ESO Architecture – Data & Analytics Platform
Data Engagement & Unified Models - Introduction

May 2021

Contributors (these slides) – Hall of Fame

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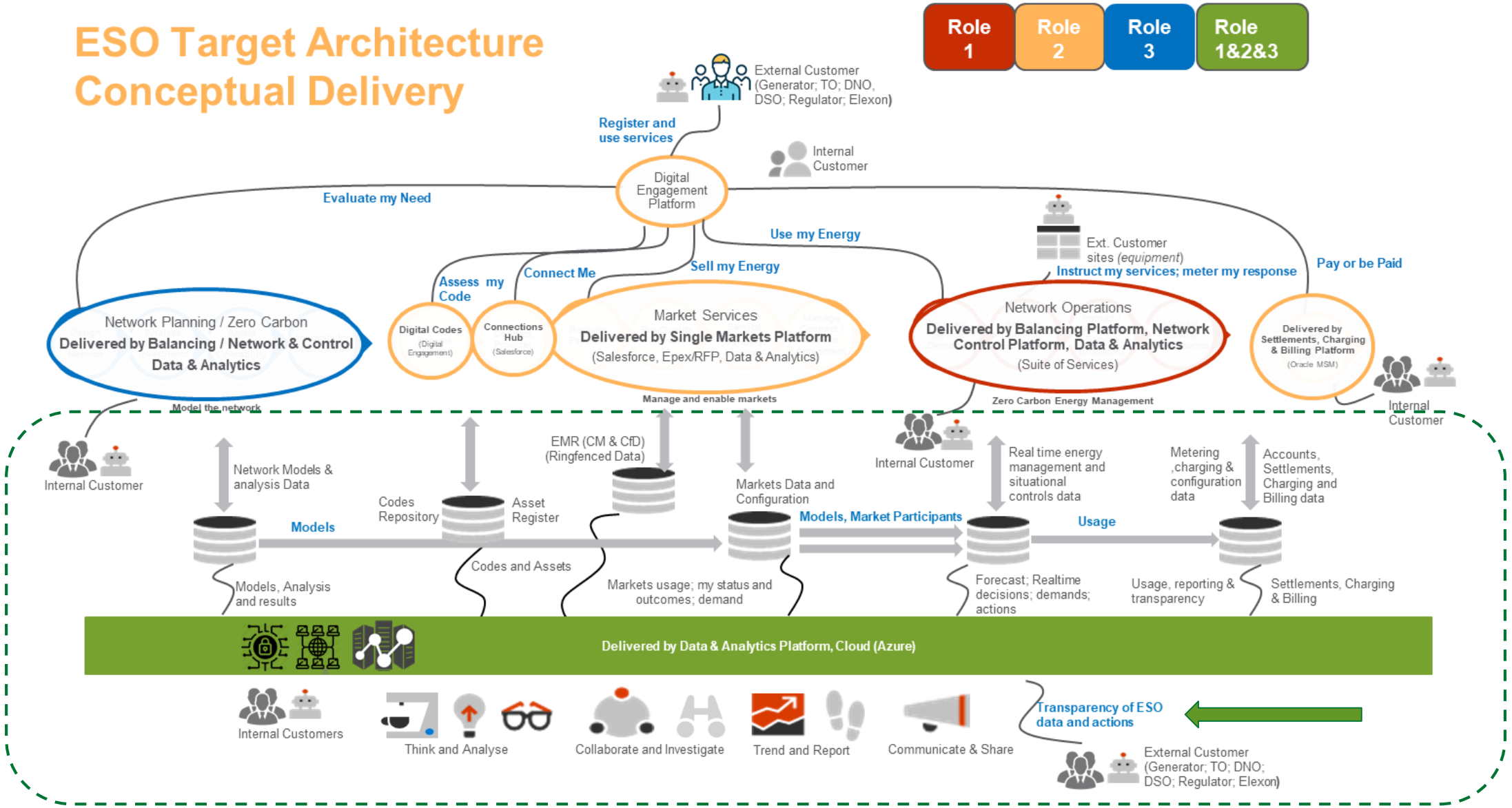
Context – the "What"

ESO Target Architecture Conceptual Delivery



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ESO T2 Data Landscape – Presumed Open context – the “Why”

Customers /
Industry Data Stakeholders

Indicative Roles / Context

Role 1 | Role 2 | Role 3 | Role 1,2&3

BEIS

NIS-D

OFGEM

Academic Institution / Media / Public

Energy Data Task Force

CORESO

ENTSO-E

Distribution Network / System Operator (DNO / DSO)

Interconnector

Transmission Operator (TO)

Elexon

Generator / Market Participant / Data Provider

Electricity System Operator (ESO target state)

Network | Planning | Situational Awareness | Balancing | Regulatory | Grid Code | Customer | Auction | Billing

