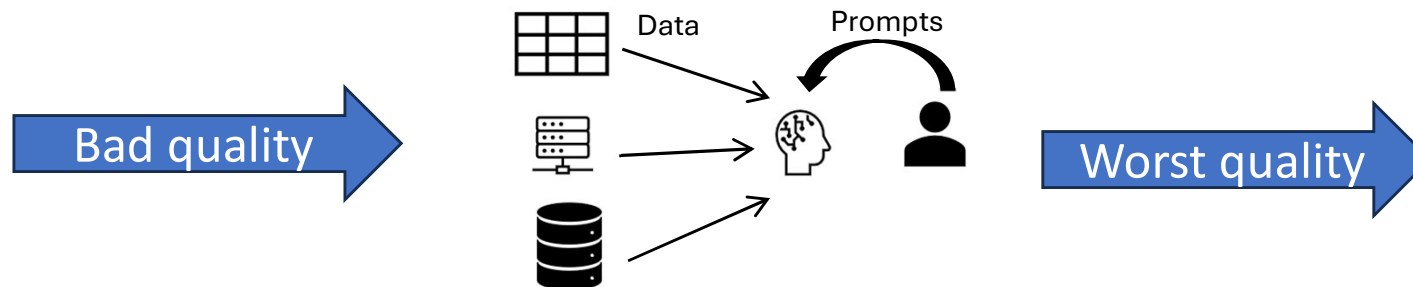


“Environment”, “Ecosystem”, “Proteins”, “Microbes”,...

Who sets the (business) schema?

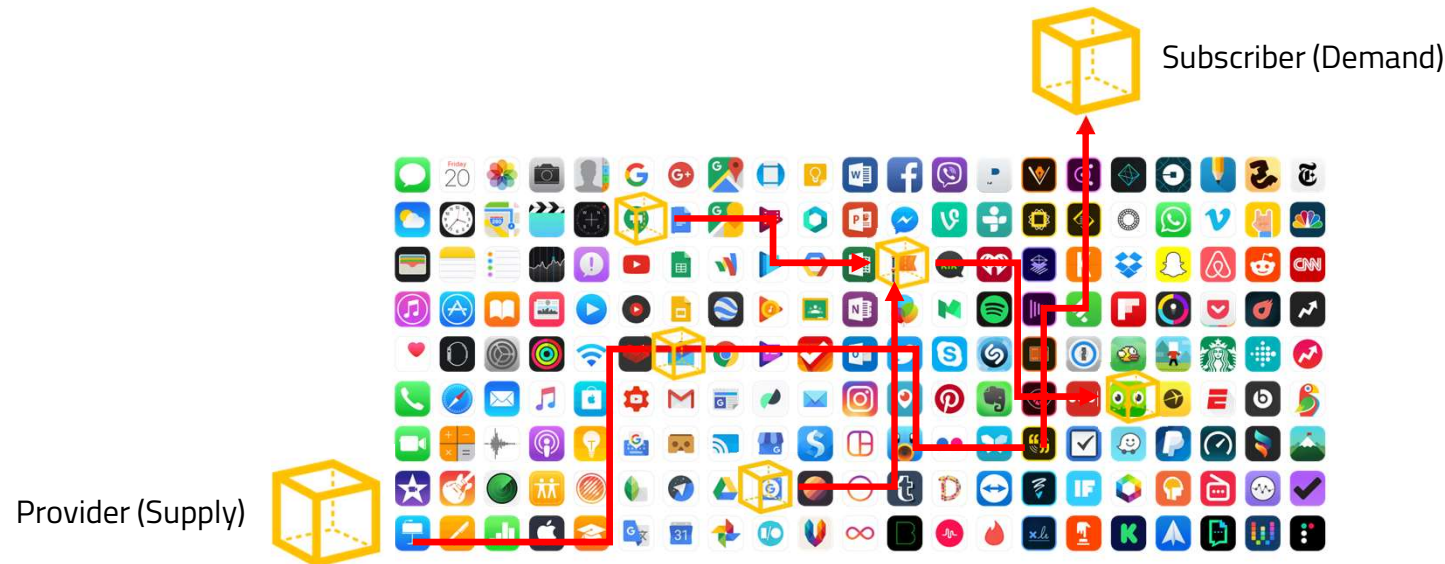
Input Data & Data mgmt NOT controlled → AI NOT controlled

