

# IOTICS

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How can we share and manage  
big ESG data?



“Humanity has a choice:  
Cooperate or perish”

United Nations Secretary-General  
António Guterres – COP27



# How FAIR are the UK's national geospatial data assets?

Assessment of the



## Interoperable: Data is still largely supplied for distinct systems

Overall, we assessed the current approach towards interoperability applied to Partner Body data as **Attention Required**. To support interoperability many of our Partner Bodies have begun to use unique feature identifiers in data sets and provide data in multiple common data formats. These are, however, predominantly aligned to the organisation's data. This means that while interoperability is good when looking through the lens of an individual organisation, it is not when looking through the lens of a holistic UK geospatial data supply network and potential future demand.

Widening data exchange to support interoperability between organisations is a persistent challenge, growing as the breadth and depth of data driven decision making increases. The move towards open standards is supporting wider syntactic interoperability, but the richness and diversity of geospatial data means semantic interoperability can still be complex and nuanced. Fundamentally geospatial data is one community's view of the world and this view may not be shared or understood by another community with whom data is shared.

### Strengths and good practice

**Multiple formats for data supply**  
Most organisations' data is accessible in multiple formats. However, the selection of

formats, for example GML, CSV, Shapefile, TIFF or GeoPackage, offered does differ between organisations. A recent survey conducted by the OS as part of the [PSGA standards work](#) showed that the most common geospatial data format is Shapefile followed by GeoPackage. Most Partner Bodies data services provide at least one (and often many) open data formats. Open file formats enable end users to ingest data more easily and transform data from common geospatial formats into other formats such as .DGN format used within computer-aided design (CAD) packages.

**Common approaches to referencing**  
Across Partner Bodies there is increasing use of unique identifiers, such as [UPRN](#) and [Unique Street Reference Number \(USRN\)](#), to provide the means of linking different data sets together more accurately and rapidly by both humans and machines. For example ownership data held by HMLR incorporates the UPRN, which can be linked via [AddressBase](#) to the underlying building in [MasterMap](#). Increasing the inclusion of common identifiers within data sets is a key step to enabling users to bring data together to gain greater geospatial insight and intelligence.

The Geospatial Commission worked with GeoPlace, the Local Government Association, Improvement Service and OS on the opening up of UPRN and USRN register data.

This enabled UPRNs and USRNs to be released under an Open Government Licence as part of the Public Sector Geospatial Agreement agreed by the Geospatial Commission in 2020. UPRN and USRN are recommended by the Open Standards Board for use by all government data relating to addresses or streets. Furthermore, the Geospatial Commission as part of the DIP work recently assessed the concept of [Correlation Relationships](#). See Figure 6.

### Improvement areas and constraints

**Cost benefit for cross domain system interoperability**  
The specification of what good system interoperability looks like between Partner Bodies and their wider market is not always obvious. As a result, Partner Bodies are not always able to plan for interoperability and can struggle to appraise the benefit versus cost of designing data interoperability outside of their core user base. Whilst this is understandable from an organisational perspective, it potentially misses opportunities for data users in other sectors who would like to use the data but struggle. Outside of government, the partnership between ESRI and Autodesk is seeking to solve the interoperability issues between the CAD and GIS domains as both collaborate when designing civil infrastructure in a building information modeling (BIM) environment.

### Domain specific approaches to system interoperability

Each of our Partner Bodies provide specific services aligned to their respective public task. For example, the Coal Authority manages coal mine asset data and also provides coal risk assessments and consultations to developers and homeowners. The drive towards net zero has seen interest in repurposing abandoned flooded coal mines for [mine source heating](#).

This has seen an increase in interest in the use of mine plans and data held by the Coal Authority from energy consultants, companies, researchers and the Coal Authority itself to support feasibility studies, drilling and testing for mine water heat schemes. This is an application that could not have been foreseen when the information was originally captured.

The difficulty lies in trying to identify and assign value to any future potential of our geospatial data. In some cases data may have limited use beyond its primary purpose and original domain. Consequently, re-engineering data to maximise its reuse may not be worth the time and cost. Our Partner Bodies are therefore mindful about where to invest in interoperability to generate the biggest impact for their community.

