Online Analytics Processing Platform

Cluj-Napoca Dataspace Use-Case

Mihai Hulea

DELPHI concept

DELPHI focuses on the strategic dimension of **integrating passenger and freight transport** in a single system, working towards integrating sectors, harmonizing data, and leveraging advanced methodologies, to transform transportation systems, for a sustainable future.

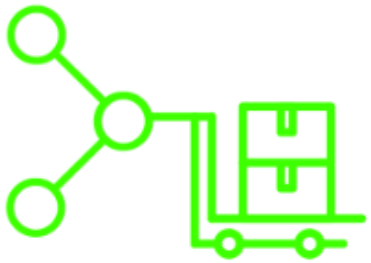
1st pillar
Governance, Ecosystem specification

2nd pillar
Architecture, Data, Processing, Optimisation

3rd pillar
DELPHI Validation activities through realistic pilot demonstrations

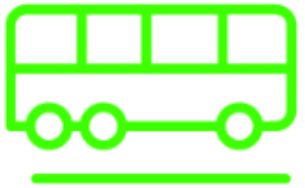
DELPHI use-cases

DELPHI's federated ecosystem will be extensively evaluated in real life settings through four pilot demonstrations across the participating transportation networks located in Spain (**Madrid**), Greece (**Athens and Mykonos**), and Romania (**Cluj-Napoca**).



USE CASE #1
Multimodal transport for a Sustainable LMD supported by blockchain **for sharing economy** in the e-commerce Channel (Spain)

USE CASE #2
Integrated freight and passengers' models and **data sharing framework** in the Attica region (Greece)



USE CASE #3
Integrated freight and passengers' models and **data sharing framework** at the island of Mykonos (Greece)

USE CASE #4
Integrated passengers' models and **data sharing governance framework** in the Cluj-Napoca Metropolitan Area (Romania)

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Cluj-Napoca Municipality

Current Status & Issues

- **Fragmented IT Systems**: Data silos across transportation services (bus, tram, bike-sharing, parking).
- **Limited Integration**: Difficulty accessing and analyzing multimodal transport data or build new services on top of the existing ones.

Benefits & Objectives

- **Unified Data Integration**: Analytics of multimodal transportation data.
- **Data-Driven Decision Making**: Real-time insights for better urban transport management.
- **Public Transparency**: Open data access and improved citizen engagement.

Cluj-Napoca – Urban Context

•**Location**: Northwestern Romania; economic and academic hub of Transylvania

•**Population**: ~330,000 residents (metropolitan area: ~400,000+)

•**Area**: ~180 km²

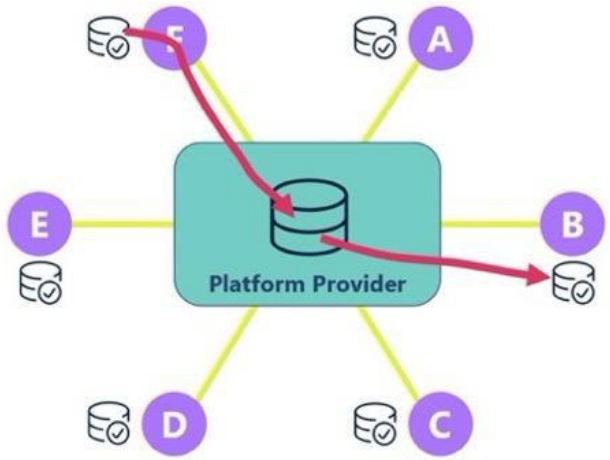
•**Economic Profile**: Major IT, education, healthcare, and services center

•**Transport Infrastructure**:

- **Public Transport**: Extensive bus, trolleybus, and tram network (CTP Cluj)
- **Road Network**: High urban traffic; city ring road and highway access (A3)
- **Rail**: National and regional train connections (CFR)
- **Air**: Cluj International Airport – second busiest in Romania

