Delivering energy sector digitalisation

The role of a digitalisation orchestrator

August 2024

ESO

Contents

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Foreword

The role of a digitalisation orchestrator in delivering energy sector digitalisation

The energy industry is evolving at pace and requires a digital-focussed approach to realising the energy transition.

To fully unlock the benefits of renewable generation and to achieve the ambition of a zero-carbon grid, there is a need for a coherent and deliberate approach to building the shared digital infrastructure industry needs.

We have worked in partnership with industry experts to detail how shared digital infrastructure can be built and operated for the benefit of all.

Together, and building on the work of the Energy Digitalisation Taskforce, we identified that an energy "**Digitalisation Orchestrator**" is required to ensure digital infrastructure is developed for, and by industry.

Working transparently and collaboratively with industry to identify, strategically plan and ensure delivery of these shared assets, the Digitalisation Orchestrator would be a key enabler of the energy transition.

In July 2024, Ofgem launched a consultation on the 'Governance of the Data Sharing Infrastructure' where they recommended that ESO take on the role of the "**Interim Data Sharing Infrastructure Coordinator**".

ESO welcome this recommendation and believe it to be the first step in a journey to realising the Digitalisation Orchestrator and its benefits.

The sector's digital infrastructure is becoming as important as our physical infrastructure.

I believe the creation of a Digitalisation Orchestrator can ensure that the digitalisation of the energy sector will be effective and for the benefit of all.

Shubhi Rajnish
Chief Information Officer, ESO

Executive summary

What is the Digitalisation Orchestrator?

Strategically planning the sector's shared digital infrastructure

Summary

It has required many years of agreements over standards and practices and 'whole system' planning of energy system infrastructure to ensure the entire physical gas and electricity system integrates together to hand-off gas & electricity seamlessly.

Energy organisations are investing in IT systems and digitalised processes. These systems and processes need to receive and hand-off information between each other equivalent to how gas and electricity are physically handed-off along their supply chains to their consumers.

Today, shared digital infrastructure isn't coordinated and now faces this hurdle. The sector's many digital investments need to achieve seamless systems integration and interoperability of energy data and they are not on a path to coalescing as a common system.

Achieving coordination will:

- lower costs, such as avoiding investment duplication
- accelerate decarbonisation from investor confidence
- help identify and support consumer vulnerabilities
- enable energy system strategic risk management

How can coordination be gained?

An **Orchestrator** is proposed as an independent organisation responsible for coordinating the sector's shared digital energy system infrastructure.

The Orchestrator is to ensure that the overall design of digital infrastructure is efficient and effective for consumers today and sustainable into the future.

It will accomplish this by leveraging markets to deliver solutions that follow the Orchestrator's thin layer of coordinating 'Enterprise Architecture' (high-level system design, principles, and security).

This design and Orchestrator decision-making will be 'presumed open' for scrutiny and market participation; it will facilitate creation of a strategic plan for shared digital infrastructure and in doing so:

- unblock strategic decisions that today's governance and market incentives has not enabled to take place
- provide certainty to technical designers and engineers who need to create detailed solutions
- break down the development silos that exist for today's digital infrastructure investments
- provide market mechanisms for selecting the most efficient suppliers to deliver the market's solutions

Why now?

Ofgem is currently exploring the need for the Orchestrator in detail through their Digitalisation Technical Advisory Group and will consult on an interim governance solution for an Orchestrator in mid 2024. This could set in motion the creation of the Digitalisation Orchestrator.

The Data Sharing Infrastructure (DSI) development is likely to be the primary focus of that interim governance solution and the DSI would be an early priority of the Orchestrator if stood up.

The decision over the market facilitator role, the regional energy system planner and the ramp up to the next price control period sets a changing landscape where coordination of digital capabilities is key.

An organisation with the remit and capability to coordinate the shared digitalisation needs of the sector is required to ensure market participants can fulfil their obligations and make advances towards a Net Zero energy system.

Why is a Digitalisation Orchestrator required?

What does the Digitalisation Orchestrator bring to the market

The need

Digitalisation is essential to achieving hyper-scaled, fast system operations needed by increasing low carbon technology penetration and to overcome growing system planning complexity, but digital investments must also meet a high standard.

- Energy operations require IT systems to use common practices for sending/receiving data to make this easy
- Innovators require simple and standardised access to data to learn what new products & services are most required by the sector and which are deliverable
- Investments into energy data requires agreed standards so they can efficiently trade-off cost *vs.* data quality
- Threat modelling to manage critical vulnerabilities requires a reliable system-wide view of dependencies and so recognisable IT 'blueprints' and telemetry data
- Effective addressing of cross-sector challenges like climate resilience and consumer vulnerabilities requires energy sector systems and information to plug'n'play with systems and data from other sectors

These requirements cannot be met through today's model of a federation of energy sector silos operating without common technical leadership – something is needed to orchestrate the sector's investments

Expected benefits

- **Coordination within** - the Orchestrator will leverage the market to deliver and operate digital infrastructure elements in a coordinated way
- **Competition without** - the Orchestrator will triage, and address risks associated with digital monopolies across the shared infrastructure
- **Efficiency and innovation** - the Orchestrator will ensure interoperability of shared digital infrastructure
- **Least cost** - shared digitalisation initiatives will be created and operated at appropriate cost and done so in an open and transparent way
- **Independence** - an autonomous, expert organisation will ensure digital energy infrastructure is developed in the best interests of consumers
- **Expertise** – an Orchestrator can make strategic technical decisions over the design of the shared digital infrastructure
- **Transparent** - solutions will be supported by the sector, assured by other sectors & deliver to the public interest using a presumed open methodology to work
- **Market led** – the Orchestrator does the minimum central design work needed for coordination, with maximised use of markets

Intervention

The consortium's view is that left unchecked, the energy system will continue to develop digitalisation initiatives that duplicate investment and lack interoperability.

The creation of an Orchestrator **directed by and utilising industry** to consolidate and deliver common objectives is the most effective solution.

This report details how the Orchestrator could be set up to do this and overleaf details the component parts of the Orchestrator.

Structuring the Digitalisation Orchestrator

Overview of the Digitalisation Orchestrator

Internal functions

The **Organisation Leader** is accountable for the Orchestrator and its staff. They ensure a clear strategic planning process and working culture is in place.

The Orchestrator's **Product Team** is responsible for deciding over the high-level design of the digital energy system, such as: capabilities it will have; delivery prioritisation and; organising package of work for the market to deliver.

They are supported by:

- **The Architecture Team**, who create digital energy system design options and scope solution requirements. They make extensive use of the sector's technical SMEs and markets for detailed designs.
- The **Portfolio Management Team**, who run and enforce processes, such as ensuring evidence-based decisions, that the Architecture Team have explored all options, and that Delivery Partners are meeting obligations.
- The **Research and Engagement Team** ensure all Orchestrator work is 'presumed open'. They help the sector navigate the energy sector's 'blueprint', scope research tasks and share findings.

Close industry collaboration

The Orchestrator is not a technology company. It will leverage the market to meet the sector's needs to do the detailed technical design, build and delivery of shared digital infrastructure.

Detailing the energy system's digital future is too large for one team, so the Orchestrator will be able to appoint technical **Design Bodies** to determine the specifics of modules within the system's architecture.

Where the Orchestrator makes high-level decisions and designs, **Delivery Partners** do most of the actual work. This term describes an actor from the sector appointed (competitively or otherwise) to deliver the Orchestrator's chosen design. These could be private companies, academics, non-profits, consortium, etc.

Where there are knowledge gaps, the Research and Engagement Team will scope Research Initiatives to learn and share information.

