



GEMINI

TRUST, PURPOSE, VALUE AND CONNECTED DIGITAL TWINS

Digital Twin Hub Governance and Trust Working Group
December 2023

Executive summary

Why do we need a framework for setting up a Connected Digital Twin as a purpose driven, value-creating, collaborative enterprise?

In this report, a Connected Digital Twin refers to a digital twin connected across organisational and sectorial boundaries.

Every Connected Digital Twin requires a clear purpose.

The value of a Connected Digital Twin depends on achieving the outcomes connected to its purpose.

Delivering successful outcomes requires long-term engagement and collaboration between stakeholders.

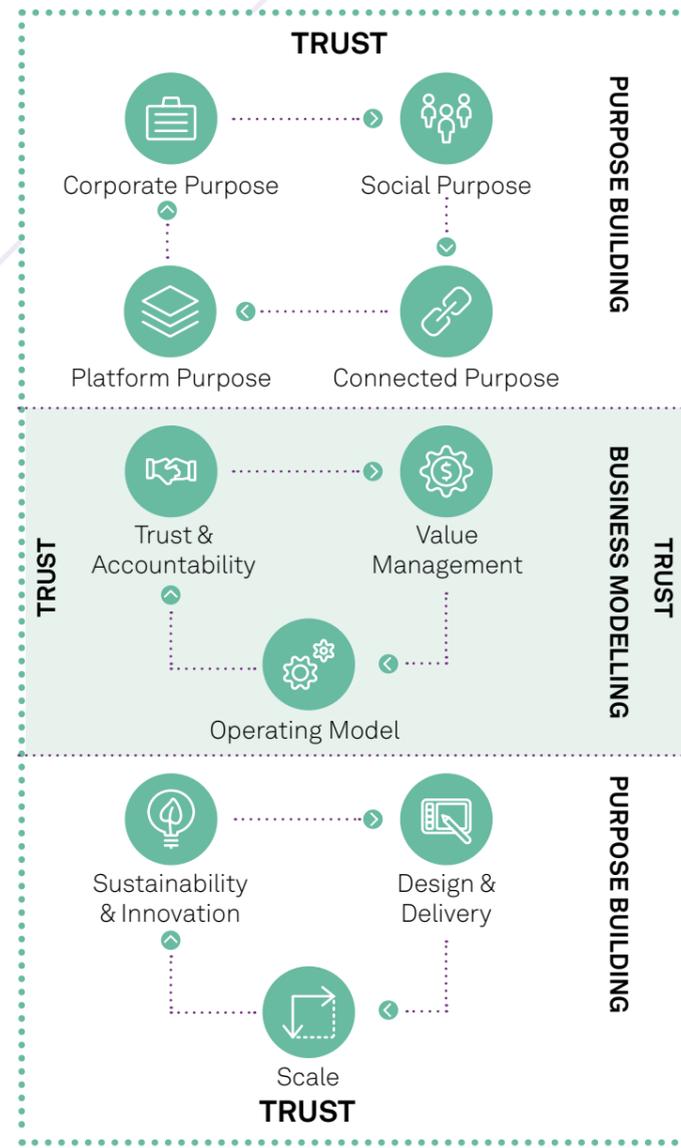
Stakeholders engage based on trust in the individual benefits, value and risk management delivered by their participation.

Trust is underpinned by a reliable operating model, strong stakeholder governance and transparent performance monitoring.

If its purpose is achieved and stakeholder value is delivered by a Connected Digital Twin then it should be financially self-sustaining.



(Ford, 2023)



What is the basis of trust?

