Deloitte.

BBB Data Strategy

March 2021

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Background

An enterprise operating model review carried out in 2020 highlighted the requirement to enhance BBB's capabilities in the data management space. BBB has mobilised a Data Management Programme to design a Data Strategy, Data Operating Model and Data Architecture to govern BBB data, enabling BBB to meet their objectives through a simplified data architecture and enable the delivery of valuable business insight.

Scope

The approach to develop the Data Strategy within the mobilisation phase is to conduct three activities: (1) Current State Assessment, (2) Data Strategy Design and (3) Implementation Approach.

This document forms the deliverable from activities 1 & 2 and covers:

Current State Assessment
- Data Usage Heatmap
- Thematic Observations Summary

Data Management Capabilities
- Overview of each capability
- Current state observations
- Benefit analysis
- Target state design

Activity 1 & 2 Approach

Activity 1: BBB Documentation Review **+** Stakeholder Interviews **=** Current State Assessment

Activity 2: BBB Corporate Missions and Business Objectives **+** Tried and Tested Data Management Framework **+** Industry Perspective & Peer Insights **=** Target State Data Management Capability

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Implementing data management capabilities and having the right operating model to support data management activities are key to delivering the data strategy.

D A T A   S T R A T E G Y

"Establish a robust data management capability to **govern** BBB data, enabling BBB to meet their objectives through a **simplified** data architecture and build a strong foundation for delivering valuable business **insight**."

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Addressing BBB's objectives through Data Management Capabilities.

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BBB's objectives

What will Data Management deliver to enable BBB's objectives?

Outcomes

Govern

We will encourage and enable SMEs to seek the finance best suited to **their needs**

We will achieve our other objectives whilst managing taxpayer resources efficiently within a **robust risk management framework.**

Improved data quality and integrity: Build trust in BBB's data by establishing proactive data profiling, monitoring and remediation processes.

Embedded data governance, risk and control: Identify, manage and control data risks. Proactively set risk appetite, monitor performance and uphold data integrity.

Ownership to embed data responsibilities: Embed effective data ownership, governance, accountability and interaction across BBB, including a robust risk management framework.

Create a **TOM** to execute on a **data strategy**

Establish a **data quality framework**

Simplify

We will increase the supply of finance available to **smaller businesses** where markets don't work well.

We will identify and help to **reduce imbalances** in access to finance for **smaller businesses across the UK.**

Accessible and trusted data: Use data as an asset to drive business decisions, allowing BBB to serve SMEs and target market demand.

Rationalised data and reporting ecosystem: Align technology and systems to a target logical data architecture. Focusing on simplification and scalability, and flexibility.

Simplified target operating model: Reduce the duplication of data sourcing and processing to increase efficiencies, centralising key data aggregation activities where necessary.

Harmonise disparate data process

Define an **enterprise wide data architecture model**

Insight

We will be the centre of expertise on smaller business finance in the UK, **providing advice and support to Government.**

We will help to create a more diverse finance market for smaller businesses, with a greater **choice of options** and providers.

Technology and tools: Leverage existing data tools to reduce inefficient manual tasks, allowing resources to focus on analysis. Technology to support enterprise wide data collaboration, creating powerful insights.

Establish a foundation for reporting and analytics: Centralised data sourcing and preparation capabilities. Provision harmonised, trusted and well governed data services across the BBB

Create a **data insight driven** organisation

Embed a **data culture across** the bank

● Corporate Objectives   ● Pain Points   ● Prior Observations

Executive Summary

Enhanced data management capabilities and a supporting operating model will enable BBB's vision through a series of outcomes aligning to govern, simplify and insight.

Outcomes		Data Management Capabilities							Op Model
		Data Governance	Data Quality Management	Metadata Management	Master Data Management	Data Architecture	Data Risk & Control	Technology & Tools	Operating Model
Govern	Improved data quality and integrity	✓	✓				✓		
Govern	Embedded data governance, risk and control	✓			✓		✓		✓
Govern	Ownership to embed data responsibilities	✓					✓		✓
Simplify	Accessible and trusted data		✓	✓	✓	✓		✓	
Simplify	Rationalised data and reporting ecosystem					✓		✓	
Simplify	Simplified target operating model	✓				✓		✓	✓
Insight	Technology and tools					✓		✓	
Insight	Establish a foundation for reporting and analytics	✓	✓		✓	✓	✓	✓	✓

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A number of thematic pain points and opportunities addressed by the outcomes of data management have been identified across the business functions.

	Outcomes	Product Areas					Finance	Risk & Compliance	Marketing & UK Network	Strategy & Economics	Policy & Gov. Relations	Operations	BI	*Instances of Impacts Addressed
		GWS	BPC	VCS	BBI	Sul								
Govern	Improved data quality and integrity	5	6	5	10	3	4	5	1	2	1	6	4	52
Govern	Embedded data governance, risk and control	3	3	2	6	1	5	3	1	1	0	4	8	37
Govern	Ownership to embed data responsibilities	4	5	3	6	1	1	3	1	2	1	2	2	31
Simplify	Accessible and trusted data	8	5	4	11	3	5	5	10	6	4	9	6	76
Simplify	Rationalised data and reporting ecosystem	5	4	4	7	1	5	4	4	2	2	4	5	47
Simplify	Simplified target operating model	3	2	4	3	1	2	3	1	0	0	1	2	22
Insight	Technology and tools	6	5	4	9	2	4	4	4	1	1	4	5	49
Insight	Establish a foundation for reporting and analytics	6	4	5	9	2	5	5	8	4	4	7	5	64

*Instances of impacts is not a reflection of number of unique observations: if the same pain point or opportunity are observed across 2 teams, it will incur 2 instances of impact.

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Top 10 thematic observations and risks associated with the current data landscape, including the impact on BBB's corporate objectives.

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Top 10* pain points and opportunities identified will be alleviated through the govern, simplify and insight vision of the Data Strategy

1. Lack of data governance over change initiatives (G)
2. Lack of data ownership formalisation (G)
3. Wide adoption of EUC solutions for manual processing of critical workflows (G)
4. Distil useful information into common data points for product and contract data to feed into finance and operations teams (I)
5. Streamline disparate processes, have holistic approach towards critical finance and risk modelling and reporting (S)
6. Uplift functionalities of core systems to remove dependencies on EUCs (e.g, CRM, PEO, BI) (S)
7. Poor quality data ingested at source (G)
8. Multiple versions of truths commonly exist across the bank (S)
9. Explore and leverage additional third party data to enrich BBB's dataset (I)
10. Develop reporting and analytics capabilities and become an insight enabled organisation (I)

Govern	Simplify	Insight

The risks of maintaining the current data landscape are roadblocks to BBB achieving its corporate missions.

Process inefficiencies driving up operational cost leading to **inefficient use of taxpayer's resource**

Inaccurate view of risk exposure leading to **sub-optimal investment decisions made with taxpayer's money**

Lack of quantifiable evidence resulting in **inability to track against bank's agenda to tackle regional imbalances**

Inaccurate market insight causing **inability to meet the financing needs of UK businesses**

*Ordering defined by the prevalence of the pain point/opportunities across the business functions.

Executive Summary

Data Usage Heatmap has identified the impact and benefit of delivering the data management capabilities across BBB.

Product: Implementation of data quality tooling and consolidation of delivery partner data into standard templates will improve data quality of source data and improve team capacity significantly.

Risk and Compliance: Multiple versions of truths exist across data managed by the product teams and within the BI warehouse. Improving the quality of the source data and uplifting BI's ability to ingest and process data should alleviate the challenge.

HR: HR's data processing activities are largely independent from the rest of the bank. There are unique challenges associated with the current HR system, which should be resolved with an upgrade / replacement tool in the next few years.

BI: BI team is concerned with the lack of central data governance over change initiatives and the lack of control over data processing activities across the bank. Implementing data controls, embedding governance into change initiatives with a data impact is necessary to better manage and serve the organisation's data needs.
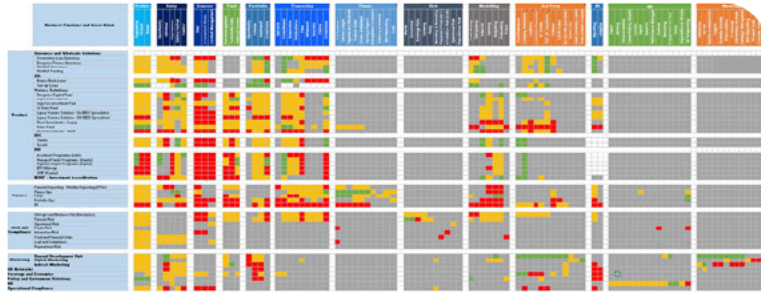
Policy and Government Relations: The team consumes MI reports produced by the BI team regularly. The reports are generally fit-for-purpose. There are benefits in being able to directly access Power BI dashboards to significantly reduce manual effort involved in requesting for metrics and KPIs from the BI team or product teams.

Marketing: Implementation of the CMS platform will enable the team to bring data across different sources together. It would be beneficial to create a single entity view which joins marketing data to data on delivery partners and SME businesses to extract insight into potential areas of demand. The quick win is to make available existing MI and reports to the team for exploration. The development of Power BI self-service capability should provide this benefit.

