

WORK SAMPLE
ENTERPRISE DATA MANAGEMENT
THROUGH A CARBON ACCOUNTING
USE CASE

CASE SUMMARY, THEN THE HAND-OVER DECK OF OCTOBER 2023.
ANONYMISED: CLIENT, PEOPLE, BRAND AND VENDOR IDENTIFIERS
REMOVED.

PROBLEM

- High-value enterprise use cases — customer data, revenue growth management, supply-chain planning, promotional-spend budgeting and carbon accounting — were blocked by inconsistent data quality, siloed ownership and no shared governance.
- The immediate challenge: make ESG data from R&D, Finance, Procurement, Manufacturing and the sustainability platform reliable enough for group reporting, in an organisation with no established data-management function.

ACTION

- Framed the Enterprise Data Management case and four-year roadmap, then designed the operating model and proved it through carbon accounting.
- Led the fourth iteration of the cross-functional data model, the quality rules, the cleansing programme and the production dashboard.
- Introduced Data Sharing Agreements, an owner / steward / custodian model and a six-level quality ladder with named accountability.
- Chaired the three-tier governance cadence, recruited the permanent EDM lead, and transferred the method, governance and use-case approach to the incoming team.

RESULT

- Governed carbon-accounting data delivered across five functions: completeness and consistency targets met for 95% of volume sold by year-end 2022, then 98% and 99%.
- Quality dashboard in production in February 2023; external reporting followed on the same model; energy-emissions work initiated.
- Hand-over to the permanent EDM lead completed on 6 October 2023, with a repeatable method estimated at 2–3 months per additional use case.
- Broader operating-model deployment remained in motion at departure.

EDM PROJECT — HAND-OVER SESSION
CARBON ACCOUNTING AND EDM CORE
CONCEPTS

6 OCTOBER 2023

AGENDA

- Case summary
- Data management issues and the EDM framework
- Roles, Data Sharing Agreements and governance
- Deployment roadmap and maturity path

DATA MANAGEMENT ISSUES ON KEY DATA INTENSIVE USE CASES

Selected Use Cases	Sustainability reporting	IBP (Integrated Business Planning)	RGM (Revenue Growth Management)	DTC Consumer Data Platform	Operational Excellence (Manufacturing)
Key Data Management Issues	• Lack of global definition of sustainability features • Sustainability processing enriched on Excel • Packaging intensity not reported in PLM • Product definition not aligned between PLM and BoM in SAP • No ownership of sustainability-related data • External reporting built on assumptions • BoM data outdated	• Vast number of data sources and different definitions make data gathering complex • Time consuming recurring data quality work to feed the demand-planning tool (demand planning) • Single Version of Truth complex to identify • Changes complex to be reflected in IBP plans due to various data manipulation • Limited dashboards available for tracking the execution of the plan	• Local sales complex to consolidate due to heterogeneity of definitions • Some partners willing to provide data – comes at high price + complex ingestion • Limited Market data available • Consolidation of transaction data needs manual reprocessing • Lack of alignment on product and customer hierarchies	• E-Commerce not connected to Customer Care system (the customer-care system), owned by R&D • Challenges in building advanced analytics capabilities (hiring AND retaining talents) • Consumer purchase history not available • Several data sources fragmented, aggregation on common dimensions is a challenge • Risk of exposure to privacy issues	• To be Completed

THE KEY DATA MANAGEMENT ISSUES FROM OTHER GLOBAL COMPANIES

External Use Case	Key functions implemented	Data Management Issues
360 Customer view (B2B Coverage) (Corporate Bank)	Customer ownership / who's getting the bonus? Global relationship management Account Planning	Data ownership, Data insights Data Lifecycle
A&P budget allocation (Pharma)	Allocate A&P budget where it has the highest impact Past and forecasted development aggregation Monitor the effect	Data Glossary, Consolidation
Customer journey management / CustSat (Automotive)	Roll-out global Customer Journeys Capture satisfaction at each moment of truth through the complete lifecycle Optimize goodwill warranty spendings on high CustSat impact areas	Data Lifecycle, Capture insights Data ownership,
Cookie / privacy / opt-in management (Footwear)	Aggregate opt-ins through various channels (direct and partner) Enable consolidated view Enable opt-in management from all touchpoints	Centralization / dissemination of consents Usage of data (purpose) Regulatory aspects / privacy
External Data Injection (Nielsen...)	Build / buy one use many Make data available to everyone	Data capture, Data rationalization (incl. injectors), Data usage
Survey optimization (Automotive)	Consolidate survey data (globally and from every part of the org)	Same as above
Data Sampling (CPG)	Access to data to sample some issues that business is going through	Data identification (catalogue)
S&OP (Food processing)	Aggregate data from all parts of the business to align production with demand forecast	Data Glossary, Data Ownership Data lifecycle, Dissemination of data
Farm to Fork Product Traceability (Agroindustry)	Farming products traceability (incl. intrants, storage, transformation, etc.) for Organic certification	Data lifecycle, Data lineages, Data Ownership