NG Electricity Transmission

National Grid Group

NG Gas Transmission / System Operator

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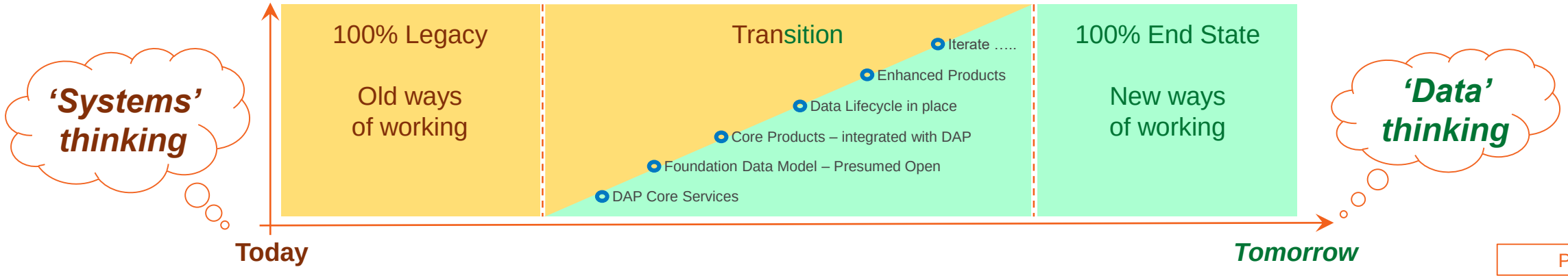
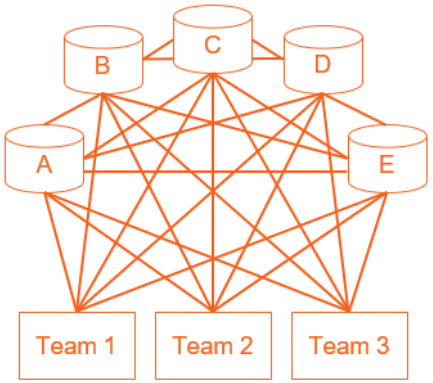
Owner: ESO Architecture Version 1.3 (May 2021)

The journey … the "Why"

DAP Solution design and development over time



Application Silos

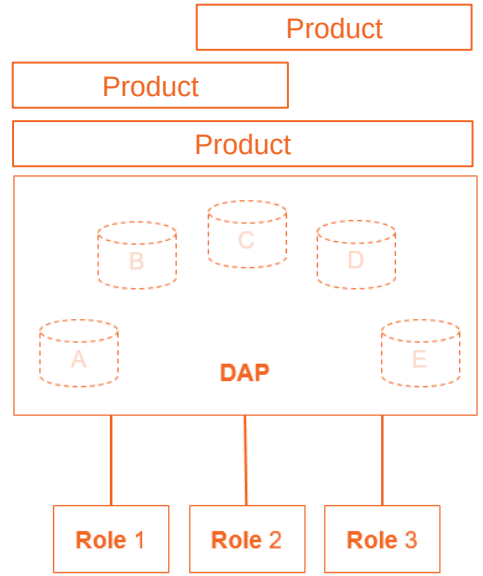


Operating the business today …

- System-based discussions
- Inconsistent data and language
- Point to point integration
- Silo data and process
- No single authoritative source
- Unresponsive / not scalable

whilst designing DAP for tomorrow.

- Data domain- and requirements-based discussions
- Common data and business vocabulary
- Collaboration and reuse
- Dynamic and responsive



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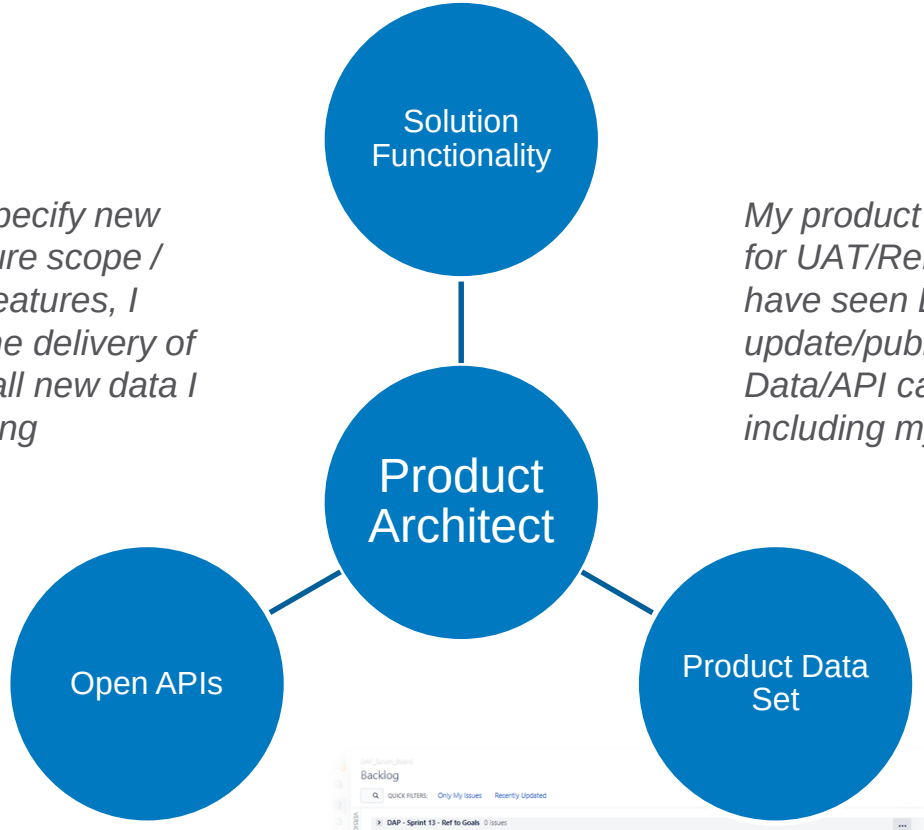
Principles – the "How"