Data & Data Quality uncontrolled → outcomes not „Lab like“



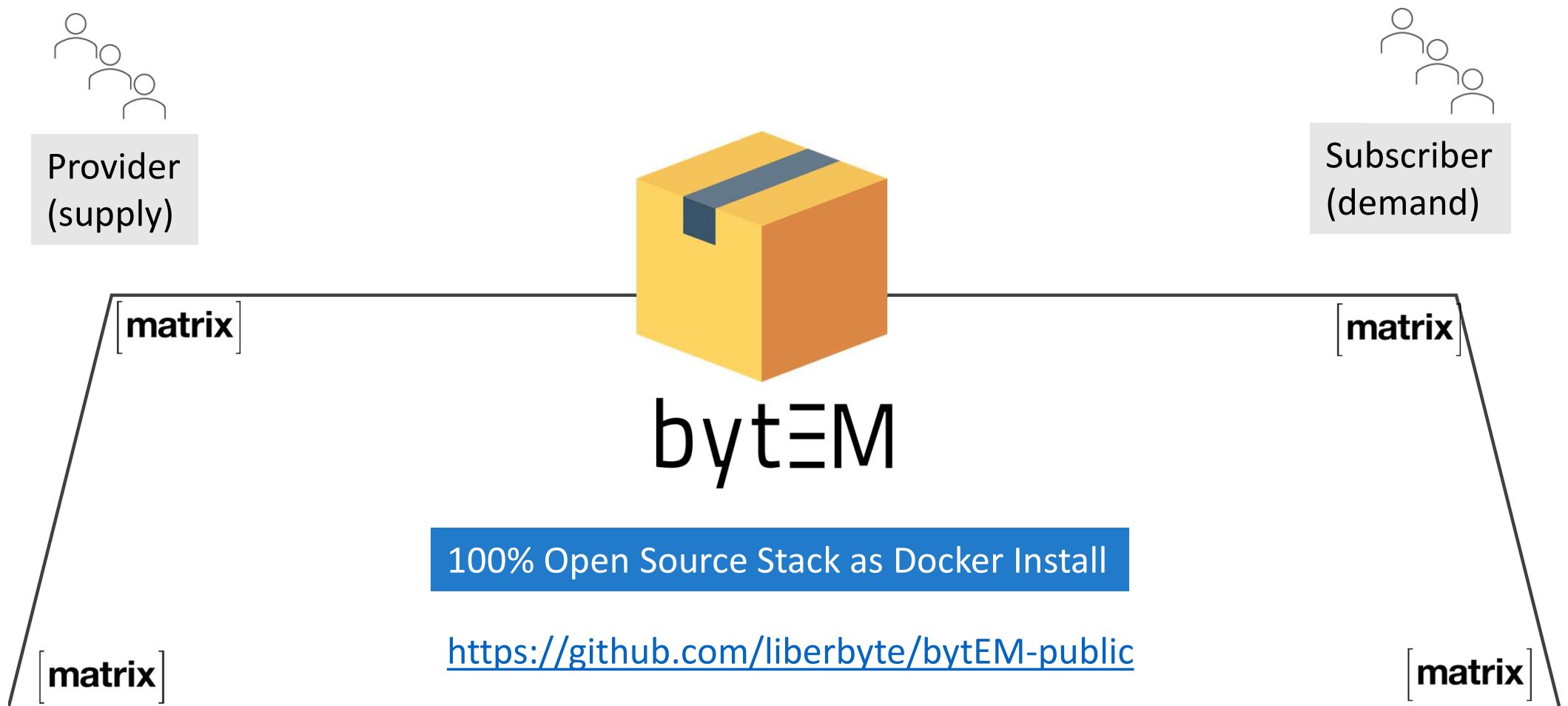
The need to exchange data is greater than ever...

How to enable exchangeable Data Products & Services?

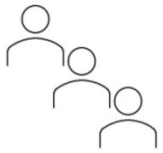


Solution: exchangeable data rooms + business (domain) context + interoperable architecture.

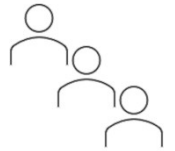
Liberbyte's **bytEM**



**World needs to connect supply & demand i.e.
“match providers to subscribers” for data**



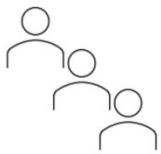
Provider
(supply)



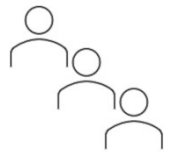
Subscriber
(demand)



The **internet and HTTP(s) layer** are already there for connecting parties...



Provider
(supply)