Strategy and Economics: The team would like to better leverage the datasets the bank currently has in order to carry out analysis to derive insights and understand programme impact on the economy. The team would like to be able to get more data relating to SME businesses, from both Delivery Partners and 3rd party data sources to enrich BBB's datasets. Both of these improvements would contribute to the team's ability to derive insights to measure against impact and inform strategy.

Finance: Rationalising reporting and modelling activities and having a comprehensive approach across product teams would streamline processes, reduce operational risks and improve accuracy of the reporting, planning and budgeting.
Operations: Uplifting the functionality of strategic workflow tools and moving manual reconciliation processes into these tools with technology controls around them would reduce operational risks significantly.

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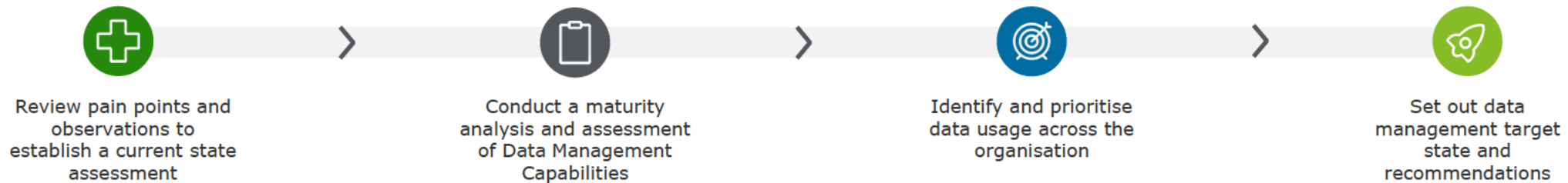
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Our Approach

Introduction

The BBB Data Strategy will be underpinned by the following core principles:

Opportunities & Pain points

Address common observations and pain points on BBB's Data Landscape

Corporate Alignment

Identify and align business priorities, drivers and strategic goals, including the BBB's corporate objectives

Industry Expertise

Leverage Deloitte's best in class frameworks, methods, resources and industry expertise
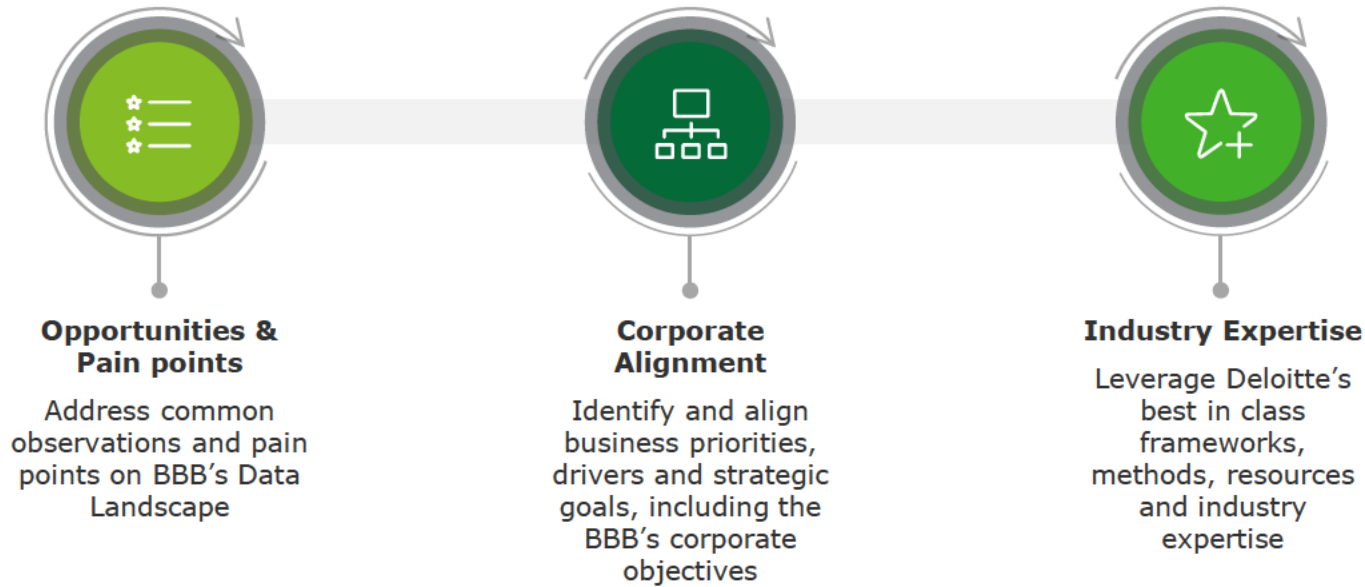
And defined through the following approach:

Review pain points and observations to establish a current state assessment

Conduct a maturity analysis and assessment of Data Management Capabilities

Identify and prioritise data usage across the organisation

Set out data management target state and recommendations

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The approach to current state assessment and data management capabilities design.

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Key Components Covered in this Section

- **Data Management Principles** – Covers the key principles for Data Management Capabilities and for each specific capability area; covering Data Governance, Data Quality Management, Metadata Management, Master Data Management, Data Risk & Control, Data Architecture and Technology & Tools.

- **Data Management Capabilities** – Using findings from stakeholder interviews, alongside industry perspectives and strategies, each data management capability section has been constructed to include the following:

  - **Overview:** Providing a brief description of the key components required and/or models to be followed.

  - **Observations and Benefits:** Linking pain points and opportunities identified through stakeholder interviews, with both challenges caused on the business and benefits from data management for the particular capability, to clearly illustrate the ways in which implementation will improve the current state of the organisation.

  - **Target State Recommendations:** Delivering a clear vision, outlining the key components required to achieve target state.

Current State Assessment

Current State Overview

Observations by Business Functions (1/2)

#	Pain Point / Opportunity Summary	Domains Impacted	GWS	VS	BPC	BBI	SuI	Strategy and Economics	Marketing	Policy and Government Relations	Risk and Compliance	Finance	Operations	BI	Number of Functions Impacted
1	Wide adoption of EUC solutions for manual processing of critical workflows	Cross-domain	Med	Med	Med	High		Med		Med	High	High	High	High	11
2	Streamline disparate data processes	Cross-domain	Med	Med					Med		Med	High	Med		8
3	Lack of standardised integration between core systems	Cross-domain	Med		Med									Med	4
4	Lack of trusted system of record	Cross-domain		Med		High			Med		High				6
5	Lack of data governance over change initiatives	Cross-domain	Data governance over change initiative is not formalised and current process is ineffective											All
6	Lack of data ownership formalisation	Cross-domain	Data ownership is not assigned across the organisation											All
7	Distil useful information into common data points	Product, Contract	Med	High	High	High	High		Med		High			High	9
8	Poor data quality at ingestion and lack of conformance to standard data definitions / rules	Funds, Portfolio, Transactions	High	Med	High	High	Med	High						High	8
9	Data processed by third parties are not available to BBB for analysis	Portfolio, Transactions	High	High	High	High			High	High	Med				7
10	Records not being maintained over time in core systems	Entity		Med		High							Med		3
11	Multiple versions of truth	Portfolio, Transactions	Med	Med							High	High	Med	High	8
12	Legacy data processes no longer satisfy current business needs	Cross-domain	Med	Med		High									4
13	Lack of comprehensive change history to enable point in time, historical analysis	Cross-domain	Med			Med			High			High	High	High	6
14	Data not stored, reliance on knowledge within the team	Contract, Entity				Med			Med			High	High		4

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Observations by Business Functions (2/2)

Impact Scale: **High** | **Medium** | **Low**

	Issue / Opportunity Summary	Domains Impacted	GWS	VS	BPC	BBI	SuI	Strategy and Economics	Marketing	Policy and Government Relations	Risk and Compliance	Finance	Operations	BI	Overall Impact
15	Lack of metadata and limited uptake of metadata documentation	Cross-domain												Medium	1
16	Data users not having direct access to the master data copy	Cross-domain						High	Medium	High	High	Medium	High		6
17	Lack of authorised distributor of data	Cross-domain			High	Medium				High	High			High	6
18	Improve file upload process in BI	Funds, Portfolio, Transactions				Medium						Medium			2
19	Explore and leverage additional third party data to enrich BBB's dataset	Reference Data	Medium			Medium	Medium		High			Medium		High	8
20	Develop reporting and analytics capabilities and become an insight enabled organisation	Cross-domain	Medium					High	High	High	High		Medium		8
21	Uplift functionalities of core systems to remove dependencies on EUCs	Cross-domain	Medium		High	High			High		High	High			8
22	BI data model inflexibility and complexity	Cross-domain				Medium						Medium		High	3
23	Minimal control and management of reference data	Reference Data						Medium			Medium		High	High	5
24	Lack of control over systems of ingestion	Funds, Portfolio, Transactions	High	High	Medium	Medium	Medium								6
25	Key person dependency for critical data processes	Cross-domain	Medium	Medium	Medium									Medium	5
26	Lack of standardised approach to modelling and reporting	Modelling, MI Reporting										Medium	High		2
27	Lack of control over critical data processes	Cross-domain										High	High		2
	Total Thematic Observations per Business Function		16	15	9	21	6	8	12	7	16	16	16	18	