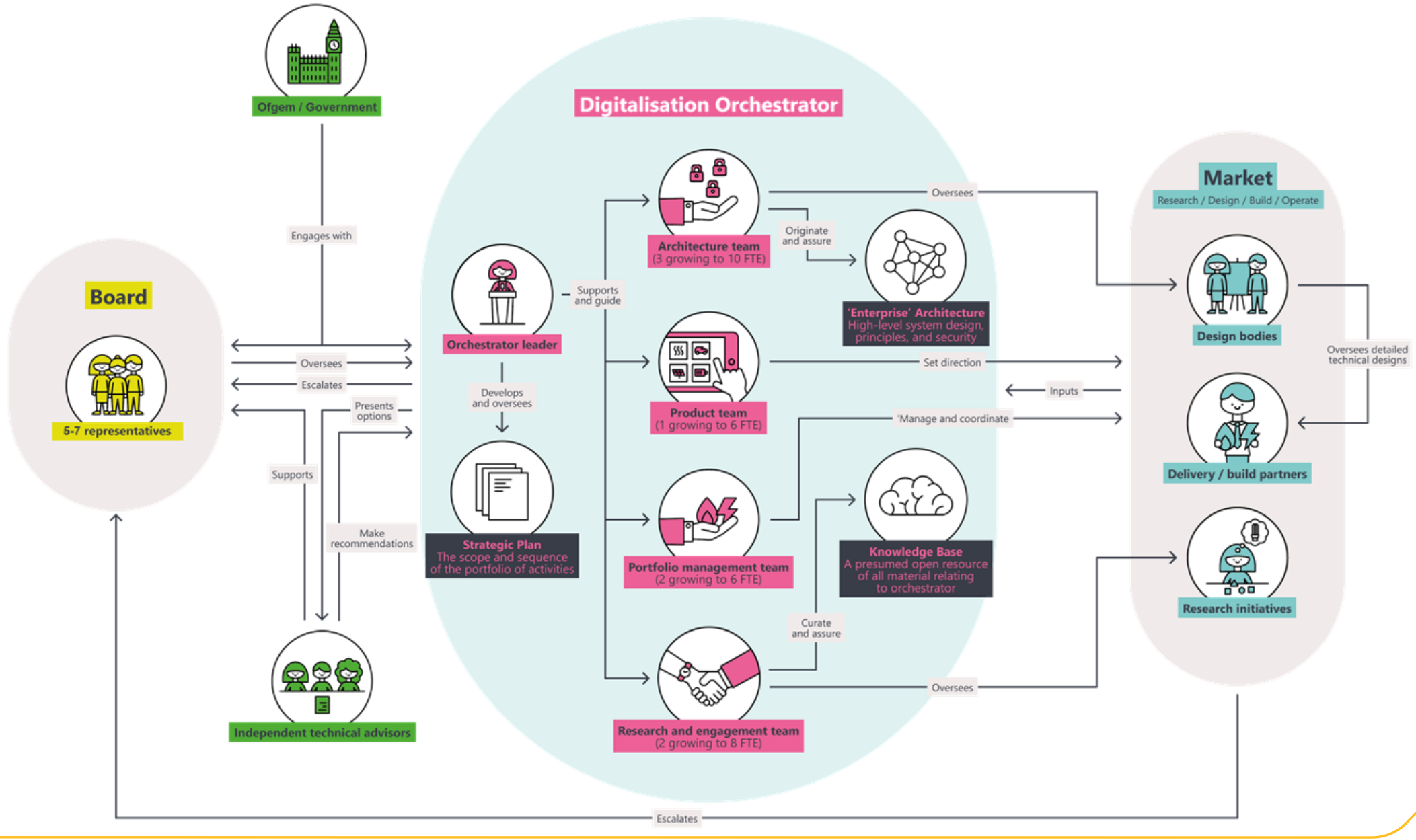
Reporting relationships

A **Board** holds the Organisation Leader and their decisions to account.

Independent Technical Advisors are appointed by the board and have domain expertise over best practice with developing 'Enterprise Architecture' for large and complex IT systems. They make recommendations to the Orchestrator on technical challenges.

Delivery Partners and **Design Bodies** will be convened and dissolved to support the Orchestrator in achieving its objectives, as needed.

All are further detailed in this report and their relationships to the Orchestrator are shown overleaf.


Ofgem / Government
Engages with
Board
5-7 representatives
Oversees
Escalates
Presents options
Supports
Make recommendations
Independent technical advisors
Digitalisation Orchestrator
Orchestrator leader
Supports and guide
Develops and oversees
Strategic Plan
The scope and sequence of the portfolio of activities
Architecture team
(3 growing to 10 FTE)
Oversees
Originate and assure
'Enterprise' Architecture
High-level system design, principles, and security
Product team
(1 growing to 6 FTE)
Set direction
Inputs
'Manage and coordinate
Portfolio management team
(2 growing to 6 FTE)
Knowledge Base
A presumed open resource of all material relating to orchestrator
Curate and assure
Research and engagement team
(2 growing to 8 FTE)
Oversees
Market
Research / Design / Build / Operate
Design bodies
Oversees detailed technical designs
Delivery / build partners
Research initiatives
Escalates

Appendix

A.1 – Objective, scope, outcomes, and success criteria

What is this trying to achieve?

Objectives, scope, outcomes, and success criteria

Objective

The Orchestrator has the following primary objective:

1. ensure the 'right' shared digital infrastructure exists and operated in a way that enables efficient and effective planning and operation of the overall energy system

The Orchestrator has the following additional objectives:

1. to maximise opportunities for scrutiny of its own work, decisions and activities to ensure it can be held to account on all matters relating to it
2. to maximise opportunities for (public or private) actors operating in the sector to lead work relating to digital infrastructure and so to minimise the scope of the Orchestrator's responsibilities and to minimise work that the Orchestrator is directly responsible for delivering, while ensuring the primary objective of the orchestrator can be met safely
3. to ensure that energy system shared digital infrastructure integrates with digital infrastructure that primarily serves other economic sectors, particularly other UK infrastructure sectors and international markets

Scope

The Orchestrator is to operate with delegated authority from the Board.

The Board, supported by its Independent Technical Advisors, will set the priorities of the overall energy system to which the Orchestrator must ensure shared digital infrastructure must meet for it to meet its primary objective.

Within this, the Orchestrator's scope is to:

1. define what digital infrastructure is 'shared' digital infrastructure and therefore in-scope of orchestrator responsibilities 2 & 3
2. coordinate the design and provide a route to implementation for shared digital infrastructure
3. Oversee the sector's delivery and operation of shared digital infrastructure & associated services
4. enable stakeholders to monitor and scrutinise shared digital infrastructure as well as the suitability, performance and resilience of the overall digital energy system

Success measures

High-level measures of success:

- High-level architecture designs for shared digital infrastructure stand up to the scrutiny of the Independent Technical Advisors and other technical SME stakeholders
- The Orchestrator has processes for the end-to-end delivery of digital solutions; these have been consulted on and they demonstrably align to global best practice digital/data delivery methodologies
- The Orchestrator can evidence that it is following its agreed processes (e.g. when it makes decisions, creates designs, appoints partners, etc)
- The Orchestrator can demonstrate its end-to-end operations follow Ofgem's Data Best Practice regulation, including treating all information it influences as 'presumed open' data
- Issues affecting digital infrastructure are already identified as risks prior to the issues manifesting
- Digital services originating from other economic sectors are measured to be increasing their uptake of energy system shared digital infrastructure

What is this trying to achieve?