“...interoperability is good when looking through the lens of an individual organisation, it is not when looking through the lens of a common UK geospatial data supply network.”

# The future is uncertain

We must embrace complexity

- Need and ownership of asset information are disparate
- Stakeholders are diverse and fractured
- Information is siloed functionally and technologically
- Security fears prevent necessary innovation

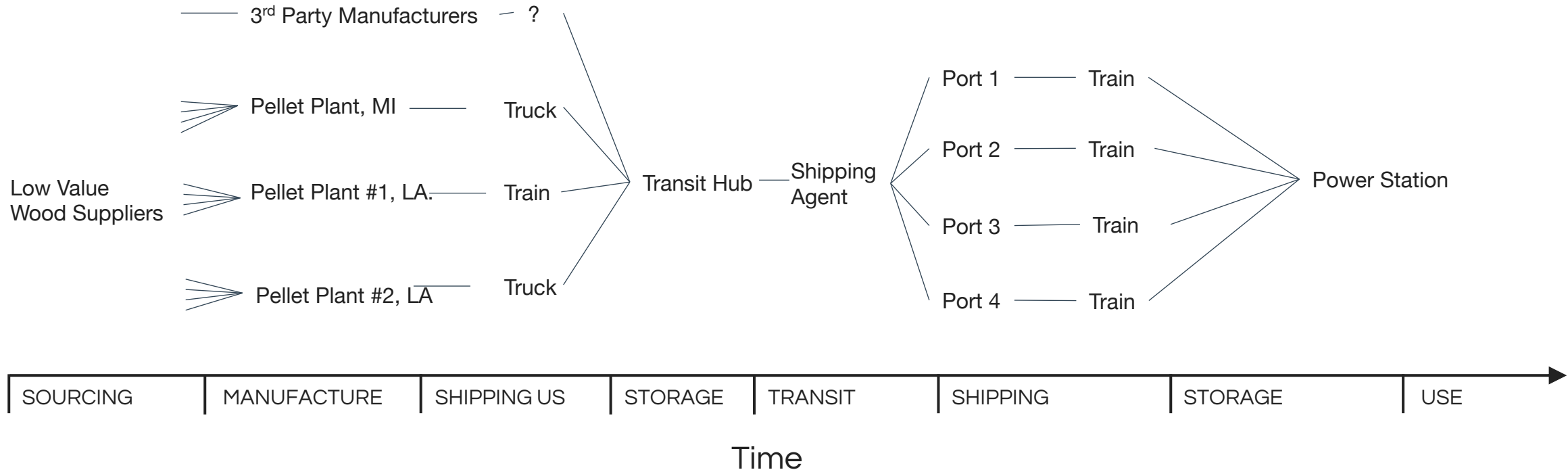
70%

of Business Partnerships fail  
(Harvard Business Review)



# Simplified Supply chain

*(with assumptions)*



# Lifecycle of a pellet

(or batch of pellets)





