



DS Smith Data Strategy

A word from our sponsor



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Our mission is to "Redefine Packaging for a Changing World" and I believe data is fundamental to how we operate and make decisions that deliver on this mission. To redefine packaging, we must deeply understand customer needs, product trends, supply chain flows, and the environmental impact of our solutions and operations across paper, packaging and recycling. High quality data and analytics are crucial to gaining this understanding and responding with innovative and sustainable solutions.

Today, we capture vast amounts of data across our business but we're not yet using all this insight to create value. This, our first ever Data Strategy, outlines the next phase of our data journey to build capabilities and a culture that allows us to use data to maximum advantage. We will invest in data technology to unlock our siloed data, upskill our people so they have the right skills and develop the right ways of working so we can use this new insight. With better tools, training and the right data foundations, we will evolve our analytical maturity from using basic reports to leveraging predictive models, optimization algorithms, and artificial intelligence.

- Our vision is a data-driven culture focused on customer-centric, responsible insights that allow us to react quickly, optimize operations, mitigate risks proactively, and provide an exceptional customer experience. This strategy enables us to extract and harness the full value of our data assets. We will challenge ourselves to continuously improve and use data to fulfill our purpose, achieve ambitious sustainability goals, and deliver superior value as the packaging partner of choice for our customers. The journey requires commitment and time but the potential is vast.

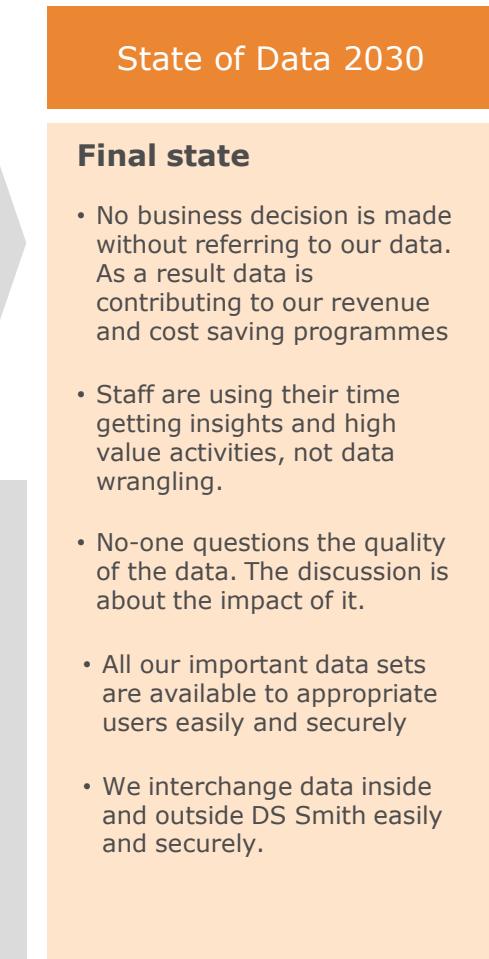
Richard Pike, CFO DSS

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Our Data Strategy on a Page

Our Data Strategy: We will only achieve our 2030 corporate targets, including doubling revenue and profitability, if we leverage our data to get deeper insights. To do that, we will unlock our siloed data and exploit it by investing in data skills for our people and our underlying data infrastructure, driving a data culture and ensuring our data related activities and processes are co-ordinated, standardised and fit for purpose across DS Smith. We will build a safe, secure and effective data ecosystem around us to ensure we are leveraging the best data insights from our customers, suppliers, partners and 3rd parties.



Underpinning beliefs, assumptions and key decisions

- Data and Analytics is at the heart of our digital transformation and a core differentiator for us if we use it correctly
- Our Data is an asset. We should manage it, secure it, exploit it, maintain it and grow it like any other key asset
- Our people need to learn the new data skills and become data literate. Its not a nice to have
- Not all our data needs to be harmonised or standardised at enterprise / DSS level. It's ok to have a layered approach depending on the cost / benefit of standardising at a higher level
- The AWS Data Factory is our default Enterprise Data Platform. Any data engineering activity should be done on the Data Factory unless there is good reason not to.
- The development of Master Data is a key enabler and foundation for exploiting our data. Led by Divisions, we will define and manage our Master Data which will interface appropriately into the Data Factory and Enterprise Data model

Our Data Strategy

- Executive Summary
- Vision and Value
- People and Skills
- Data Services
- Process and Governance
- Roadmap
- Further Reading



01

Executive Summary



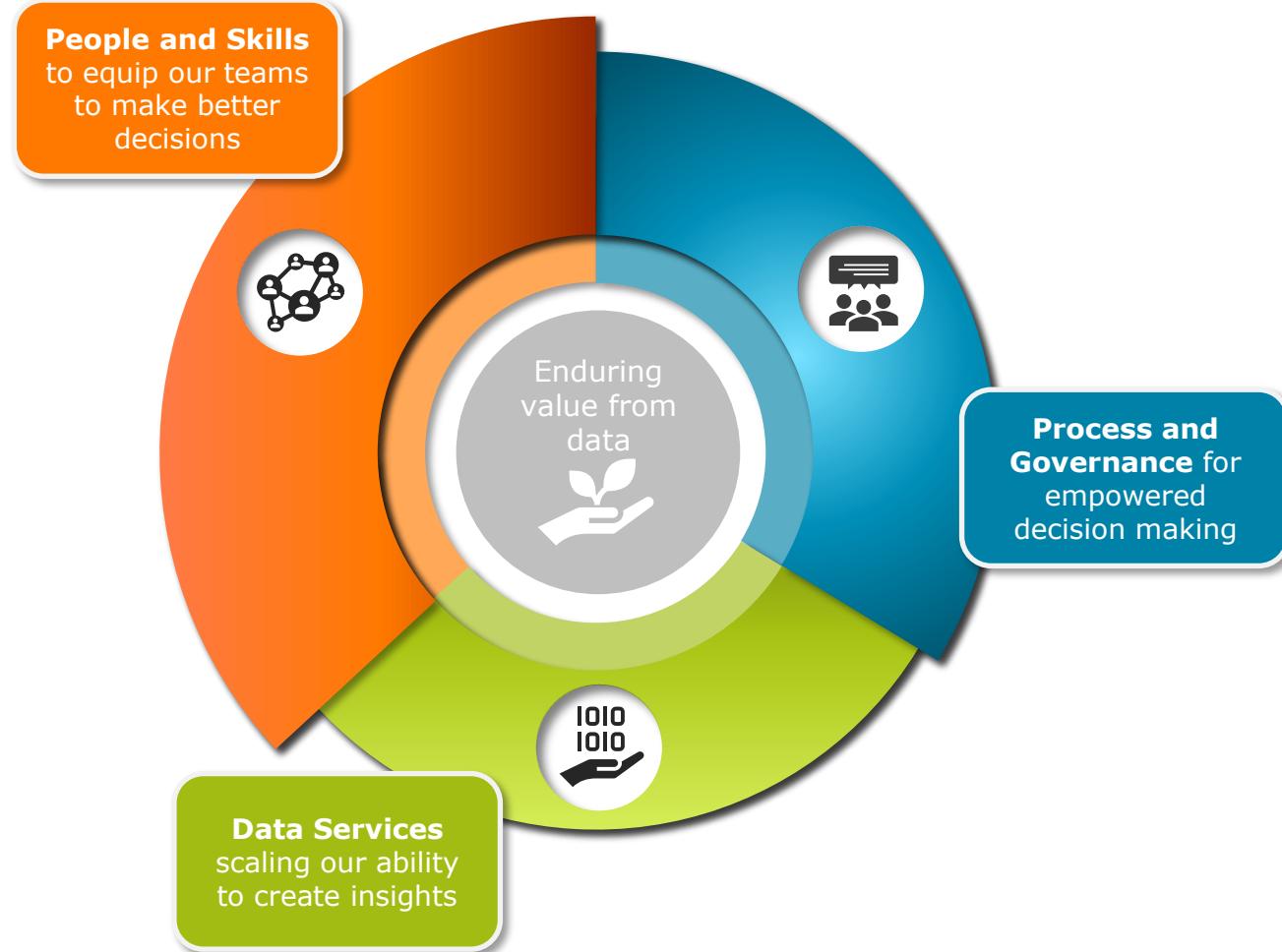
DS Smith Data Strategy

A connected business making fantastic decisions

We are leading the transition to a circular economy. We are increasing capacity and service levels and delivering best in class customer experience. These all depend upon new thinking, which in turn, depends on having access to great data across our connected business. Our data strategy sets out how we will achieve this.

Building Blocks for our Data Strategy

- **People and Skills:** The most important part of our data journey – our individuals and teams who use their growing data skills to make the very best decisions for our customers.
- **Process & Governance:** Minimum guardrails to help us scale and operate data driven decision making safely, securely and efficiently.
- **Data Services:** Data & technology services enable us to raise the game for data driven insights through access to innovative technology, global reach and scalability.