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The following is an overview of detailed issue description and the impact they have on the data landscape (1/3)

	Issue Summary	Issue Description	Domains Impacted	Overall Impact	Challenge Caused
1	Wide adoption of EUC solutions for manual processing of critical workflows	Data processes are dependent on a number of EUCs that are manually operated.	Cross-domain	H	• EUCs are currently widely adopted across the bank, being used as tactical solutions to bridge gaps, such as the lack of workflow tools, lack of systems of record, challenge with rigid BI warehouse data model, scattered information across various different sources, etc. Manual effort is required to operate such EUC solutions, and the lack of controls around them posses concerning operational risks around EUC outputs. • There is a lack of documentation around how many EUCs are currently in use, where they are stored and all operations they perform on the data due to such solutions being developed in the past and continuously evolving and changing hands over time. • Data stored in such EUC solutions are sometimes considered to be the source of truth.
3	Lack of standardised integration between core systems	There is a lack of oversight and control from data management perspectives over change projects.	Cross-domain	M	• The lack of integration creates the requirement to have a manual process around transferring data from one application to another. • This promotes the use of EUCs.
4	Systems of record are not designated across all data domains, with data duplicated and tactical solutions required	Data available to the bank, but not visible to central BI function. It is common for master copies of data to reside in EUCs.	Cross-domain	H	• The lack of adequate systems of record for critical data domains have led to the adoption of EUCs as source of truth. • BI warehouse has been established to ingest data from different parts of the bank, however it is not widely recognised as EUC replacements from a record keeping perspective. As a result, updates made may not feed into BI, leading to multiple versions of truth causing confusion further downstream.
5	Lack of data governance over change initiatives	There is a lack of oversight and control from data management perspectives over change projects.	Cross-domain	H	• New product launches do not consider the impact on enterprise data architecture, leading to more disparate data processes, adoption of tactical solutions, and gaps in gathering data requirements on behalf of other areas within the bank, worsening other challenges observed so far.
6	Lack of metadata and limited uptake of metadata documentation	The bank owns very limited amount of metadata about its data landscape. A business glossary was developed without an enterprise level review of critical data elements, and as a result, does not cover all critical data elements. The updake of the business glossary is also limited. Maintenance of the glossary is reliant on one key person within the organisation.	Cross-domain	M	• The lack of precise data definition has led to bad quality data being provided by delivery partners. Downstream impact of this is potential confusion for data consumers as they encounter such data elements when conducting analysis.
7	Lack of data ownership formalisation	Recognition of good data practices is limited across the bank. There is a lack of ownership of data use outside of individual product teams, the impact on downstream data consumers are not considered.	Cross-domain	H	• Such issue results in the proliferation of unavailability and bad quality in data required to support downstream services.
9	Poor data quality at ingestion and lack of conformance to standard data definitions / rules	For relationship considerations or delivery window pressure, product teams often tend to push back on requirements from other parts of the bank in relation to collecting data attributes from delivery partners at programme outset, or resolving data quality issues caused by delivery partners with live programmes.	Funds, Portfolio, Transactions	H	• Downstream teams such as Operations, BI teams have to work with bad quality data. This leads to unnecessary manual effort required to cleanse and wrangle data. • Unavailability of critical data attributes act as blockers on downstream functions. They are forced to seek alternative data sources, conduct surveys, and in some cases, base analysis on qualitative factors as opposed to quantitative evidence. • Analysis and reporting can be impacted by this issue and lead to inaccurate understanding of the bank's risk exposure, programme evaluations and market insights.

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The following is an overview of detailed issue description and the impact they have on the data landscape (2/3)

	Issue Summary	Issue Description	Domains Impacted	Overall Impact	Challenge Caused
11	Records not being maintained over time in core systems	Records inputted into the system but not maintained over time, causing them to go out of date.	Entity	H	• Inadequate maintenance of records lead to data quality issues. This creates discrepancy between what the product team knows as the truth and the copy downstream data consumers can have access to. This drives up manual remediation effort. • This also creates a challenge in establishing the trusted source of truth.
12	Multiple versions of truth	Multiple versions of truth exist across business functions.	Portfolio, Transactions	M	• Different areas of the bank see different versions of truth. This discrepancy creates confusion and challenges across product and enterprise level reporting, driving up unnecessary reconciliation requirements.
13	Legacy data processes no longer satisfy current business needs	Historical data stored in excel files that have data quality issues. Such data often pre-dates a number of systems which are now widely adopted by the bank as workflow tool or system of record.	Cross-domain	M	• Historical data in excel files creates requirement for manual intervention, and is another driver towards the use of EUC solutions.
14	Lack of comprehensive change history to enable point in time, historical analysis	Historic view of data stored in older version of files, and corrections applied to data are not captured in many cases. Corrections to historic data requires significant manual effort.	Cross-domain	H	• Future references to historical data can be inaccurate, hindering the ability to conduct investigations and respond to queries coming from the bank's stakeholders (for example, queries from government organisations and European funding providers).
15	Data not stored anywhere, reliance on knowledge within the team	Data captured through interactions are often not updated. No process is defined for such capturing of updates at source. Product teams tend to rely on knowledge of relationship managers within the team for contract terms and key persons contact details.	Contract, Entity	H	• Manual effort required for teams to source the most updated information to support critical processes. This has been considered as less of an impact for product teams but has a more significant impact on other teams, such as finance, marketing, strategy and economics teams, for the purpose of resolving queries, reaching out to third parties for programme evaluations or getting feedback on third party journey experience.
16	Data users not having direct access to the master data copy	Users do not have direct access to system of record therefore relying on manual data extracts stored in excel.	Cross-domain	M	• The user access issue creates the requirement to have a manual process around the solution and promotes the use of EUCs. • There lacks central data oversight over who's using what, impacting the ability to ensure all data users have access to the most accurate and up-to-date copy of information to feed into their use cases. Potential risk of introducing discrepancies into multiple copies of the same data and driving up reconciliation effort downstream.
17	Lack of authorised distributor of data	The publishing of dashboards and reports are performed in siloes across business functions. There is no recognition of an autorised distributor.	Cross-domain	H	• Anyone can publish anything. There is no consistancy across multiple publishers of the same information, robustness of the output may be in question due to the lack of central governance, and the scenario promotes siloed data processes.

Current State Overview

The following is an overview of detailed issue description and the impact they have on the data landscape (3/3)

	Issue Summary	Issue Description	Domains Impacted	Overall Impact	Challenge Caused
22	BI data model inflexibility and complexity	BI data model is too complex and rigid to adapt to new business needs, such as the introduction of new data attributes.	Cross-domain	H	• BI is not able to cater for new data requirements and act as the trusted source for MI Reporting, driving the dependency on tactical EUC solutions to plug the gap.
23	Minimal control and management of reference data	Different business functions have their own approach of consuming reference data: manually accessing 3rd party website to get live information, consuming reference data from excel that is stored on G Drive, manually map reference data onto BBB's datasets.	Reference Data	M	• Risk of different parts of the bank using different versions of reference data, leading to potential discrepancies and driving up reconciliation effort. The lack of governance around sharing and use of reference data such as FX rates generates concerns around the accuracy of reporting produced.
24	Lack of control over systems of ingestion	Data ingestion pipelines into BBB have minimal validation or controls.	Funds, Portfolio, Transactions	H	• Bad quality data gets ingested as a result of lack of control over systems of ingestion. Issues are not identified soon enough for timely resolution, leading to delays in data ingestion or even bad quality data being ingested.
25	Key person dependency for critical data processes	Critical data processes known to a group of resources. Knowledge of how these processes are run are not widely known across the bank, creating key person dependency on those that have built and are running these processes.	Cross-domain	M	• This dependency on knowledge known to a limited number of resources is a risk towards business continuity. This have been observed in both product teams for the credit risk and finance models as well as IT for the BI warehouse that have grown to be too complex to maintain or update by anyone other than the individuals who have built or run them since the start.
26	Lack of standardised approach to modelling and reporting	Streamline disparate data processes across product teams have led to different approaches applied to modelling and reporting.	Modelling, MI Reporting	H	• It creates challenges on downstream report compilation tasks when consolidating and standardising outputs that are based on different assumptions and have gone through different transformations. • It creates extra effort in validating the underlying assumptions and transformation logic, as multiple processes need to be validated, as opposed to one consistent approach.
27	Lack of control over critical data processes	Significant manual effort involved in running critical data processes, such as the approving and processing of transactions.	Cross-domain	H	• Increased operational risk around critical business processes, prone to human error and requires manual effort for validation and reconciliation.

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The following are a number of opportunities identified throughout the stakeholder interviews which have been highlighted to add significant value to day-to-day data processes.