# SHAPE of ports

PIP first Net Zero port by 2050

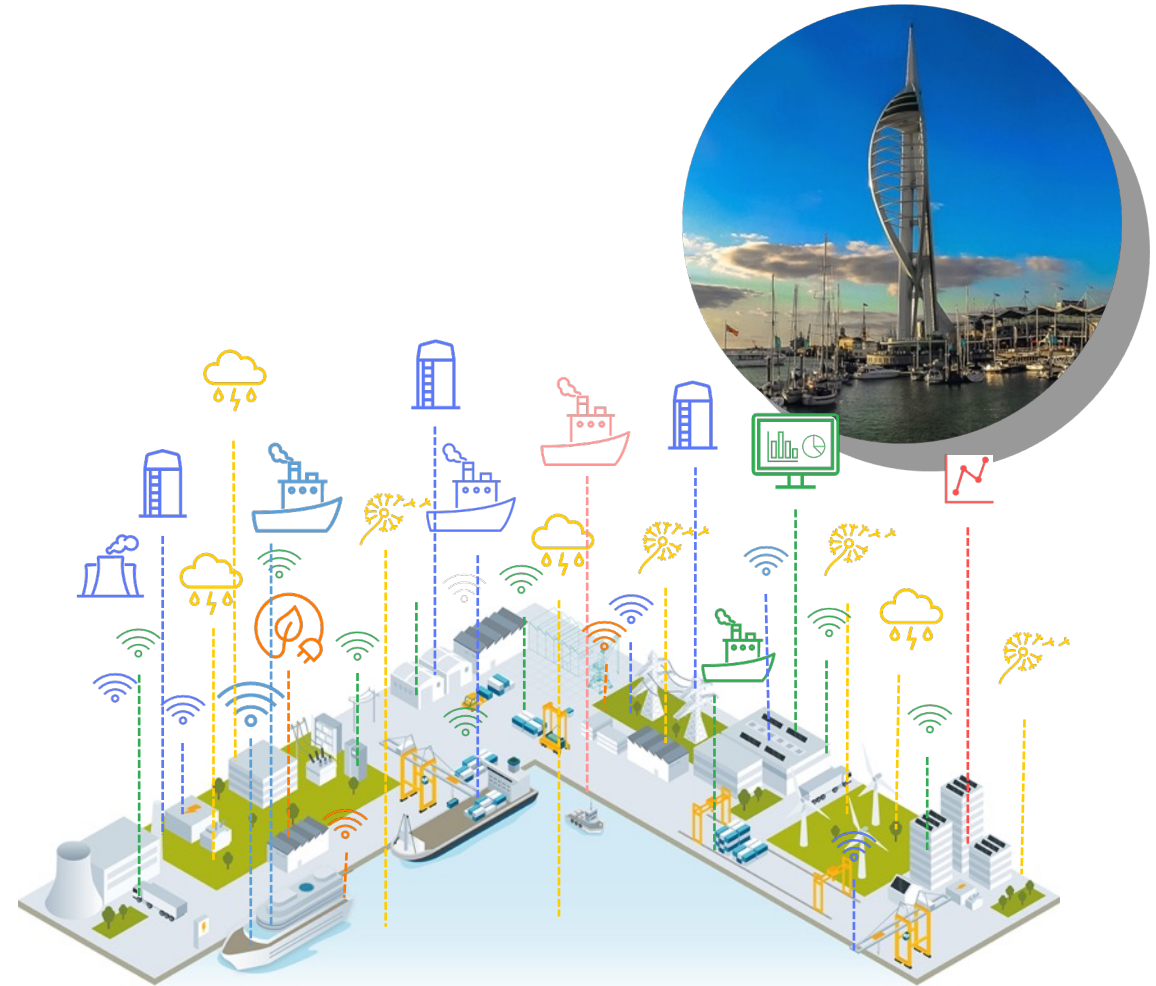
Maritime operations are crucial

Significant contributors to GHG emissions

New technologies offer potential

But what are the barriers?

Which intervention will deliver the greatest impact?