DS Smith Data Strategy



A Connected Business, Making Great Decisions

We are a business that thrives on its connections – across and between our globally distributed customers, partners and colleagues. Whilst we may work and reside in different functions, countries and time-zones, data is a connective tissue of our organisation. The **greatest decisions** we make everyday rest on great access to and confidence in that data, drawn from all parts of our world.

Challenges

- **Society and regulation:** Shifting societal norms and regulation such as GDPR directly shape how we must manage data well – including skills, processes, assurance and the sustainability of data technologies.
- **Cyber & Data Risk:** Recognised by most companies as a principal risk to manage – the disruption or failure of critical technology and the loss of sensitive data caused by security breach
- **Data Growth:** Scale and variety of data is seemingly exponential - becoming ever more challenging to effectively identify, source, manage, protect and use. Data from connected machines, processes, across the supply chain, from customers and industry.
- **Technology advancements:** the rate of the Generative AI explosion has polarised opinion on the opportunity and risk with these new, untested data capabilities in easy reach of public, private individuals, teams, and industries.
- **Industry trends:** Progressive companies are enhancing their business models by overlaying products and services with value-added data offerings, creating distinctive competitive advantage.



#1
Data embedded in every
decision, interaction,
and process

*McKinsey Data Driven
Enterprise of 2025*



Case for Change

Turning insights from data into a competitive advantage, navigating regulatory landscapes with confidence, and achieving new levels of operational resilience. This is the future within reach for DS Smith. The **Data Strategy** presents a framework of strategic intentions, and roadmap to unlock the value of data, harnessing it as a strategic asset in a changing world.

Competitive Advantage through Data

Global competition is fierce, customer expectations are dynamic, and regulatory landscapes are complex. We must leverage data to:

- **Customer Experience:** Create a compelling whole customer journey through professional and intimate services that differentiate us from competition
- **Fuel innovation:** Develop data-driven solutions that meet evolving customer needs and unlock new markets and “data as a service” business models.
- **Boost efficiency:** Optimise manufacturing processes, supply chain and logistics and driving a data-enabled DS Smith Way across our company.
- **Enhance quality:** Proactively address quality, ensuring defect-free products and customer satisfaction and on time, in full delivery.
- **Strengthen decision-making:** Gain real-time insights to inform strategic investments and navigate volatile environments.
- **Ensure resilience & compliance:** Proactively protect ourselves from cyber threats and data breach, get ahead of regulatory compliance and build trust and brand reputation.





Strategic intentions

So how can we be a more connected business through enriched, valuable data? How can we adopt principles of a circular economy for data? How can we avoid the challenges ahead, whilst reaping the huge benefits for our customers, shareholders and colleagues? The strategic intentions below set out how we will achieve this.

Strategic intentions

- **Data first culture:** Data is the responsibility and passion of everyone whether specialised in data technology, business usage, data value, quality and governance.
- **Data is valued:** We specifically connect data lifecycle investments to the value it creates. Aligned through goals, aims, OKRs, investment, plans and activities.
- **Data is a skill:** We will invest in data skills and professional data accreditation and roles working with partners who can scale our capability
- **Data is accessible:** We will build, secure and operate an **Enterprise Data Factory** platform providing integrated, enriched and reusable data.
- **Data is protected:** We will protect the confidentiality, integrity and availability of our data through proactive cyber detection, protection and response
- **Data is fit for purpose:** We will make decisions based on fit for purpose data – enabled through data governance practices, data quality processes and tools.
- **Data is defined:** We will define and structure our data effectively for reuse and enrichment
- **Data is to be designed:** We will design data layers for digital enablement, analysis, modelling and common understanding





Data Vision

What could we achieve
through data?



Vision



Image by Frank Somers, permission granted

Press release:

DS Smith has doubled its size organically over the last few years, achieving great success via its pillar of success strategies. Each of these strategies has been successful by fully empowering change and agility with exceptional commitment, quality people, supported by the latest technology.

None of this would have been possible were it not for our harmonized Data Strategy and significant investment in our data readiness, which started back in 2024.

We recognized that data is the fuel that we would need to power our transformation, and that it needed to be ready for the journey ahead.

In 2030, our data first culture makes it possible to....



Customers

- Give customers a personalised and tailored experience at each point on their journey
- Be available and accessible 24/7 across multiple channels and platforms
- Give real time status updates on key activities and provide pro-active services eg notifications of order shipment
- Enable a more frictionless, low touch experience including machine to machine ordering
- Give us deep insight into customer performance and profitability so we can optimise our resources



Teams

- Get the accurate, secure and timely data they need to do their jobs and make effective decisions without unnecessary data preparation work
- Use the latest data analytical tools and platforms to give them even greater insight into our operations or opportunities for growth
- Meet our evolving regulatory and compliance requirements more easily with up to date and accurate data.



Suppliers

- Have a streamlined purchasing experience that is frictionless, fast and accurate and so minimises their and our administration costs
- Get better insight into our inventory levels so they can plan better and support us more effectively in our operations



Value from Data

Where can data help deliver on our objectives and key results?





Value from Data

Our long-term goals and aims set out where we want to be as a company towards 2030. It is inconceivable to think how our four strategic aims of delighting our customers, realising the potential of our people, leading the way in sustainability and doubling the size and profitability of our business can succeed without data as a true growth lever.

What we are doing

A selection of transformational themes for our company, to bring this to life. These are examples that do not represent the full scope of all our data initiatives:

- **Customer Experience:** How data will enable customer obsession, and new ways to interact with customers on their terms.
- **Connected Factory:** How data will enable every day to be the best day in our sites and facilities.
- **Innovation & R&D:** How data helps us transform our products and take new digital and data business models to market.
- **Supply Chain:** How data helps us forecast and orchestrate the many moving parts of our internal and external supply chain.
- **Regulatory Compliance:** How data helps us confidently answer regulatory and customer needs for Corporate Compliance, EU Deforestation and sustainability reporting.
- **Focused Growth:** Data will allow us to identify our most profitable products, markets and segments so that we can focus our limited resources in the right areas to double revenue and margin by 2030





People & Skills

How and why will we equip our teams with the skills they want and need?





People and Skills

Data starts with our people. We want to enable everyone to be successful as individuals, teams and a connected business by promoting a culture of data first, career paths for modern, enjoyable skills and clear roles and responsibilities.

What we are doing

- Culture and Awareness:** Building a data first culture means that our teams are firstly aware of the enormous power of data for the decisions they make every day but also the risk that data has in a modern, connected world. Building on the DS Smith way, people are encouraged to constantly seek efficiency, value, reduced waste and effort from everything we do around data. Including how we define it, who owns it, where we store it and how we use it for great decisions.
- Skills and Competence:** Data literacy is a recognised and marketable skill. Like any other skill, it requires a level of dedication to acquire through learning, on the job experience and formal accreditation. We'll do this through internal online training, but also through working side by side with key data partners who bring cutting edge experience to DS Smith.
- Roles and Responsibilities:** We all play a different vital part when it comes to maximising the value and minimising the risk from data. We will define specific data roles and responsibilities that span the data lifecycle.

Data Engineer

According to LinkedIn, "Data Engineer" is the 10th role with the greatest number of paid LinkedIn job posts in Jan 1-March 31 2024. Up 4 points from previous quarter.

LinkedIn Global
Talent Trends





Culture, Skills and Roles

	What have we done	What lies ahead
Culture and Awareness	<ul style="list-style-type: none">• Generative AI Pilots launched• Tech Talks bringing data technology conversations to DS Smith – including AI, GenAI, Integration, Cloud• External presentations including Cyber insurers, AWS conference, round tables	<ul style="list-style-type: none">• Data roadshows into our facilities• More Tech Talk focusing on emerging trends like Quantum• Plexus rollout with updated content
Skills and Competence	<ul style="list-style-type: none">• Initiated an England based Data Apprenticeship scheme inviting 30 colleagues across business functions to an 18-month hands on course• Started our technology training on Amazon Web Services (AWS) technology platform• Digital Academy available on Percipio	<ul style="list-style-type: none">• Year 2 of England Data Apprenticeships• Data apprenticeships rolled out into other regions• AWS & Gen AI training available to all who need it• AWS Certification support• Career paths showing path from data engineer to head of data
Roles & Responsibilities	<ul style="list-style-type: none">• Job descriptions developed for key data roles• Initial divisional recruitment of data architects• Established our data governance structure including Enterprise and Divisional Data Councils, and Data Board	<ul style="list-style-type: none">• Enable data councils to embed the Data Strategy• Establish standardised Job Descriptions in HR• Roll out our data organisation across group and divisions



Data Services

What business and technology services will we deploy to help us all be more successful through data?





Data Services

In a connected company it is ever more critical that we are readily able to connect, combine and access the data we need, in a consistent and secure way, with predictable levels of service. To achieve this in the most efficient and effective way, we have decided to offer Data Services, enabled through people and technology to the whole company.