Outcomes that each constituent part of the Orchestrator is responsible for

Board

- Stakeholders understand the high-level needs of the energy system from shared digital infrastructure
- Stakeholders trust that the Orchestrator as an organisation is fit for purpose

Organisation Leader

- A strategic plan for shared digital infrastructure exists and is delivered to
- The Orchestrator as an organisation projects a positive culture and is a rewarding place to work

Product Team

- Shared digital infrastructure design and delivery benefits from evidence-based and timely decisions

Independent Technical Advisors

- The strategy for and high-level design of shared digital infrastructure is scrutinised and validated

Architecture Team

- Effective 'enterprise' architecture exists for shared digital infrastructure of the energy system
- The 'enterprise' architecture is available for use by the sector, subject to presumed open data triage
- A practical approach exists for how the sector will approach delivery of the 'enterprise' architecture

Portfolio Management Team

- Orchestrator work, decisions and activities follow transparent and robust processes
- There are appropriate routes for stakeholders to escalate risks, issues and concerns
- Delivery Partners are in place to take responsibility for the delivery of shared digital infrastructure

Research & Engagement Team

- Stakeholders have open access to all information relating to shared digital infrastructure and the Orchestrator on a 'presumed open' basis
- Effective research and stakeholder engagement is carried out to inform decisions relating to shared digital infrastructure

Corporate Team

- Essential corporate functions for a modern organisation are provided for all of the Orchestator's teams, its Board and Independent Technical Advisors

A.2 – Processes & outputs

Strategic Planning

Ensuring there is an agreed mission for the sector and an adaptable plan

Overview

Strategic Planning comprises the sum of material produced by the Orchestrator relating to the scope and sequence of the portfolio of activities it plans on undertaking, as well as what it will direct third parties to undertake on its behalf.

Strategic Planning is a core responsibility of the Orchestrator as an organisation, with the Organisation Leader as the accountable party. The strategy and its plan needs to meet the requirements of the overall energy system, as guided by the Board.

In practice the Portfolio Management Team will coordinate the relevant parties within the Orchestrator to create, maintain and update the relevant material outputs of strategic planning using their processes, with the Organisation leader providing review and assurance.

- **Summary**: Documentation relating to activities undertaken directly and indirectly by the Orchestrator to plan, deliver and operate Shared Digital Infrastructure
- **Application:** Create transparency and coordinate stakeholders around a common plan and set of objectives

Group:

Process Output

Outputs

Below is a (non-exhaustive) list of outputs that Strategic Planning processes will create and maintain:

- strategic objectives
- 'enterprise' architecture (as-is and to-be)
- a delivery roadmap
- risks, issues and dependencies
- a mapping of who is responsible for delivering what
- success metrics and measures
- For each investment:
  - its purpose
  - high-level capabilities and services
  - how it integrates
  - expected timings for the delivery of features
  - order of magnitude cost estimation
  - objectives and success metrics and measures
  - where to go to find technical details

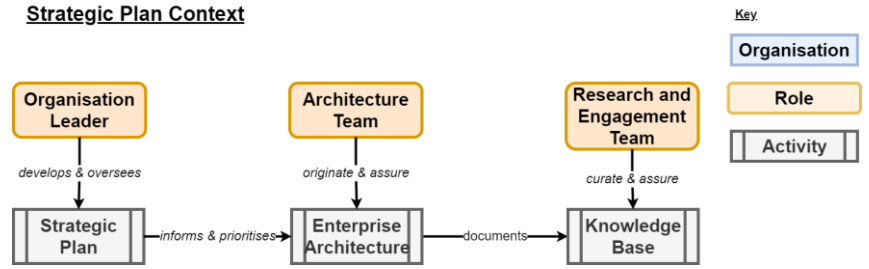
Outcomes

Stakeholders benefit from 'presumed open' transparency over the current and planned state for shared digital infrastructure and how delivery of the planned state is to be brought about

Stakeholders can understand how their needs from shared digital infrastructure will be met

Market actors have confidence over which parts of the market they can freely invest and innovate in and for which parts of the market digital infrastructure is treated as 'shared' and so requires engagement via the Orchestrator's processes

Market actors have certainty over the scope of work for which they are responsible and how their success will be measured for these responsibilities



'Enterprise' Architecture

Design work for digital engineering to make the digital energy system

Overview

This is the work that constitutes the top-level technical design, approach, decisions and delivery principles and constraints that an enterprise adopts to oversee end-to-end delivery and management of its IT systems and digital capabilities.

In this case the 'enterprise' spans many organisations, and its scope is all the centrally planned parts of the digital energy system, i.e. all 'Shared Digital Infrastructure'. Markets are free to integrate with this shared digital infrastructure to create their own products and services and so extend the digital energy system.

The Architecture Team are responsible for creating and maintaining 'Enterprise' Architecture. They develop options and govern the sector's digital engineering. The objective is to create a design that manages trade-offs to best meet the needs of the overall system as described by Strategic Planning and informed by Independent Technical Advisors.

- **Summary**: Documentation relating to the engineering design of shared digital infrastructure
- **Application:** To design and oversee the shared digital infrastructure for the energy system

Group:

Process Output

Outputs

Below is a (non-exhaustive) list of outputs that 'Enterprise' Architecture processes will create and maintain:

- high-level requirements interpreted from researched needs
- Architecture governance framework, such as including:
  - technical delivery principles
  - delivery constraints
  - design process requirements
- conceptual architecture designs
- delineation and definition of design solution features
- as-is and planned to-be architecture states
- dependency maps
- as-is and planned to-be architecture states
- implementation and transition strategies

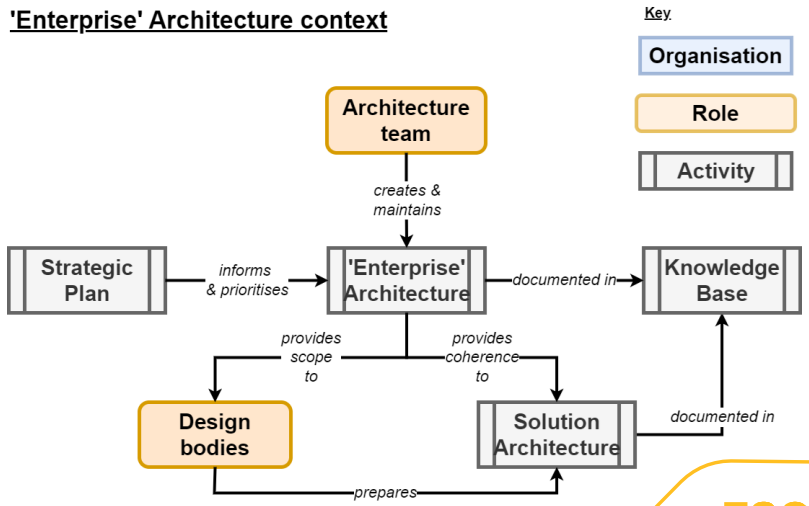
Outcomes

The 'enterprise' architecture design enables shared digital infrastructure, once built, to meet the Strategic Planning objectives and therefore the needs of the overall energy system

Technical SMEs within and beyond the sector can self-service an understanding of the design of shared digital energy infrastructure to enable them to do their work

Design Bodies and Delivery Partners are equipped to do their work and there is information and understanding that allows for effective oversight of these groups' work by the Architecture Team

'Enterprise' Architecture context



Solution Architecture

Outlining key outputs of the Orchestrator

Overview

Solution architecture will create high-fidelity designs from the conceptual system architecture created through the enterprise architecture design process.

The Architecture Team develops solution architecture work to Design Bodies that it appoints and therefore this work will be conducted by technical SMEs from the sector (and other sectors). Commonly, solution architecture includes detailed design work, such as making technology choices over software used.

To manage the scale and risks associated with creating effective shared digital infrastructure, in this case Design Bodies will restrict their design work to 'high-level' solution architecture, this will leave detailed 'low-level' design work for Delivery Partners to determine as part of their work.

Delivery Partners' low-level solution architecture must follow Design Bodies high-level solution architecture, which in turn follows the Architecture Team's enterprise-level expectations.