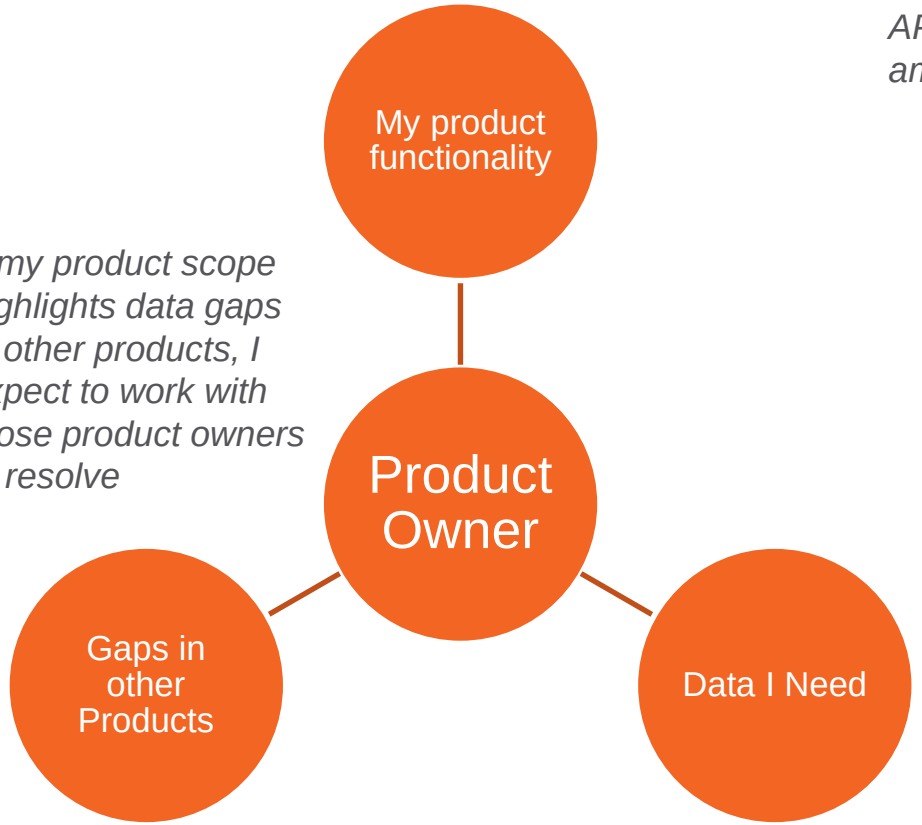
ESO Target Architecture Data and API Principles

When I specify new architecture scope / product features, I include the delivery of APIs for all new data I am creating

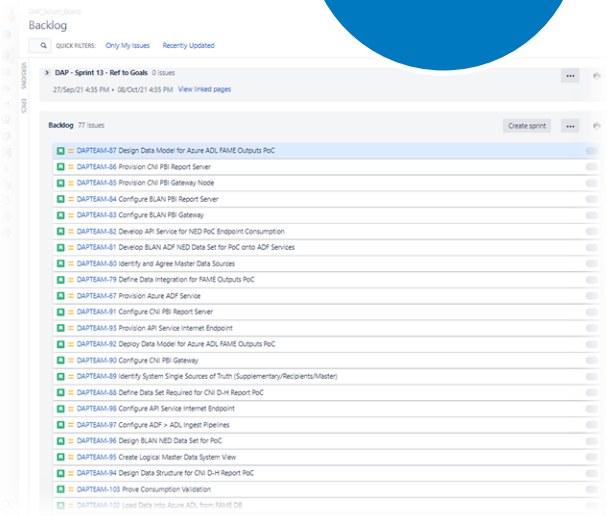


My product is only ready for UAT/Release when I have seen DAP update/publish the Data/API catalogue including my new data

If my product scope highlights data gaps in other products, I expect to work with those product owners to resolve



My first route to data I need is APIs that have already been published via the Data/API catalogue. If data I need is not published yet, I go to the relevant product owner to request publication.