Data Sharing Models

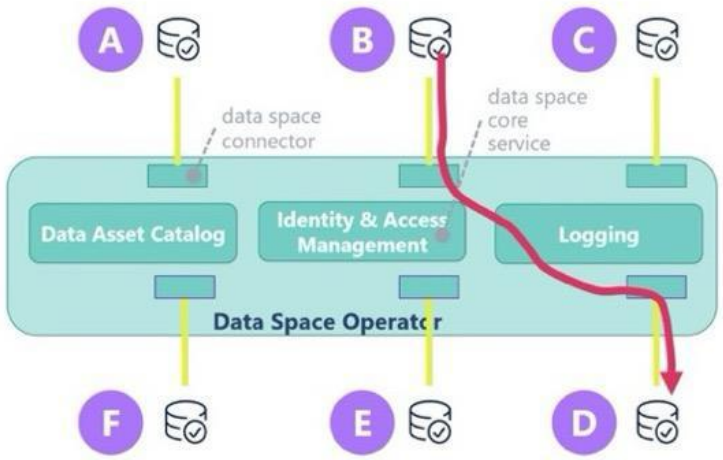
Data Platform



lead concepts: «API»

A **(product) platform** is a set of elements (components, roles, processes, relationships, and interfaces) with a uniform architecture serving an organization as the basis for products and services for different customers.

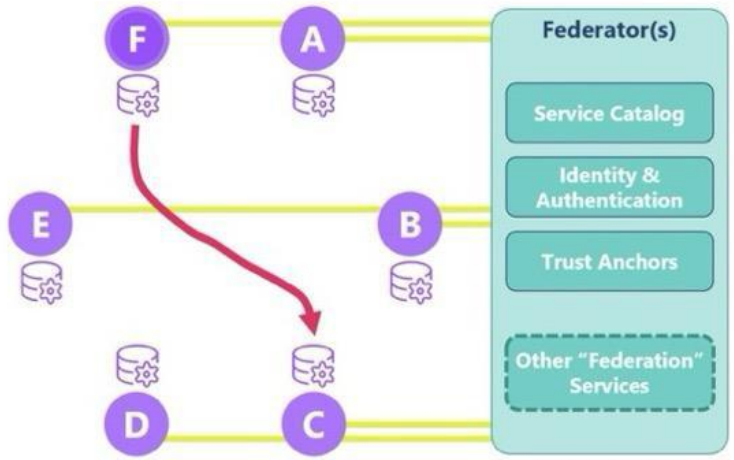
Data Space



«data asset»

A **data space** is a coordinated set of (i) technical standards, (ii) organizational policies, and (iii) core services under a (iv) specified governance model to enable and facilitate data exchange between its participants.