- **Summary**: Documentation relating to solution architecture as scoped by the Architecture Team
- **Application:** Guides design and build work

Group:

Process Output

Outputs

Below is a (non-exhaustive) list of outputs that Solution Architecture processes will create and maintain:

- detailed functional and non-functional requirements
- logical and physical architecture diagrams
- delineation and definition of design solution features
- as-is and planned to-be architecture states
- dependency maps
- as-is and planned to-be architecture states
- implementation and transition strategies
- service agreements

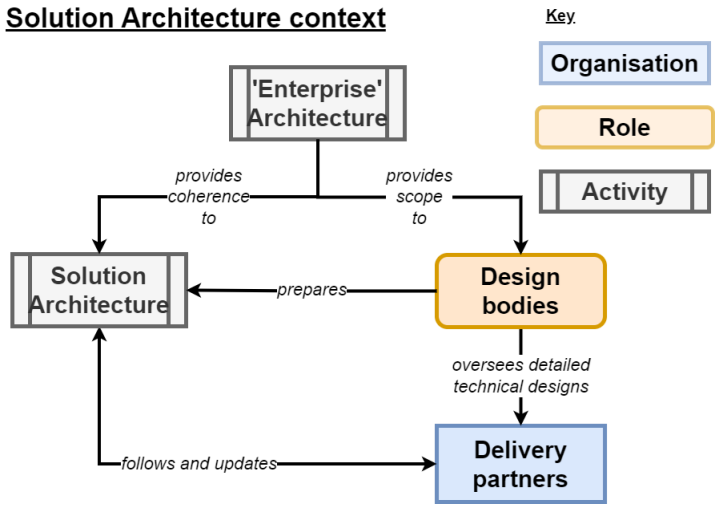
Outcomes

The solution architecture enables delivery of shared digital infrastructure that meets the Strategic Planning objectives.

Technical SMEs within and beyond the sector can self-service an understanding of the designs, plans and status of services.

All the technical information needed to appoint a Delivery Partner is available for each work package.

Solution Architecture context



Shared Knowledge Base

A tool to help overcome the engineering complexity

Overview

The Shared Knowledge Base is a 'presumed open' resource that provides a gateway to all the information created directly and indirectly.

This covers all types of content, including: strategic planning; architectural work; roadmaps, build status, service menus and sign-posting; findings from research engagements with stakeholders; details about the Orchestrator processes and its decisions and how it arrived at them.

The Shared Knowledge Base is an authoritative source of information populated collectively by the Orchestrator's teams and by its Delivery Partners. The Research & Engagement team are responsible for curating the Shared Knowledge Base. They are therefore responsible for ensuring content contributions are being made to an agreed standard and for escalating remedial action, as required.

- **Summary**: A public portal for accessing all documentation relating to the work of the Orchestrator and its partners
- **Application:** To enable market actors to deliver and opportunities to scrutinise the Orchestrator and its partners

Group:

Output

Outputs

The Shared Knowledge Base is a portal for everyone, its collective content is in essence a 'blueprint' that describes in detail the services and design of the current and planned future shared digital infrastructure for the energy sector. The output is:

- a front-end (web and mobile) application hosted in the public domain for anyone to use
- user registered users access to additional information about shared digital infrastructure that does not pass open data triage sensitivity tests
- guidance to contributors on practices and expectations for when adding content to the Knowledge Base
- Engagement channels for stakeholders to use, such as to raise opportunities, concerns, risks, dependencies, etc that they feel the Orchestrator needs to consider.

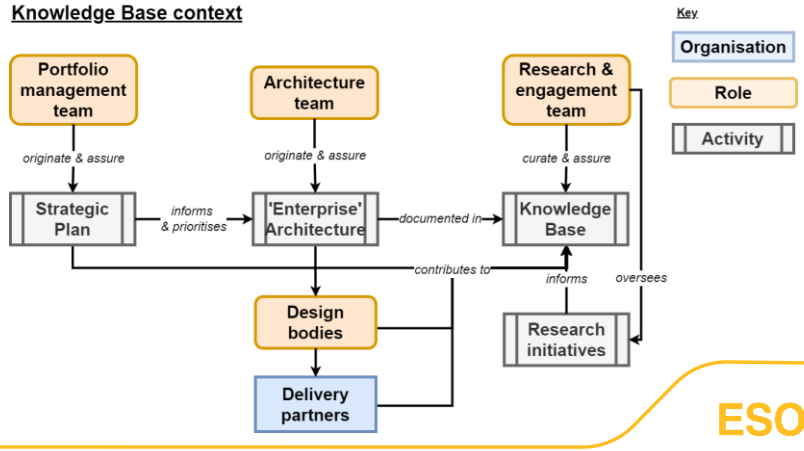
Outcomes

Important information, such as what investments are being made, their status and who is responsible for delivering them, is available to everyone

People responsible for contributing to the Shared Knowledge Base know how to make their contributions and the quality and depth of information they need to provide

Stakeholders of the energy sector can engage and provide their views to the Orchestrator about any of its work

Stakeholders who are designing components of the Shared Digital Infrastructure have access to the 'blueprint' information they need to do their job efficiently



Decision Making

Setting direction for the sector that is open to scrutiny

Overview

Important decisions to be made include:

- What is and is not Shared Digital Infrastructure?
- What design will we use for Shared Digital Infrastructure?
- How shall we approach delivery of Shared Digital Infrastructure?
- Who is delivering which parts of the Shared Digital Infrastructure

These decisions are made by the Product Team, following Portfolio Management Team's processes.

The Board will expect the Product Team to evidence their decision-making and particularly to explain any differences between what they decide and what was recommended by the Independent Technical Advisors.

Summary: Decisions by the Product Team are documented by following Portfolio Management Team processes and those processes ensure decisions can be scrutinised

Application: Provide direction for everyone to follow as they collectively deliver Shared Digital Infrastructure

Group:

Process

Outputs

Below is a (non-exhaustive) list of outputs that decision-making processes will create and maintain:

- processes that provide a framework around which decisions are expected to be made
- details about when decisions are planned to be made and a history of what decisions have been made
- documentation used for the making of each decision
- documentation of decision recommendations made by the Independent Technical Advisors
- decisions and supporting evidence over scoped questions, such as questions the Architecture Team may have for how to proceed, are documented following the processes
- stakeholder feedback (any stakeholder) is captured and summarised
- documentation of reviews and assurance of decisions by the Board and Independent Technical Advisors
- Opinions of the Board are documented

Outcomes

The sector has clarity over the direction for Shared Digital Infrastructure and so actors in the sector are able to act with confidence to carry out their own responsibilities and priorities

Decisions follow a robust process that is trusted by stakeholders to be a high-quality process

Decision-making (schedule, decisions, evidence, etc) is transparent (presumed open) and so stakeholders are able to scrutinise this information

Contracting services

Getting the sector to do the heavy-lifting

Overview

To get the best outcome the Orchestrator needs to maximise the taking advantage of (public and private) actors in the sector and from other sectors. This includes getting support to engage and learn stakeholders' requirements, conduct detailed design work, to build and run digital solutions and to wider tasks such as to conduct monitoring the overall performance of shared digital infrastructure.

The Portfolio Management Team manage the Orchestrator's contracting, with the Architecture Team and Research and Engagement team inputting key information to help scope contract requirements and oversee performance.

Individuals may be contracted, such as to participate in Design Bodies and organisations may be procured as Delivery Partners, to deliver scoped outcomes (research, detailed design, build, operate services, etc).

Summary: The Orchestrator procures the support of the sector and other stakeholders to conduct 'heavy-lifting' work on its behalf

Application: To enable scaled market-led delivery of the Shared Digital Infrastructure

Group:

Process

Outputs

Below is a (non-exhaustive) list of outputs that contracting services will deliver:

- Contracts with terms that ensure Design Bodies' and Delivery Partners' work best serve energy consumers and the wider public interest.
- Information assets about research, architecture and built/operated services suitable for inclusion in the Shared Knowledge Base.

Outcomes

Services are procured that deliver the Shared Digital Infrastructure as per the strategic planning and its 'enterprise architecture'

Energy consumers and the wider public gain benefits from the investments made into Shared Digital Infrastructure that have been governed on their behalf by the Orchestrator

The products and services arising from the Shared Digital Infrastructure are available for use by the sector and other sectors, allowing them to in turn derive products and services on top of this infrastructure

A.3 – Roles & responsibilities

Board

Roles and Responsibilities

Overview

The board's primary function is to ensure appropriate oversight of the Orchestrator. They can ratify the appointment of the Organisation leader, approve the overall budget or challenge the activities of the Orchestrator. They also provide a line of escalation for emergent risks. The board also assesses if the Orchestrator is meeting its objectives and success criteria.