The data services provided to the company

- **Enterprise Data Factory:** The Enterprise Data Factory makes it possible to draw in valuable data from inside and outside DS Smith (from systems, files, web applications), combined, and aggregated for maximum insights and actions for DS Smith.
- **Master Data Management:** Aligning on common definitions of our customers, products, locations and more so that we're all talking the same
- **Business Intelligence & Analytics:** Putting visualisation and analysis tools in the hands of our teams.
- **Data Architecture:** A structured way to define and mature the data that is important to us.
- **Data Security:** Protecting the integrity, availability and confidentiality of data within our Enterprise Data Factory and across our Integration gateways
- **Internal and External Integration:** A repeatable mechanism to enable digital messages to be exchanged between our systems and outside DS Smith
- **Data Quality:** Defining, monitoring and improving the quality of our data.





Data Services

The building blocks of our data services.

Serving the needs of our partners, machines, customers, people and stakeholders.

Data comes from our connected factory machinery, our facilities, our IT systems, transport fleet and – more and more – from our products.

Data is exchanged in all directions between the inside and outside world.



Our partners



Machines



Our customers



Our people



Our stakeholders

External Data Integration

Master Data Management

Data Architecture

Data Security

Internal Data Integration

Enterprise Data Factory

Providing integrated and aggregated data sets to DS Smith. Enabling the circular economy of data whereby we “source data once and reuse many times” to create value across our entire business.



Our machinery



Our facilities



Our systems



Our fleet



Our products



Process & Governance

Why and how do we set guardrails to help empower everyone to use data to its fullest?





Data Process and Governance

Data is a vital asset for operations, growth and compliance. As such, it requires effective, cross company governance to ensure that, like any other asset, data is managed effectively, securely, and in compliance with regulations. Governance underpins our confidence to make the best decisions we can every day for our colleagues, our customers, partners and shareholders. It does this by establishing policies, procedures, and standards for the collection, storage, usage, and sharing of data across the organization.

How we work together for data value

- **How we work together:** As with most corporate services we operate in both a centralised and federated manner. We have chosen to provide centralised data teams and services, such as the Data Factory, where there is a need for consistency, economy of scale or access to scarce resources. Where activity is best placed closest to our sites, customers and decision-making processes we choose to federate our data capabilities such as master data management and data analytics.
- **Data Governance:** Data governance describes the principles, policies and standards for how we manage and use data safely, securely and responsibly across the company.





How we work together

Why is this important?

We are a business that thrives on its connections – across and between our globally distributed customers, partners and colleagues. Whilst we may work and reside in different functions, countries and time-zones, data is a connective tissue of our organisation. We need to work together in a structured way to get greatest value from this data.

What is our strategy?

- Over time when technology, skills and governance allows, we offer more and more self-service to individuals to analyse and engineer their own data products

Simplified Data Lifecycle

	Specify & Collect Data	Aggregate and Store	Analyse & Use
Group Functions	<ul style="list-style-type: none"> Set Group Data Standards (e.g. GDPR, Sustainability) Define processes for data use Promote harmonisation of data structures 	<ul style="list-style-type: none"> Provide Data Services (incl. Ent Data Factory, MDM, Data Quality) 	<ul style="list-style-type: none"> Provide Data Services (incl. BI & Analytics, GenAI)
Divisional Functions	<ul style="list-style-type: none"> Specify the data that we need to drive decisions (incl. Quality) Prioritise data projects Set data standards (e.g. ISO55001) Manage master data 	<ul style="list-style-type: none"> Manage backup, retention and deletion 	<ul style="list-style-type: none"> Reinforce a “pull” of data services for max reuse Define data product needs (e.g. cross divisional analysis) Embed systems and data products into bau
Individuals	<ul style="list-style-type: none"> Apply data quality standards to the data we enter into our systems 	<ul style="list-style-type: none"> Manage personal and team file spaces (e.g. SharePoint, OneDrive, shared drives) 	<ul style="list-style-type: none"> Follow Policy (e.g. Appropriate Use, GDPR) Self-serve to Data Factory through BI & Analytics



Data Governance

Why is this important?

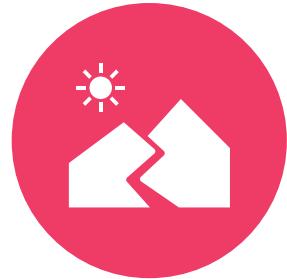
As a company of 30,000 people, it is important to set out a well understood decision making structure for managing data through its lifecycle. This seeks to promote best practice for efficient and valued data use, whilst minimising risk of non-compliance, cost escalation and value erosion of our data initiatives.

What does it look like today?

- Data Board that sets overall data strategy
- Enterprise Data Council that coordinates implementation of the data strategy across our company and point of escalation for divisional data councils
- Divisional Data Councils that provide operational advice, guidance and approvals for data initiatives

What is our strategy?

- Operationalise our data board, enterprise and divisional data councils with a remit to drive, enable and measure delivery of the data strategy.
- Establish specified data roles through training, recruitment and partnering/sourcing into our divisions where they explicitly deliver value or reduce data risk.
- Embed data decision making into our Delivery Lifecycle with stage gate checks on data viability, quality and cost



Plan & Roadmap

How we will release value by maturing our data services over time?





Data Plan and Roadmap

Our data strategy defines the **people & skills, process & governance** and **data services** we need to release the **data value** set out in the strategy. The actions required to deliver the strategy are owned across group, division and individuals in our organisation. The role of the Data Board, Enterprise Data Council and individuals.

How the data plan and roadmap will be delivered

- **Data Projects:** Business sponsored change initiatives with clear line of sight to goals, aims and OKRs. Delivered through corporate planning and execution. E.g. CX, Supply Chain, Finance Transformation, HR transformation.
- **Data Services:** Business aligned change initiatives that build enabling capability from our data services. E.g. Data Factory, master Data Management, Integration platforms.
- **People & Skills, Process & Governance:** Specific activities to mature our skills, roles & responsibilities and governance. E.g. Establishing data councils, developing Digital and Data Training services.





Data Maturity

Why is this important?

Data Maturity is measurable. We can assess where we are on a journey from basic through to transformation capability.

What is our strategy?

- We will develop our data maturity across the dimensions in the data strategy to the degree of maturity that we need for the business we are today and the business we wish to be in the future.
- We will invest in capability maturity where it has tangible benefit for our people, customers and stakeholders.

Level 1 Basic	Level 2 Opportunistic	Level 3 Systematic	Level 4 Differentiating	Level 5 Transformational
<ul style="list-style-type: none"> ▪ Data is not exploited, it is used ▪ D&A is managed in silos ▪ People argue about whose data is correct <ul style="list-style-type: none"> ▪ Analysis is ad hoc ▪ Spreadsheet and information firefighting ▪ Transactional 	<ul style="list-style-type: none"> ▪ IT attempts to formalize information availability requirements ▪ Progress is hampered by culture; inconsistent incentives <ul style="list-style-type: none"> ▪ Organizational barriers and lack of leadership ▪ Strategy is over 100 pages; not business-relevant ▪ Data quality and insight efforts, but still in silos 	<ul style="list-style-type: none"> ▪ Different content types are still treated differently ▪ Strategy and vision formed (five pages) <ul style="list-style-type: none"> ▪ Agile emerges ▪ Exogenous data sources are readily integrated ▪ Business executives become D&A champions 	<ul style="list-style-type: none"> ▪ Executives champion and communicate best practices <ul style="list-style-type: none"> ▪ Business-led/driven, with CDO ▪ D&A is an indispensable fuel for performance and innovation, and linked across programs ▪ Program mgmt.. mentality for ongoing synergy ▪ Link to outcome and data used for ROI 	<ul style="list-style-type: none"> ▪ D&A is central to business strategy <ul style="list-style-type: none"> ▪ Data value influences investments ▪ Strategy and execution aligned and continually improved ▪ Outside-in perspective ▪ CDO sits on board