	Opportunity Summary	Opportunity Description	Domains Impacted	Overall Impact	Benefit
2	Streamline disparate data processes	Inconsistent processes exist within business functions and across the bank. There are opportunities to remove siloes and streamline such processes.	Cross-domain	M	• Streamlined processes allows for easier central governance, provides clarity to the processes and frees up data experts to focus more time and energy on strategic tasks, such as building analytical solutions to derive valueable insight for decision making or strategy setting.
8	Distil useful information into common data points	Data captured in the form of word / PDF documents or stored on public website.	Product, Contract	H	• Extracting useful information into a structured format enables data users easier access to the information required, reduces reliance on time consuming documentation review, and reduces operational risks associated with mis-interpretation of complex documents.
18	Improve file upload process in BI	Current file upload process picks up 3rd party feed files and performs basic validation against the content of the files. The validation process is designed for files to be rejected by the system once any error is picked up, without validating against the rest of the files, leading to multiple iterations of file updates before it is finally ingested by BI. This validation process should be improved to scan through the entire file before it is rejected to minimise the number of iterations required for a successful file upload. The current file upload process is adopted by Regional Investments.	Funds, Portfolio, Transactions	M	• An improved file upload process should benefit file ingestion by minimising the number of iterations required to achieve successful file upload; reducing delays associated with error handling and exceptions processes and improving Delivery Partner experience.
19	Explore and leverage additional third party data to enrich BBB's dataset	Source 3rd party data, such as survey data, specialist data providers data and publicly available data sources to enrich existing BBB datasets.	Reference Data	M	• Having a richer dataset as foundation to conduct data analytics.
20	Develop reporting and analytics capabilities and become an insight enabled organisation	Apply data analytics to use cases to extract insight out of BBB's datasets.	Cross-domain	M	• Having the technical capability to draw deeper insight into market demands, demonstrate the impact on customers, regional economies and sectors of interest. • This feeds into #19.
21	Uplift functionalities of core systems to remove dependencies on EUCs	A number of core systems are being used by business functions as data repository for reporting purposes only as opposed to supporting critical business workflows.	Cross-domain	H	• Developing the capabilities of core systems enables streamlining of critical business processes, removes reliance on tactical EUC solutions, reduces operational risk and inefficiencies, have better quality data for reporting and analysis.

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The following is an overview of which Data Management Capabilities are going to contribute towards the remediation of the issues identified.

	Issue / Opportunity Summary	Route to Resolution	Benefit to Resolution	Data Governance	Data Quality Management	Metadata Management	Master Data Management	Data Architecture	Data Risk & Control	Technology & Tools	Operating Model
1	Wide adoption of EUC solutions for manual processing of critical workflows	Replace EUC solutions with strategic workflow tools / RPA solutions as they develop and mature.	Reduce the number of processes relying on EUC solutions to remove operational inefficiencies and reduce operational risk	✓		✓		✓	✓		✓
2	Streamline disparate data processes	Standardise elements of the data processes, such as define standard data integration patterns (API, ETL tool, Data Ingestion Platform).	Streamlined processes allows for easier central governance, provides clarity to the processes and frees up data experts to focus more time and energy on strategic tasks, such as building analytical solutions to derive valueable insight for decision making or strategy setting.			✓					✓
3	Lack of standardised integration between core systems	Establish strategic ETL tool and implement integration pipelines between core systems.	Establish automated integration to reduce reliance on manual data transfer and EUC solutions.					✓			
4	Systems of record are not designated across all data domains, with data duplicated and tactical solutions required	Design strategic solutions with business needs in mind. Invest in core systems of engagement to support critical business processes.	Inherit systematic controls benefit the long term data quality management and bring operational efficiencies to product and downstream teams. This also has the added benefit of reducing dependencies on workaround EUC solutions.			✓		✓	✓		✓
5	Lack of data governance over change initiatives	Embed data governance into change initiatives. Impact assess against enterprise data landscape, crystalise requirements, bring in data management expertise, promote the use of strategic solutions.	Ensure solutions aligns to business objectives and effective ongoing data management.	✓							✓
6	Lack of metadata and limited uptake of metadata documentation	Establish Data Management Capabilities, including metadata management. Identify and capture metadata of all critical data elements.	Metadata provides clarity around data definitions, relationships and ownerships. Technical metadata also benefit future change projects by providing the baseline data estate for impact assessment and requirement gathering.			✓				✓	
7	Lack of data ownership formalisation	Roll out DMO comms and training courses to advocate best data practices and raise awareness; Embed data ownership and responsibilities across the organisation to influence day-to-day behaviour.	Formalising data ownership and raising data awareness across the organisation promotes good data practices in day-to-day activities; enables the organisation to focus resources on delivering additional value as opposed to problem fixes.	✓						✓	✓
8	Distil useful information into common data points	Identify critical data elements through data user interviews; Design data capture and storage mechanisms to standardise the collection, storage and sharing of useful data points through authorised distributor to benefit downstream data processing.	Extracting useful information into a structured format enables data users easier access to the information required, reduces reliance on time consuming documentation review, and reduces operational risks associated with mis-interpretation of complex documents.	✓		✓					
9	Poor data quality at ingestion and lack of conformance to standard data definitions / rules	Establish a data quality programme to monitor, report and remediate data quality issues on critical business data, enabling accurate reporting and insights to the business. Build data quality management capability to support BAU DQ monitoring, issue identification and resolution.	Improved data quality reduces manual correction and reconciliation efforts, promotes operational efficiencies and increases accuracy of insights drawn from data. Reduction in such manual activities also frees up data experts to focus more time and energy on strategic tasks, such as building analytical solutions to derive valueable insight for decision making or strategy setting.	✓	✓	✓		✓	✓	✓	

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The following is an overview of which Data Management Capabilities are going to contribute towards the remediation of the issues identified (1/3)

	Issue / Opportunity Summary	Route to Resolution	Benefit to Resolution	Data Governance	Data Quality Management	Metadata Management	Master Data Management	Data Architecture	Data Risk & Control	Technology & Tools	Operating Model
10	Data processed by third parties are not available to BBB for analysis	Identify critical data elements through data user interviews; Embed data governance into change project lifecycle; Build out BBB's technical capability to be able to ingest, process, store and analyse additional datasets that are not currently available to the bank.	Being able to extract valuable insights from missing datasets to: understand the needs of UK businesses; quantify the impact our investment has on our investees / borrowers; feedback into programme design and development; get clarity on the risks we are exposed to (credit and fraud losses).	✓							✓
11	Records not being maintained over time in core systems	Establish data quality programme to monitor, report and remediate data quality issues relating to out of date records. Identify golden source system per data domain, and invest in functional uplifts for such systems to be adopted by business as workflow tools.	Ensuring records are maintained over time in core systems as part of data quality management at source. This allows for accurate insight to be drawn from underlying high quality data. This also has the added benefit of moving dependencies away from EUC solutions once data quality improves and there is reduced requirement to seek workaround solutions for better quality data.	✓	✓		✓		✓		✓
12	Multiple versions of truth	Maintain high data quality at source through the launch of a data quality programme, uplifting the functionality of workflow systems; replace EUC solutions with strategic applications and implementation of better governance and controls around golden sources. Establish authorised distributor of data to mirror the golden source and serve as the single source of truth for analysis and reporting.	Removing alternative sources of truth promotes clarity and consistency across the bank, removes unnecessary manual reconciliation effort, provides enterprise wide data oversight and allows for easier central governance.	✓			✓	✓	✓	✓	
13	Legacy data processes no longer satisfy current business needs	Revisit data requirements based on current business needs; prioritise based on benefits delivered and appetite and feasibility to implement. Build flexibility and scalability into technology infrastructure to evolve alongside the changing business needs.	Ensure our solutions are refined to address current business needs and align to BBB objectives and mission statements, and future solutions are flexible and scalable to cater to changing business needs.	✓	✓						
14	Lack of comprehensive change history to enable point in time, historical analysis	Define data archiving and retention policy and schedules based on regulatory guidance. Develop BBB's capability to capture and store change in a more user-friendly format.	Having the ability to conduct point in time analysis on the data to address external stakeholder queries, extract useful insight and be compliant with GDPR.	✓				✓			
15	Data not stored anywhere, reliance on knowledge within the team	Identify critical data elements through data user interviews; Design data capture and storage mechanisms to standardise the collection, storage and sharing of useful data points through authorised distributor to benefit downstream data processing.	Extracting useful information into a structured format enables data users easier access to the information required, reduces reliance on manual information gathering processes.	✓			✓				
16	Data users not having direct access to the master data copy	Identify Golden Sources for all master data domains; Establish authorised data distributor; Implement data quality controls around strategic applications and make data available to end users through self-serve reporting capability, whilst maintaining governance and control over user access.	Allowing data users access to trusted copies of data increases operational efficiency and reduces the risk of potential bad quality data coming from unvalidated source and impacting the accuracy of reporting or insights.	✓			✓	✓		✓	✓

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The following is an overview of which Data Management Capabilities are going to contribute towards the remediation of the issues identified (2/3)