- **Reports to**: N/A
- **Size of team:** an odd number

In guiding the work of the Orchestrator the board will follow the 'Seven Principles of Public Life' (aka. The Nolan Principles), summarised as selflessness, integrity, objectivity, accountability, openness, honesty, and leadership.

Responsible For	Providing oversight on the activities of the Orchestrator
Accountable For	Providing council to the Organisation leader, ratifying the appointment of Technical Advisors, confirming budgets, responding to escalations.
Consults	With the Orchestrator and Ofgem
Informs	The sector, Ofgem, government, consumer groups.

Group:

Governance

Organisation Leader & Corporate functions

Roles & responsibilities

Organisation Leader

The Organisation Leader is the responsible for ensuring the Orchestrator has a clear strategy and that its working culture is a positive one.

This includes ensuring the corporate functions are in place and performing, in addition to the 'core' Orchestrator staff performing their duties diligently and in the public interest. The responsibility over Strategic Planning sits with the Organisation Leader. A RACI for the Organisation Leader is provided to the right

- **Reports to**: Board

Group:

Orchestrator

Corporate functions

For the Orchestrator to perform its core functions it will require a suite of staff that handle core enabling functions such as IT services, Human Resources, Finance & Legal. These staff are responsible for ensuring that staff in the Orchestrator can perform their roles effectively.

It is worth noting that the legal team within the Orchestrator are responsible for two key elements. The first is ensuring intellectual property rights associated with the development of shared digital infrastructure, and the second is to support contractual arrangements that the Orchestrator makes with third parties (Design Bodies and Delivery Partners)

These corporate functions are the responsibility of the Organisation leader.

- **Reports to**: Organisation Leader
- **Size of team:** 2-4 FTE depending on implementation

Group:

Orchestrator

Responsible For	Oversight on the activities of the Orchestrator
Accountable For	The strategic plan and the operating of the Orchestrator
Consults	Stakeholders, Architecture Team, Research & Engagement, Product Team, and Portfolio Management Team.
Informs	The sector, government, consumer groups.

Product Team

Roles & responsibilities

Overview

The Product Team includes a senior Product owner and other product owners that will be responsible for localised topics. Product owners make decisions over the design and delivery of Shared Digital Infrastructure

Additionally, the Product Team tasks the Technical Advisors to make recommendations on what actions the Product Team should take. The Product Team is then responsible for explaining why they have made the decisions they have taken and why they have deviated from recommendations, where they have done so.

- **Reports to**: Organisation Leader and Board
- **Size of team:** 1 FTE, growing to 6 FTE

- **Capabilities required:** Domain expertise over the delivery of Digital systems; integration of business requirements and technical capabilities
- **Key interfaces/interactions:** Engaging with Technical Advisors; disseminate decisions to Orchestrator Teams and publicly; research and enterprise architecture processes
- **What goes into shared knowledge base:** Their decisions and the evidence supporting those decisions and the schedule for upcoming decisions
- **Delegated Authority:** To select the preferred design of the Shared Digital Infrastructure for the sector
- **How feature is 'checked':** Scrutiny from Technical Advisors, the Board and stakeholder feedback from across the sector

Responsible For	Making decisions about the design and delivery of Shared Digital Infrastructure
Accountable For	The quality of the design of the Shared Digital Infrastructure and the practicalities of how it will be delivered
Consults	Many stakeholders, but particularly the Technical Advisors, Architecture Team and Research & Engagement Team
Informs	The Portfolio Management Team, the Board, Design Bodies and the sector

Group:

Orchestrator

Independent Technical Advisors

Roles and Responsibilities

Overview

The Independent Technical Advisors are a body of individuals responsible for making recommendations concerning what shared digital infrastructure should be prioritised for development by the Orchestrator.

The selection of Independent Technical Advisors will use the Cabinet Office's public appointment's portal, follow the Cabinet Office's 'Governance Code on Public Appointments,' and fall under the assurance of The Commissioner for Public Appointments. The Board will ratify the appointment of Independent Technical Advisors.

Independent Technical Advisors will perform their role by reviewing information collated by the Orchestrator. The Orchestrator staff will provide specific detail on the decision for which advice is sought, including potential options, and the form of recommendation required. The Independent Technical Advisors will then make recommendations accordingly.

- **Provides recommendations to**: Product Team
- **Size: Max** 5 individuals – specific skills required

Group:

Governance

- **Who people work for:** These are public appointments and not staff of the Orchestrator. These should be largely made up of experts from other sectors. The consortium's view is that this can be made up of five individuals; inclusive of a 'chair' of the Advisors. Four advisors should be from other economic sectors than energy.
- **Capabilities required:** Detailed understanding of digital infrastructure, some knowledge of energy. Able to pass relevant security clearances.
- **Key interfaces/interactions:** The advisors are informed by the Research & Engagement and Architecture Teams. They make recommendations based on the process set out by the Portfolio Management Team.
- **What goes into shared knowledge base:** Recommendations made, and any relevant artefacts related to those recommendations.
- **Delegated Authority***:* The board provides delegated authority over what is or is not in scope for 'shared digital infrastructure' and recommends actions in keeping with that scope. Within this envelope, the Advisors can determine priorities
- **How feature is 'checked':** Recommendations can be audited by government. Audits will generate ongoing list of identified issues, mitigation actions, owners.

Responsible For	Making recommendations to the Orchestrator, which in turn inform Orchestrator priorities and activities. Chairing capability research panels.
Accountable For	Accountable over decisions recommended. Ensuring stakeholders views are adequately represented.
Consults	Stakeholders, Architecture Team, Research & Engagement, Product Team, and Portfolio Management Team.
Informs	The Portfolio Management Team, Architecture Team, Research and Engagement Team, Design Body(s) & the sector.

Architecture Team

Roles & responsibilities

Overview

The Architecture Team is a staffed function, housing the architectural capabilities of the Orchestrator and responsible for the 'enterprise architecture' of shared digital infrastructure.

It designs plausible options that can meet the functional and non-functional requirements of the sector. The team's work contributes to the Orchestrator's knowledge base, creating a pragmatic roadmap of deliverables that will release the shared digital infrastructure of the sector in an architecturally coherent manner.

- **Reports to:** Organisation Leader
- **Size of team:** 3 FTE, growing to 10 FTE

Group:

Orchestrator

- **Capabilities required:** Enterprise architecture and its sub domains such as security, platform, and data architecture.
- **Key interfaces/interactions:** Provides functional and non-functional requirements to the Portfolio Management Team to inform contracts. Signs-off on those requirements having been met to a sufficient level of quality and in alignment with the 'Enterprise Architecture' (through the work of the Delivery Bodies)
- **What goes into shared knowledge base:** Technical strategies, designs and artefacts associated with the Enterprise Architecture such as solution designs, data architecture, cloud architecture, etc.
- **Delegated Authority:** Sets out the technical scope of contracts. Quality assurance and acceptance of contract deliverables. Responsible for design of the shared digital infrastructure.
- **How feature is 'checked':** All material is presumed open and published as appropriate. Held accountable by Portfolio Management Team that they are following process and priorities of the strategic plan.

Responsible For	Maintaining a defined and coherent high-level architecture. Working in the open and making designs visible and meaningful.
Accountable For	Ensuring coherence of the shared digitalised energy system. Assuring that the shared digitalised energy system is designed in accordance with best practice, and that functional requirements are met.
Consults	Solution Architects, Research and Engagement Team , SMEs, Portfolio Management Team, Design Bodies, Delivery Partners. Product Team
Informs	Design Bodies, Delivery Partners.

Portfolio Management Team

Roles & responsibilities

Overview

The Portfolio Management Team is a staffed function of the Orchestrator that designs processes and ensures their implementation. It also manages contractual relationships between the Orchestrator, Design Bodies and Delivery Partners.

This team is responsible design and ownership of processes, and provides governance for the activities of the Orchestrator and its collaborators.