In the context of a Connected Digital Twin, trust is comprised of these elements:



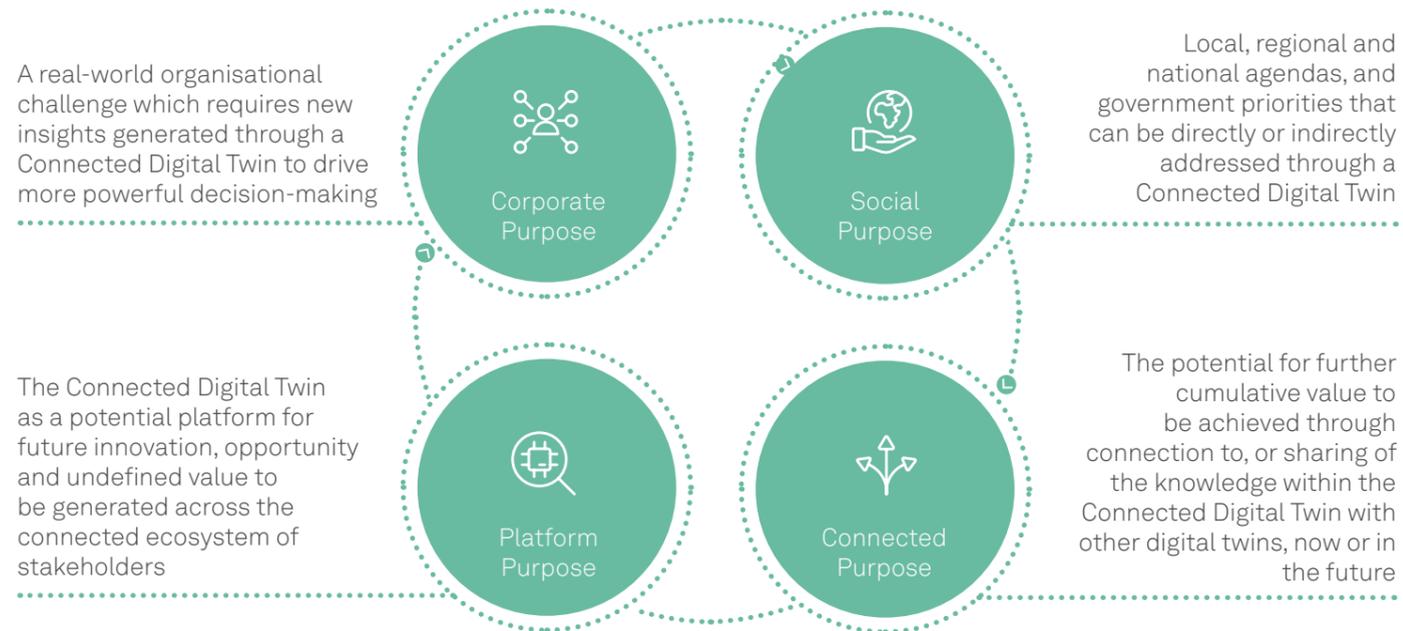
What is the purpose?

The purpose of the Connected Digital Twin is to address a specific challenge or problem.

The purpose defines the outcomes to be achieved by the Connected Digital Twin.

A Connected Digital Twin purpose driver may be corporate or societal but aligning purpose with wider corporate governance agendas increases likelihood of success.

Purpose drivers (these may overlap):



(Ford, 2023)