	Issue / Opportunity Summary	Route to Resolution	Benefit to Resolution	Data Governance	Data Quality Management	Metadata Management	Master Data Management	Data Architecture	Data Risk & Control	Technology & Tools	Operating Model
17	Lack of authorised distributor of data	Identify Golden Sources for all master data domains; Establish authorised data distributor; Implement data quality controls around strategic applications and make data available to end users through self-serve reporting capability, whilst maintaining governance and control over user access.	Allowing data users access to trusted copies of data increases operational efficiency and reduces the risk of potential bad quality data coming from unvalidated source and impacting the accuracy of reporting or insights.	✓	✓		✓	✓	✓		
18	Improve file upload process in BI	Improve the existing file validation and exceptions process surrounding batch file upload. Implement data ingestion platform across batch file ingestion processes.	Streamlined process established around file validation and error handling would speed up data ingestion time, streamline the issue resolution process and improve delivery partner experience.					✓			
19	Explore and leverage additional third party data to enrich BBB's dataset	Integrate into additional third party data sources to plug the gap with existing reference data not meeting business needs. For example, data that allows us to perform sector tagging, demonstrate job creation, measure performance of investees and more.	Enrich BBB's dataset enable insight, better understand the market demand, have oversight over which sector or region our investments are flowing into, the impact investments have on underlying investees and ultimately, track and deliver against our corporate objectives.	✓				✓			
20	Develop reporting and analytics capabilities and become an insight enabled organisation	Apply data analytics on enriched BBB dataset to extract insight.	Having the technical capability to derive insight from BBB's datasets, better understand the market and demand, have oversight over which sector or region our investments are flowing into, the impact investments have on underlying investees, and many more benefits.					✓			
21	Uplift functionalities of core systems to remove dependencies on EUCs	Identify trusted system of record per data domain and use case, and invest in these systems to establish them as the Golden Source. Replace EUC solutions once the Golden Sources are ready.	Developing the capabilities of core systems enables streamlining of critical business processes, removes reliance on tactical EUC solutions, reduces operational risk and inefficiencies, have better quality data for reporting and analysis.	✓				✓			
22	BI data model inflexibility and complexity	Develop BI to be flexible and scalable to cater for evolving business needs.	Enable BI as authorised data distributor to streamline data user processes, remove manual data gathering steps, ensure users have access to top quality data and focus on delivering additional value for the business.	✓			✓	✓			
23	Minimal control and management of reference data	Develop reference data hub to be the authorised distributor of reference data within BBB.	Establishing the authorised data distributor for reference data removes the operational risk of using out of date reference data and the manual reconciliation effort required to support critical data processes involving reference datasets.	✓			✓		✓		
24	Lack of control over systems of ingestion	Establish data governance programme close to data sources; define standardised data ingestion template and encourage adoption by programme teams; embed data governance early in change project lifecyle to define data ingestion requirements;	Having monitoring and control close to source ensures high quality data enter the organisation to support critical business processes, remove manual correction or reconciliation efforts, drive accurate reporting and analytical insights.	✓	✓				✓	✓	

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	Issue / Opportunity Summary	Route to Resolution	Benefit to Resolution	Data Governance	Data Quality Management	Metadata Management	Master Data Management	Data Architecture	Data Risk & Control	Technology & Tools	Operating Model
25	Key person dependency for critical data processes	Capture business and technical metadata including data lineage for critical data processes and publish the data catalogue to data users and processors across the bank.	Removing key person dependency reduces risks to business continuity. Having data catalogue widely available to data users and processors provides transparency to data processes and promotes sharing of knowledge amongst the bank.			✓				✓	
26	Lack of standardised approach to modelling and reporting	Define principles and guidelines around modelling and reporting. Streamline and consolidate common data tasks across the organisation to be performed centrally. Gather requirements from downstream data users to inform report and model design.	Standardised approach ensures consistent underlying assumptions are applied across different product teams, reduces reconciliation and consolidation effort required by data users and reduces the risk of confusion associated with potential mis-interpretation of requirements across the number of data providers (e.g., supplying the right figure out of a range of different NAVs).			✓			✓		✓
27	Lack of control over critical data processes	Establish systems of control around critical processes; define key control indicators to monitor and assess control effectiveness along the data processing journey.	Significant manual effort involved in running critical data processes, such as the approving and processing of transactions.	✓	✓			✓	✓	✓	

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Principles underpinning the Data Strategy

Data Strategy

- Data is viewed as a critical business asset, and should be managed and leveraged to generate the greatest business impact.
- Data Strategy should support business objective and data intense initiatives should be assessed against the data vision.

Data Governance
- Data items and systems must have clearly defined ownership and accountability.
- Common data dictionaries should be instilled in business operations.
- Business rules to govern data usage and management should be defined, publicised and kept up-to-date.
- Steering Committee and Working Groups should meet regularly to discuss Data Governance issues.

Data Quality Management
- Data should be fit for purpose to support business needs.
- Data should always be corrected at the source.
- Data Quality assessments must be an ongoing exercise.
- Quality standards are always applied.
- Effective data quality remediation should be present across the organisation.

Metadata Management
- Metadata should be available in key systems.
- There must be common attributes of metadata captured across key systems.
- Metadata must be proactively maintained and published.
- Business metadata should be maintained across the organisation.

Master Data Management
- Data should be mastered in key repositories and accessible across different technologies.
- Data controls should be in place to prevent duplication of data records and prevent data quality issues.

Data Architecture
- An enterprise data model must be maintained and kept up-to-date.
- Standard processes should be used to maintain data architecture.
- Architecture artefacts must be used to facilitate stakeholder communication during requirements elicitation tasks.

Data Risk & Control
- There should be a single and consistent approach to assessing data criticality.
- Business should monitor against risk appetite thresholds via consistent key control indicators (KCIs)
- Data controls should be in place to manage systems and data integrity risk.

Technology & Tools
- Technology and Tools should be appropriately used to improve the accessibility and quality of data that is used to make decisions.
- Technology and Tools should increase efficiency in dealing with the quality of data, therefore optimising the cost associated to it.

Summary of Data Management Capabilities

The following is a summary of the current and target state overlaid on the Data Management Capabilities* maturity scale. We believe BBB can aim to fully transition to target state by the end of the 24 month implementation period, provided IT, Architecture and Change Management are onboard and change initiatives managed with cadence.

	1 - Minimal	2 - Basic	3 - Proactive	4 - Optimised
Data Governance	• No formal data governance roles assigned. • No formal data owners and data stewards. • None or limited governance processes.	• Some data governance roles assigned. • Limited data owners and data stewards are assigned. • Key data governance processes defined and drafted in a few business units.	• Data governance organisation formalised with key roles assigned. • Data owners and data stewards assigned according to master data domains. • Data governance policy documented and communicated. • Business processes are standardised to support data governance policies.	• Steering committee and working groups exist which meeting regularly to discuss governance issues. • Reporting is performed on compliance with data governance processes. • Organisation-wide compliance with key data governance processes that are continually updated to support the changing environment.
Data Quality Management	• Data quality issues are identified by errors in process. • Little or no quality criteria defined for data elements. • No processes for identifying and remediating data quality issues.	• Informal processes exist for issue identification and remediation. • Cleansing and remediation activities performed for critical areas. • Quality criteria defined for some critical data elements.	• Centralised data quality management team exists with formal roles assigned. • Formal processes exist to profile, identify, track and remediate data quality issues. • Quality criteria defined for all critical data elements. • Specialist data quality tools used within key business areas.	• Effective data quality issue prioritisation mechanism across the organisation. • Reporting on data quality issue identification and remediation communicated to appropriate stakeholders and forums. • Specialist data quality tools available to all business areas and used as required.
Metadata Management	• Limited or no metadata is maintained.	• Some technical metadata is maintained in silos and primarily used by IT. • Business metadata (business vocabulary) is maintained for some terms.	• Technical, business and operational metadata is proactively maintained for key business units. • Business metadata is maintained for key terms.	• Technical, business and operational metadata is proactively maintained and published. • Business metadata is maintained enterprise-wide. • Metadata is used in context for ongoing business operations and change projects. • Metadata management tools are used.
Master Data Management	• Master data domains (business entities) have not been defined. • Multiple versions of the truth exist.	• Data owners are assigned to each master data domain. • Authoritative data sources (Systems-of-Record) exist for some master data domains.	• Authoritative data sources (Systems-of-Record) exist for all master data domains.	• Authoritative data sources (Systems-of-Record) exist for each domain are used for all business processes and changes projects. • The organisation benefits from fact-based decision making.
Data Risk & Control	• Minimal control framework with Risk and Control owners not identified	• Data quality and process controls exist with data quality escalation and remediation protocols	• Data control points, indicators, metrics and MI implemented across all CDEs • Defined Risk roles and responsibilities	• Layered control approach adopted across the organisation • Automated and monitored controls across critical processes with Risk Control Assessments in place
Data Architecture	• High volume of data processes are completed using End User Computing solutions • High volume of point to point integrations, with limited automation • Change priority is to resolve issues with the existing architecture	• Dedicated platforms for each system category, but capabilities and flexibility is limited • Some level of manual data processing for core processes and reporting • Change is focused on enhancing existing architecture, rather than delivering new capabilities	• Data processed using dedicated tooling, tailored to business requirements • Clear designation of systems into the five system categories • Standardised reporting is largely automated, with self service capabilities for ad hoc reporting • Change is largely focused on enhancing the data architecture to provide improved services	• Data processes optimised for efficiency, data quality and risk mitigation, using automation, data flow monitoring etc. • Advanced AI and Analytics capabilities, above and beyond reliable MI reporting. • Change is focused on innovation and capitalising on new opportunities. • Data architecture is seen as a key source of value for the organisation.
Technology and Tooling	• Data management tooling do not exist. • No central repository for policies, standards and metadata.	• Basic functionalities of data management tooling have been adopted by areas of the bank in silo-es. • Data management processes are largely manual. • Policies, standards and metadata exist in silo-es and consumption are limited.	• Tools used to support day-to-day data management activities across key areas of the bank. • Policies, standards and metadata are stored and maintained in central repositories and are easily accessible to the organisation. • Updates to documentation partially automated through tooling.	• Tools used to support day-to-day data management activities across all areas of the bank. • Policies, standards and metadata are stored and maintained in central repositories and easily accessible to all parts of the organisation whilst maintaining access rights centrally. • Policies and standards are implemented in the form of rules through tooling and regularly updated as the data management capability and / or business needs evolve. • Updates to documentations are largely automated through tools. • Business and technical metadata are well integrated in the form of a data catalogue and supports semantic searches.