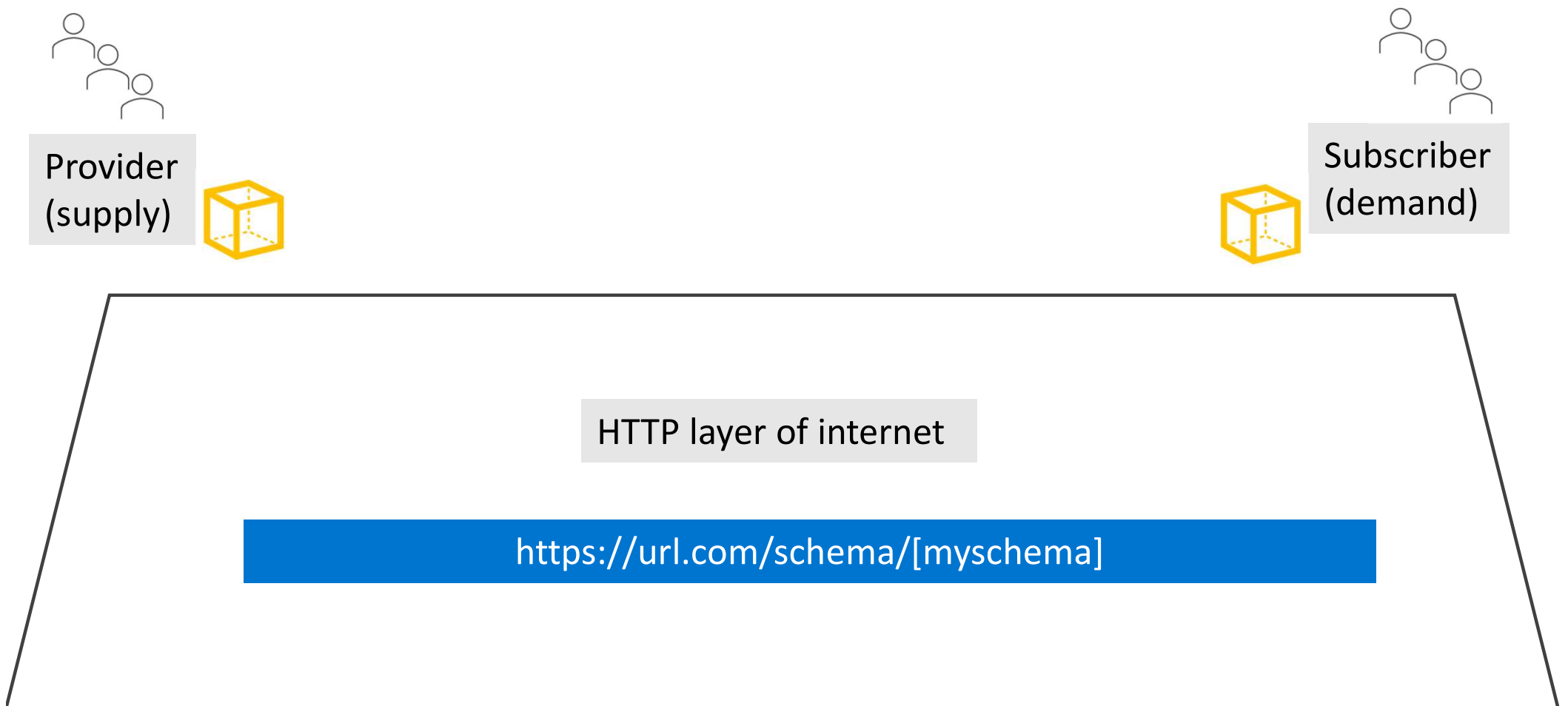


Subscriber
(demand)

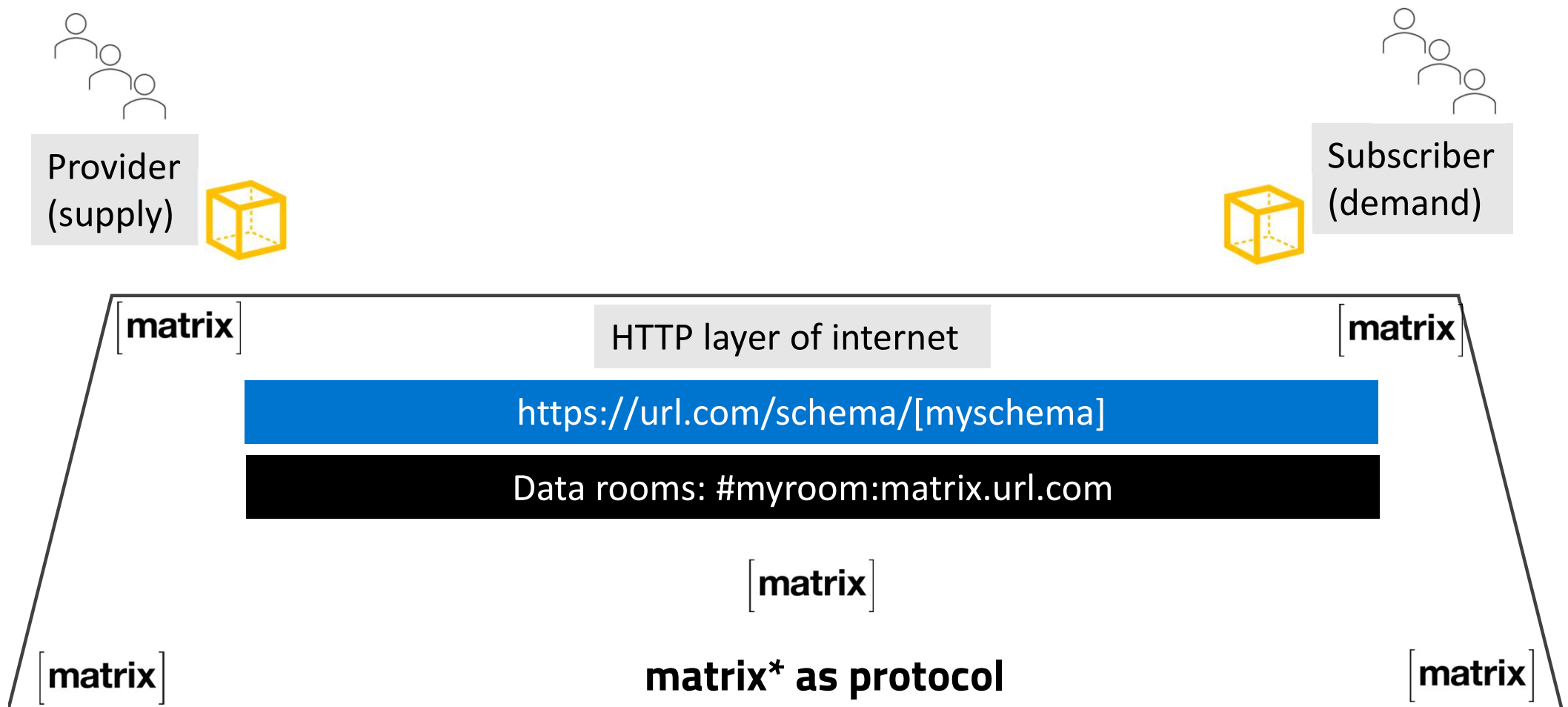


HTTP layer of internet

...yet you still need to tie the business and exchange semantics to (web2) / URL system...