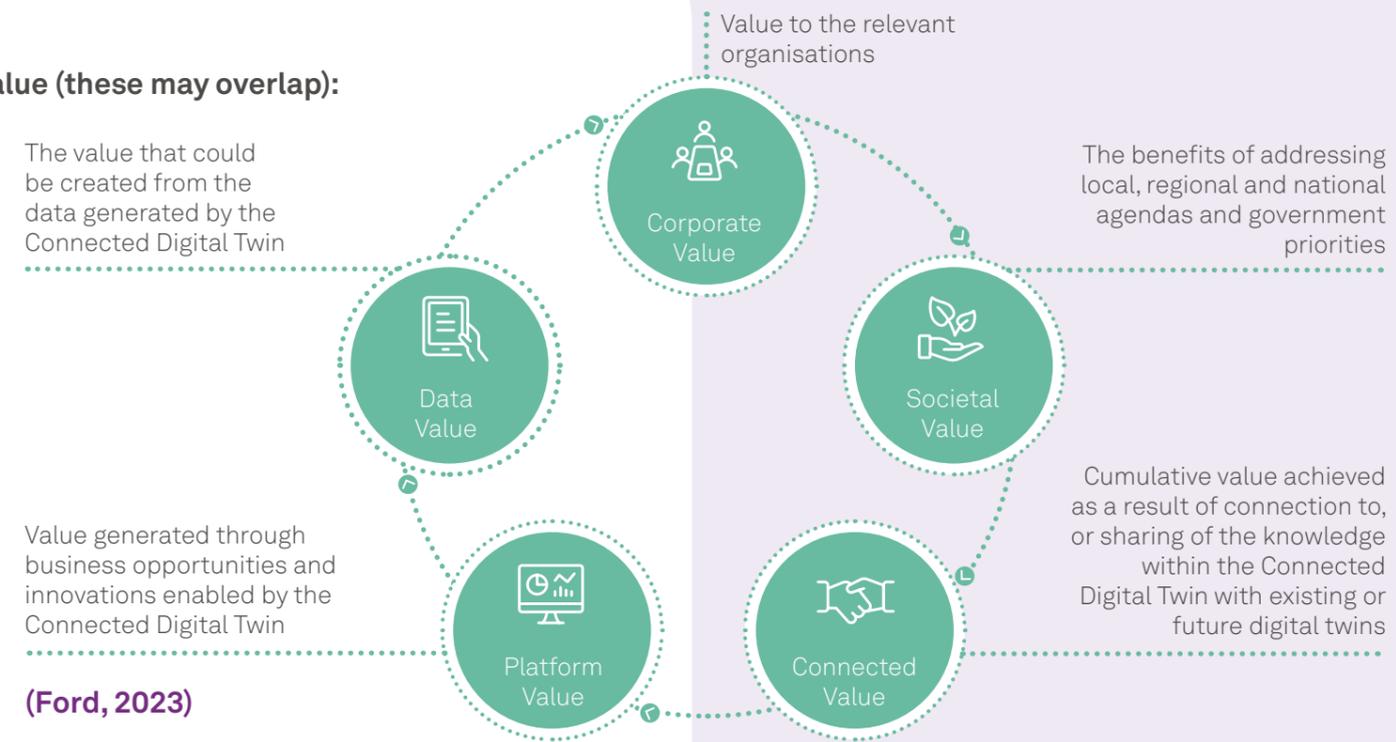
What is the value?

The value (benefit) delivered by the Connected Digital Twin meeting the purpose should be forecast for each participant.

Defining value enables individual and collected business modelling and supports the business case for the Connected Digital Twin. Value can be different, depending on each participant's characteristics.

The operating model must ensure that value (benefit) is received and perceived to be received by all participants.

Types of value (these may overlap):



(Ford, 2023)

Planning the operating model

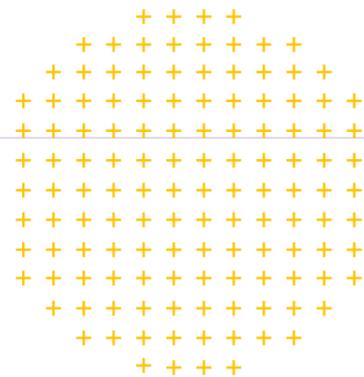
The operating model can be designed and mapped by asking the following questions:

Stakeholders

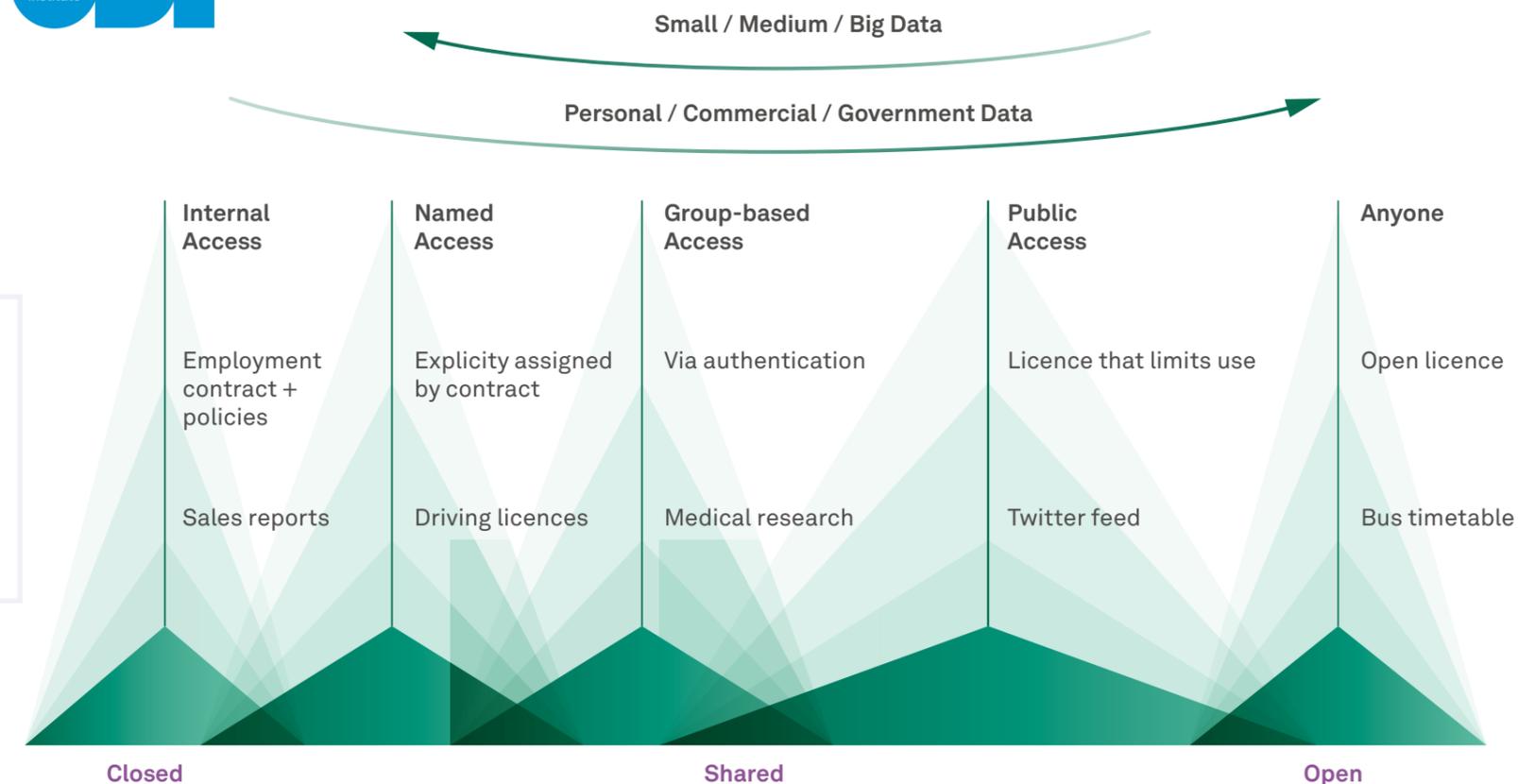
- Who are the stakeholders (including data providers and data consumers)?
- What is the value and the risk for each stakeholder?
- How will benefits be measured for each stakeholder?
- How can the value and benefits be leveraged to incentivise effective engagement from each stakeholder?

Data

- What data sets are needed for the purpose and what type of data is it?
- What risks need to be mitigated in connection with the data to enable it to be shared?
- How long is data needed and what happens if it is withdrawn?



The Data Spectrum



Development and operation

- What type of technical capability is needed and how will each capability be procured, managed and controlled?
- What other resources and investment of time will be required and which stakeholder(s) will be responsible for this?
- Can a federated distributed model be used to reduce the need for control of data to be transferred?
- What is the cost of development and ongoing operation of the Connected Digital Twin?
- How long will the Connected Digital Twin operate?