- **Reports to**: Organisation Leader
- **Size of team:** 2 FTE, growing to 6 FTE

- **Capabilities required:** Project management, PMO, business planning and operations, process development, contracting, auditing and evaluation.
- **Key interfaces/interactions:** Incorporating Technical Advisor recommendations (and Product Team decisions) into the Strategic Plan and communicating priorities to the Architecture Team.
- **What goes into shared knowledge base:** Process designs, policies, strategies, outcomes of decisions, contract details, delivery plan/roadmap, reports/outputs from delivery of projects.
- **Delegated Authority:** Contracting strategy, procurement, and mobilisation of packages of works up to a pre-defined value. Delivery methodology including milestones, deliverables, and payment. Risk management and audit, quality assurance.
- **How feature is 'checked':** This feature designs processes for the operation of the orchestrator and those processes can be independently assured and reviewed at the request of the Technical Advisors or the Board.

Responsible For	Designing processes and governance of the Orchestrator, ensuring processes and governance are adhered to. Setting the agenda for the Board. Leading creation of the Strategic Plan.
Accountable For	Creating, enforcing and managing contractual relationships so as to ensure delivery of work by the Orchestrator and any contracted parties.
Consults	The Research Office, The Architecture Team, the Technical Advisors, Product Team
Informs	The Research Office, The Architecture Team, the Technical Advisors, The Design Body(s), The Board

Group:

Orchestrator

Research and Engagement Team

Roles & responsibilities

Overview

The Research and Engagement Team is a staffed function that ensures that the Orchestrator is representing the views of a wide cross section of society in a way that supports the Technical Advisors and Organisation Leader to make recommendations and decisions.

It is responsible for curating the Shared Knowledge Base and performing or sourcing primary and secondary research to inform the delivery of the Orchestrator's strategic plan and 'Enterprise Architecture'. It also performs secretariat functions for Capability Research Panels and Technical Advisors.

- **Reports to**: Organisation Leader
- **Size of team:** 2 FTE, growing to 8 FTE

- **Capabilities required:** Research, knowledge management, stakeholder engagement.
- **Key interfaces/interactions:** Gathers requirements from stakeholders, directed by the strategic plan.
- **What goes into shared knowledge base:** The Research and Engagement Team is responsible for curating the shared knowledge base. Any research they commission or undertake will form part of the shared knowledge base.
- **Delegated Authority***:* Limited authority to self-approve research. Broadly undertakes tasks set out in Strategic Plan. Fully responsible for shared knowledge base.
- **How feature is 'checked':** The Research and Engagement Team's work is documented in the shared knowledge base. Curating the shared knowledge base requires the Research and Engagement Team to triage information into it, and structure the information contained therein. Records of this triage can also be treated as presumed open.

Responsible For	Designing processes and governance of the Orchestrator, ensuring processes and governance are adhered to. Setting the agenda for the Board. Leading creation of the Strategic Plan.
Accountable For	Bringing insight and informative research to the Orchestrator. Maintaining a record of decision-making rationale and producing materials to inform those decisions
Consults	Architecture Team, SMEs, Portfolio Management Team, Design Bodies, Delivery Partners, Stakeholders, Product Team
Informs	Stakeholder panel, programme office, Architecture Team, Design Bodies.

Group:

Orchestrator

Design Bodies

Roles and Responsibilities

Overview

The Design Bodies are organisations who are contracted by the Orchestrator to develop the high-level Solution Architecture for specific parts of the 'Enterprise Architecture'. Solution Architecture, in this context, is an elaboration of the Enterprise Architecture for a particular technology implementation. They are responsible for working to contract and enabling the 'Enterprise Architecture' to be realised. Additionally, assure the work done by Delivery Partners.

The Orchestrator delegates day-to-day delivery responsibility to the Design Bodies. In their function the Design Bodies act as client representatives for the orchestrator, allowing the orchestrator to increase its staffing when additional design, management, and SME resources are required.

Summary: Works to contract with Digitalisation Orchestrator

- **Outputs:** Solution Architecture for the challenges posed.

- **Who people work for:** Staff will be provided by the organisation who is issued the contract to act as Design Body for a particular scope of work.
- **Capabilities required:** A third party organisation will need technical credibility to design and oversee development of Solution Architecture for a given scope of work.
- **Key interfaces/interactions:** They are provided Enterprise Architecture from the Architecture Team and tasked with creating aligned and coherent Solution Architecture to meet the Orchestrator's requirements. They may then oversee Delivery Partners in developing the solution.
- **What goes into shared knowledge base:** Solution architecture and any related documentation.
- **Delegated Authority:** To develop designs within the constraints of the contractual arrangement set out by the Portfolio Management Team. Contract will also set out the monitoring/quality assurance relationship with Delivery Partner
- **How feature is 'checked':** Contractual obligation to provide information to the shared knowledge base. Overseen by the Architecture Team.

Responsible For	Developing detailed specifications (solution architecture) for work to be completed by a Delivery Partner.
Accountable For	Ensuring solutions are delivered by Delivery entities in adherence with the Solution Architecture and aligned to the broader Enterprise Architecture.
Consults	Architecture Team and Portfolio Management Team
Informs	Stakeholder panel, Portfolio Management Team, Architecture Team, Design Bodies, Research & Engagement Team.

Group:

Market

Delivery Partner(s)

Roles and Responsibilities

Overview

An organisation that does detailed Solution Architecture and then builds and/or operates the service or product that was designed. The Delivery Partner is responsible for developing working solutions of the Design Body(s) high level Solution Architecture to align to the requirements of the Strategic Plan.

They are the organisations responsible for developing solutions using best practices such as Government Digital Service model of solution development. In some cases, particularly for smaller scopes of work, the Design Body and Delivery Partner may be the same organisation.

- **Summary**: Works to contract under the Orchestrator
- **Outputs:** Working solutions that meet the Orchestrator's requirements and scope of work, follow to the Solution Architecture, and provide capability to the Orchestrator and wider sector.

- **Who people work for:** Private Companies, Academic Bodies, QuaNGOS
- **Capabilities required:** Deep technical delivery knowledge around the contract they have been awarded including the implementation, testing, service transition, and support of solutions.
- **Key interfaces/interactions:** Delivery partner is contracted by the Portfolio Management Team and managed by the Design Body on behalf of the Architecture Team.
- **What goes into shared knowledge base:** Contractually obliged to populate the detail of the design that they have been responsible for developing.
- **Delegated Authority:** To deliver to the scope of the contract set out by the Orchestrator, aligning with the Design Body's Solution Architecture.
- **How feature is 'checked':** Contractual obligation to provide information to shared knowledge base. Overseen by the Design Body and Architecture Team.

Responsible For	Delivering the product or service set out through contractual arrangement to meet the functional and non-functional requirements, and within an agreed timescale and budget.
Accountable For	Executing on the instructions of the relevant Design Body.
Consults	Providing the Design Body with technical/product outputs for review and approval. Reporting up to Corporate Functions/Programme Office on progress, expenditure, etc.
Informs	May be N/A. In some cases sub-contractors, broader project stakeholders incl. Research and Engagement Team.

Group:

Market

Research Initiatives

Roles and Responsibilities

Overview

A working group formed for the purpose of hearing from the industry, wider sector, and academia on a given topic or theme.

The working groups are chaired by an Independent Technical Advisor and the secretariat function is performed by a member of staff in the Research and Engagement Team. The working groups function as a means to gather insight into the needs of the shared digital infrastructure.

Where a particular challenge has been identified and prioritised in the Strategic Plan, a bespoke group may be set up for that purpose to explore in more detail.

- **Summary**: Groups of interested experts supporting the Orchestrator
- **Outputs:** Insight and feedback from stakeholders, evidence of external best practice.