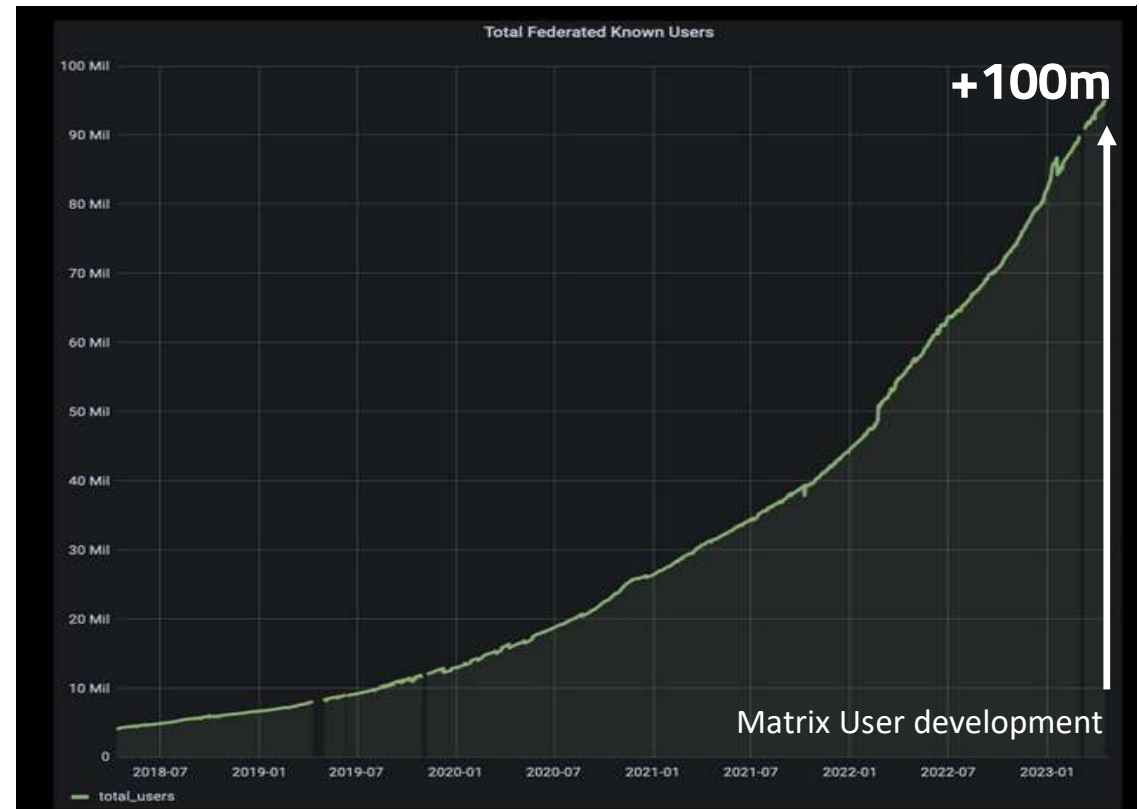


...and then mix in globally **accessible data rooms**,
using **standard communication protocol** [matrix]

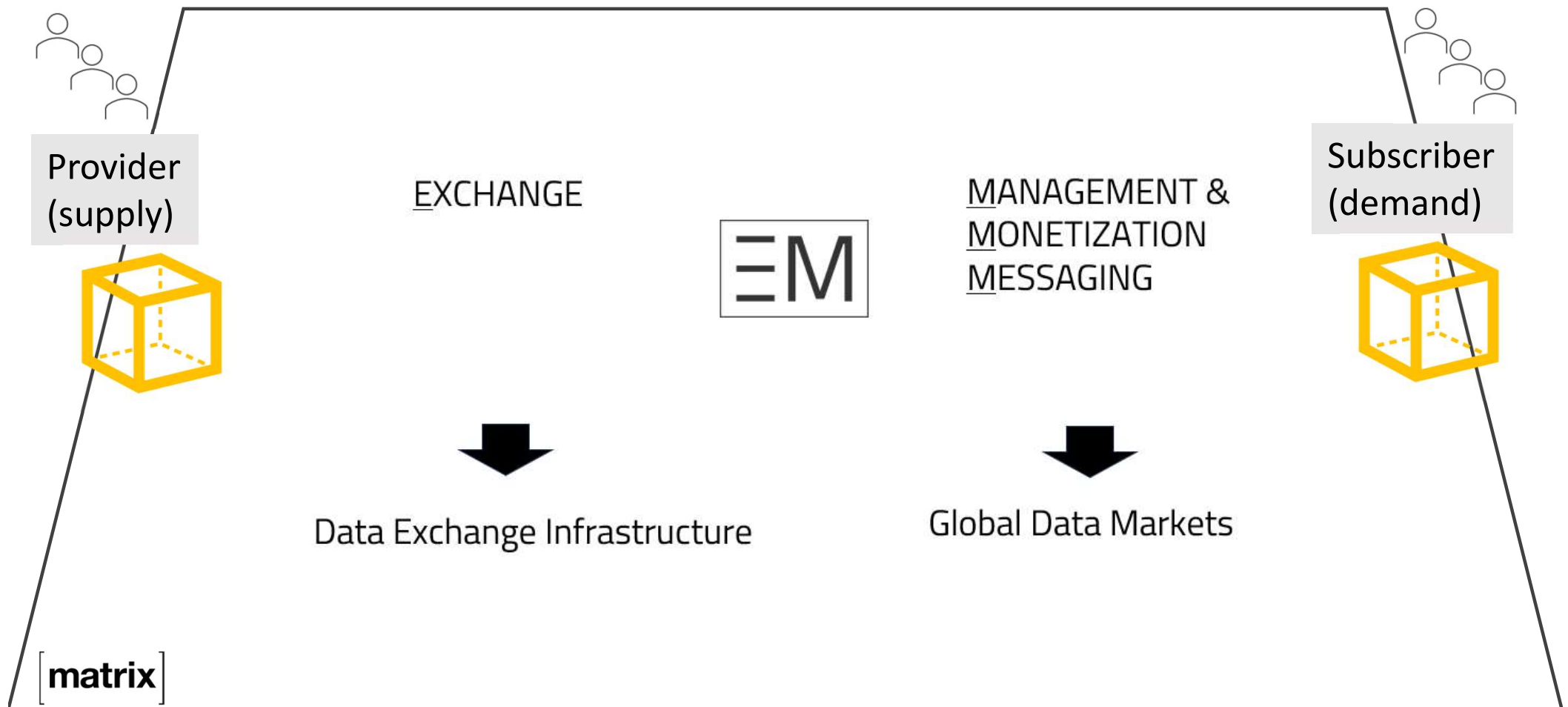


Liberbyte's bytEM builds on [matrix] standard* (with +100m users)...