Sustainability

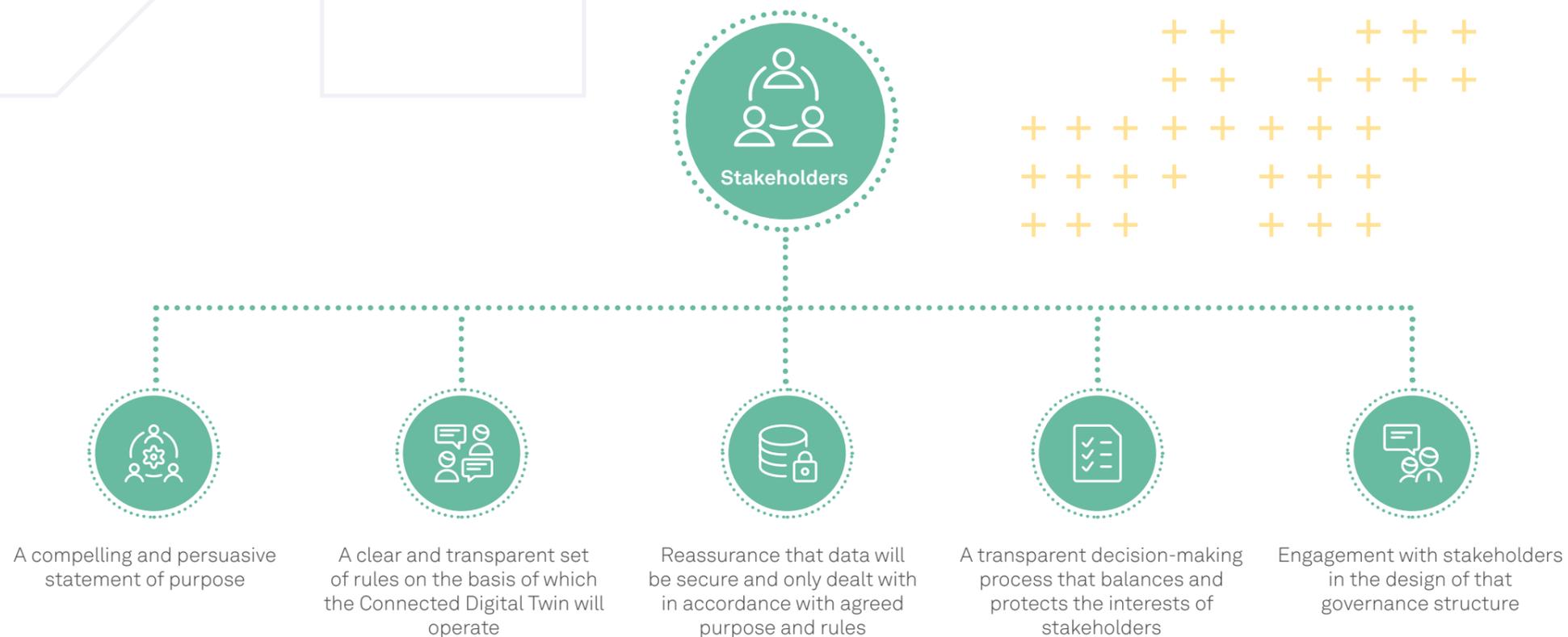
- Define the enduring value of the Connected Digital Twin that will drive commercial sustainability and scalability.
- Demonstrate continuing value through a development plan that grows from a test bed of scenarios (Proof of Concept -> Alpha -> Beta).
- Address cost (including opportunity cost) to stakeholders of not maintaining Connected Digital Twin both individually and collectively.
- Include KPIs and approach to performance monitoring and reporting.