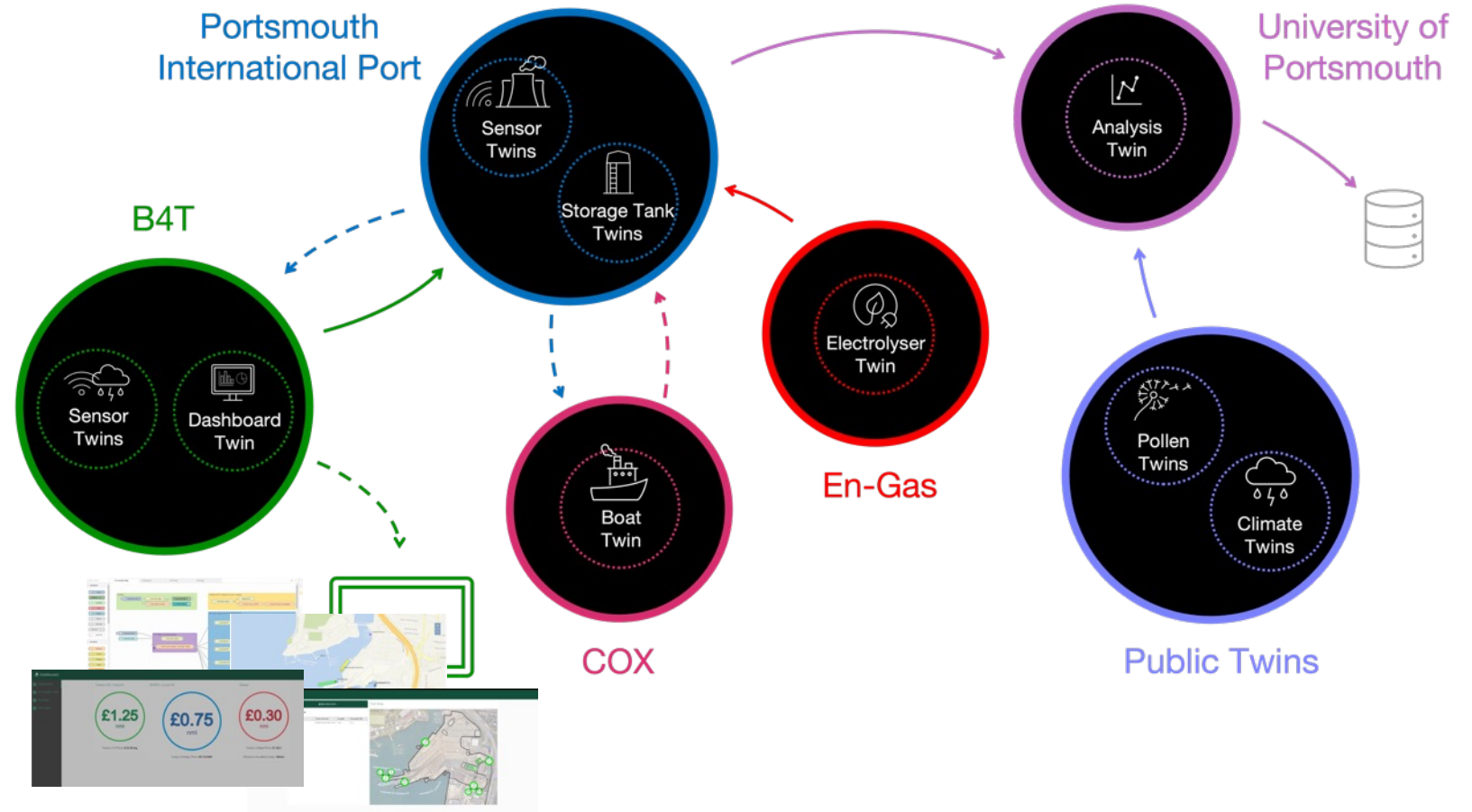


*Deliver a modular green hydrogen generation system & digital decision support tool for ports*

Learn at scale

Digitally optimise

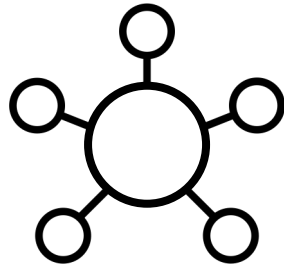
Transform business





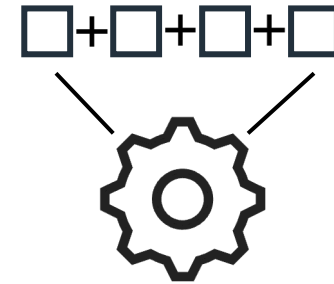
# Why words matter

Collaboration  $\neq$  cooperation



## Collaboration

Shared ownership  
and/or interests



## Cooperation

Separate ownership  
and/or interests

# Let's be clear

- Trust
- Confidence
- Flexibility



# Trust

- Open is vital...but
- Low trust/no trust ecosystems
- Work the way people do
- Prove and move



# Confidence

- We agree what we're talking about
- Machines interoperating with machines
- Right data, right time to right people
  - Not absolute velocity/veracity