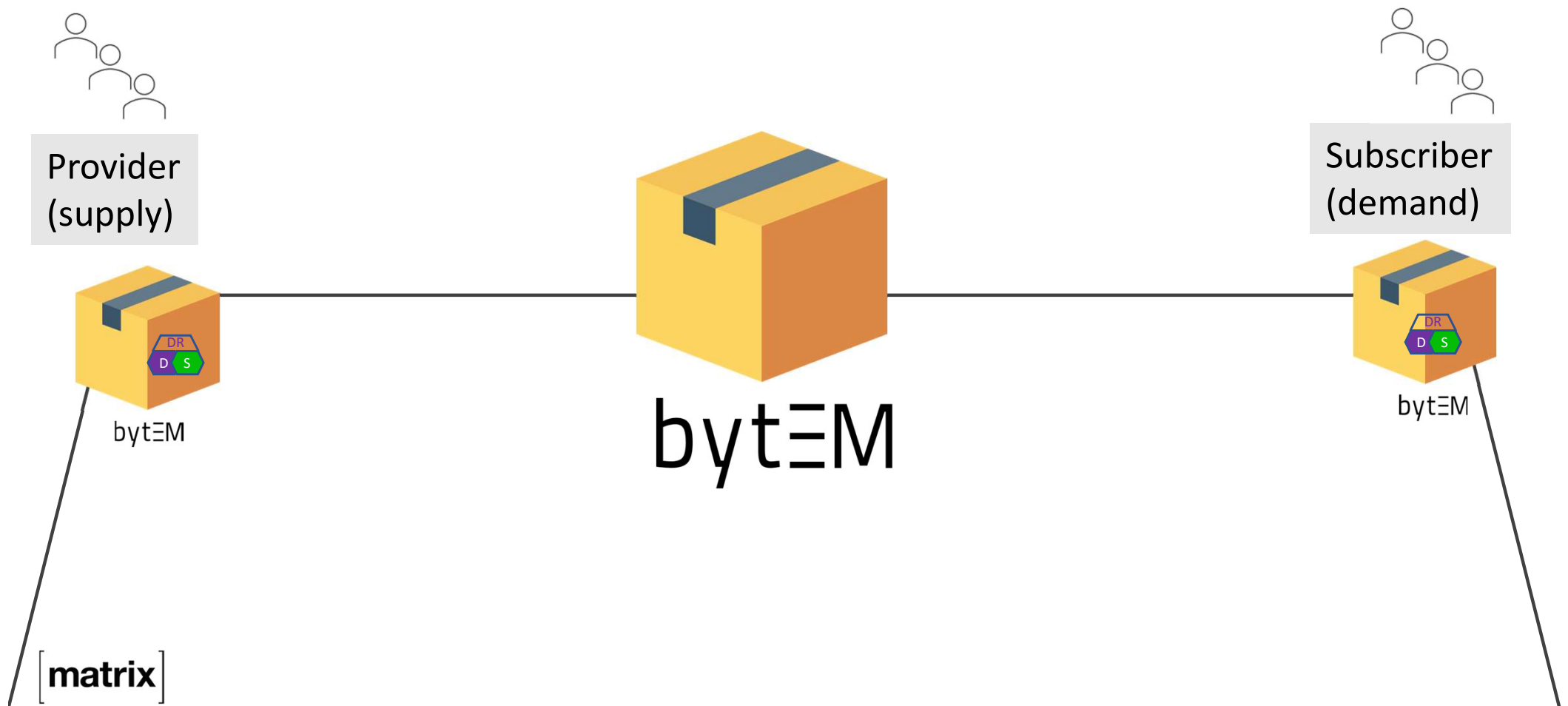
- Open-source project for secure, decentralized communication
- +100m users, ~17m rooms, ~64k servers
- Matrix is Liberbyte's technical platform engine and enables open & federated data exchange