D&A = data and analytics; ROI = return on investment

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Gartner Data Maturity Model



Data Projects

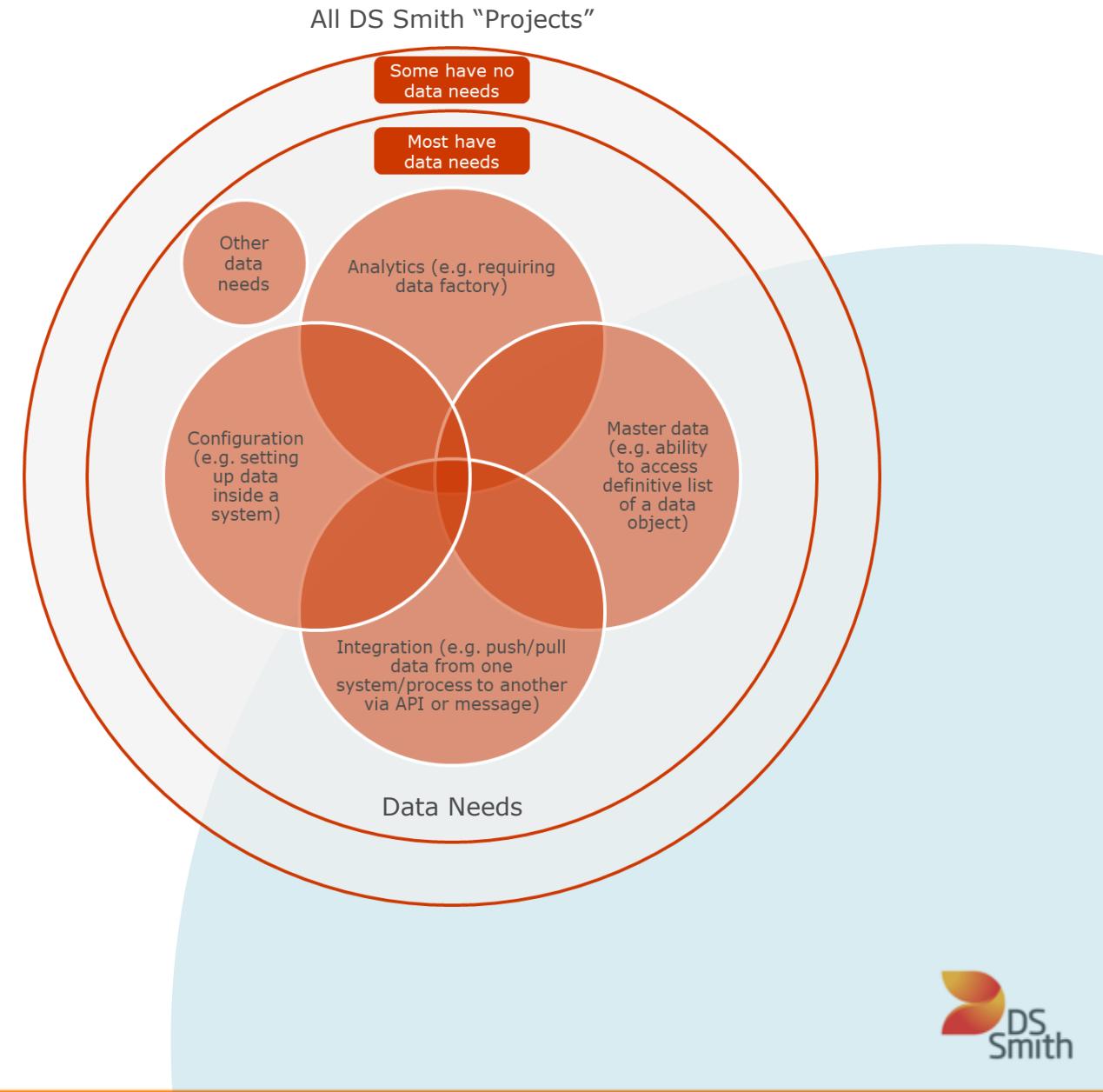
Why is this important?

Nearly all change initiatives/projects have some requirement on data in order to successfully deliver return on investment. Not all data needs are the same.

- Analytics of data across multiple systems
- Configuration of data in one or more systems
- Master Data extension to new data sets
- Integration between systems, processes and B2B

What is our strategy?

-
- We will track the strategic intentions of the data strategy via Enterprise Data Council governance
 - We will factor data investment in project business cases
 - We will assess data readiness as part of our delivery lifecycle – using Divisional and Enterprise Data Council assurance / approval
 - We will invest in Data Services (e.g. MDM, Data Factory) based on the forecast needs of our data projects consolidating investment where possible to return delivery bottlenecks and improve TCO. E.g. prioritising CUSTOMER data in the Enterprise Data Factory





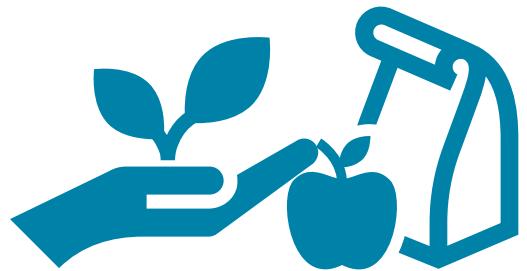
Further Reading

Further reading to support the data strategy



Glossary of key terms

Term	Simple definition	Term	Simple Definition
API	Application Programming Interface. A set of rules and protocols for building and interacting with software applications, enabling different systems to communicate efficiently.	ELT	Extract, Load, Transform. A data integration process similar to ETL but the data transformation occurs after the data is loaded into the target data warehouse, leveraging the power of modern data processing systems.
AWS	Amazon Web Services. A comprehensive cloud computing platform provided by Amazon that offers scalable computing power, storage, and other IT solutions and utilities over the internet.	ETL	Extract, Transform, Load. A data integration process that involves extracting data from various sources, transforming it into a structured format, and loading it into a target database or data warehouse.
Data Factory	The name of our own DSS enterprise data platform, built on AWS, that creates a secure and cost-effective environment for storing, processing and analysis our data to support decision making	Foundational Model	A large-scale pre-trained model that provides a basic structure and understanding, which can be further adapted and fine-tuned for specific tasks and applications across different domains.
Data Model	A data model is an abstract framework that organizes elements of data and standardizes how they relate to one another and to the properties of real-world entities, facilitating the accurate and efficient processing of data across systems.	Gen A	General Artificial Intelligence: A type of AI designed to understand, learn, and apply knowledge across a wide range of tasks, mirroring human cognitive abilities.
Data Pipeline	A set of data processing steps configured to automate the flow of data from one system to another, typically involving stages like extraction, transformation, and loading.	Gold/Silver/Bronze layers	In data platform terms, the gold/silver/bronze layering approach organizes data processing stages where bronze stores raw data, silver holds cleansed and processed data, and gold contains refined, business-ready data optimized for high-value analytics and reporting.
Data Quality	Data quality refers to the accuracy, completeness, reliability, and relevance of data within the context of its intended use, ensuring that it meets the specific requirements and standards necessary for effective decision-making and operational processes.	LLM	Advanced AI models that process and generate human-like text based on vast amounts of training data, used for applications like chatbots, translation, and content generation.
Date Warehouse / Lake	A data lake is a storage repository that holds raw data in its native format until it is needed, while a data warehouse is a system used for reporting and data analysis, structured to facilitate querying and managing aggregated data from multiple sources.	MDM	Master Data Management: A method of managing the organization's critical information to provide a single point of reference, ensuring consistency and control in the ongoing maintenance and application use of this data.
EDC	Enterprise Data Council. One level of our data governance structure	MILOPs	Machine Learning Operations: A set of practices that aims to deploy and maintain machine learning models in production reliably and efficiently, similar to DevOps but for ML
EDM	Enterprise Data Model. Provides a cohesive, comprehensive view of an organization's data architecture, detailing the interrelationships between data entities across the entire business to support integration, governance, and strategic use of data.		



Value from Data

Deep dive into example value areas of our business, enabled through data





Customer Experience

Why is this important?

DS Smith aims to reinvent an industry leading, digitally enabled, personalised, omnichannel, end-to-end experience that makes it easy for our customers to work with us and empowers our people with the right tools, information and insights to better serve our customers' needs and add value to their business.

Data Enabled Goals

- Become the preferred partner for our Key Accounts increasing volumes
- Provide a distinctive service to each type of customer increasing their NPS performance
- Reinvent a unique end-to-end customer experience to deliver profitable growth

Data Needs

- Capture and leverage expertise and knowledge in our business in a way that enhances our customer relations
- Create a customer 360 view, gathering all customer related data in one place, to enable and empower our employees to deliver faster, easier and more valuable customer experiences
- Understand the needs and priorities of our customers and industry, including buying habits, consumer trends, regulatory expectations, to drive differentiation through innovation.
- Providing our customers up to date and real-time visibility of their end-to-end journey, including their orders, invoices, delivery, and scope 3 footprint.
- Connecting data through our internal and external supply chain to provide end to end data to our customers



Innovation & R&D

Why is this important?

Innovation is about creating and nurturing new products, services and business models. The technical and operational data needs vary by product or service, but these need an adaptive commercial platform in which to support sales and customer service.

Data Enabled Goals

- Bring new data enabled services to market (aka “Data as a Service”)
- Embed data services into our products (e.g. tracking, temperature, vibration) to inform product design and customer service
- Providing data into our material optimisation R&D programmes

Data Needs

- Securely opening up selected data sets to our customers, partners and industry
- Sourcing data from outside DS Smith – e.g. our products in transit, weather, traffic, financial markets and more
- Connecting to DS Smith machinery hosted in customer and partner facilities in order to monitor, understand and control
- Combining different data sets (both ours and 3rd parties) to create new value for customers and hence create new revenue streams



Connected Factory

Why is this important?

Achieving unrivalled efficiency, agility and stability of manufacturing through people, process and advanced digital technologies. Data has the ability to help make every day in our factories, "the perfect day".