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Data Governance is the exercise of authority and control over the management of data assets. Data Governance guides how an organisation performs all other data management functions to manage its information as a strategic asset. It requires executive support, funding and leadership. It also requires processes and forums to ensure that information assets are fit for purpose, protected and reliable at all levels of organisation and across all functions and locations.

Policy

Setting out the broad principles for the operation of governance and the data domains. The policy guides the decision making of the DG Steering and Working Groups, as well as providing high-level focus for anyone using data within the organisation.

Process

Setting out the required data governance activities to be carried out and by whom.

Reporting

Management information, performance management and value demonstration. Data governance reporting capability to communicate the progress of embedding data governance to senior management

Organisation

A model of the data governance organisation and the interrelationships of the various forums, roles and responsibilities. Provides clarity on reporting lines and levels.

Ownership

A series of interrelated role descriptions, linking to the organisational model, steering group and terms of reference.

Technology

Tools and technology to support execution of data governance activities and manage data governance artefacts e.g. data glossary.

Standards

The standards define common data entities, their attributes and inter-relationships as well as records of authority for each data object and data element.

Communications and Training

Training, education and awareness and the identification of stakeholders and communications required to support data governance objectives.

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Data Governance

Observations (1/3)

	Issue Summary	Issue Description	Domain Impacted	Overall Impact	Challenge Caused
1	Wide adoption of EUC solutions for manual processing of standard workflows	Data processes are dependent on a number of EUCs that are manually operated.	Cross-domain	H	• EUCs are currently widely adopted across the bank, being used as tactical solutions to bridge gaps, such as the lack of workflow tools, lack of systems of record, challenge with rigid BI warehouse data model, scattered information across various different sources, etc. Manual effort is required to operate such EUC solutions. • There is a lack of documentation around how many EUCs are currently in use, where they are stored and all operations they perform on the data due to such solutions being developed in the past and continuously evolving and changing hands over time. • Data stored in such EUC solutions are sometimes considered to be the source of truth.
5	Lack of data governance over change initiatives	There is a lack of oversight and control from data management perspectives over change projects.	Cross-domain	H	• Change projects do not consider the impact on enterprise data architecture, leading to more disparate data processes, adoption of tactical solutions, and gaps in gathering data requirements on behalf of other areas within the bank, worsening other challenges.
6	Lack of metadata and limited uptake of metadata documentation	The bank owns very limited amount of metadata about its data landscape. A business glossary was developed without an enterprise level review of critical data elements, and as a result, does not cover all critical data elements. The updake of the business glossary is also limited. Maintenance of the glossary is reliant on one key person within the organisation.	Cross-domain	M	• The lack of precise data definition has led to bad quality data being provided by delivery partners. Downstream impact of this is potential confusion for data consumers as they encounter such data elements when conducting analysis.
7	Lack of data ownership formalisation	Recognition of good data practices is limited across the bank. There is a lack of ownership of data use outside of individual product teams, the impact on downstream data consumers are not considered.	Cross-domain	H	• Such issue results in the proliferation of unavailability and bad quality in data required to support downstream services.
8	Data not stored structured format, data users reliant on manual documentation review to extract information	Data captured in the form of word / PDF documents or stored on public website.	Product, Contract	H	• Data being stored in word and PDF documents are hard to access and analyse centrally. Any processes dependent on information stored in such unstructured format relies on manual maintenance.
9	Poor data quality at ingestion and lack of conformance to standard data definitions / rules	For relationship considerations or delivery window pressure, product teams often tend to push back on requirements from other parts of the bank in relation to collecting data attributes from delivery partners at programme outset, or resolving data quality issues caused by delivery partners with live programmes.	Funds, Portfolio, Transactions	H	• Downstream teams such as Operations, BI teams have to work with bad quality data. This leads to unnecessary manual effort required to cleanse and wrangle data. • Unavailability of critical data attributes act as blockers on downstream functions. They are forced to seek alternative data sources, conduct surveys, and in some cases, base analysis on qualitative factors as opposed to quantitative evidence. • Analysis and reporting can be impacted by this issue and lead to inaccurate understanding of the bank's risk exposure, programme evaluations and market insights.
10	Data processed by third parties are not available to BBB for analysis	Data being processed by third parties on behalf of BBB. Output of the processing is available, however the input data are not.	Portfolio, Transactions	H	• This hinders BBB's ability to draw insight on the underlying data and its ability to validate the processing performed. Challenges arise when there is descrepancy between BBB's calculation versus the output received from third party.
11	Records not being maintained over time in core systems	Records inputted into the system but not maintained over time, causing them to go out of date.	Entity	M	• Inadequate maintenance of records lead to data quality issues. This creates discrepancy between what the product team knows as the truth and the copy downstream data consumers can have access to. This drives up manual remediation effort. • This also creates a challenge in establishing the trusted source of truth.

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Observations (2/3)

	Issue Summary	Issue Description	Domain Impacted	Overall Impact	Challenge Caused
12	Multiple versions of truth	Multiple versions of truth exist across business functions.	Portfolio, Transactions	M	• Different areas of the bank see different versions of truth. This discrepancy creates confusion and challenges across product and enterprise level reporting, driving up unnecessary reconciliation requirements.
13	Legacy data processes no longer satisfy current business needs	Historical data stored in excel files that have data quality issues. Such data often pre-dates a number of systems which are now widely adopted by the bank as workflow tool or system of record.	Cross-domain	M	• Historical data in excel files creates requirement for manual intervention, and is another driver towards the use of EUC solutions.
14	Lack of comprehensive change history to enable point in time, historical analysis	Historic view of data stored in older version of files, and corrections applied to data are not captured in many cases. Corrections to historic data requires significant manual effort.	Cross-domain	H	• Future references to historical data can be inaccurate, hindering the ability to conduct investigations and respond to queries coming from the bank's stakeholders (for example, queries from government organisations and European funding providers).
15	Data not stored anywhere, reliance on knowledge within the team	Data captured through interactions are often not updated. No process is defined for such capturing of updates at source. Product teams tend to rely on knowledge of relationship managers within the team for contract terms and key persons contact details.	Contract, Entity	H	• Manual effort required for teams to source the most updated information to support critical processes. This has been considered as less of an impact for product teams but has a more significant impact on other teams, such as finance, marketing, strategy and economics teams, for the purpose of resolving queries, reaching out to third parties for programme evaluations or getting feedback on third party journey experience.
16	Data users not having direct access to the master data copy	Users do not have direct access to system of record therefore relying on manual data extracts stored in excel.	Cross-domain	M	• The user access issue creates the requirement to have a manual process around the solution and promotes the use of EUCs. • There lacks central data oversight over who's using what, impacting the ability to ensure all data users have access to the most accurate and up-to-date copy of information to feed into their use cases. Potential risk of introducing discrepancies into multiple copies of the same data and driving up reconciliation effort downstream.
17	Lack of authorised distributor of data	The publishing of dashboards and reports are performed in siloes across business functions. There is no recognition of an authorised distributor.	Cross-domain	H	• Anyone can publish anything. There is no consistency across multiple publishers of the same information, robustness of the output may be in question due to the lack of central governance, and the scenario promotes siloed data processes.
19	Leverage additional third party data sources to enrich BBB's dataset	Source 3rd party data, such as survey data, specialist data providers data and publicly available data sources to enrich existing BBB datasets.	Reference Data	M	• Having a richer dataset as foundation to conduct data analytics.
21	Limited capabilities of core systems, requiring EUC solutions to plug gaps	A number of core systems are being used by business functions as data repository for reporting purposes only as opposed to supporting critical business workflows.	Cross-domain	H	• A number of manual processes are stood up involving heavy use of EUC solutions to work around the core systems. This increases dependencies on tactical solutions, increases operational overhead and risks surrounding critical workflows. • Data stored in such systems are not well maintained as this is considered to be a separate task to completing critical business tasks. This causes the deterioration of the data quality and leads to reconciliation efforts further downstream.
22	BI data model inflexibility and complexity	BI data model is too complex and rigid to adapt to new business needs, such as the introduction of new data attributes.	Cross-domain	H	• BI is not able to cater for new data requirements and act as the trusted source for MI Reporting, driving the dependency on tactical EUC solutions to plug the gap.