theodi.org/data-spectrum



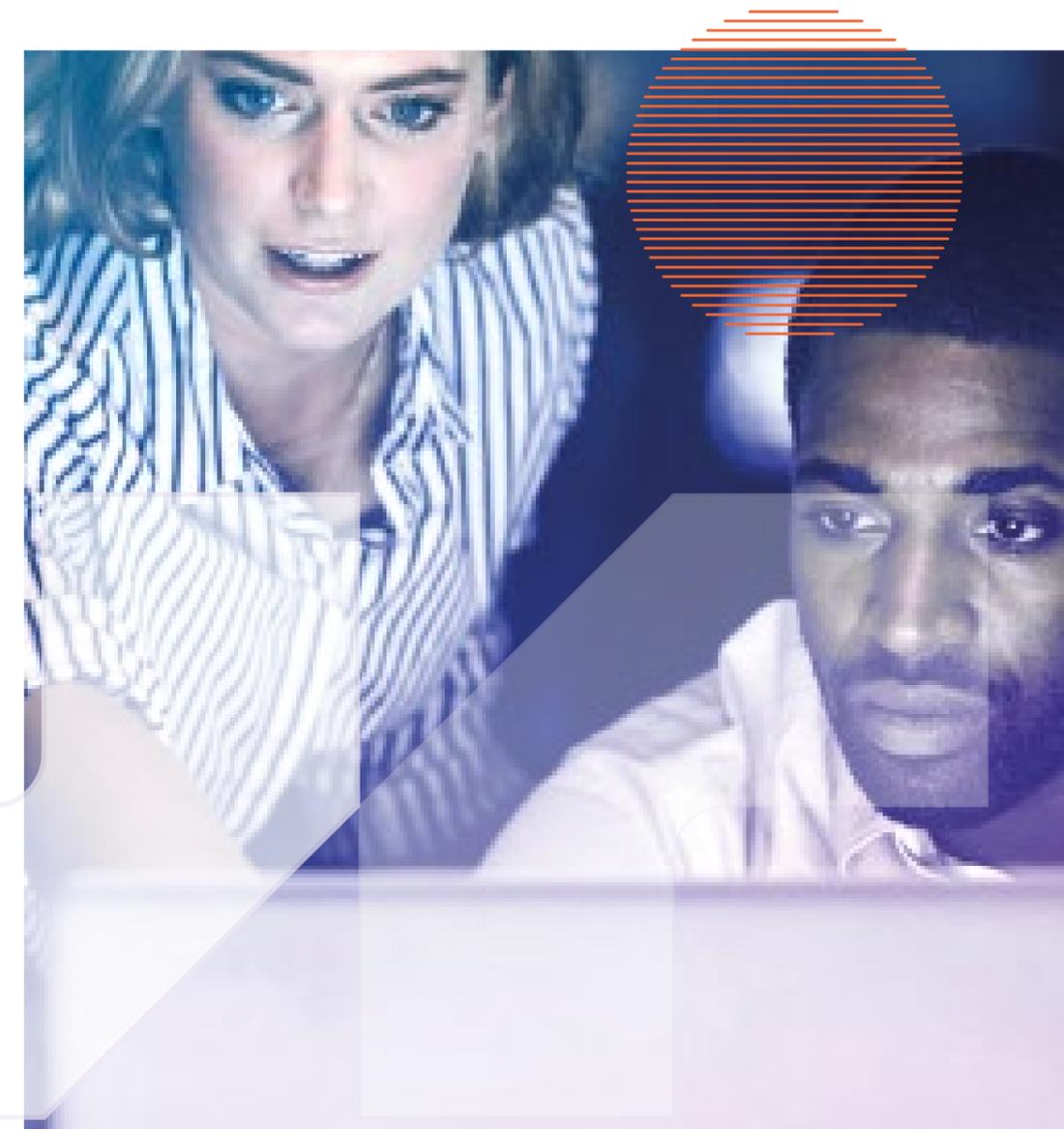
Designing governance model

A strong governance structure that engenders trust amongst stakeholders includes:



(Pinsent Masons LLP)

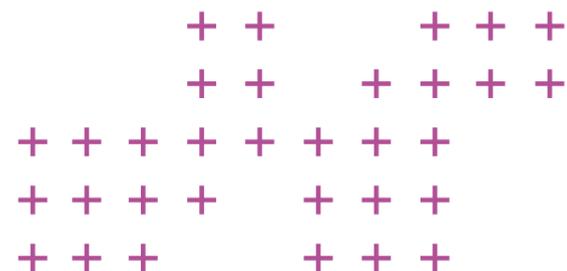
- The governance model will be designed during the formulation and co-creation of the Connected Digital Twin and will govern its functioning during the operation and evaluation phases.
- The context, complexity, scale and sensitivity of the Connected Digital Twin will help stakeholders determine what governance bodies are required.
- Stakeholders and governance bodies need a clear understanding of how the Connected Digital Twin is developed and deployed.
- Clear terms of reference will enable governance bodies to verify and assure compliance with the rules and promote trust in competence and outcomes.
- Rules set out how the Connected Digital Twin will function to achieve its purpose including:
 - the nature of the data that will be made accessible;
 - the identity or class of the persons or organisations with whom it will be shared;
 - the uses to which such persons or organisations will be entitled to put that data;
 - policy, ethics and mechanisms and standards to address data assurance and information governance (and AI ethics and governance); and
 - how wider legal and regulatory issues should be addressed.