Data Enabled Goals

- Delivering overall operations effectiveness (OOE) and overall equipment effectiveness for (OEE).
- Improving product quality and flexibility
- Improve productivity, health & safety
- Enable factories to be part of a connected supply chain



Data Needs

- Having access to data from our fixed and mobile plant – directly through sensors or via historians and equipment manufacturer cloud
- Handling huge amounts of real-time streaming data from machinery
- Integrating data into operational dashboards
- Overlaying data with predictive algorithms
- Sharing certain site/factory data to cluster/region/division and group
- Bridging data across the Operational and Information technology domains



Supply Chain

Why is this important?

Paper supply chain plays a critical role in meeting demand required by internal and external customers, setting up mills for success in the make process and better optimising DS Smith's make-buy-sell decision making.

Data Enabled Goals

- Better inventory control
- Supply chain planning and scheduling make-buy-sell allocations
- Demand planning by packaging
- Supply capability of paper mills

Data Needs

- Provide data to enable standardised, controlled end to end flow
- Reduce manual data transformation in Excel / Access
- Change locally maintained "master" data into globally accessible
- Improve governance on data reliability / accuracy





Regulatory

Why is this important?

Stakeholders including authorities, regulators, investors and civil society are wanting both increased visibility into companies' operations and enforcing additional regulations in areas such as sustainability, risk management, invoicing etc. These new regulations, especially in ESG areas, are setting new minimum reporting standards that will apply to us. EU Deforestation, E-Invoicing and UK corporate governance code are just 3 examples

Data Needs

- Production on production processes and outputs combined with metrics related to energy usage, emissions, waste disposal, and resource consumption to monitor environmental impact and compliance with sustainability regulations.
- Specific data required to comply with industry regulations, including data related to health, safety, and environmental impacts.
- Financial and audit related data to show compliance to financial reporting standards and tax regulations.

Data Enabled Goals

- Compliance with Industry Standards: Implement data management practices that ensure compliance with industry standards and governmental regulations
- Enhanced Reporting Capabilities: Develop robust data collection and reporting systems to facilitate real-time compliance monitoring and ensure timely reporting to regulatory bodies.
- Data Integrity and Security: Establish rigorous data integrity and security measures to protect sensitive information and ensure it meets the stringent requirements set by regulators.



EUDR

On 29 June 2023, the Regulation on deforestation-free products entered into force.

European Commission



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Data Services

Deep Dive into the data services and our strategy for them





Enterprise Data Factory

Why is this important?

In order to fully leverage our data for best possible decision making and cross company insights, we believe the best way is to standardise, integrate and aggregate data in a centrally managed and accessible data platform. We call this the Data Factory.

What is our strategy?

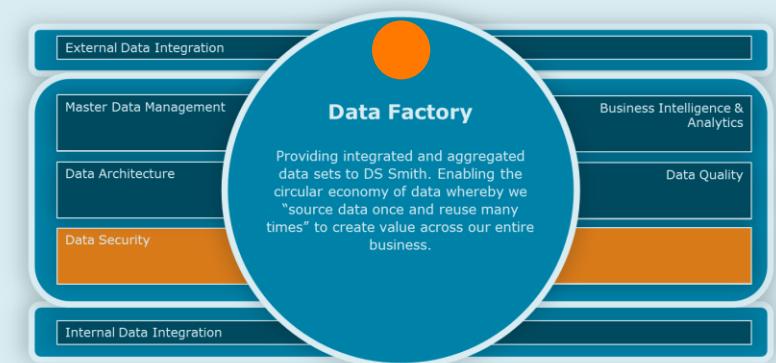
- Data factory will comprise a set of discrete services including data lake, enterprise data warehouse, data marts, real-time streaming data, AI training.
- Data factory is the standard for group and divisions for the services it offers.
- We will continue to evolve the platform for greater self-service, automation of data management, and new functionality including artificial intelligence
- We will continuously add more data to the Data Factory starting with the most important data sets, that combined, unlock value for DS Smith.
- We will publish key performance indicators and metrics to measure the impact of the data factory for continuous improvement.

What does it look like today?

- A central data team to manage the platform and provide specialist data skills to our business
- A capability for building key data products
- Processes to source, organise, store and make available the data we need
- Encrypted data sets with fine grained access controls

Technology

- Our Data Factory is built upon AWS Data management technologies
- The AWS environment is scalable, cost predictable, globally accessible, constantly updated with modern components (e.g AI)
- Built on industry available skillsets and part of our data skills journey





Master Data Management

Why is this important?

We have critical data that is vital to consistently apply across our organisation. Often, we are referring to the same customer, product or location, but using different terms. Master Data Management (MDM) makes it possible to get have a unified, accurate, and consistent view of this data across the company.

What does it look like today?

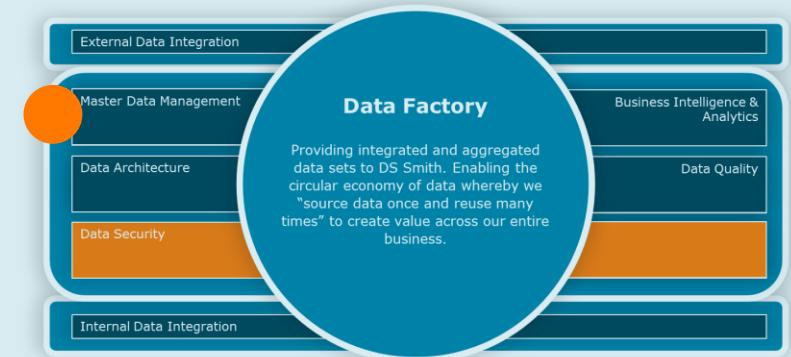
- DS Smith provides devolved MDM teams with specific focus on data important to Paper & Recycling, Packaging and TMS.
- Planning, prioritisation, management and publishing of agreed master lists of data
- Platform management of MDM technology

Technology

- Semarchy MDM tooling is in use by DS Smith to be used in Consolidation style MDM for cleansing and matching.

What is our strategy?

- Feed the data factory with approved master lists from MDM to improve connectivity of our data – such that procurement spend report relate to accurate sites.
- We will allow systems to subscribe to the curated lists managed by MDM if they are able to consume the data without breaking their own internal data structures. E.g. CX can access a definitive list of products.
- Improve governance of curated MDM data sets through ownership, stewardship and data quality.
- Mastering of the most important data such as party, organisation, product, plant, asset, country.





Data Quality

Why is this important?

The quality of our data directly impacts the quality of our decisions. Competitive and compliance landscape means we cannot afford to get this wrong. The purpose of data quality is to ensure that data is accurate, complete, consistent, and timely by minimising data errors, inconsistencies, and duplicates.

What does it look like today?

- Basic rules-based data quality check in the Data Factory
- Basic data viability check in our delivery lifecycle

Technology

- Today we have no enterprise wide tooling for systematic data quality management

What is our strategy?

- Select data quality management technology where it is needed most
- Significantly enhance data requirements management and design within the DS Smith delivery lifecycle, including checkpoints for data viability.
- Define “fit for purpose” in aspects of accuracy, completeness, reliability, timeliness, meaning, accessibility and lawfulness
- Proactively address data quality as an ongoing process, prioritising data quality appropriately with transparency and visibility
- Embed data quality within our skills and learning, Data Roles (data owners and stewards) and data governance processes.





Why is this important?

Our teams make decisions daily to delight our customers and run our operations. Whilst many of these decisions are simply supported through access to our IT systems, now and in future we need the ability to visualise and contextualise more complex data sets. Business Intelligence and Analytics should be available to everyone in DS Smith when, and where they need it.

What is our strategy?

- Strengthen our data literacy skills across the organisation through training and support
- Open up the Data Factory which provides storage and process to enable self-service PowerBI on top with strong role-based access to protect data
- Enhance governance of PowerBI through skills prerequisites and technical controls to minimise risk of data leakage and incorrect analysis
- Further develop the operating model for analytics centres of excellence
- Continue to develop advanced analytics capability including AI/ML Generative AI and predictive and prescriptive analytics

What does it look like today?

- PowerBI technology available to everyone in DS Smith with suitable training
- Pockets of analytics teams within DS Smith
- Hundreds of PowerBI users, workspaces and reports in use

Technology

- Microsoft PowerBI is our preferred tool
- The Enterprise Data Factory on AWS is our strategic data warehouse source for PowerBI
- A range of existing technology that have restrictions (e.g. Tableau, Qlikview, Cognos)





Data Architecture

Why is this important?

If data is a new asset for DS Smith, just like any of our facility or plant assets, it is easier to manage in a consistent way if we are able to describe what it is, its hierarchy, components, capabilities, condition, quality and more. Data Architecture is a discipline as well as an output set of models that makes this possible. It is a prerequisite to data engineering, data preparation, data integration and data quality.

What is our strategy?