(Data) Ecosystem



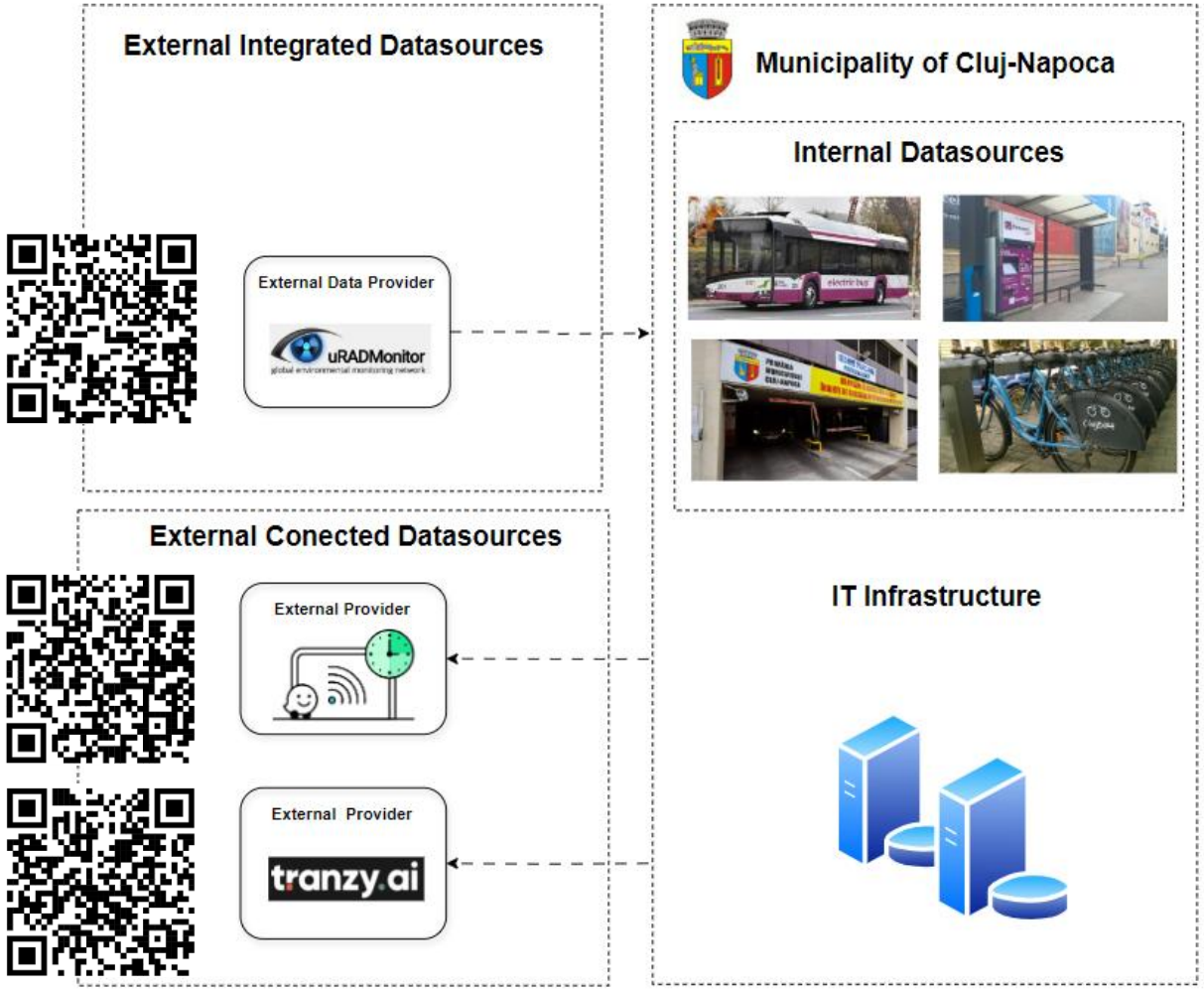
«service»

An **ecosystem** is the alignment structure of the multilateral set of partners that need to interact in order for a focal value proposition to materialize.

data warehouse (DWH) • data lake • data lake house • cloud data warehouse • data mesh • data hub • industry platform • one/two-sided platforms

Source: Strnadl & Schöning (2023). Data platforms, Data Spaces, and (Date-) Ecosystems. in: Weber (Ed.), Data Governance. Springer

Analysis of Datasources and Legacy Systems



Internal Datasources

- Provided by or under control of internal IT systems
- Exposed by internal IT systems