A COMMON SET OF DATA MANAGEMENT ISSUES

Internal analysis

Selected Use Cases	Sustainability reporting	IBP (Integrated Business Planning)	RGM (Revenue Growth Management)	DTC Consumer Data Platform	Operational Excellence (Manufacturing)
Key Data Management Issues	- Lack of global definition of sustainability features - Sustainability processing enriched on Excel - Packaging intensity not reported in PLM - Product definition not aligned between PLM and BoM in SAP - No ownership of sustainability-related data - External reporting built on assumptions - BoM data outdated	- Vast number of data sources and different definitions make data gathering complex - Time consuming recurring data quality work to feed Garvis (demand planning) Single Version of Truth complex to identify - Changes complex to be reflected in IBP plans due to various data manipulation - Limited dashboards available for tracking the execution of the plan	- Local sales complex to consolidate due to heterogeneity of definitions - Some partners willing to provide data – comes at high price + complex ingestion - Limited Market data available Consolidation of transaction data needs manual reprocessing - Lack of alignment on product and customer hierarchies	- E-Commerce not connected to Customer Care system (Pega), owned by R&D - Challenges in building advanced analytics capabilities (hiring AND retaining talents) - Consumer purchase history not available - Several data sources fragmented, aggregation on common dimensions is a challenge - Risk of exposure to privacy issues	To be Completed

External analysis

External Use Case	Key functions implemented	Data Management Issues
360 Customer view (B2B Coverage) (Corporate Bank)	Customer ownership / who's getting the bonus? Global relationship management Account Planning	Data ownership, Data insights Data Lifecycle
A&P budget allocation (Pharma)	Allocate A&P budget where it has the highest impact Past and forecasted development aggregation Monitor the effect	Data Glossary, Consolidation
Customer journey management / CustSat (Automotive)	Roll-out global Customer Journeys Capture satisfaction at each moment of truth through the complete lifecycle Optimize goodwill warranty spendings on high CustSat impact areas	Data Lifecycle, Capture insights Data ownership,
Cookie / privacy / opt-in management (Footwear)	Aggregate opt-ins through various channels (direct and partner) Enable consolidated view Enable opt-in management from all touchpoints	Centralization / dissemination of consents Usage of data (purpose) Regulatory aspects / privacy
External Data Injection (Nielsen...)	Build / buy one use many Make data available to everyone	Data capture, Data rationalization (incl. injectors), Data usage
Survey optimization (Automotive)	Consolidate survey data (globally and from every part of the org)	Same as above
Data Sampling (CPG)	Access to data to sample some issues that business is going through	Data identification (catalogue)
S&OP (Food processing)	Aggregate data from all parts of the business to align production with demand forecast	Data Glossary, Data Ownership Data lifecycle, Dissemination of data
Farm to Fork Product Traceability (Agroindustry)	Farming products traceability (incl. intrants, storage, transformation, etc.) for Organic certification	Data lifecycle, Data lineages, Data Ownership

Data Management Issues

Data Definitions are local to parts of the organization, which makes it complex to share or consolidate; also lack of data ownership encourages users to recreate silos at the cost of duplicated processing effort

Data available does not always support expected **Data Usage**, generating needs of complex manual data transformation (weaknesses)

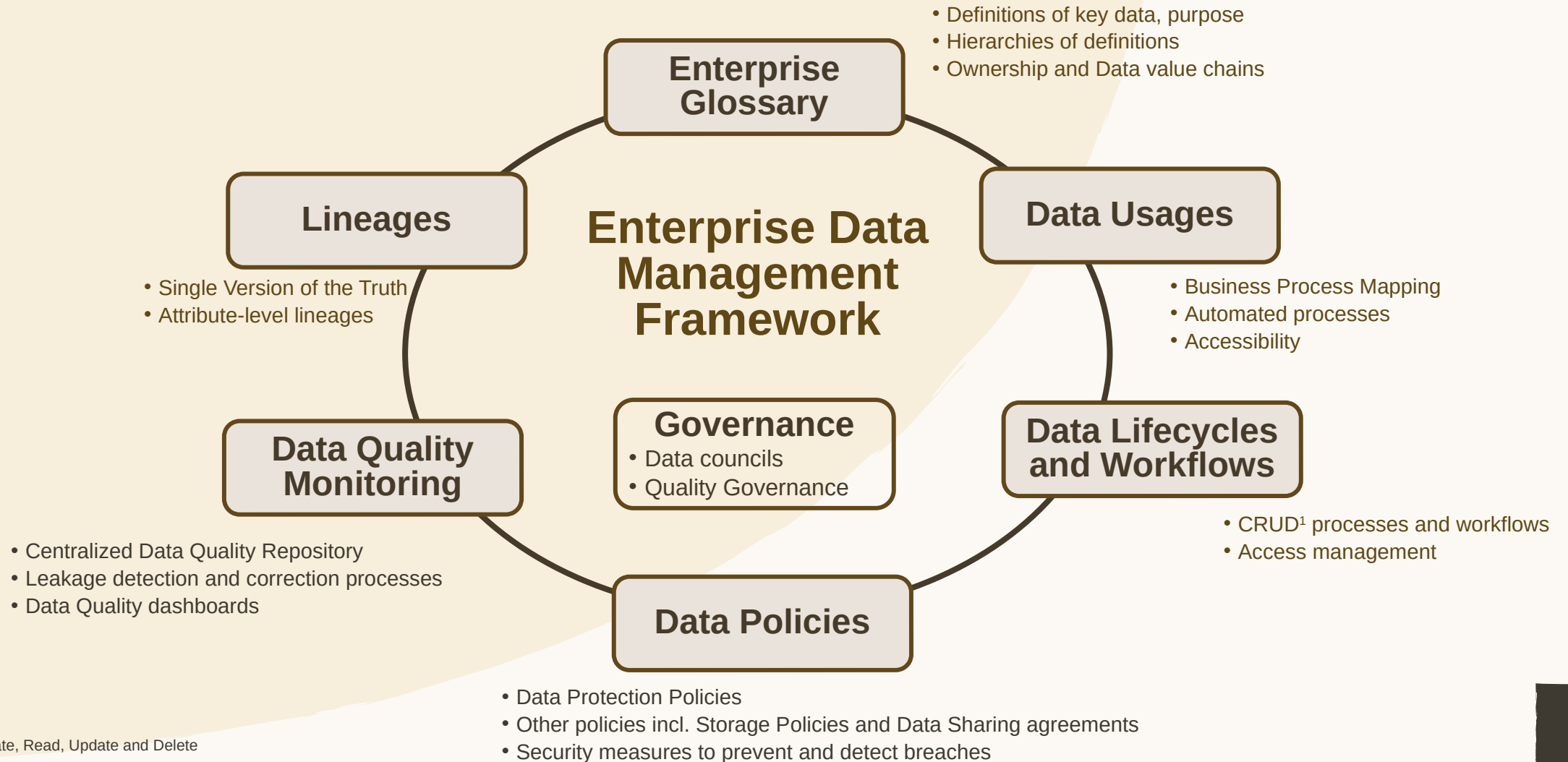
Data Lifecycles and workflows are not standardized, which exposes to duplicates and outdated data