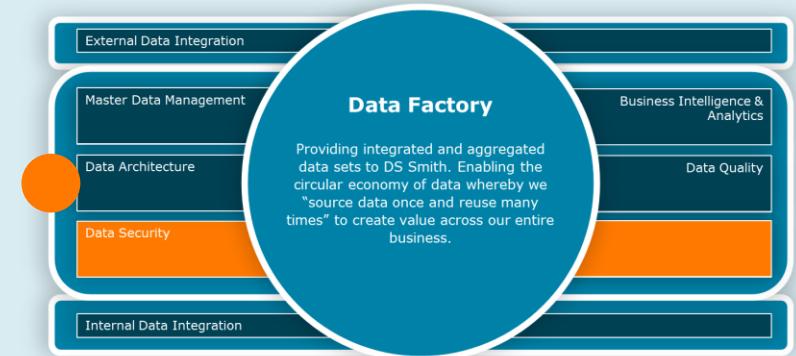
- We will document our data assets, mapping how data flows through our systems.
- We will map change initiatives to the data that they need in order to guide prioritisation and dependency management
- Build our data factory according to the structures of the Ent Data Model
- Build our Integration Hub according to the Ent Data Model
- Data architecture encompasses a wide range of components, including data models, data integration, data storage, and data governance.

What does it look like today?

- The data landscape is fragmented and of significant variety and standards. This erodes business value from analytics.
- Our first Enterprise Data Model that describes the data that is important to us.
- First steps in shaping the Data Factory in accordance to the Ent Data Model

Technology

- Some basic data modelling tools





Data Security

Why is this important?

Data security is crucial as it protects sensitive information from unauthorized access, breaches, and theft, which are essential to maintaining the integrity and confidentiality of business operations and customer data. Data is a valuable asset and like any asset, it needs to be protected so that only appropriate users can have access. Increasingly it will become our competitive advantage.

What is our strategy?

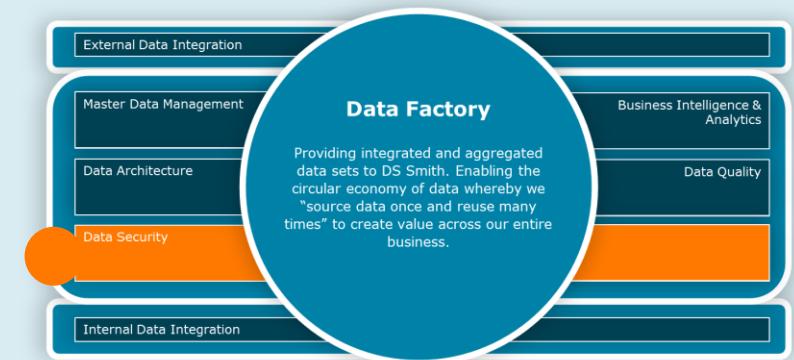
- Continue to implement a Layered Security Measures including firewalls, intrusion detection systems, encryption, and secure access protocols to protect data at rest, in transit, and during processing.
- Conduct regular security audits and compliance checks to identify vulnerabilities and ensure adherence to industry standards and regulations such as GDPR, HIPAA, or ISO 27001.
- Develop comprehensive training programs for employees to understand data security protocols, recognize phishing and other cyber threats, and promote secure handling of sensitive information.
- Develop specific guidance and risk management to manage our use of Gen AI applications.

What does it look it today?

- Over the past 3 years, we have stepped up our Information security capability significantly and had great progress in Information security generally.
- However there is more to do particularly around employee awareness and training, ensuring appropriate access controls are always in place and embedding effective security processes across the organisation
- We also need to ensure our processes are future proof eg able to handle AI risks.

Technology

- A range of Microsoft and other technologies for the detection, protection and recovery of data security threat





Data Integration

Why is this important?

Our Data Factory plays a vital role in bringing data together for connected, aggregated analysis and insights. To get data to where we need it, and to then offer it up electronically to those inside and outside our company is where Integration comes in. We need two types of integration – messages, and extract/transform and load.

What does it look like today?

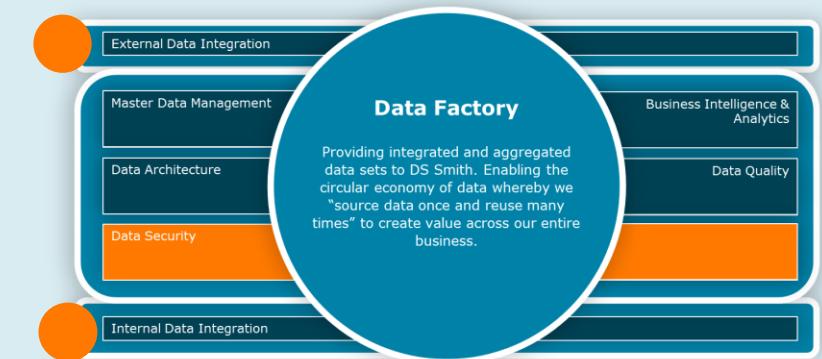
- We support tens of thousands of Electronic Data Interchange messages, a format that has been around for 30 years. Our MS BizTalk technology that supports this is nearing end of life.

Technology

- AWS Data technologies for extracting, transforming and loading data from our many IT systems into the data factory
- AWS API technology for making data available via modern APIs for use by other systems inside and outside of DS Smith

What is our strategy?

- Build an “API marketplace” (Application Programming Interface) whereby the data available for messaging internally and externally is available to developers to more easily integrate systems and build exciting digital products
- Build an “Integration Hub” service of people, process and technology to serve the growing needs of connecting data across and between our systems and those of our customers, partners and products.
- Define, select and build an industrial Integration layer into our manufacturing environments making it possible to access and analyse data from our machines in the Data Factory





Further Views

Additional views on strategy, roles, case for change to support our journey





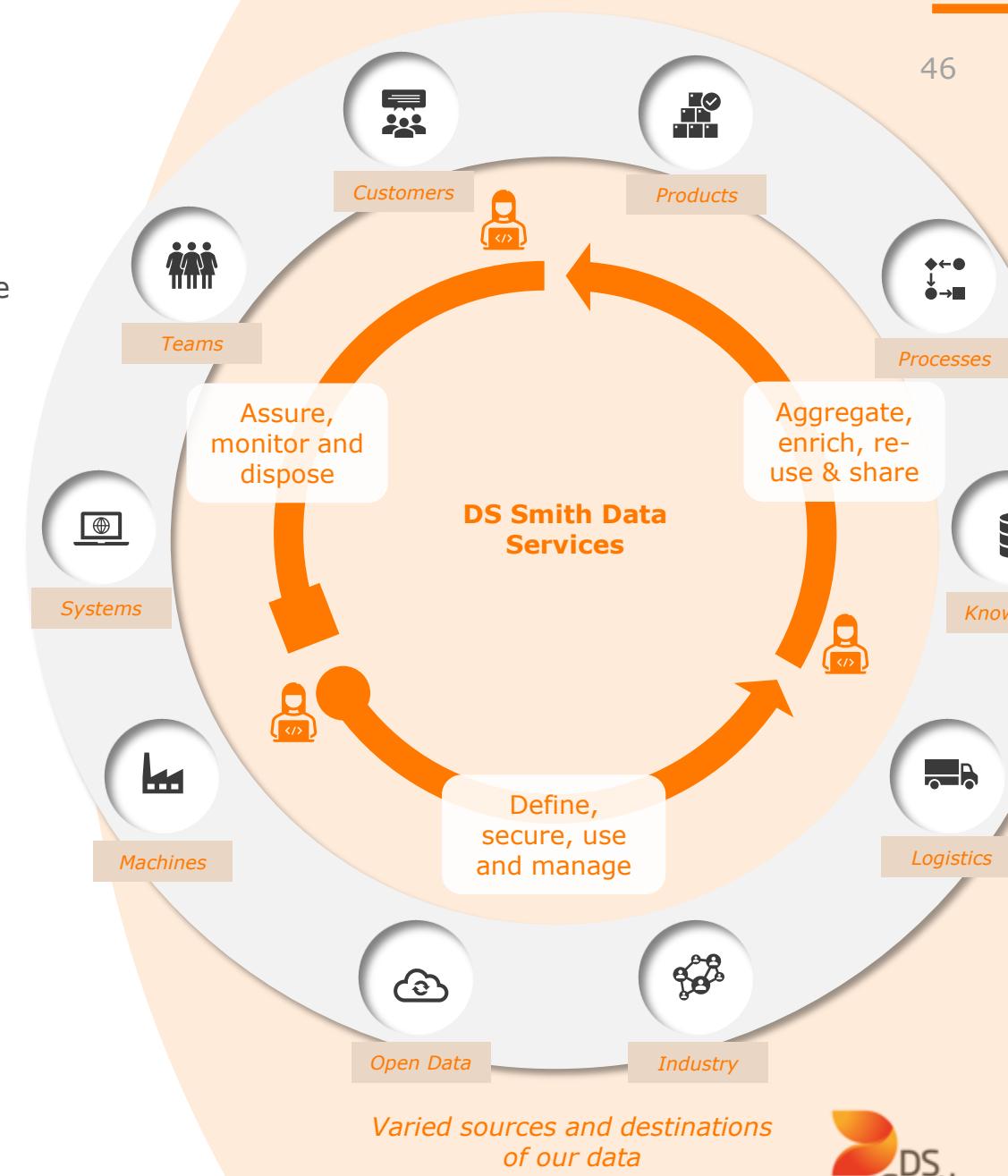
Circular Economy of Data

What is the simplest way to explain the approach we are taking to delivering value from our data? Just like the circular economy aims to minimise waste and maximise resource lifespan and utilisation, we believe the same principles can be applied to the sourcing, value extraction, reuse and disposal of data.