"Example backlog reminder"

+ *Register API's delivered from Sprint 13 into API catalogue*
Register new data items from Sprint 13 into Data catalogue
Update processes and share with linked product owners

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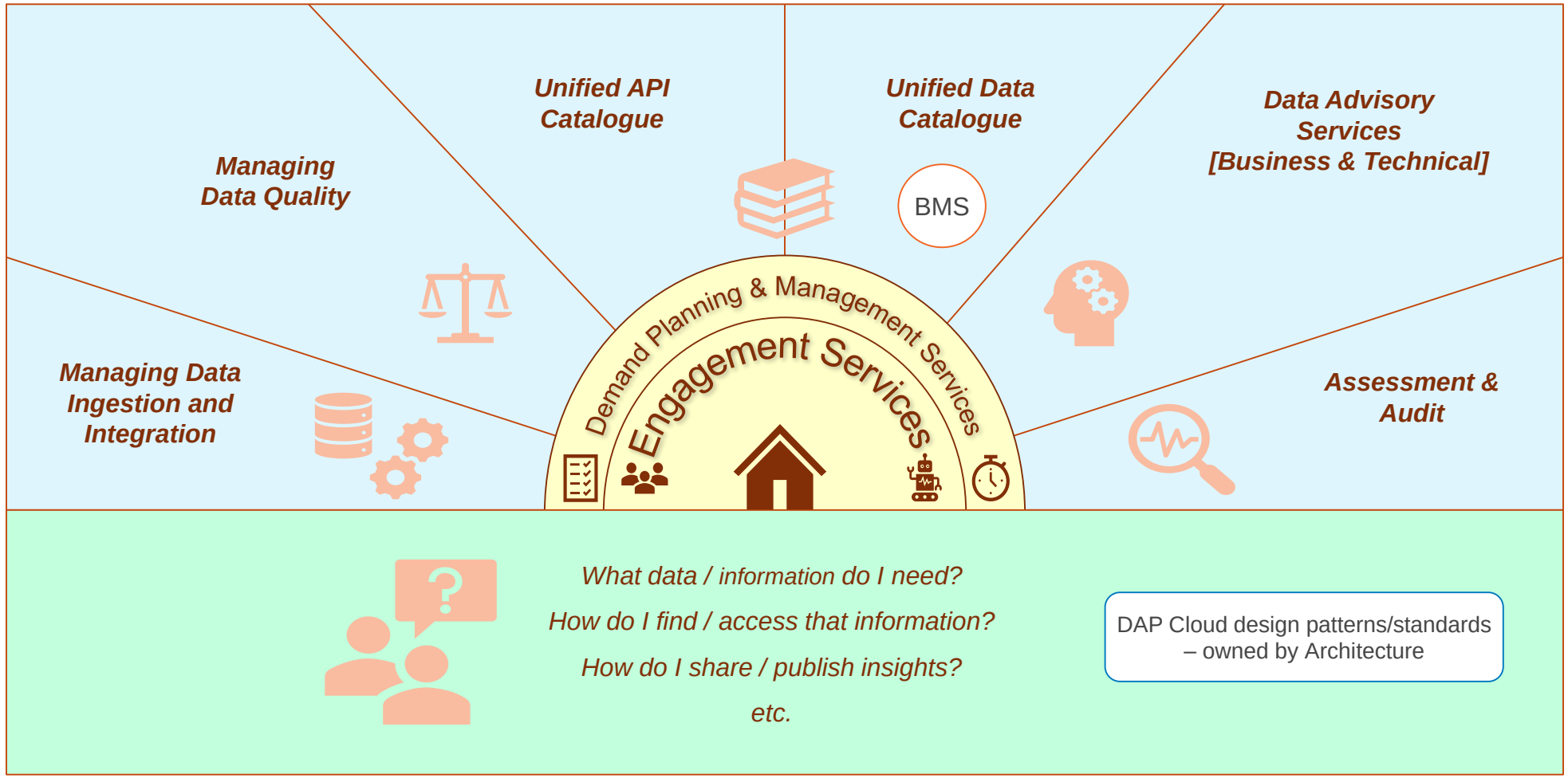
What does DAP engagement look like ? – the "How"

Takeaway – DAP is more than just a technology platform – move away from applications-centric and towards data conversations

60 100
80 100
100 100



20 40 60

20 40 60

100 100 60

100 80 60

Year 3 Year 2 Year 1

Example DAP % assistance levels shown for as-is to interim to target architecture - TBD

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DAP Engagement – the “How”

DAP engagements / requirements are expected to fall into three broad categories:

Based on the anticipated levels of support required …

UC1: Low

Clearly defined data needs	✓
Agreed product backlog and funding	✓

Prioritisation

UC2: Medium

Clearly defined data needs	✓	✗
Agreed product backlog and funding	✗	✓

Prioritisation & Advisory

UC3: High

Clearly defined data needs	✗
Agreed product backlog and funding	✗

Advisory

Takeaway – how to reflect in Mandate / INVP / Value Stream / Backlog ?