Effective or suspected poor **Data Quality** triggers a lack of trust in management dashboards and reports

There is no **Single Version Of The Truth**, making it complex to reconcile data from conflicting sources

Lack of **Data Policies** exposes the organization to the risk of privacy leakages and compliance issues

AN INDUSTRY STANDARD ENTERPRISE DATA MANAGEMENT FRAMEWORK



THE ENTERPRISE GLOSSARY

Illustration of a Glossary Definition for a Merchant Acquirer

1. Merchant-related Dimensions

1.1 Merchant Segment

Definition/Business Rules:

The **Merchant Segment** dimension describes the business segment in which the merchant sits in.

The merchant segment is defined at Chain-ID level.

The dimension segments allocates the NI merchant portfolio based on last 12-months volumes, and is currently considering 2 segments: **Key Merchants**, with Chain-ID having a 40+ Million yearly volume with NI, and SME, which is further split in to **Medium SME** (10 to 40 Million) and **Small SME** (less than 10 Million).

Context/Usage:

The dimension is primarily used for financial performance evaluation and monitoring.

The defined threshold of AED 40M applies to the chain ID level.

Merchant segmentation remains constant during a 12 months period and is reviewed annually during budget finalization process.

New merchants are allocated an initial segment at the time of on-boarding – that is based on an estimated yearly volume and is reviewed for the following budget cycle.

The maintenance of the segments definition and the allocation of merchants to segments are under the control of the business team.

The initial allocation of merchants to the **Merchant Segments** is automated, and is based upon:

- The business rules presented above for the merchants having at least a complete year of activity with NI at the end of the first budget cycle (2016), or
- The estimated business potential, as committed by the sales and documented by the AFU at the onboarding.

Owner:

- Samer Soliman
- Salim Mahmood Awan
- Manish Bhatia

Users:

- Business Team (Sales Efficiency, Relationship Management)
- Finance Team (Performance)

Lifecycle:

- Initial allocation based on 2015 merchant performance
- Segment allocation of new merchants done at onboarding
- Segmentation review cycles aligned with budgetary schedule

EDM REQUIRES CLEAR DATA SHARING AGREEMENT BETWEEN THE DATA ORIGINATING ORGANIZATION AND THE USING ORGANIZATION TO REFLECT MUTUAL OBLIGATIONS

Originating Organization



R&D, Finance, ESG platform, Manufacturing

EDM - Landing Organization

I am providing you Quality Data to enable you to report on the Group's CO2 emissions

I am protecting the Data shared with me, and restrict my usage to agreed purposes (Carbon Accounting)

Mutual Obligations, under EDM Facilitation, Control, Approval and Governance

Using Organization



ESG - Carbon Accounting

WHAT IS COVERED IN THE DATA SHARING AGREEMENTS?

Sections	Content
Parties, Agreement Owners	Data owner from Originating Organization – incl. role description with responsibilities and obligations Process Owner from Using Organization
Purpose	Intended usage from the Using Organization of the Data Shared - Description of the required Data Protection Measures to be activated by the Using organization (privacy, security, access, retention, IP protection, compliance and other risk exposure) - Description of the Data Quality Controls And Measures to be applied by the Originating Organization for enabling the performance of the Using Organization in the execution of registered processes (incl. Traceability, error recycling, validation, etc.)
Scope	Description of the data needed for the intended usages (incl. list of fields needed by ESG), agreed definitions, Medias and data locations, service levels, error recycling processes, check points, etc.
Mutual Obligations	Set of rules , incl. access rights, nondisclosure, data correction / recycling processes, data stewardship, 5V data requirements, format, platforms, medias...
Gate checks	Data control points , trusted parties, validation and reviews
Agreement management	Other definitions for the Execution of the Agreement , incl. Change Control Process, Escalation routes, Limits, etc.