- **Who people work for:** The members of the working group are sourced from individuals interested in the work and impact of the Orchestrator. As the number of topics and projects the Orchestrator is facilitating grows, it would be expected that the number of groups and topics covered may grow with it.
- **Key interfaces/interactions:** The Research and Engagement Team curates the content and output of the groups and utilises them as sources of information, risks and opportunities.
- **What goes into shared knowledge base:** Minutes of the meetings, shared notes from participants, any analysis / view of the records.
- **How feature is 'checked':** The groups' Independent Technical Advisor chairs and Orchestrator secretariat function ensures detail of these sessions is useful for all parties. All knowledge being presumed open in the shared knowledge base ensures the discussions are transparent and can be viewed by those not involved in the sessions.

Group:

Market

A.4 – Background research

Commonly referenced governance models

Summary of the review of existing governance models

Context

There are many different approaches to developing and maintaining governance mechanisms and a variety of different regulatory, sociological and legal structures that can be utilised to enable and then maintain them.

The energy sector is not unique in its digital transformation and can learn from other sectors experiences, as well as the approaches trialled or suggested by the sector in other contexts.

The digital transformation of the sector, and in particular the interdependencies and complexity that will emerge will need to be carefully considered.

Feedback loops and mechanisms will need to be in place for identifying and resolving challenges in the use of the tooling, to manage and set expectations of and on users.

Governance models

Governance model reviewed as part of background research:

- Open Banking
- Energy Digitation Taskforce recommendation
- Virtual Energy System
- Digital Spine Feasibility Study
- Flexibility Digital Infrastructure
- W3W (World Wide Web Consortium)
- Bluetooth Special Interest Group
- Estonia's e-Government Initative

Open Banking

The Competition and Markets Authority (CMA) gave mandate to nine institutions to fund and adopt open banking and formed the Open Banking Implementation Entity (OBIE)

The OBIE is a private body; its governance, composition and budget is determined by the CMA. It is funded by the UK's nine largest current account providers and overseen by the CMA, the Financial Conduct Authority and His Majesty's Treasury. The nine mandated institutions (referred to as the "CMA9") are: AIBG, Bank of Ireland, Barclays, Danske, HSBC, Lloyds Banking Group, Nationwide, RBS and Santander.

Its core responsibilities are to agree, consult upon, implement, maintain and make widely available, without charge, open and common banking standards. This approach has created a successful Open Banking standard, with other jurisdictions across the world having creating their own implementation entities to replicate what has been achieved in the UK.

Energy Digitalisation Taskforce

Summary of the Taskforce governance work

Context

The Energy Digitalisation Taskforce was established by The Department for Business Energy and Industrial Strategy (BEIS), Ofgem and Innovate UK to deliver a set of actionable recommendations that challenge the status quo and help deliver the digitalised energy system needed to reach Net Zero.

The key objectives of the taskforce were to:

- Refocus the energy sector on the challenge and opportunities of Digitalisation as a core component of transformation, not just an enabler
- Accelerate digitalisation of the energy system, enabling Net Zero compatible business models, markets, and industry structures
- Draw on experience from other sectors and provide a focal point to ensure digitalisation efforts are coordinated and effective Identify digitalisation gaps that require innovation support
- Identify the governance risks that digitalisation raises and present frameworks to mitigate issues.

Recommendations

The Energy Digitalisation Taskforce made six high-level recommendations set out below:

1. Unlock value of customer actions and assets
2. **Deliver interoperability** - through the development of public interest digital assets and standards
3. **Implement new digital governance approach and entities** – including the development of the 'Digital Delivery Body'
4. **Adopt digital security measures** – embedding cyber security best practice into digital energy infrastructure.
5. Enable carbon monitoring and accounting
6. **Embed a digitalisation culture** – providing digitalisation leadership for the energy sector

Relevance to the Digitalisation Orchestrator

The Orchestrator is a refinement of the Digital Delivery Body proposed in Recommendation 3 of the Energy Digitalisation Taskforce.

The Orchestrator has the potential to support the creation of Digital Energy System Architecture and deliver key Shared Digital Infrastructure (called 'Public Interest Digital Assets' in the Energy Digitalisation Taskforce report)

The Orchestrator will be able to ensure that digital security best practice is embedded across all shared digital infrastructure and will help to drive digitalisation culture across the energy sector by providing clear leadership and outreach.

Virtual Energy System

Summary of the VirtualES governance work

Context

ESO launched the Virtual Energy System (VirtualES) programme to enable the creation of an ecosystem of connected digital twins of the entire energy system of Great Britain. As part of the programme, it outlined a governance model that can set strategy and operational governance of the VirtualES, while considering the sectoral needs and orchestration.

The governance model was assessed against the following principles, ensuring it was able to meet these principles.

1. **Legitimate through** a new and independent entity known as the Orchestrator with a clear mandate from government to support digital transformation.
2. **Accountability with** relevant entity prioritizing features/development through funding, and ensuring the projects are delivered.
3. **Stakeholder Engagement** by ensuring a formal avenue for industry experts to influence decisions.
4. **Responsiveness** through mechanisms for quick feedback to help set up new standards, advise on future changes and mobilise quickly.
5. **Participation** by incorporating a stakeholder panel for sector to become involved on a rolling basis.
6. **Empowerment** by providing opportunities Innovators and entrepreneurs are encouraged to develop new products.

Recommendations

The VirtualES governance model saw the creation of a new independent Digitalisation Orchestrator Entity for coordination and conflict resolution with clear government backing. The entity was proposed to mandated to engage the industry to ensure sector needs are actioned, and standards are defined quickly, through structured feedback, and oversight from Expert Advisors.

Another new entity was also proposed, named Common Infrastructure Operator. This entity was proposed to help manage and improve common energy digital tools or services created for the public good, acting as the “operator of last resort”.

The model had outlined the following benefits:

High level of transparency, accountability and public oversight through a fully independent Orchestrator and public oversight and guidance through Expert Advisors.

- Higher and more responsive industry engagement.

The model had outlined the following risks:

- Government and sector alignment required to form a Digitalisation Orchestrator Entity.

Relevance to the Digitalisation Orchestrator

The VirtualES governance work supports the need for a Orchestrator, as identified in their model.

It provides further evidence for the needs case to set up a sector wide Orchestrator, and a need to allocate an operator of last resort for long-term operations of a digital asset developed for public good.

The VirtualES model also helped understand the various topics that need governance and helped clarify the scope of this role, such as supporting security best practices, regulations updates, streamlined delivery of common assets, and ensuring interoperability of common assets.

The Orchestrator as described by VirtualES will help to foster a culture of data sharing, and digitalisation across the energy sector by providing leadership and escalation pathways.

Digital Spine Feasibility Study

Summary of the Digital Spine feasibility study governance work

Context

The digital spine feasibility study outlined potential governance models related to the needs of the implementation and steady-state operation phases of a data sharing infrastructure. It is considered that separate governance approaches will be required for the two lifecycle phases (implementation and steady-state) because of their distinct requirements.

These lifecycle phase were outlined over three-time horizons:

- **Implementation**
- **Interim-state**
- **Steady-state**

They were also intentionally designed from a perspective of ultimately facilitating cross-sector data sharing and interoperability.

Recommendations

The Digital Spine feasibility study noted that sector governance plays a vital role in shaping the operations and policies within the UK energy sector and encompasses various regulatory bodies, government departments, and industry stakeholders that work collectively to ensure the efficient, coordinated and sustainable management of energy resources.

The feasibility study concluded that developing a DSI could be achieved through the delivery of an implementation phase, a Data Sharing Infrastructure Task Group would be established. This would have the appropriate secretariat, terms of reference and funding mechanisms to develop the data sharing infrastructure blueprints, and technical MVP.

It was noted that during this period, the relevant roles and responsibilities of the Data Sharing Infrastructure Task Group can be handed over to the Energy Data Sharing Infrastructure Operator as and when that entity becomes technically capable to take on the responsibility.

Relevance to the Digitalisation Orchestrator

The Digital Spine Feasibility governance work supports the need for an Orchestrator. It provides further evidence for the needs case to set up a sector wide Digitalisation Orchestrator, and a need to allocate an operator of last resort for long-term operations of a digital asset developed for public good.