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ESO Data Engagement

Unified Models – Overview

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Concept of Unified ESO Data Model – why now ? (examples – there are currently 20+ silos)

- variability in data structure between systems/datastores
- inconsistencies in data values
- multiple instances of same reference data
- variability in resolution/granularity

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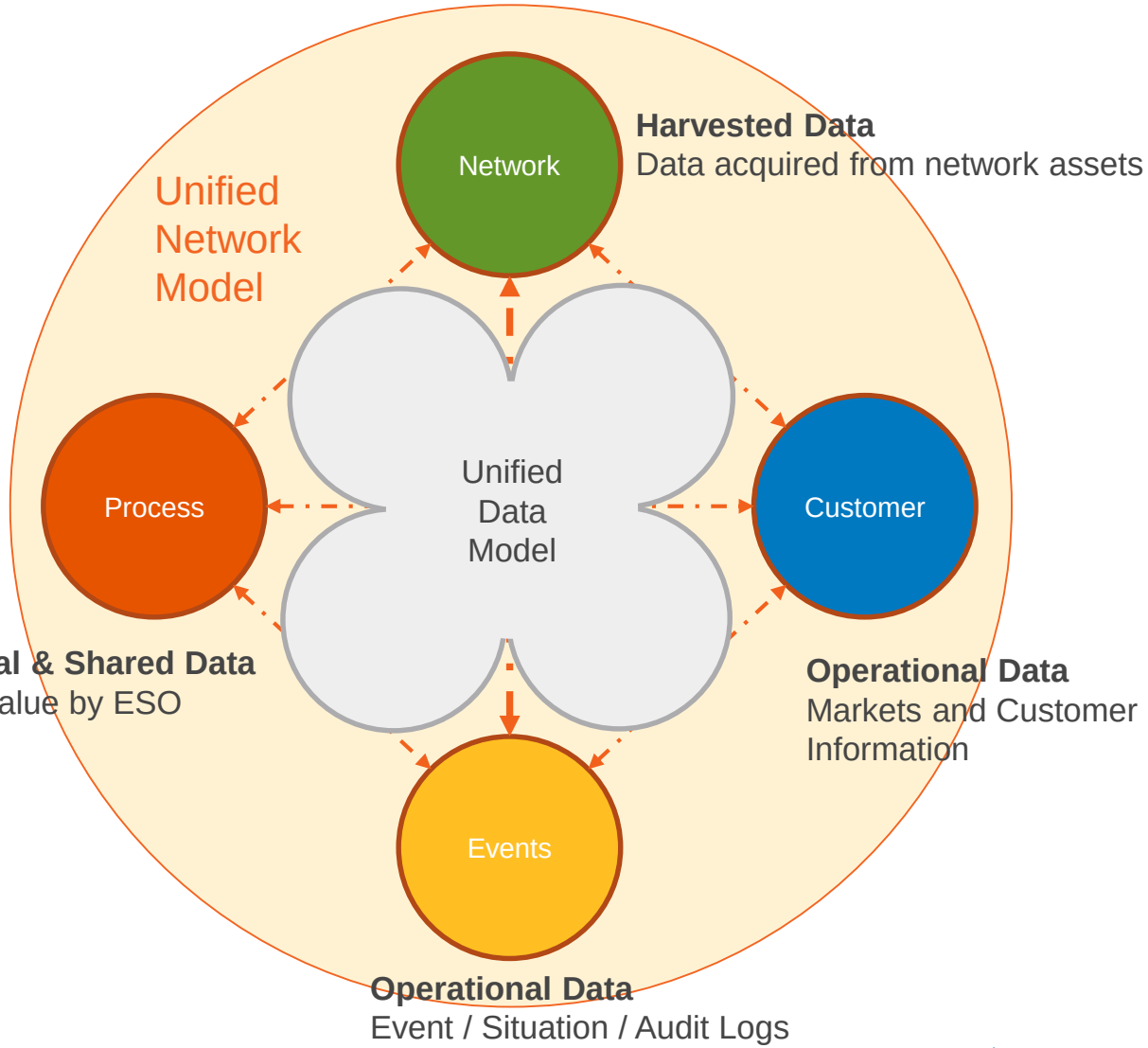
Unified Network Model Methodology Applied to ESO

The diagram illustrates the relationships between a Unified Network Model (UNM) and Unified Data Model (UDM).

- **Unified Network Model** – This model focusses on four pillars where data is typically originated
- **Unified Data Model** – This model focusses on relationships between the four pillars



ESO Relationship with Assets

From the network view ESO gathers raw data from non-ESO operated assets, performs process functions and instructs non-ESO operated assets to balance the Electricity network. Increasingly the asset mix is changing with new data sets and renewable energy modelling challenges – driving the need to represent data in a consistent way.