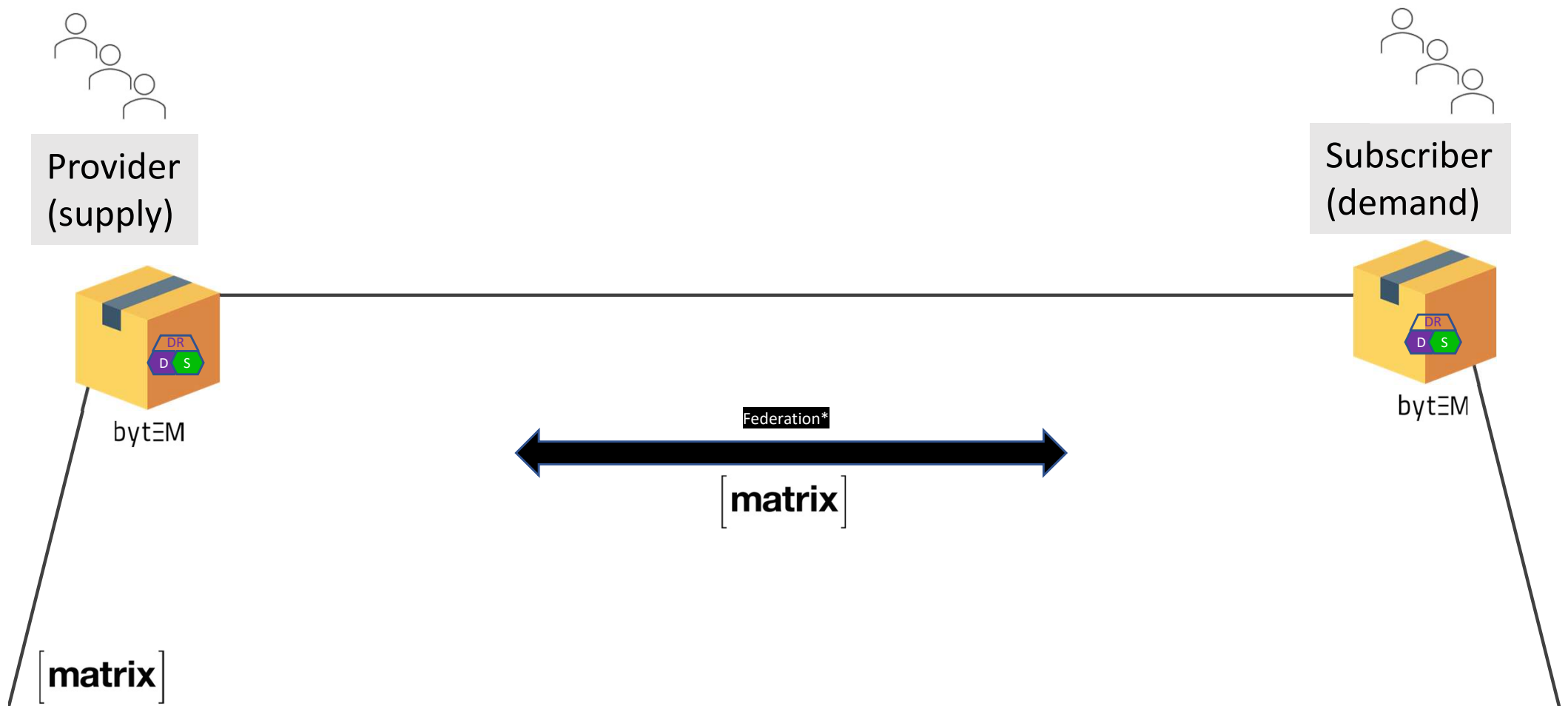
...hence enables bytEM to **Exchange, Manage, Monetize and Message** data



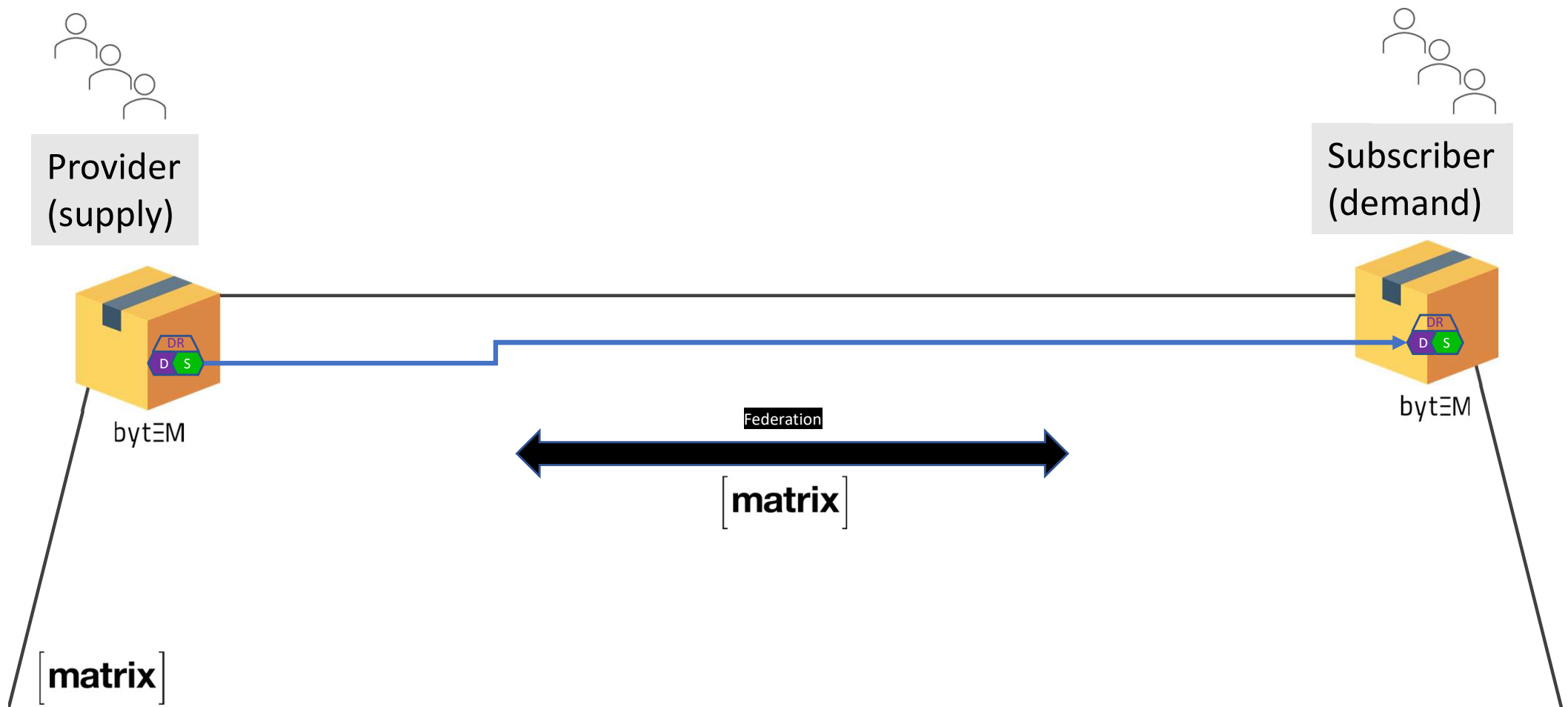
bytEM as 100% opensource solution for any individual or organization...