Principles
Details

EDM APPROACH FOR DATA QUALITY IMPROVEMENT

Data Quality Improvement

	Activities	Responsible	Measurement
Level 5 Correctness Audited	Data are reviewed by experts, to control that all is correct. This operation is done manually and can be done through a sampling of the key / most critical references, and automated consistency check	Business Experts	% Audited Data
Level 4 Referential Integrity Controlled	Once all the links are reconnected and that missing specs were added, control that for each of the links, there is a valid reference – that can be done through automated lookup (e.g., lookup that every HG Reference ID in ZPKG, there is an existing record in HG) – broken links fixed through level 2 and level 3 activities	Data Owner	Number of Broken Links
Level 3 Missing Specs Created	Once the missing links are reconnected, we might identify some connections that cannot be created, due to absence of reference available for the record (e.g., missing spec for a ZPKG), that requires the creation of a new spec in the originating system	Business Experts	Number of missing Specs
Level 2 Missing Links are reconnected	Mobilization of Data Cleansing squads to review all the records with missing links, and reconnect with existing references (e.g., each ZPKG record should have an HG Packaging Reference Code)	Data Stewards	Number of Missing Links
Level 1 New / Updated Data is Ring-Fenced	Corrections are implemented at the data origination end, to prevent new records to be created without the correct reference. This can be done either through process control enforcement or technically	Process Owner	Confirmation from Process Owner
Level 0 Data Quality is not Controlled	Starting point – the data quality level is not measured – build of reports to measure Data Quality, appointment of Data Owner, who will be in charge of allocating Data Stewards and development of DSP agreements with ESG (as needed)	Data Owner	-

DATA QUALITY RULES



Rule ID	Rule Description	Data Owner	Workaround	Implementation
1	...	...	...	...
2	...	...	...	...
3	...	...	...	...
4	...	...	...	...
5	...	...	...	...
6	...	...	...	...
7	...	...	...	...
8	...	...	...	...
9	...	...	...	...
10	...	...	...	...
11	...	...	...	...
12	...	...	...	...
13	...	...	...	...
14	...	...	...	...
15	...	...	...	...
16	...	...	...	...
17	...	...	...	...
18	...	...	...	...
19	...	...	...	...
20	...	...	...	...
21	...	...	...	...
22	...	...	...	...
23	...	...	...	...
24	...	...	...	...
25	...	...	...	...
26	...	...	...	...
27	...	...	...	...
28	...	...	...	...
29	...	...	...	...
30	...	...	...	...

THE EDM MODEL FOR ESG CARBON ACCOUNTING

The EDM Model is supported by **30+ Data Quality Rules** that were reviewed and validated by ESG experts

Each rule is assigned to a **Data Owner**, in charge of maintaining the consistency and relevance of the rules

Workarounds are identified when relevant, to enable producing the Carbon Accounting reporting when DQ Rules are not met

Rules are implemented in Dashboards and Tiles to enable monitoring the Data Quality Rules

DATA QUALITY DASHBOARDS



THE DATA QUALITY DASHBOARDS FOR ESG CARBON ACCOUNTING

The Data Quality Monitoring UX was defined to easily and conveniently detect and identify the Data Quality Issues

The Data Quality Dashboards highlights the evolution of the Data Quality Score over the last 6 weeks identification of trends and potential derailments

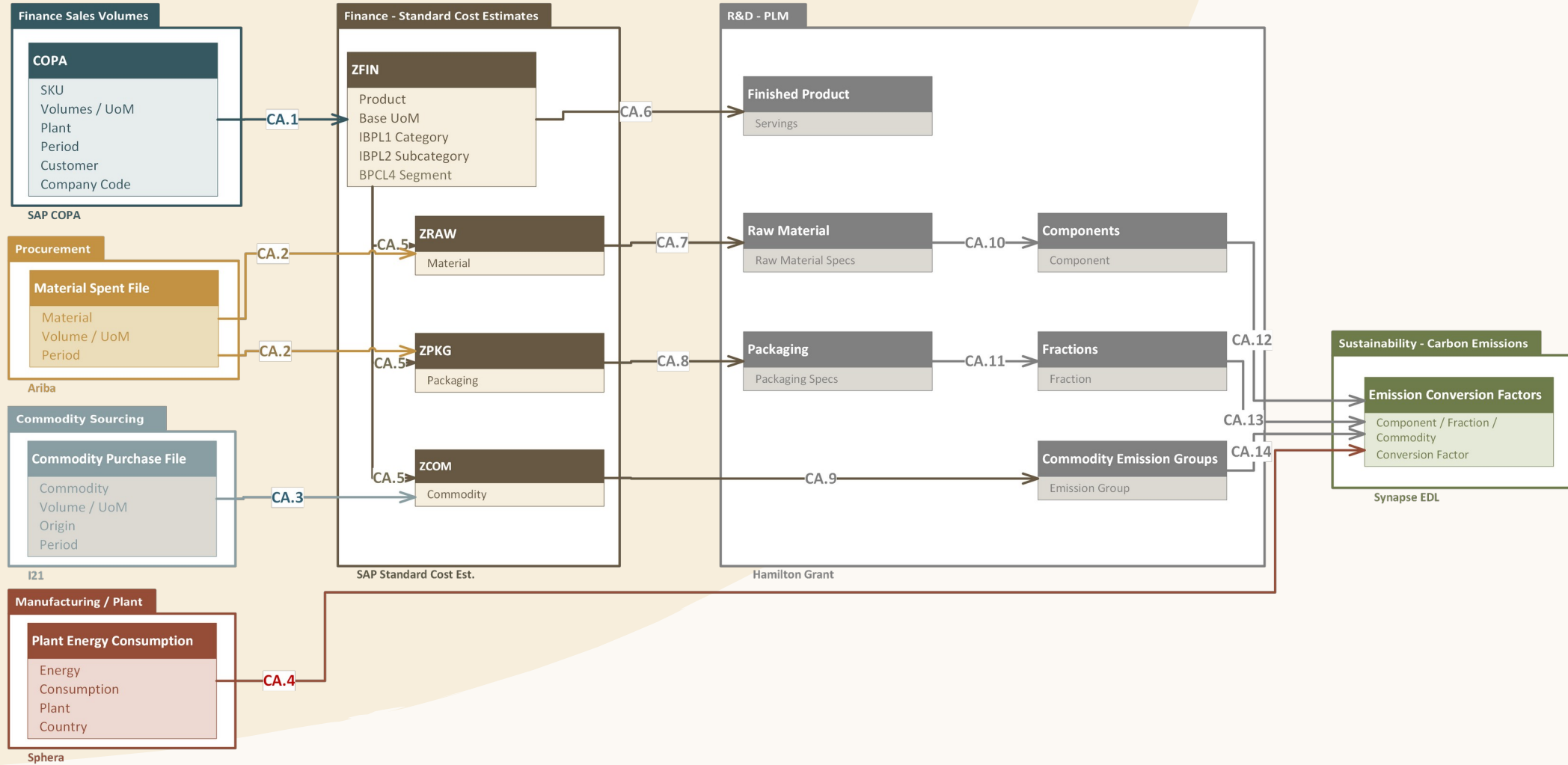
The Data Quality Dashboards are connected to the Data Quality Rules repository