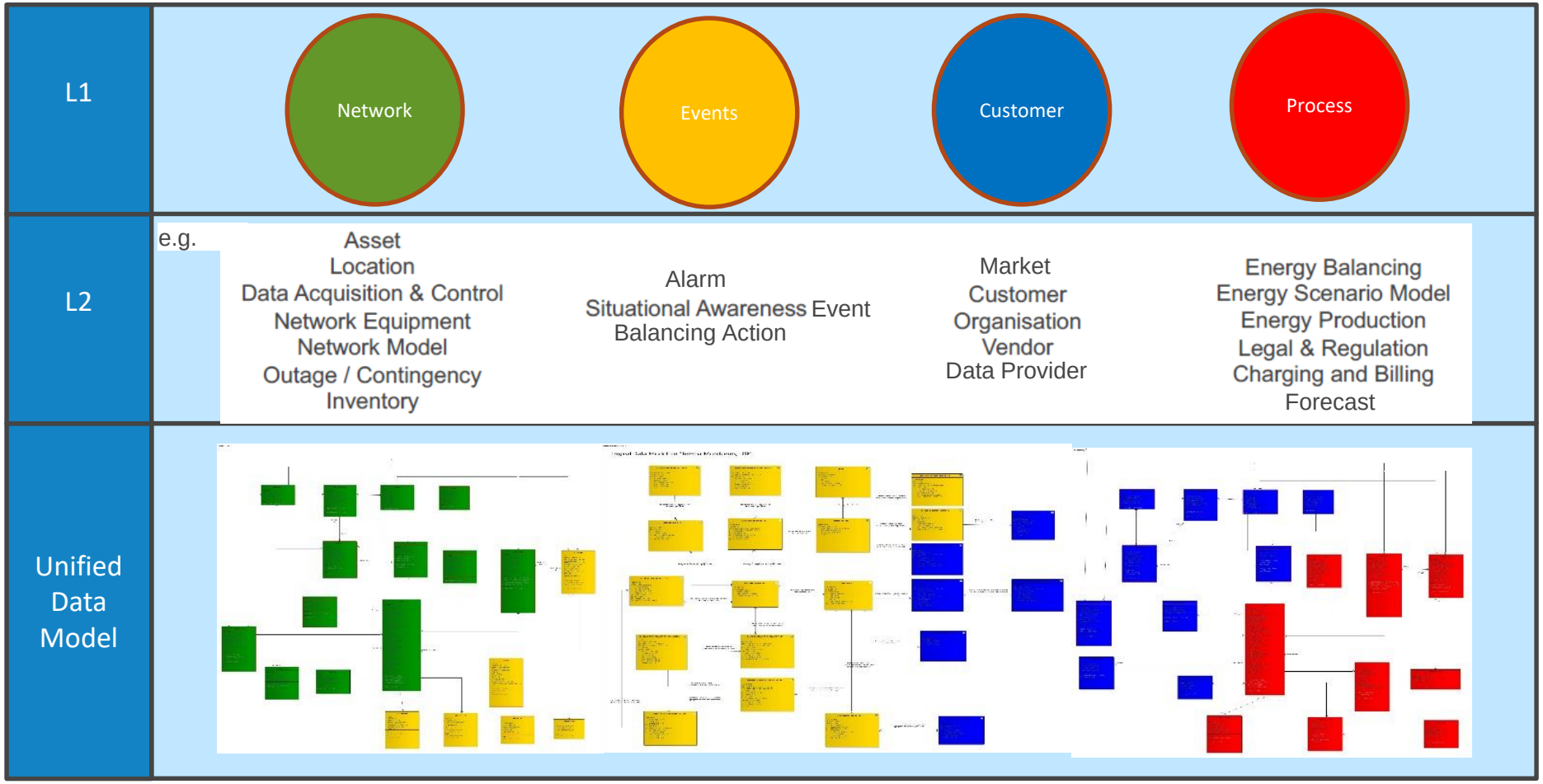
This model is used across multiple industries, and in effect is derivation from People, Process, Technology. Public Services use a similar model called "POLE"

Consistent Unified Network & Data Model – creates the ESO Information Model

ESO Pillars

ESO Data Assets – BMS/DML

ESO Data Model – Presumed Open Data



\+ Core Processes

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ESO Data Lifecycle principles

The framework is intended to define data retention policies and lifecycle of data movement across the architecture.

The intention is that long term retention and consolidated views will be in the Zone 2 landing zone.

It is anticipated that Products will have storage needs in Zone 1 and 2

Data Partitions		Zone 1 (CNI)			Zone 2 (Enterprise)		
Landing Zone	**Data Tier**	**Future**	**Current**	**Contingency**	**Future**	**Current**	**Archive**
Primary Storage	Partitions / Spaces	-T	30 Days (Ops Window)	30 Days - T+	-T	365 Days (Financial Year)	365 Days Aged
		When data is equal to the current zone 1 time window those data items are moved into the Current window to enable a rolling window and manage retention	Rolling 30 day window of Critical Operational Data, data is synchonrised with the current data in zone 2. Data Aged 30 days is removed to manage retention	Data in excess of 30 days is retained to manage Blackstart retention requirements. Data that has changed and is aged 30 days is synchronised with current in zone 2	When data is equal to the current zone 2 time window those data items are moved into the Current window to enable a rolling window and manage retention	Rolling 365 day window, typically covering the current financial year, data aged 365 days is moved in the zone 2 long term retention archive	All Data aged 365 days is retained in the data lake long term archive data storage pricing tier
Shared Operational Data	Regulatory						
	Published						
	Cache						
Historical Data	Operational History						
	Cache						
Harvested Data	Information (Structured)						
	DEEP Data (Unstructered)						
	Cache						

Above is example / draft – Work in progress

Takeaway – Once we have a Data-driven approach, we can simplify our data lifecycle

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ESO Architecture - DAP

Norma’s team – Takeaways

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Key takeaways

- Consider how to engage with DAP on scope, maturity, funding and resourcing
  - DAP cannot resource 100% of your data scope
  - Programme / Product teams have to carve out funds to supplement for ALL ROLES

- Product teams have an obligation to define, implement and then share their Data/API deliverables into DAP
  - Does your INVP consider the maturity of data backlog/funding to engage correctly with DAP ?
  - Add consistent items into your backlogs – Register Processes, Update Data catalogue, Update API catalogue etc
  - Don’t accept “someone else will do it” from your teams
  - Audit your backlogs and review with DAP core team

- Ask yourselves and your teams –
  - Have I negotiated a resource split between my Products funding pot and DAP core team ?
  - What am I doing to promote data visibility, re-use and sharing ?
  - Am I following the principles or am I in a silo ?
  - What evidence can I show that I am owning my data requirements and sharing into DAP ?
  - How is my backlog delivering against Presumed Open Data regulatory commitments ?