The legal framework

A strong governance structure that engenders trust amongst stakeholders includes:

- The purpose and rules can be set out and implemented with different levels of formality from soft obligations, bilateral or multilateral agreements. In some cases, it may be appropriate to establish a separate corporate entity for the Connected Digital Twin to supplement and enhance the contractual arrangements and to enable sustainability.
 - Lawyers must approach the legal issues on the basis of the intended purpose, value and business modelling, on a foundation of robust governance structures.
 - Legal arrangements must encourage and protect innovation and avoid constraining innovation through overly rigid contractual structures, but also protect “control” and build accountability.
- Matters to be clarified in data sharing agreements and SaaS/ platform agreements include:
 - Data provision
 - Data use
 - Commercial sensitivity
 - Intellectual property rights
 - Third party rights to access or use the data (or outputs generated from the data)
 - Data protection and other regulatory issues (such as competition law)
 - Technical and information governance and security measures to increase assurance and address constraints, including any AI related governance and assurance
 - Generating value of one sort or another for all stakeholders and public benefit, pro-competition impact
 - Performance obligations and allocation of liabilities
 - Different circumstances for withdrawing from or terminating the Connected Digital Twin
 - Jurisdictional issues



Who we are

Co-chairs

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Carolyn Lang Pinsent Masons LLP	James Veitch Balfour Beatty
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Peter van Manen Frazer-Nash Consultancy	
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Reference materials

- [Articles and Publications – DT Hub Community](#)
- [Digital Twin Hub – DT Hub Community](#)
- [Ford, C.J. \(2023\). Digital Twin Ecosystems: Shaping Purpose, Managing Value, Understanding Trust. \(pp. 1-6\). Lancaster University](#)
- [Government 2022-2025 Roadmap for Digital and Data](#)
- [Towards ecosystems of connected digital twins to address global challenges | The Alan Turing Institute](#)
- [Turing launches pioneering new digital twins initiative | The Alan Turing Institute](#)
- [UK Government: Enabling a Cyber-Physical Infrastructure](#)
- [What are digital twins and why do we need them? | The Alan Turing Institute](#)

Data

[UK Government: Data Quality Framework](#)

Open Data Institute

- [Assessing Risk when Sharing Data Guide](#)
- [Data Assurance White Paper](#)
- [Data Ecosystem Map](#)
- [Data Ethics Canvas](#)
- [Data Skills Framework](#)
- [Data Spectrum](#)

Data sharing (including data trusts/ institutions' reports)

- [Ada Lovelace: Exploring legal mechanisms for data stewardship](#)
- [Data Loch](#)
- [Data Sharing Coalition tools and publications](#)
- [Data trusts: legal and governance considerations \(report\) – part of ODI's Can data trusts increase or help data sharing?](#)
- [Measuring the impact of data institutions \(report\) – The ODI Reflections on mentoring emerging data institutions](#)
- [Principles for a Data Economy](#)
- [Rail Delivery Group publications](#)
- [Rulebook for a fair data economy | Sitra](#)

AI related principles, guidance and best practice

- [AI and Data Guidance | ICO](#)
- [AI Risk Management Framework | NIST](#)
- [AI Standards Hub](#)
- [Algorithmic Transparency Standard](#)
- [ATI guidance eg Explaining decisions made with AI](#)
- [CDEI portfolio of AI assurance techniques](#)
- [From Rail to Open Rail: Topologies of Rail Licenses](#)
- [Open Rail: Towards Open and Responsible AI Licensing Frameworks](#)
- [UK Government White Paper on AI](#)
- [WEF AI procurement guidelines](#)



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Friel A-M, Cameron S, Ford C J, *et al.* 'Trust, Purpose, Value and Connected Digital Twins'

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