Each Tile in the dashboard is allocated to a Data Owner, making it actionable and avoid ambiguity

Carbon Accounting DQ D

RECAP - EDM MODEL FOR ESG CARBON ACCOUNTING & EXTERNAL REPORTING

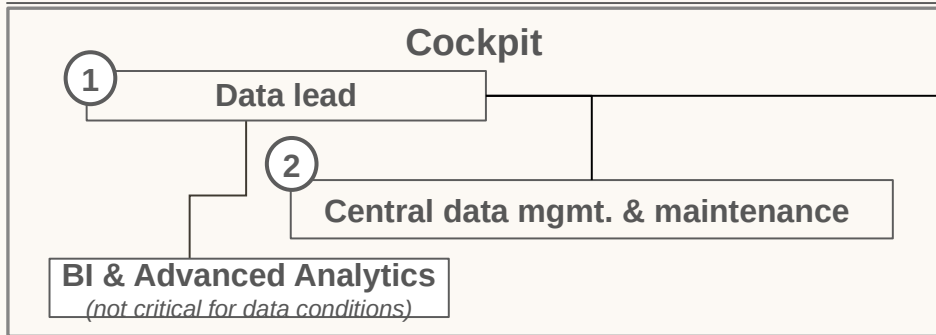
V 1.4, 27TH JAN 2023



TRANSPARENT GOVERNANCE STRUCTURE SHOULD ENABLE THE ORGANIZATION TO FOLLOW DATA (QUALITY) GUIDELINES

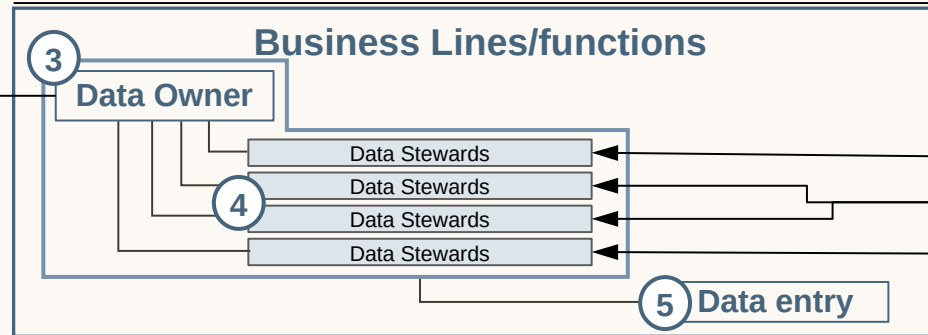
Central data entity

Control tower of data management organization



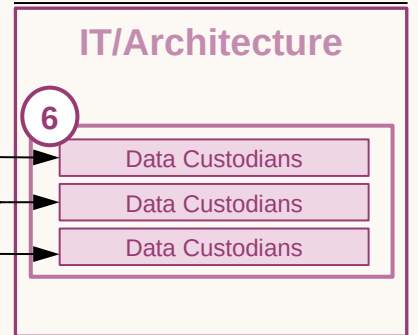
Pivots of the mechanism

Data champions within the institution



ILLUSTRATION

Focal point on the IT side



1 Data lead

- Responsible for **data management** and target **data model set-up**
- **Transversal role** coordinating business & IT
- Oversees the **implementation of data policies**

2 Central data mgmt. & maintenance

- Team **assists data lead in all mandates**, e.g. policy writing, governance, quality measurement, etc.
- Maintenance team assists in **validating data** and **assigns data entry owners** for data fixes