Data Governance

Observations (3/3)

	Issue Summary	Issue Description	Domain Impacted	Overall Impact	Challenge Caused
23	Minimal control and management of reference data	Different business functions have their own approach of consuming reference data: manually accessing 3rd party website to get live information, consuming reference data from excel that is stored on G Drive, manually map reference data onto BBB's datasets.	Reference Data	M	• Risk of different parts of the bank using different versions of reference data, leading to potential discrepancies and driving up reconciliation effort. The lack of governance around sharing and use of reference data such as FX rates generates concerns around the accuracy of reporting produced.
27	Lack of control over critical data processes	Significant manual effort involved in running critical data processes, such as the approving and processing of transactions.	Cross-domain	H	• Increased operational risk around critical business processes, prone to human error and requires manual effort for validation and reconciliation.

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Benefit Analysis (1/2)

#	Issue Summary	Data Governance	Policy	Standard	Organisation	Ownership	Comms and Training	Reporting	Process	Technology
1	Wide adoption of EUC solutions for manual processing of standard workflows	• Feed into policy and standard around the Wide adoption of EUC solutions for manual processing of standard workflows from a data management perspective. • Assign ownership to active EUCs. • Closely monitor the use of EUCs by periodically report against usage and compliance against policy and standard. • Establish data governance processes to receive, prioritise and resolve data issues associated with the use of EUCs.	✓	✓		✓		✓	✓	
5	Lack of data governance over change initiatives	• Embed data governance into project change lifecycle. • Communicate governance process with the organisation. • Feed into Change Management policy, embed into governance structure for change approval, assign ownership to identify impact on data domains.	✓		✓	✓	✓			
6	Lack of metadata and limited uptake of metadata documentation	• Identify and define critical data elements across the bank, in preparation for metadata activities. This will ensure optimal coverage of data elements. • Assign ownership to critical data elements.	✓	✓						
7	Lack of data ownership formalisation	• Develop and implement communications strategy and training plan to raise awareness. • Assign ownership and governance structure to enforce control and behaviour. • Establish processes for data issue identification and resolution across business functions.			✓	✓	✓			
8	Data not stored structured format, data users reliant on manual documentation review to extract information	• Establish file management policy for data stored in files. • Establish ownership for the logging and user access control of documents. • Identify and define critical data elements across the bank to understand the requirement to extract standardised data points from documents. • Assign ownership to critical data elements and ensure capture and storage of CDEs to support critical business processes of non-product teams.	✓			✓		✓	✓	
9	Poor data quality at ingestion and lack of conformance to standard data definitions / rules	• Define data standard covering minimum requirements for 3rd party data. • Define data policy around the obtaining and usage of 3rd party data. • Assign ownership and accountability to enforce control and monitor compliance. • Define governance structure and processes around issue monitoring, identification, escalation and resolution.	✓	✓	✓	✓			✓	
10	Data processed by third parties are not available to BBB for analysis	• Define metadata standard including minimum requirement for 3rd party data. • Define data policy around the obtaining and use of 3rd party data. • Assign ownership and accountability to enforce control and monitor compliance.	✓	✓		✓				
11	Records not being maintained over time in core systems	• Define data management policy and standard outlining the minimum requirement for ongoing records management. • Define ownership and process to support the identification, prioritisation and remediation of data issues.	✓	✓	✓	✓			✓	
12	Multiple versions of truth	• Establish policy and standard for master data management. • Establish process and ownership to support the identification, creation and management of sources of truths and distribution of copies of truths. • Establish governance structure around the management of master data. • Identify trusted systems of origin, establish system of record and make available master data copies to data users.	✓	✓	✓	✓			✓	✓
13	Legacy data processes no longer satisfy current business needs	• Prioritise issues based on criticality to business processes. • Define data management policy and standard outlining the minimum requirement for data management. • Define ownership and process to support the identification, prioritisation and remediation of data issues.	✓	✓	✓	✓			✓	

Data Governance

Benefit Analysis (2/2)

	Issue Summary	Data Governance	Policy	Standard	Organisation	Ownership	Comms and Training	Reporting	Process	Technology
14	Lack of comprehensive change history to enable point in time, historical analysis	• Identify critical data elements that require change history retention. • Define data management policy and standard outlining the requirement for data retention.	✓	✓						
15	Data not stored anywhere, reliance on knowledge within the team	• Understand business critical processes and critical data elements required to support such processes. • Define minimum requirements and metrics for management of critical data elements. • Identify gaps between requirements and current data estate. • Address gaps through owners, stewards and custodians responsible for the data elements.		✓		✓				
16	Data users not having direct access to the master data copy	• Feed into the definition of user access policy. • Assign ownership for user access governance and control. Establish system of record and authorised distributor of data to govern and make data available to users.	✓			✓				✓
17	Lack of authorised distributor of data	• Define master data management standard to cover the requirement of having authorised distributor of data, as well as the identification of trusted system of origin and establishment of the system of record.		✓						✓
19	Leverage additional third party data sources to enrich BBB's dataset	• Establish policy and standard covering reference data ingestion and usage. • Identify business and domain owner for reference datasets for ongoing maintenance and user access control of this data. • Capture and store reference data in dedicated reference data hub as the authorised distributor to all data users. • Define process for new reference data requests to be channelled through to DMO.	✓	✓		✓			✓	✓
21	Limited capabilities of core systems, requiring EUC solutions to plug gaps	• Define owner of core systems (data custodians) to support business data owners with ensuring system functionality supports critical business processes. • Define issue identification and escalation process for major functionality gaps. • Establish data governance organisation to review, triage and prioritise issues and provide support for resolution.			✓	✓			✓	
23	Minimal control and management of reference data	• Establish policy and standard covering reference data ingestion and usage. • Identify business and domain owner for reference datasets for ongoing maintenance and user access control of this data. • Capture and store reference data in dedicated reference data hub as the authorised distributor to all data users. • Define process for new reference data requests to be channelled through to DMO.	✓	✓		✓			✓	✓
27	Lack of control over critical data processes	Define data governance controls around critical data processes through: • Policy, standard. • Assign data owners as risk owners, data custodians as control owners, data stewards as control monitor. • Define issue identification, escalation and resolution process for when issues are identified, through monitoring of key risk metrics and consumer observation.	✓	✓	✓	✓		✓	✓	

Data Governance

Target State

Data Governance Vision

All critical information assets will be owned by the business, certified and unambiguously defined, aligned with defined standards and regulatory requirements, supported by the strong governance process, appropriate documentation and technology, and presented for all users in a "fit-for-purpose" manner.

Responsibilities of data stakeholders (producers, consumers, owners) are well understood.

	Current State			Target State
	1 - Minimal	**2 - Basic**	**3 - Proactive**	**4 - Optimised**
Data Governance	• No formal data governance roles assigned. • No formal data owners and data stewards. • None or limited governance processes.	• Some data governance roles assigned. • Limited data owners and data stewards are assigned. • Key data governance processes defined and drafted in a few business units.	• Data governance organisation formalised with key roles assigned. • Data owners and data stewards assigned according to master data domains. • Data governance policy documented and communicated. • Business processes are standardised to support data governance policies.	• Steering committee and working groups operating effectively. • Reporting is performed on compliance with data governance processes. • Organisation-wide compliance achieved • Key data governance processes that are continually updated to support the changing environment.

DG components	Target state
Policy	Policy setting out high level statements and principles covering governance, control, management and usage of data fully implemented.
Organisation	Data governance committees and forums set and manage the strategy and direction for key components.
Ownership	Owners and stakeholders assigned for all critical data, formal responsibilities included in job role descriptions.
Processes	Well defined and operating data governance processes and procedures. (e.g. defining critical data, setting thresholds)
Standards	Data standards refined through implementation, feedback collection and incorporation.
Comms & training	Awareness of data management and baseline competency across all business users; A set of mandatory and optional training courses identified for desirable data practices identified and rolled out across the bank.
Reporting	Metrics, monitoring and MI over data governance KPIs and KRIs against thresholds and risk appetite.
Technology	Glossary and metadata tooling in place to facilitate common understanding of data and enable sustainable maintenance of metadata.