ESO Architecture - DAP Architecture Reference

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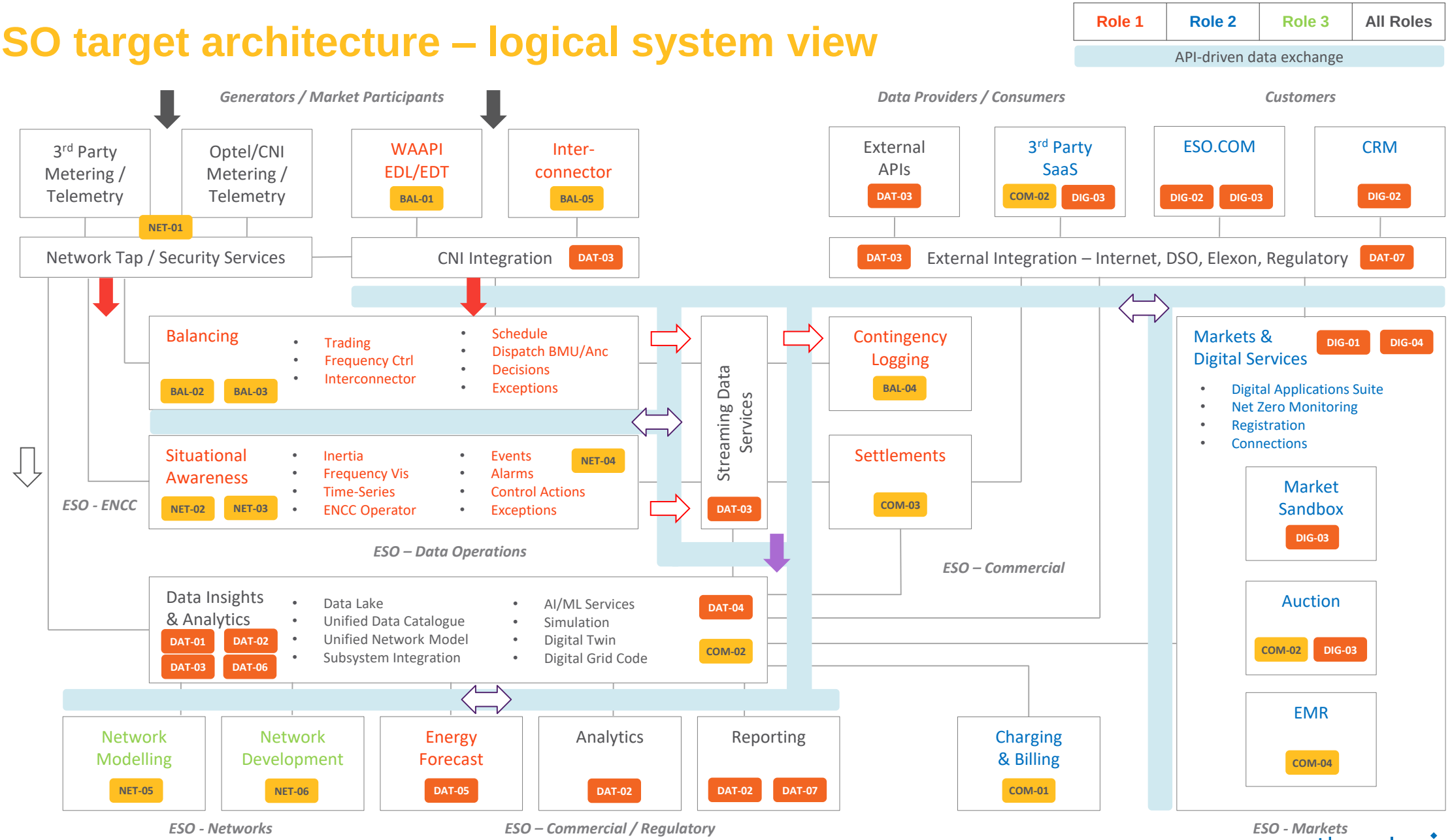
ESO target architecture – logical system view