3 Data Owners

- Define asset/domain **rules and attributes**
- Define data **quality targets** and improvement initiatives
- Assign **user rights**

4 Data Stewards

- Locally **support and adjust central rules and policies**
- **Review condition of data**, perform reporting and **ensure data is corrected**
- Identifies **data-related IT problems**

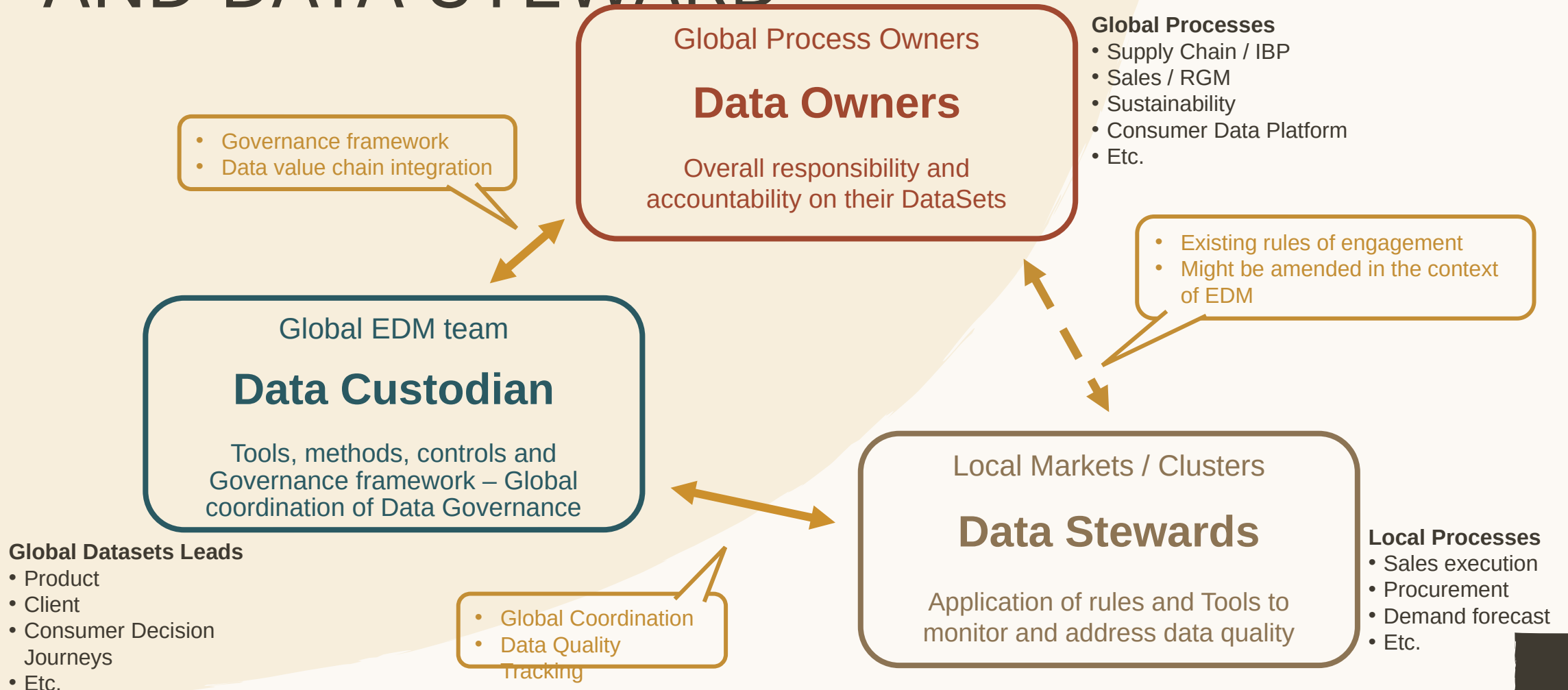
5 Data entry

- End-users in charge of '**producing data**' (e.g. Sales team)
- **Governed by data owners/stewards**; Sponsorsh. through the line

6 Data Custodians

- Responsible from a **technology configuration** perspective
- Translate **business definitions into system requirements**
- Define **master source of truth**
- Manage **user rights set-up**

THE ENTERPRISE MANAGEMENT ECOSYSTEM COVERS 3 KEY ROLES: THE DATA OWNER, THE DATA CUSTODIAN AND DATA STEWARD



KEY ENTERPRISE DATA MANAGEMENT ROLES

GLOBAL DATA OWNER

Accountable for Governance of a Dataset (within EDM framework)