This model provides the need to grow the governance model in an agile manner. The Orchestrator model needs to start small and build its capabilities as new products and services are requested from the sector.

Lastly, the Digital Spine Feasibility Study outlines the need for the Orchestrator to incorporate other sector expertise, potentially growing to link with Orchestrators emerging from different sectors, and at a certain point finishing their remit and passing responsibilities to a national orchestrator.

Flexibility Digital Infrastructure

Summary of the Flexibility Digital Infrastructure governance work

Context

Ofgem has proposed a vision for the future of distributed flexibility with an aim to create a common digital energy infrastructure, which they describe as the “world’s first distributed energy ‘super’ marketplace”.

In a net-zero energy system with abundant variable renewables and increased electric heating and transport, flexibility is crucial. Without it, renewable energy would go to waste, electric vehicles and heat pumps would strain peak demand, and overall energy costs would rise.

Ofgem proposes a common digital energy infrastructure to facilitate distributed flexibility. This vision aims to unite the industry toward a flex-centric future. The infrastructure would enable efficient utilization of assets connected to the distribution network.

Recommendations

To develop the Flexibility Digital Infrastructure specific responsibilities are required and would include the delivery of data standards, communication protocols for APIs, standardised products, stacking rules for assets to deliver multiple products, standardised contracts, and others.

Currently, the role of developing capability in this space is being fulfilled by the Open Networks Project by the Energy Networks Association, but due to its membership nature delivery has been slow and accountability is split across multiple parties. Ofgem are currently aligning initiatives across this space, such as Flex Markets Unlocked, Automatic Asset Registration, the Open Networks work on flexibility, and the role of the Market Facilitator.

In July 2024 Ofgem published a consultation 'Flexibility Market Asset Registration' which explores this topic further and makes recommendations on how to progress the objectives of flexibility digital infrastructure.

Relevance to the Digitalisation Orchestrator

The FDI governance will necessitate thinking on governance and implementation that has implications on the Orchestrator.

The FDI implementation will require digital solutions to effectively fulfil its responsibilities. Given it’s likely an implementation of the Data Sharing Infrastructure careful consideration of how any governance of technologies, standards and implementation interlinks with the FDI operator and the Orchestrator will be need to be given.

The Orchestrator can bring in the architecture, data, product development, and service development expertise, while the FDI implements a use case to support the development of flexibility in the UK market.

A.5 – Worked examples: design process

Automatic Asset Registration

How the AAR programme could have been delivered in this framework

Origin of requirements

This example presumes the sector has set up the Orchestrator, and the Orchestrator identifies the need for AAR.

The Research and Engagement Team, having commissioned research or undertaken it itself, identifies the need for low carbon assets to be visible to energy network companies, noting that the visibility of these is estimated to be at around 40%. This information is presented to the Independent Technical Advisors, who within the confines of processes set out by the Portfolio Management Team decide to task the Architecture Team for scoping high level solutions to solve this challenge.

Development of work

Once a high-level architecture approach has been developed, and then agreed by the Independent Technical Advisors, a contract or tender is issued by the Portfolio Management Team, with support from Legal. The contract or tender then enables a Design Body to develop in more detail the Solution Architecture to solve the challenge.

Once a contract is in place, the Design Body undertakes more detailed Solution Architecture until there is sufficient detail for the Orchestrator to contact for a delivery partner. The Design Body then oversees the work of the Delivery Partner in the development of the AAR solution through the course of its lifecycle, stage-gating its progress that demonstrably align to global best practice digital/data delivery methodologies.

Ongoing solution management

Once a solution has gone live, the Design Body will, as specified in the terms of their contract, support oversight of the AAR solution for a specified timeframe. The AAR solution is then run by the Delivery Partner to the terms of their contact, which specifies a period through which they are liable to run the service and notes how costs are expected to be recovered for the service.

Depending on the Delivery Partner and Ofgem and DESNZ's expectations for the solution, they may choose to regulate the service in some way – this decision falls outside the scope of the Orchestrators work.

Authentication Service

How an Orchestrator might implement an Authentication Service

Origin of requirements

This example presumes the sector has set up the Orchestrator, and the Orchestrator identifies the need for an Authentication Service.

An Authentication service, i.e., a way for ensuring the identity of a user in a digital system is a common component in many systems. As the shared digital infrastructure becomes more complex the need of authentication services is likely to increase. The Orchestrator may identify the need to standardise authentication across multiple component parts of the shared digital infrastructure.

Development of work

As with other examples, the Authentication Service would be developed in high level detail by the Architecture Team and contracted out to a Design Body and ultimately a Delivery Body. Depending on the scope of the solution that has been designed, there are two scenarios worth describing. Scenario A is the instance where a working prototype is developed, alongside relevant documentation and is then made available open source for the sector to utilise.

Scenario B is an instance where, for the resilience of the whole energy system it is identified that an organisation should be responsible for running and operating an Authentication Service; with the Orchestrator using its influence and contractual arrangements to ensure all shared digitalisation infrastructure that has need of an Authentication Service, utilises the new approach that has been implemented.

Ongoing solution management

Within Scenario A, the Orchestrator may appoint a Delivery Partner to be responsible for maintaining and updating the open-source code that enables a common authentication service replicable pattern organisations can use to maintain interoperability. Within scenario B, a Delivery partner would be responsible for maintaining and operating an Authentication Service, with responsibility to integrate this service with key systems in the shared digitalised energy system.

Data Sharing Infrastructure

How Data Sharing Infrastructure could be delivered in this framework

Set up of Orchestrator and current work

This example presumes the DSI and Orchestrator are being developed concurrently.

The Data Sharing Infrastructure (DSI) has currently been developed by a consortium led by National Grid ESO, with support of the National Digital Twin Programme (NDTP) to support the Virtual Energy System (VirtualES) programme.

The DSI work is currently considered to be in its alpha phase. The VirtualES programme in the structure defined by this work would be considered a Design Body developing the DSI for the benefit of the sector.

Once an Orchestrator exists and is staffed, the continued development of the core DSI capabilities could be transitioned to the responsibility of the Orchestrator to oversee.

Development of work

Once the Orchestrator exists and is ready to take on projects, it would take on the oversight and coordination of development of the relevant parts of the DSI (Prepare, Trust, Share) from VirtualES and would subcontract relevant parties (Delivery Partners) to continue to develop the work and operate the DSI. This may include appointing an ‘operator’ of DSI.

As this work progresses, all documentation relating to the development of the DSI will be transferred into the shared knowledge base of the Orchestrator.

This allows the VirtualES to deliver to specific use cases while the development of underlying capabilities are managed by the Orchestrator through a Delivery Partner or ‘operator’.

Future looking

The Delivery Partner, or ‘operator’ of the DSI would then be responsible for its development, security and interoperability, with market users then using that infrastructure to deliver their own use cases.

These may include the VirtualES, the Flexibility Digital Infrastructure, or third-party market implementations of the DSI.

A.6 – Questions identified

Key questions

Questions that will need resolved

Overview

As the work develops and more thought is provided by the regulator, government and other industry parties, key themes and questions are likely to emerge. We have highlighted a number of these that have come to the consortium's mind as we have developed this work.

Questions

1. What is the detailed scope of the orchestrator?
2. What risks are each party to this governance structure responsible for?
3. How is the total spending the Orchestrator determined?
4. How is the cost of the Orchestrator recovered?
5. How is the Orchestrator set up in relation to Ofgem's interim governance proposal?
6. What is the maximum value & length of contacts the Orchestrator can procure without additional oversight?
7. How are public appointments made to this body, depending on the organisation structure option taken?
8. What is the relationship between the Orchestrator and SIF/NIA funding?
9. What is the likely long-list of shared digital infrastructure that the Orchestrator may need to facilitate the development of?
10. Does the Orchestrator need a separate audit and risk capability and where does it sit if so?
11. How will recruitment be achieved, particularly with the hard-to-find roles on Architecture.

ESO