The Circular Economy of Data

- Reduce:** Minimise the time and resource impact when sourcing data by only collecting data necessary for specific purposes, avoiding unnecessary accumulation and duplication.
- Reuse:** Drive value to the far reaches of our business by ensuring data is accurate, complete, and standardised for easier reuse. Store fit for purpose data efficiently, including through our Data Factory and IT Applications and make it accessible for different uses.
- Recycle:** Analyse data repeatedly for different objectives across all parts of DS Smith, extracting maximum value without needing to return to source before it is disposed of carefully.

Circularity is in our DNA – it's what distinguishes us from our competitors and what positively engages our customers. Applying the principles of circularity to data should be second nature for us all. However, as data is an intangible asset, it takes leadership, strategy, planning, and resource to build the data related capabilities and services we need.





Roles and Skills

Data starts with our people and getting the right blend of roles and skills that offer an attractive career path, rewarding job assignment opportunities in data.

Creation / Management Area



Data Owner

The owner of a particular data set. Responsible for agreeing mastering & quality rules. Responsible for quality and integrity of the data set



Data Steward

Works with the data, often under the data owner to process & work with the data but is not the ultimate owner.



Data Process Owner

Responsible for owning and managing the overall business *process* that uses the data

Data Engineering



Data Engineer

Responsible for building data pipelines and managing technology applications around particular data sets



Data Architect

Responsible designing, modelling, and integrating organization's data assets to support business objectives.



Platform Engineer

Responsible for managing the overall Data Factory Platform eg running and maintaining it and developing it.



Product Owner

Responsible for product owning/ product managing any data products that we build ie product ownership for key data pipeline products

Data User



Business User

Customer of the analysis of the data ie person tasked with making a decision for which analysis/data is needed. Responsible for defining analysis needed.



Data Scientist

Applies modern data science techniques eg AI/ML to analyse the data and create insights



Data Analyst

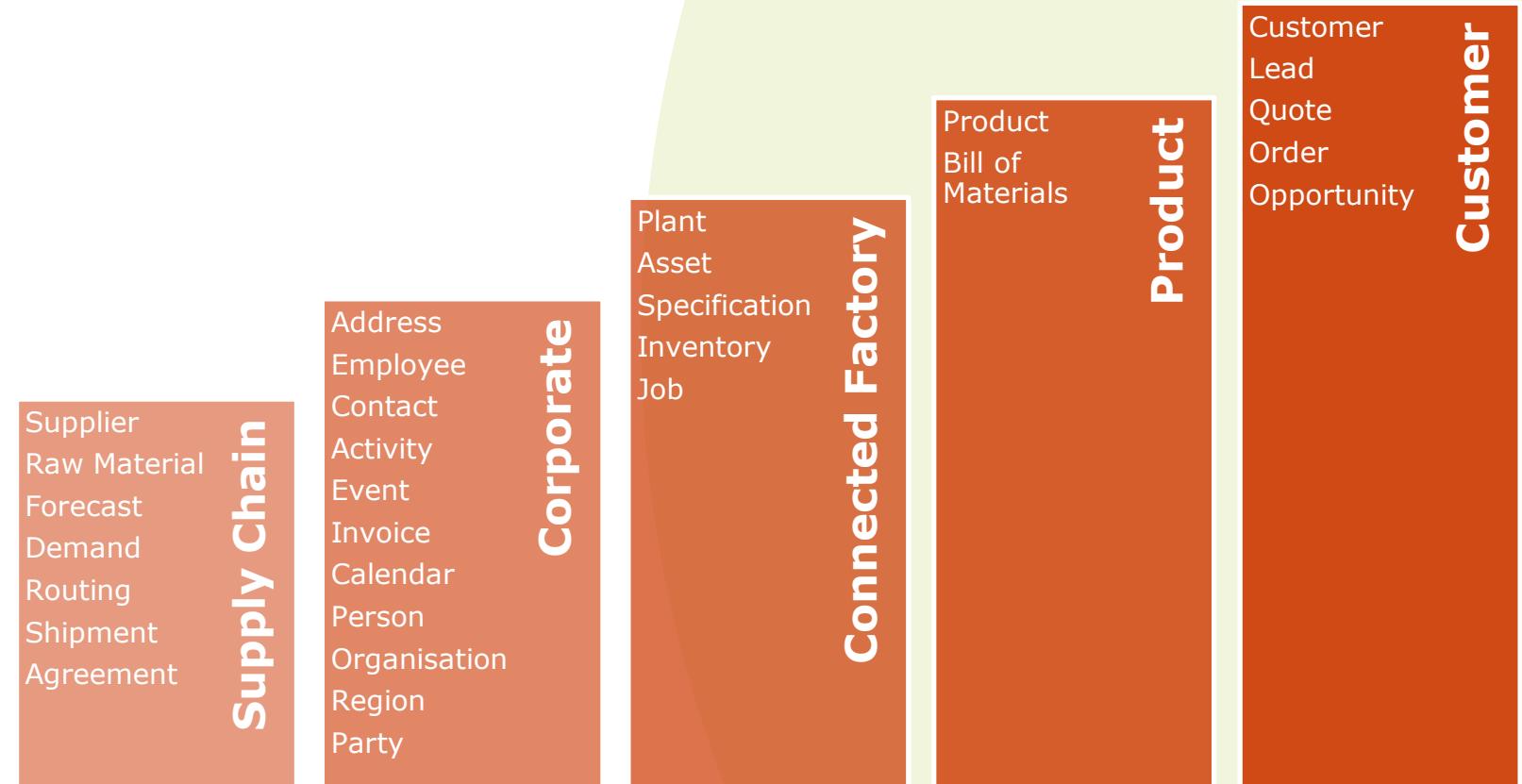
Responsible for doing first level analysis and/ or developing analytics reports/ dashboards etc

Key Data Skills

- Data Management (eg storage , retrieval, lifecycle management),
- Data Analysis (Proficiency in using statistical and analytical tools e.g Excel to interpret value from data)
- Data Visualisation (e.g. using PowerBI tools to create dashboards and reports that visualize complex data),
- Data Governance (understanding important of data governance and our data governance processes)
- Data Engineering (technical skills in designing, building, and maintaining the infrastructure required for extracting, transforming, and loading data (ETL processes).

Enterprise Data Model (Simplified)

- Our enterprise data model describes the data that's important to our Goals, Aims and Objectives.
- It describes the data that we use every day to make the best decisions for our customers.
- The enterprise data model is used to shape the structure of our Enterprise Data Factory



DS Smith Enterprise Data Model
(simplified for comms and engagement)