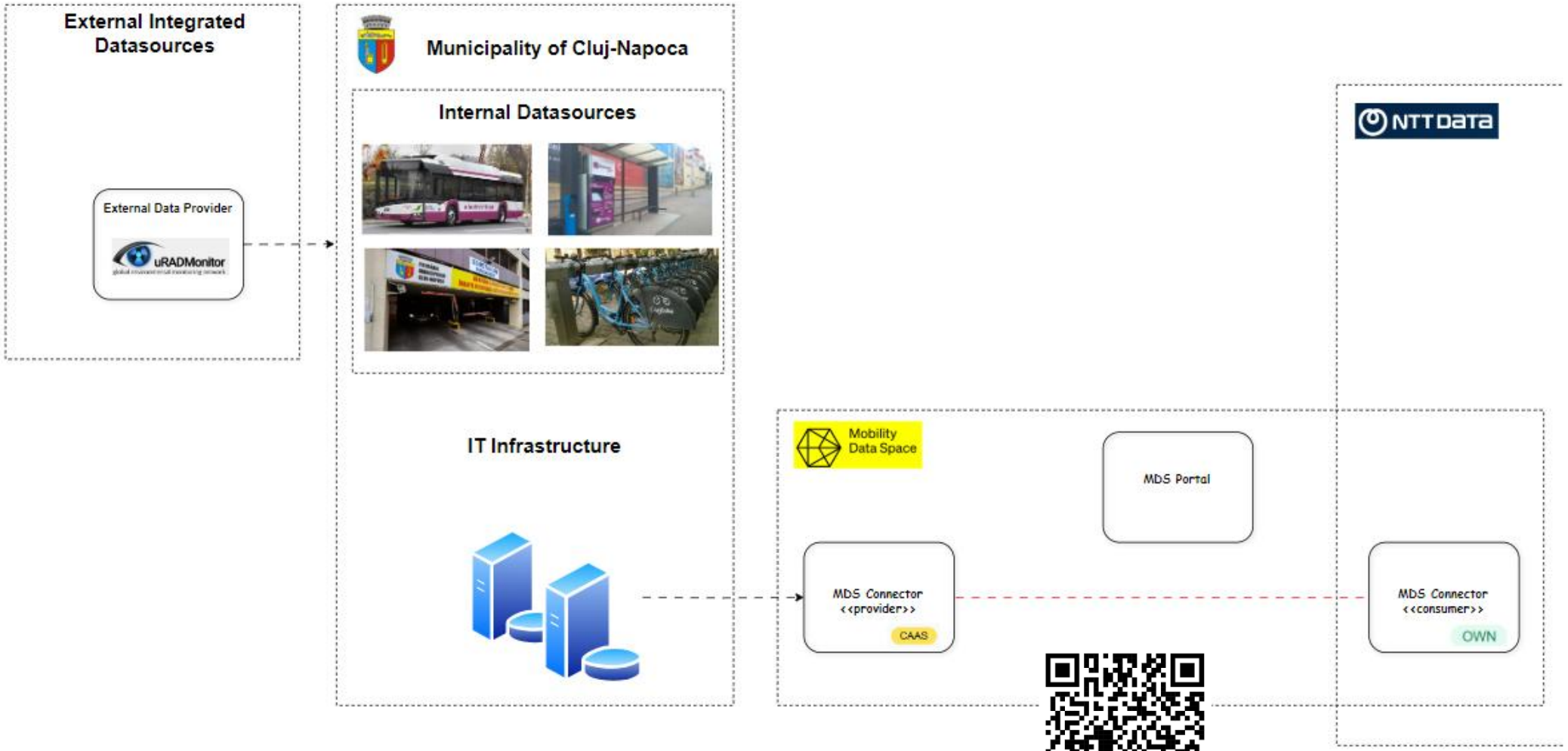
External Integrated Datasources

- Provided by external systems
- Integrated with internal IT systems which can be exposed or provided by these