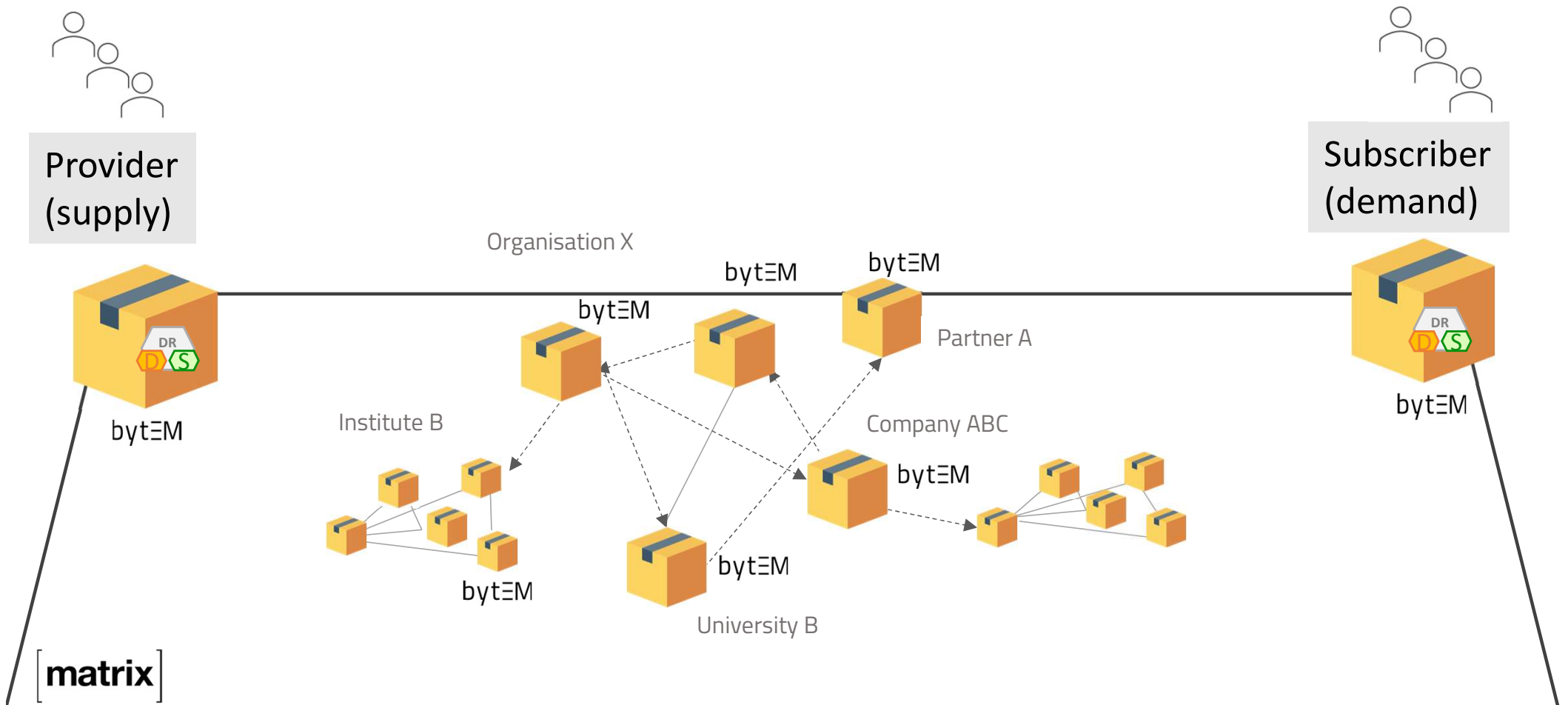
to connect data supply & demand over matrix's federated network*