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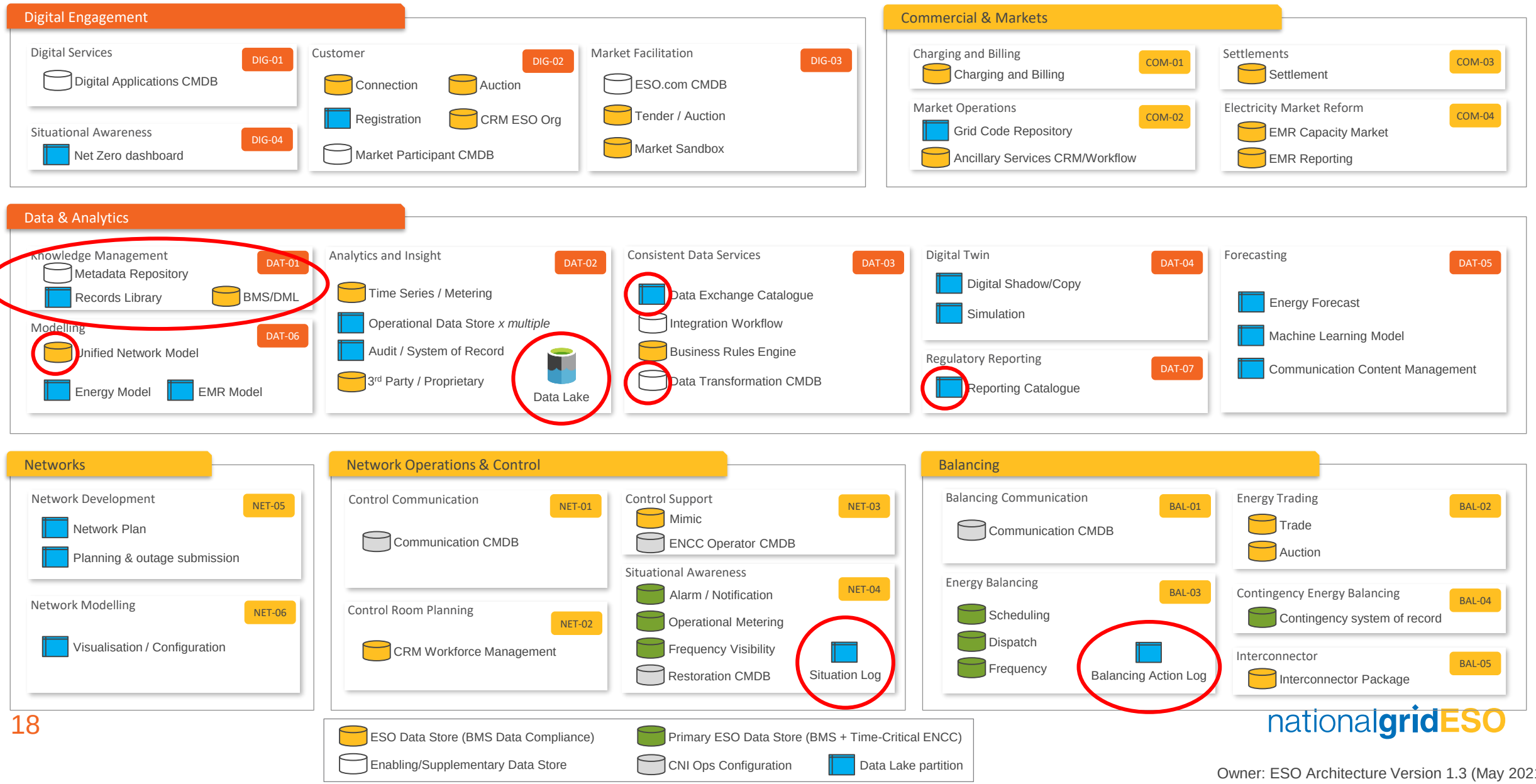
DAP initial priorities

T2 Platform architecture – Subsystem data landscape



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ESO Platform architecture – Apps rationalisation

Data & Analytics

22 → 22

T1 Applications + New Capabilities	Rationalise to T2 Component	T2 Subsystem	T2 Target Platform
NEW - Advanced Search	**NEW - Advanced Search**	**Knowledge Management**	Data & Analytics
NEW – Records Management	**NEW – Records Management**		
Crystal Reports Tableau	**Internal Reporting**	**Analytics and Insight**	
NED	**NEW - Data Lake**		
NEW – Time Series Insights	**NEW – Time Series Insights**		
NEW - Predictive Analytics	**NEW - Predictive Analytics**		
NEW - Predictive Analytics CNI	**NEW - Predictive Analytics CNI**		
NEW - Commercial Simulation NEW - Market Simulation	**NEW - Simulation**	**Digital Twin**	
NEW - Training Simulator	**NEW - Training Simulator**		
Email Incentives	**Communication**	**Forecasting**	
EFS (becoming PEF)	**Energy Forecasting**		
NEW – Innovation Labs	**NEW - Innovation**		
CNI-CDSA	**CNI Integration**	**Consistent Data Services**	
FAME	**Interpolate-Extrapolate**		
NEW - Workflow Automation	**NEW - Workflow Automation**		
CDSA MPSI Talend	**Non-CNI Integration**		
Generator Uncertainty Model OFSA OLTA OSA Plexos	**Power Systems Modelling**	**Modelling**	
BID3	**Economic Modelling**		
EMR Modelling	**EMR Modelling**		
CIMDESK	**NEW – Unified Network Model**		
BMRS Elexon Modis / ETR Trading Reporting and Notification System (TRNS)	**External Reporting**	**Regulatory Reporting**	
LIMS	**Information Provision**		