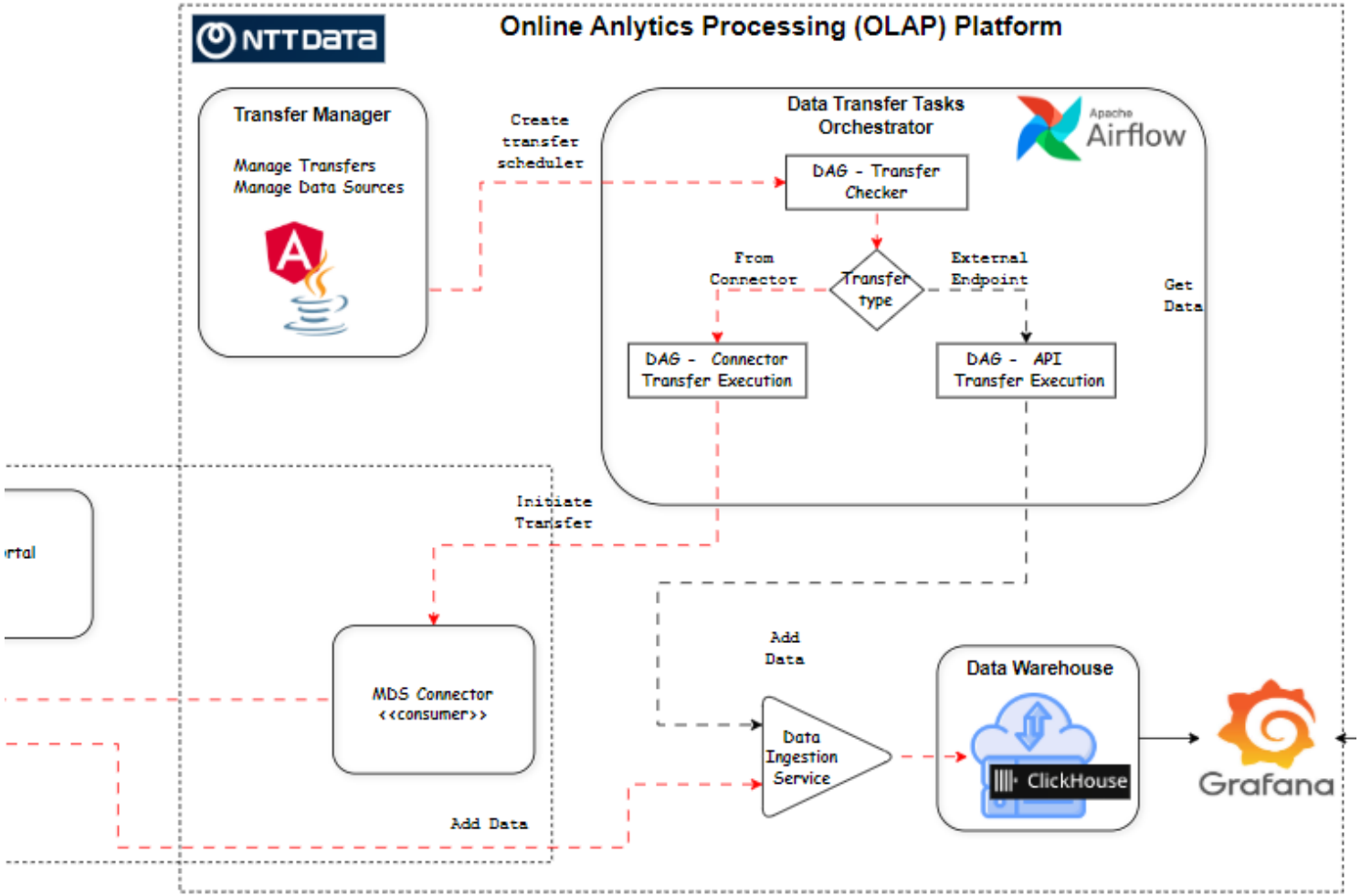
External Connected Datasources

- Provided by external systems
- Some integration exist but data are not exposed by internal IT systems