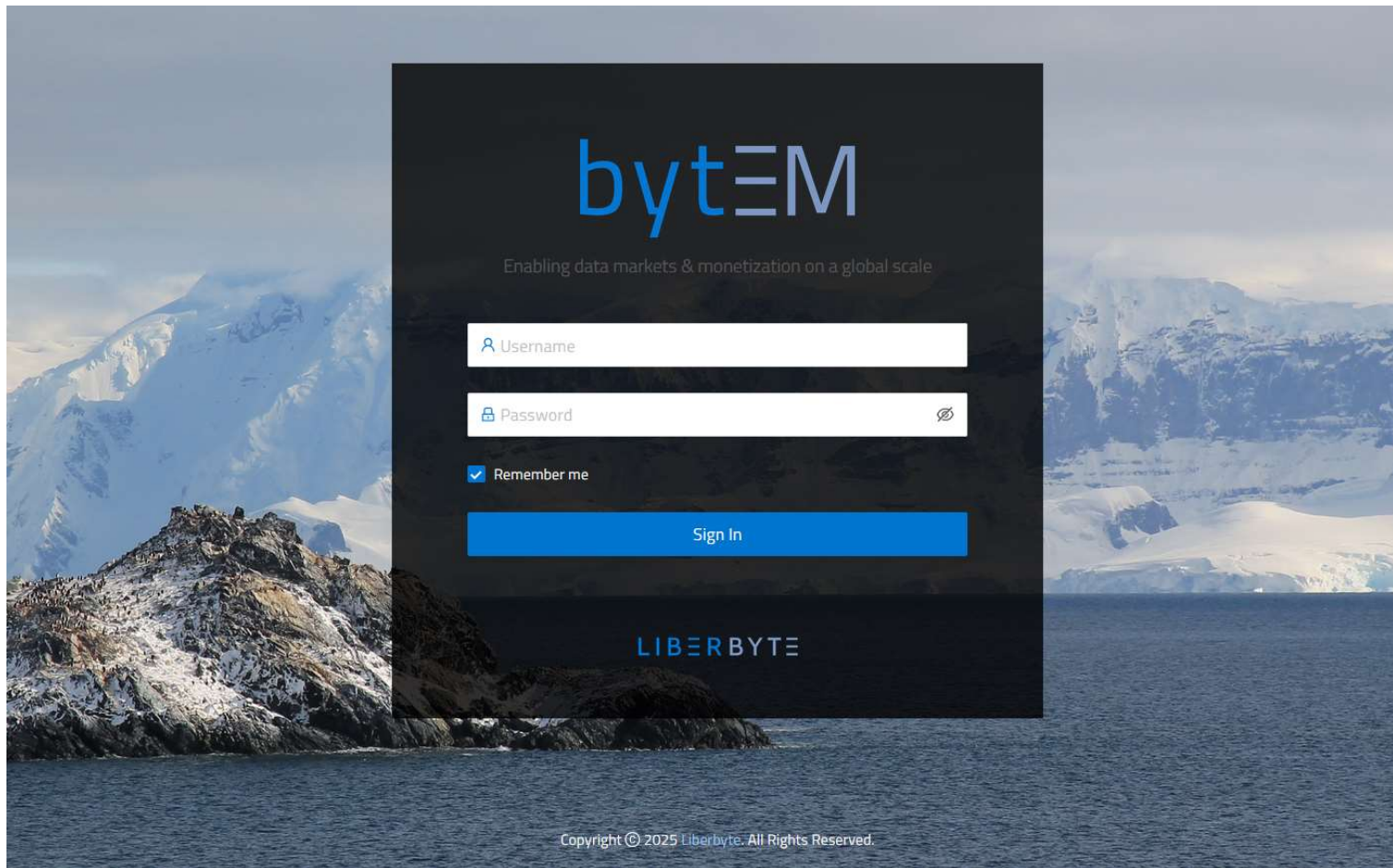
...enabling **data (supplies)** to be **shaped into data (demand) products and exchanged...**



...via decentralized Network of bytEMs (globally)



bytEM live demos @ request



For bytEM Partners

Where are we on the journey?

- Next iteration of **bytEM** launching in November 2025.
- AGPL public version from 10/2025: <https://github.com/liberbyte/bytEM-public>

What are we looking for?

- **bytEM** pilots on non-commercial basis for NGOs/communities/universities/public authorities.
- **bytEM** product adoption for real scientific data management / exchange and discovery problems including applying AI (of your choice) with active / ongoing user feedback

Abstract

Abstrakt - DE

- **bytEM** ist eine offene, modulare Plattform für das Datenmanagement, die dezentrale Datenhoheit mit zentralen Standards vereint. Organisationseinheiten behalten die Kontrolle über ihre Datenräume und bestimmen selbst, welche Daten sie wie veröffentlichen – innerhalb eines Rahmens aus gemeinsam genutzten Metadaten-, Lizenz- und Workflow-Standards. Besonders im Fokus steht dabei der kontrollierte Datenaustausch: **bytEM** ermöglicht die sichere und flexible Zusammenarbeit zwischen Einheiten und externen Partnern, z. B. durch projektbasierte Datenräume mit fein justierbarem Zugriffsmanagement. Daten können automatisiert oder „on-demand“ publiziert, geteilt und kombiniert werden – auch KI-gestützt oder als dynamische Datenprodukte. Dabei unterstützt **bytEM** sowohl interne Workflows als auch föderierte Netzwerke und Drittsysteme. So wird kollaborative, transparente und reproduzierbare Arbeits-/Datenmanagement basis auf Basis eines flexiblen Daten-Ökosystems realisierbar – ohne Daten aus der Hand zu geben.

Abstract EN

- **bytEM** is an open, modular platform for data management that combines decentralized data ownership with centralized standards. Organizations maintain full control over their data spaces and decide how and what to publish – all within a shared framework of metadata, licensing, and workflow policies. A key focus is on controlled data exchange: **bytEM** enables secure and flexible collaboration between internal teams and external partners via project-specific data spaces and customizable access control. Data can be shared, published, and combined either automatically or on-demand – including AI-supported or dynamically generated data products. **bytEM** supports both internal workflows and federated networks, allowing integration with third-party systems. This makes collaborative, transparent, and reproducible data exchange / management possible – without giving up control over the data.

LIBERBYTE

FREE YOUR DATA

website: www.liberbyte.com

bytEM intro: www.liberbyte.com/bytEM.html

bytEM install: <https://github.com/liberbyte/bytEM-public>

matrix room (help): <https://matrix.to/#/#bytem-install-admin:matrix.liberbyte.com>

contact: info@liberbyte.com