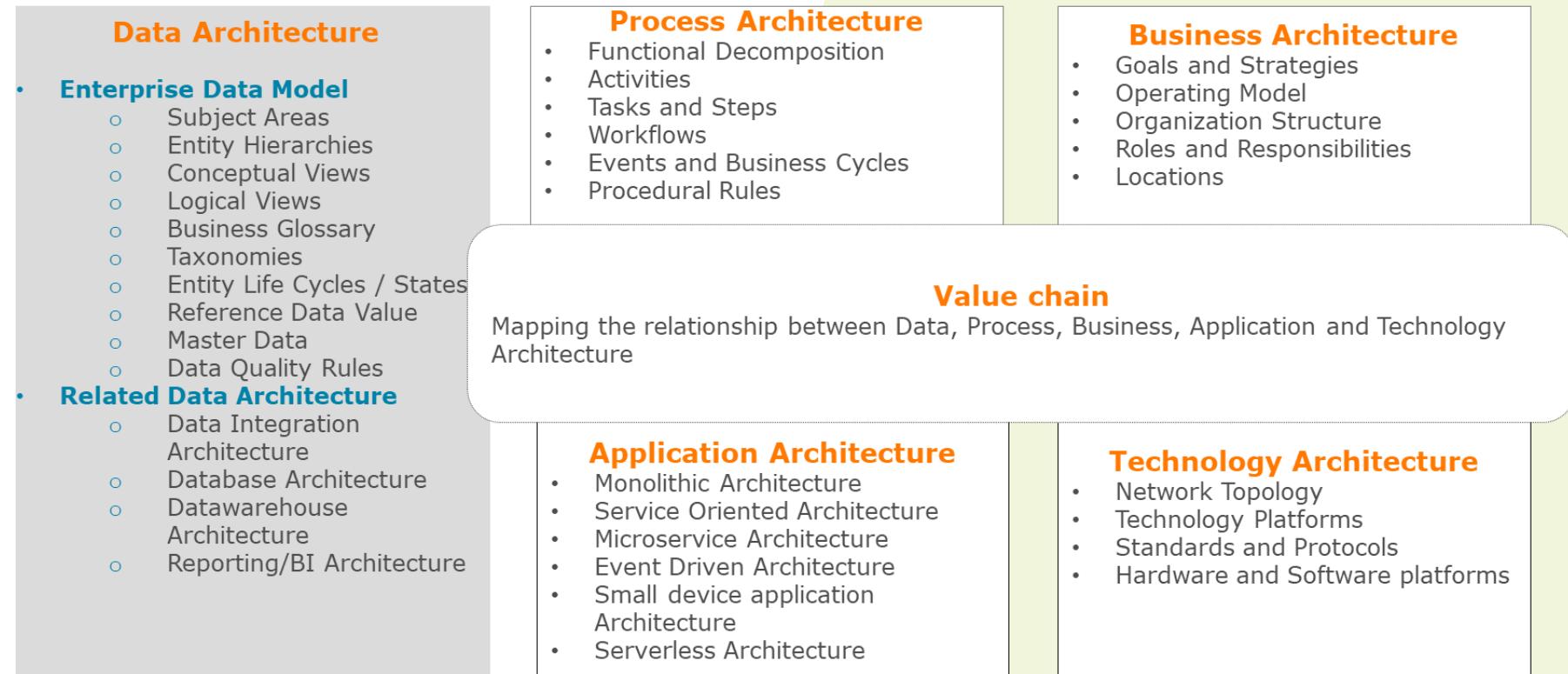
Digital & Data Hub Interfaces

- This describes the many interfaces of our Digital and Data Team – the D&D Hub



Components of a Data Architecture

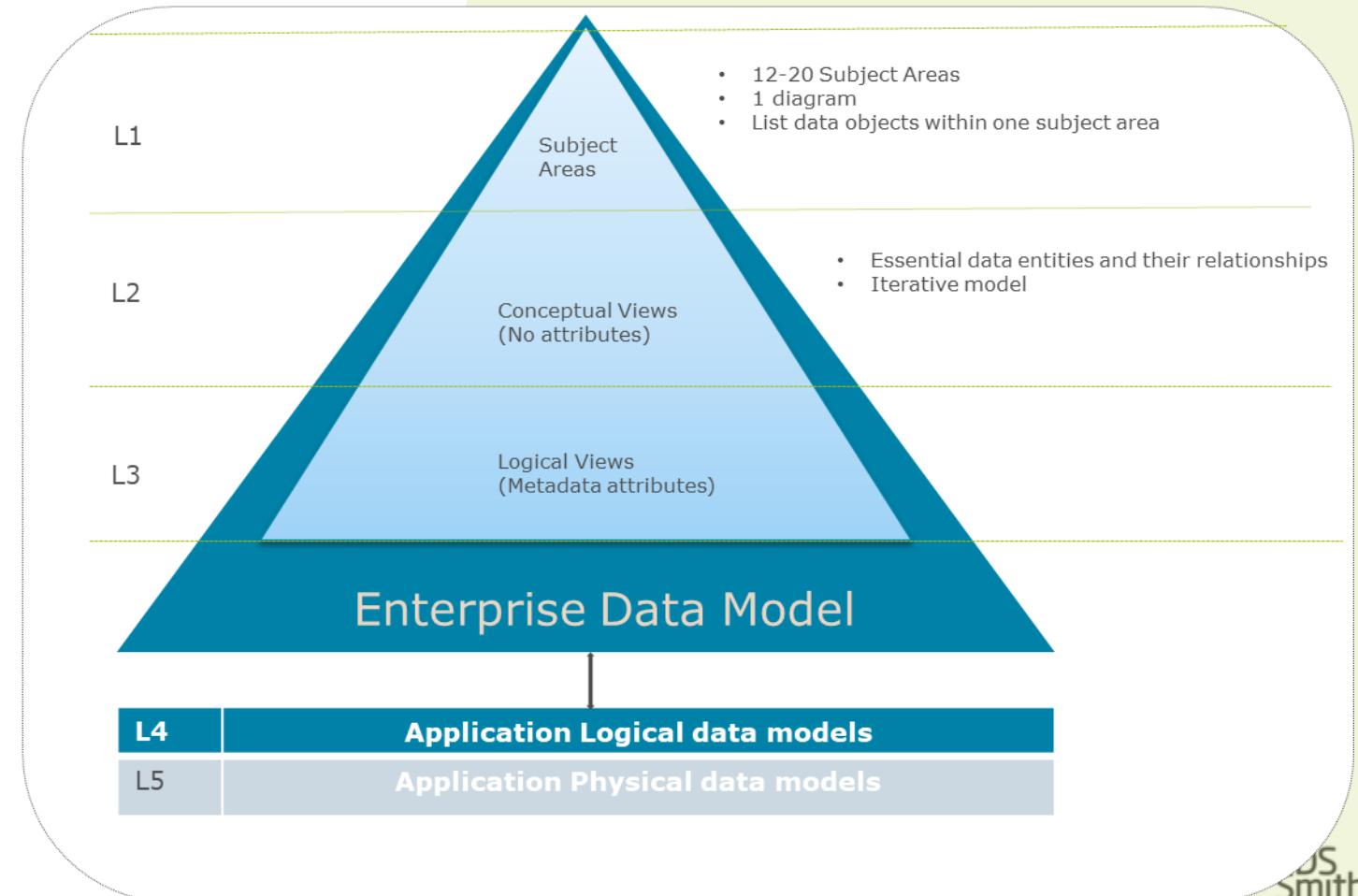
- In context of other Architecture areas, the grey area describes the components of data architecture



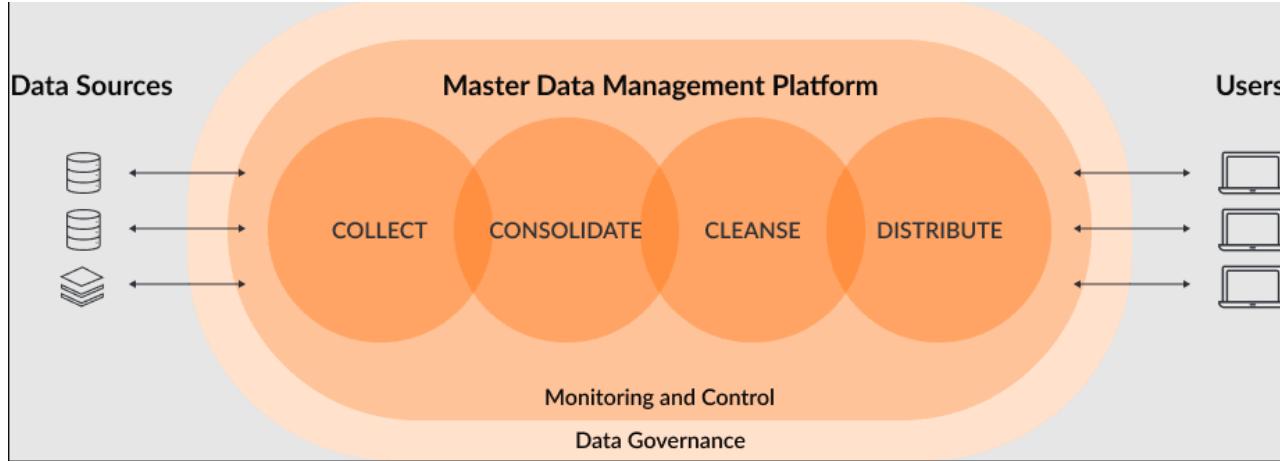
Our Enterprise Data Model

Enterprise Data Model

- An enterprise data model (EDM) is an integrated subject-oriented data model defining the essential data produced and consumed across an entire organization.
 - EDM covers the data critical to effective operations and decision making of the organization
 - All the entities ,attributes and rules in the model are defined once with no redundancy. There will only be one version of entity.
 - Conceptualizing the relationships between different types of information in an organization, independent of the organization's structure, processes, people, or domains.



Components of Master Data Management



What Does Good Look Like?

- Enterprise Data Model critical lists such as Party, Organization, Product, Plant, Asset, Country, Currency are mastered
- Mastered data is actively distributed to where it is utilized so that all applications and onward uses benefit from a complete common understanding
- MDM does not Master transactions or directly support analytics, its only job, to provide standard complete enterprise data sets by which to understand and organize events.

Our Purpose



Redefining Packaging for a Changing World

- Developing the right strategies
- Thinking differently
- Innovating together
- Putting sustainability at the heart