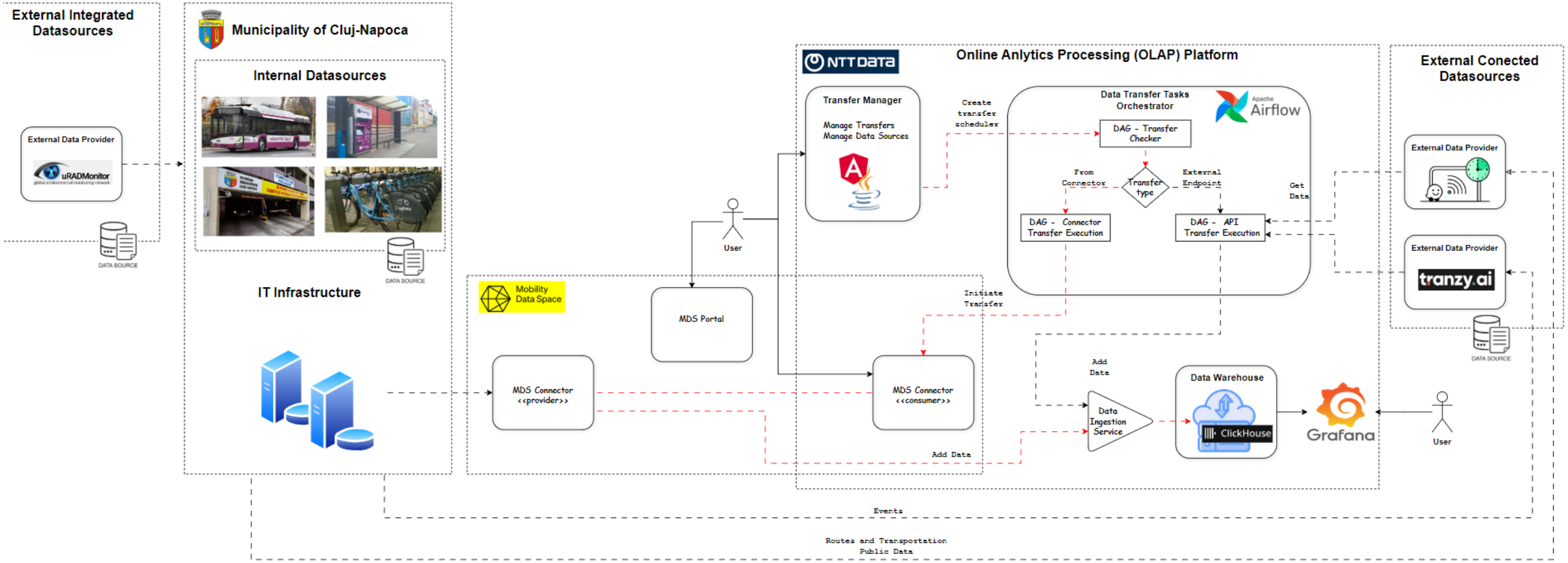
Dataspace Governance



Online Data Analytics Platform



Complete Solution & Demo

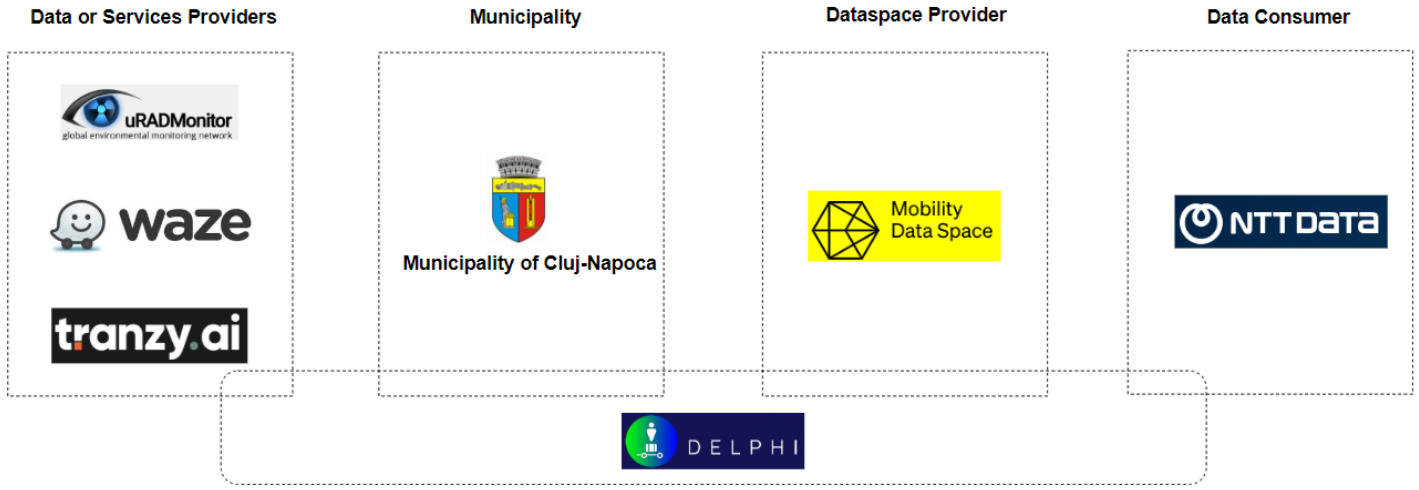


Conclusions

- **Platform Development Status:**
  - Currently under development; full evaluation planned as part of DELPHI WP5 demonstration activities.

- **Effective Collaboration:**
  - Successful implementation **through strong partnership with Cluj-Napoca Municipality**.
  - Municipality demonstrated openness **and proactive approach towards adopting new technologies**.
    - Join MDS
    - Access Waz Partnership Program

- **Technical Integration:**
  - Close **cooperation with Cluj-Napoca's IT department** to **analyze legacy systems** and available data sources.
  - **Joint execution of administrative and technical procedures** for joining the Mobility Data Space, configuring connectors, and data integration.



THANK YOU