Authority on **definitions, business rules and Policies**

Establish system for **auditing and reporting data quality**

Authority on **data creation and acquisition**

Accountable for **detection and resolution** of data quality issues

GLOBAL DATA CUSTODIAN

Owens the **Enterprise DM¹ Operating Model**

Provides directions to Local Data Stewards

Consolidate and Maintain DM¹ **Policies, Rules and Standards**

Lead the adoption of the Global DM¹ Assets

DM¹ Expertise, 2nd line of support to the local DM¹ teams

LOCAL DATA STEWARD

Implement the Global DM¹ Operating Model locally

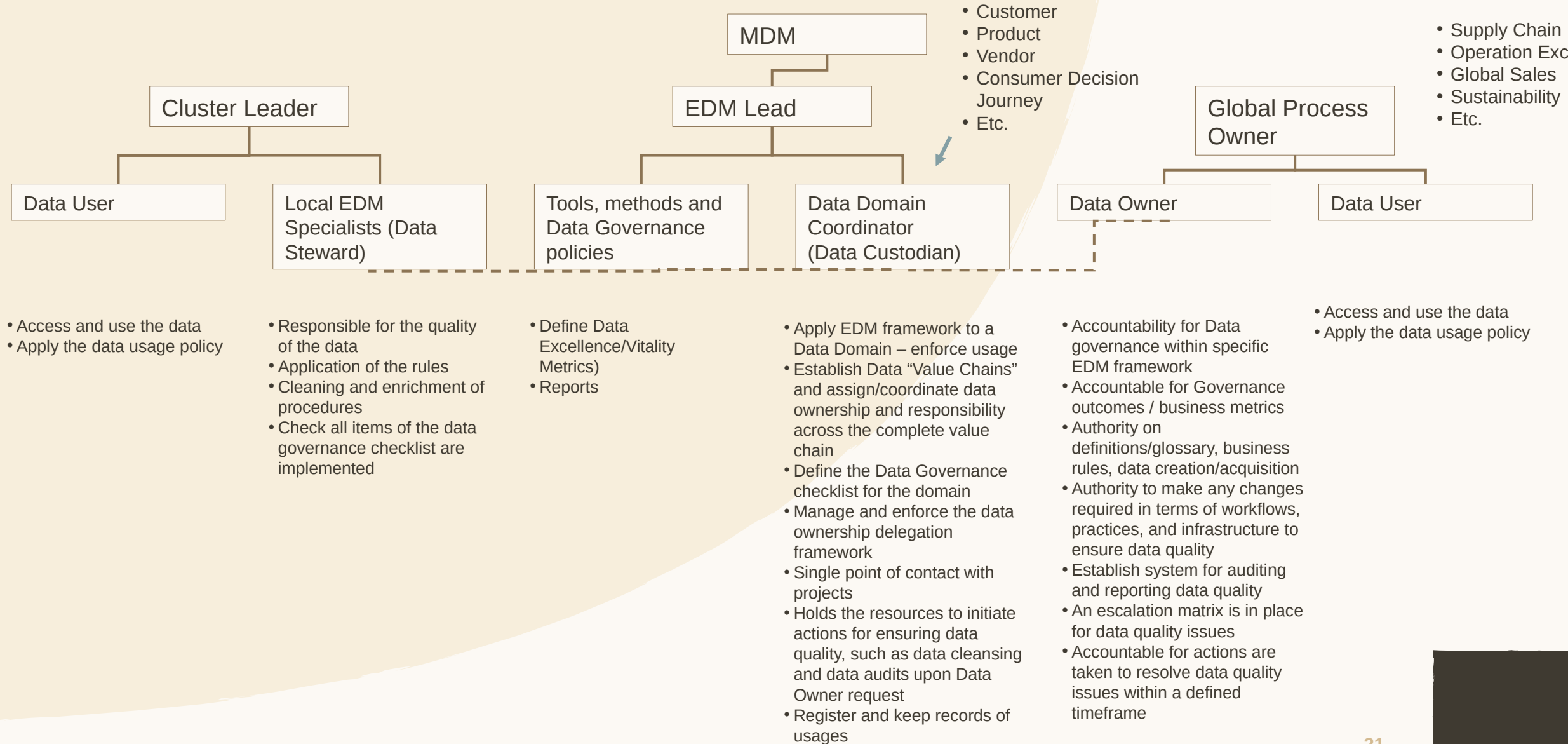
Act as the local **Data Steward**

Interface with Data Privacy, act as a first line on Privacy issues

Provide input to the Global Data Manager on **local requirements**

Train and Support End Users and Data Owners on Data Management

ORGANIZATION BLUEPRINT



THE EDM GOVERNANCE STRUCTURE IS DEFINED AND READY TO BE ESTABLISHED¹

DATA COUNCIL

(TO BE ESTABLISHED POST SUCCESSFUL DEPLOYMENT OF EDM ESG USE CASE)

Objectives:

- Lead the execution of the EDM roadmap
- Ensure adherence towards the newly established roles and governance
- Arbitrate conflicting agenda of different EDM Use Cases
- Used as a platform to further drive the transformation of the Group towards becoming a data-driven organization
- Allocate and monitor the appropriate usage of resources

Frequency: Quarterly

Chair: EDM Lead¹

Participants: CFO, CIO, Sustainability, R&D and Supply Chain leaders, other leaders upon invitation

EDM STEERING COMMITTEE

(TO BE ESTABLISHED WHEN PERMANENT ORGANIZATION IN PLACE)

Objectives:

- Drive the correct execution of the EDM ESG Use Case
- Arbitrate on resolution of Data Quality Issues that have business impact
- Support in pushing the EDM agenda, incl. change management and ensure buy-in from key stakeholders
- Address data creation process leakages

Frequency: Monthly

Chair: EDM Lead¹

Participants: Sustainability lead, Finance and IT leads, MDM lead, ESG data lead + R&D, SCE, COPA and ESG-platform data owners upon invitation

EDM DATA QUALITY PROGRESS MEETING

(TO BE ESTABLISHED WHEN PERMANENT ORGANIZATION IN PLACE)

Objectives:

- Detect and raise Data Quality Issue
- Review the DQI² and execution of remediation plans
- Ensure alignment between key EDM Data Owners and Stakeholders (operational)
- Support, facilitate, drive focus, build synergies and raise escalations
- Identify evolution needs to the Data Quality Rules

Frequency: weekly during stabilisation, then bi-weekly

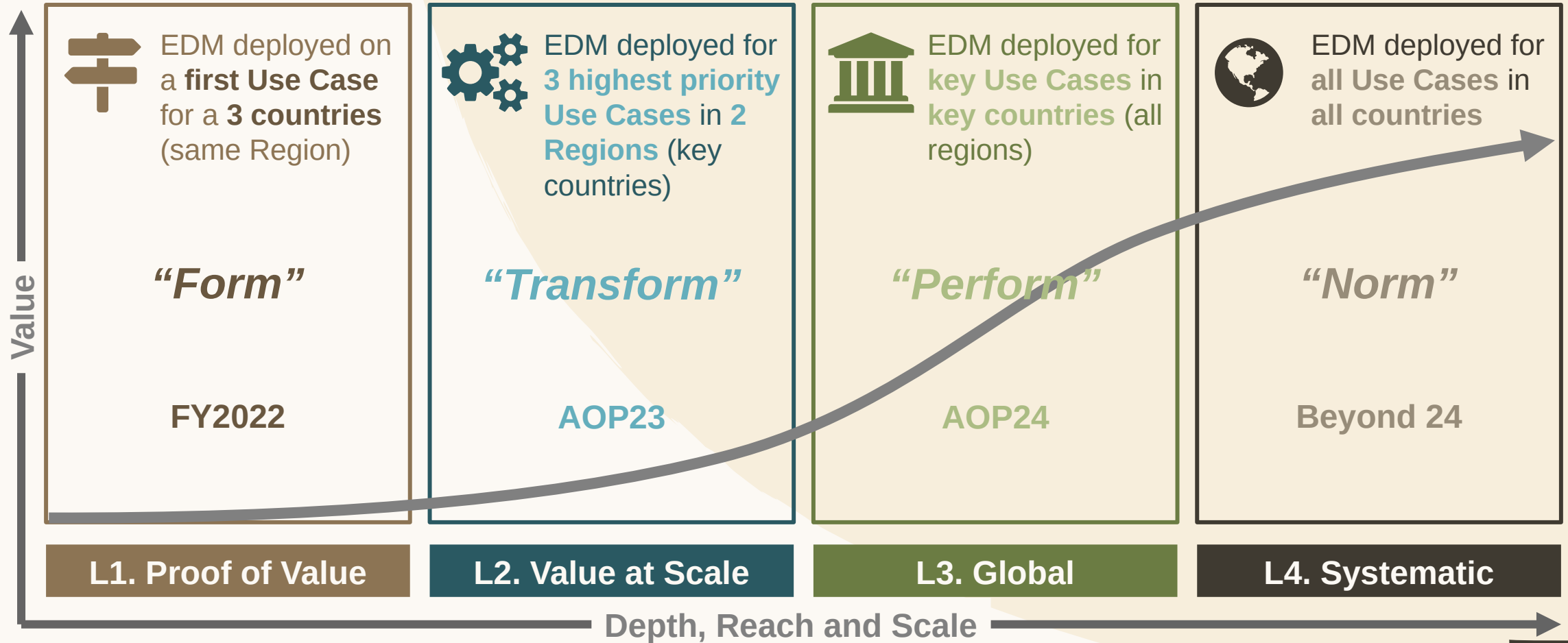
Chair: EDM Lead¹

Participants: MDM lead, ESG data lead and the dataset data owners (PLM, costing, packaging, sales volumes, emission factors, data platform) + others upon invitation

(1) Permanent EDM Lead when hired

(2) Data Quality Issues

FOUR STEPS OF EDM TRANSFORMATION WERE IDENTIFIED FOR A PROGRESSIVE AND VALUE-DRIVEN DEPLOYMENT



THE FOUR TRANSFORMATION STEPS WILL BRING THE GROUP THROUGH INCREASING LEVELS OF DATA MANAGEMENT MATURITY

	L1. Proof of Value	L2. Value at Scale	L3. Global	L4. Systematic
Management	Steering on “lagging” indicators (Financial results)	Steering on “leading” indicators (KPI’s)	Data-driven decision making (“push” from insights)	Scenario planning & forward-looking decision making (“pull” for insights)
Technology	Scattered landscape of data sources and reporting tools	Global BI tooling used on set of integrated systems	ONE BI platform to connect multiple data sources and set-up predictive models	Technology in house to move into natural language analytics, streaming analytics / AI
People	Ad hoc ‘Experts’ performing reporting activities based on their capabilities	Number of key resources dedicated to analytical activities identified as business analysts	Data scientist role fulfilled by certified and skilled resources and high degree of self-service for associates	Internal pool of analytics resources with a career path in field of analytics
Organization	Roles & responsibilities are ‘scattered’	Standardized blueprint of roles & responsibilities with central group resp. for BI	Central group of data scientists is formed	Central group of data scientists reporting into ‘independent’ function on C-level (CDO)
Data	Isolated bottom-up initiatives on data governance	Data governance driven from silos based on standardized ways of working	Enterprise-wide data strategy, governance model and harmonized way of working	Data is managed as an asset at an enterprise-wide level.