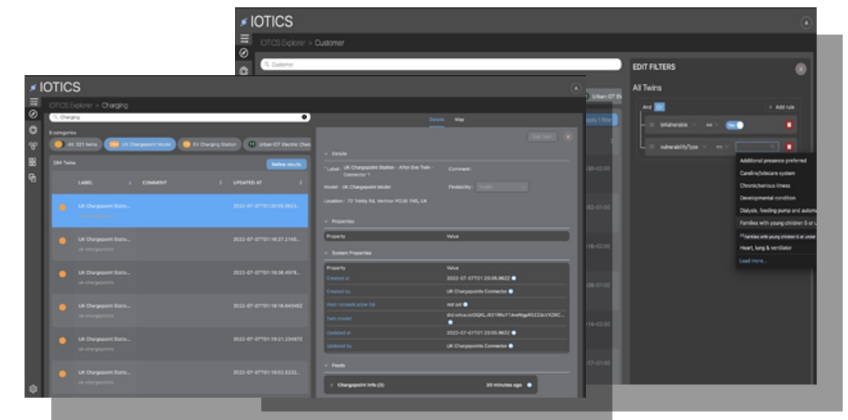
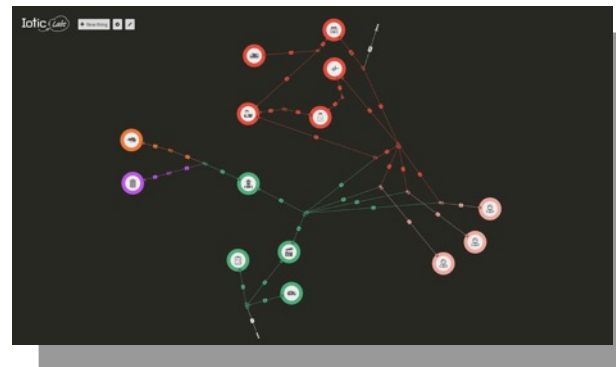
# Flexibility

- Patchwork data
- Patchwork partnerships
- Evolving requirements

# So...

Security fears delaying/preventing  
Silos - functionally/technologically  
Diverse stakeholders  
Need/ownership of assets is disparate

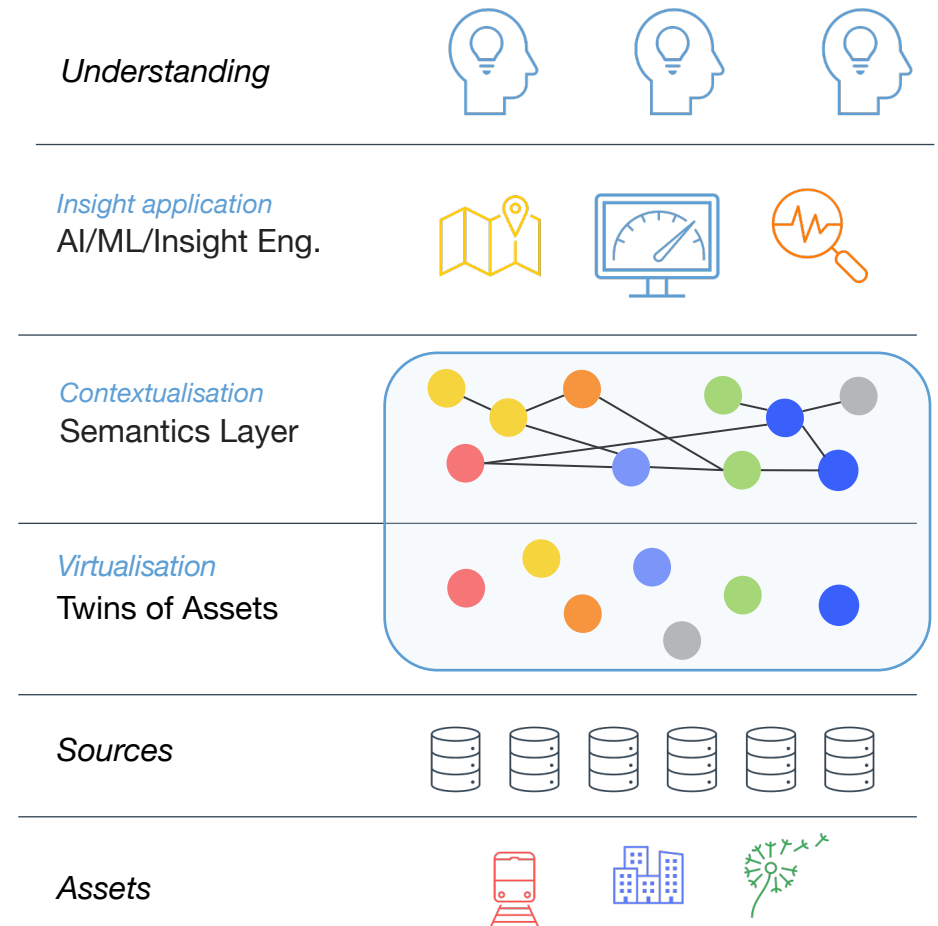
- ✓ Virtualise assets and their interactions
- ✓ Semantics enable machines to interoperate
- ✓ Decentralise federated architecture
- ✓ Owners retain control of their information





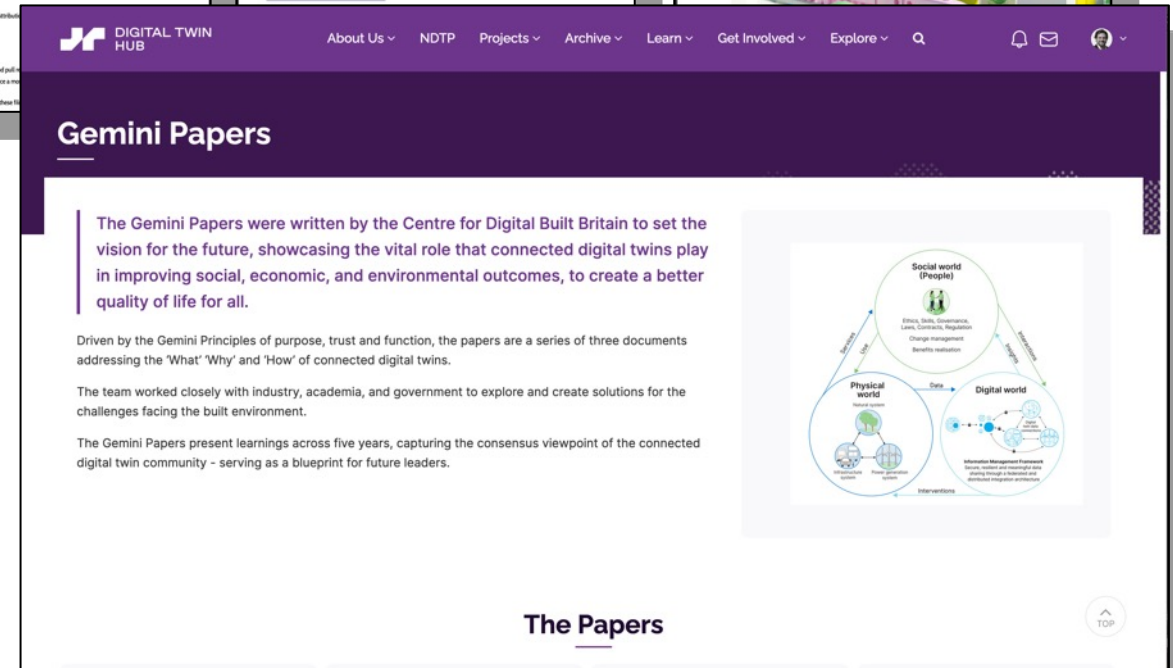
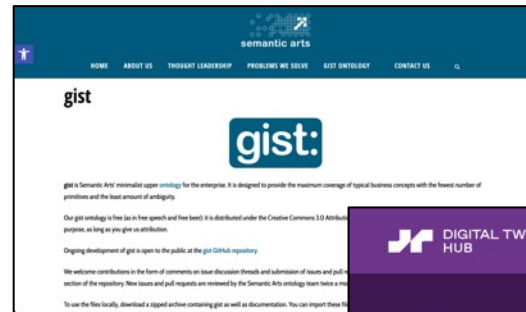
# What does that mean?

- Semantics
- Streaming data  
(incl. bypass)
- Twins



# Where is the action?

- FAIR
- Selective
- Finally not industry-specific
- Not a National Digital Twin  
...a nation of digital twins



# Summary

## Digital Collaboration

Difficult data governance

Limited to original use cases

Time consuming

Hard to add new partners

For people



## Digital Cooperation

Evolution of trust – your data your rules

Learn and adapt simply

Share in days not months

Easy to add and remove partners

For machines to benefit people



JOIN US

DELIVERING DIGITAL COOPERATION

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