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Data Quality Management

Metadata Management

Master Data Management

Data Risk & Control

Data Architecture
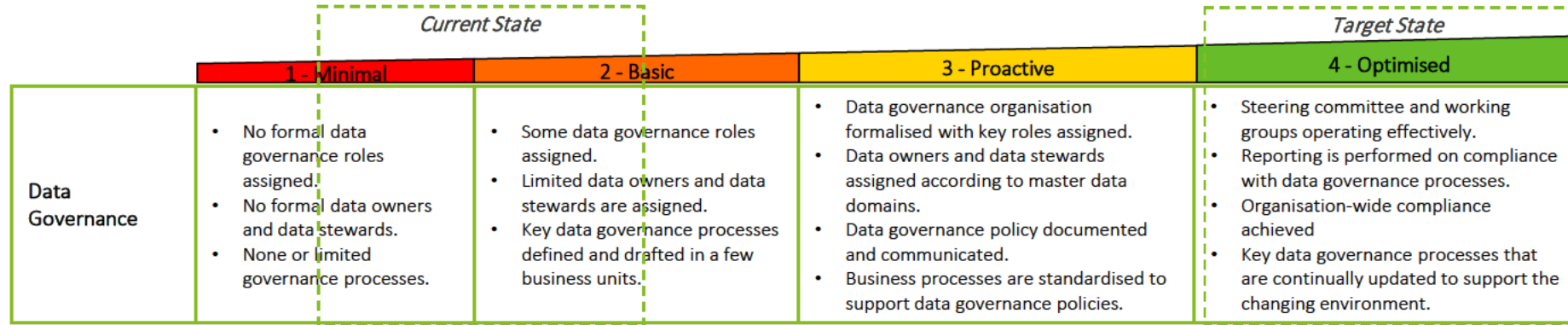
Technology & Tooling

Data Management Capabilities

Data Quality Management

Data Quality Management

Overview

Data Quality Processes

Process	#
DQ Management Methodology	1
DQ Program Set-up	2
DQ Project Scoping	3
DQ Profiling	4
Data Quality Assessment	5
Data Cleansing	6
Issues Reporting & Resolution	7
DQ Monitoring & Control	8

The data quality processes:
- Establish data governance program, including data quality programs and defining scope for these data projects;
- Perform data profiling, data cleansing and data quality assessment tasks;
- Assist Reporting and resolving data issues; and
- Help maintaining an effective data quality monitoring & control environment.

Technology Model

Tool	#
Metadata Repository	1
DQ Profiling Tools	2
Data Quality Assessment Tools	3
Business Rules Management Tools	4
Issues Reporting & Tracking Tools	5
Data Cleansing Tools	6
DQ Dashboards	7
DQ Monitoring & Control Tools	8

The technology model:
- Addresses the automation support tools that are required for effective data governance management
- Focuses on functionality requirements of the tools as it relates to performing the tasks defined in the Data Governance Operating Model
- Can range in sophistication from MS Excel Templates to full-featured commercial applications, as long as the required functionality is present.

Data Quality Processes in detail

Process	Detail
DQ Management Methodology	• Establishes process, artefacts and methodology for executing data quality operating model components.
DQ Profiling	• Inspection and evaluation of data sets to highlight potential issues e.g.: % of records populated; potential outliers; relationships between columns; mismatches to metadata glossary. • Sometimes used for discovery i.e. to infer potential data quality rules based on profiling results and describe the contents of a dataset.
Data Quality Assessment	• Defines a set of rules representing "fit-for-purpose" criteria and tests a population of data assets to determine the degree to which they conform to those rules. • Fails are usually indicative of a data quality issue which requires attention.
Data Cleansing	• Defines a set of rule-based transformations which are applied to a population of data assets to make them conform to a published data standard (i.e. postal address abbreviations). • Should not be used to enable data owners to abdicate their data quality responsibilities.
Issues Reporting & Resolution	• Covers both consumer observations and "fails" from data quality assessments. • Tracks issue from initial report through root cause investigation, to mitigation or resolution. • Impact of issue on business is quantified and used for prioritisation purposes.
DQ Monitoring & Control	• Dashboards and reports by which data quality can be monitored as part of business-as-usual. • Thresholds and triggers are employed which support a "manage-to-quality", "manage-by-exception" data lifecycle management strategy. • Data quality risk management framework and risk appetite.

Data Quality Management

Observations

	Issue Summary	Issue Description	Domain Impacted	Overall Impact	Challenge Caused
9	Poor data quality at ingestion and lack of conformance to standard data definitions / rules	For relationship considerations or delivery window pressure, product teams often tend to push back on requirements from other parts of the bank in relation to collecting data attributes from delivery partners at programme outset, or resolving data quality issues caused by delivery partners with live programmes.	Funds, Portfolio, Transactions	H	• Downstream teams such as Operations, BI teams have to work with bad quality data. This leads to unnecessary manual effort required to cleanse and wrangle data. • Unavailability of critical data attributes act as blockers on downstream functions. They are forced to seek alternative data sources, conduct surveys, and in some cases, base analysis on qualitative factors as opposed to quantitative evidence. • Analysis and reporting can be impacted by this issue and lead to inaccurate understanding of the bank's risk exposure, programme evaluations and market insights.
11	Records not being maintained over time in core systems	Records inputted into the system but not maintained over time, causing them to go out of date.	Entity	M	• Inadequate maintenance of records lead to data quality issues. This creates discrepancy between what the product team knows as the truth and the copy downstream data consumers can have access to. This drives up manual remediation effort. • This also creates a challenge in establishing the trusted source of truth.
13	Legacy data processes no longer satisfy current business needs	Historical data stored in excel files that have data quality issues. Such data often pre-dates a number of systems which are now widely adopted by the bank as workflow tool or system of record.	Cross-domain	M	• Historical data in excel files creates requirement for manual intervention, and is another driver towards the use of EUC solutions.
17	Lack of authorised distributor of data	The publishing of dashboards and reports are performed in siloes across business functions. There is no recognition of an autorised distributor.	Cross-domain	H	• Anyone can publish anything. There is no consistancy across multiple publishers of the same information, robustness of the output may be in question due to the lack of central governance, and the scenario promotes siloed data processes.
24	Lack of control over systems of ingestion	Data ingestion pipelines into BBB have minimal validation or controls.	Funds, Portfolio, Transactions	H	• Bad quality data gets ingested as a result of lack of control over systems of ingestion. Issues are not identified soon enough for timely resolution, leading to delays in data ingestion or even bad quality data being ingested.
27	Lack of control over critical data processes	Significant manual effort involved in running critical data processes, such as the approving and processing of transactions.	Cross-domain	H	• Increased operational risk around critical business processes, prone to human error and requires manual effort for validation and reconciliation.

Data Quality Management

Benefit Analysis

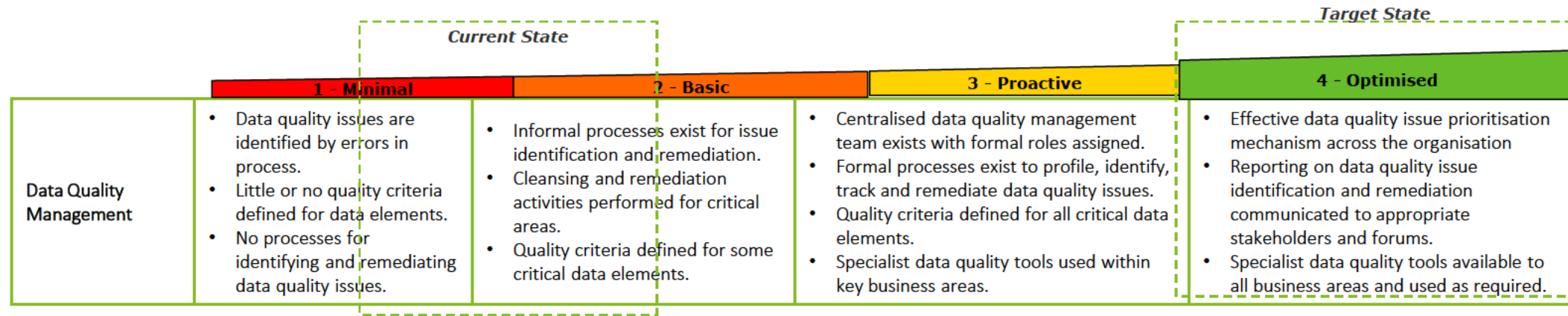|	Issue Summary	Data Quality	Standard & Methodology	DQ Project	DQ Profiling	DQ Assessment	Data Cleansing	Issues Report & Resolution	DQ Monitoring & Control
9	Poor data quality at ingestion and lack of conformance to standard data definitions / rules	• Data quality standard will be used to guide data requirement definition with Delivery Partners for future contract allocations to prevent data quality issues from source. • Profile and assess data provided by delivery partners to understand the size of the data quality issues, inform data quality rules and define data cleanse requirements. • Perform data cleanse on existing delivery partner data. • Establish Issue reporting and remediation process to ensure issues have a clear route of being flagged, investigated, and escalated if not resolved.	✓	✓	✓	✓	✓	✓	✓
11	Records not being maintained over time in core systems	• Use data quality methodology to inform and guide the data update process. • Profile records to discover insight into the records maintained and inform data quality rules definition. • Conduct initial data quality assessment to define the scope of a data quality project. • Data Quality project aimed at records update in source systems as an initial cleansing exercise can lay a solid foundation for ongoing monitoring and control. • Define data quality rules and implement into DQ tooling for ongoing monitoring and control. • Follow data governance and data quality issue identification and resolution process as channel for flagging, triaging, investigating and resolving issues associated with out of date records, both arising from within and outside of the business area where the impacts are felt.	✓	✓	✓	✓	✓	✓	✓
13	Legacy data processes no longer satisfy current business needs	• Profile historic data to get insight into potential data quality issues and inform data quality rules. • Conduct initial data quality assessment to understand the size of the issue. • Perform data cleanse on historic data available and bring into system of record for storage and archiving.		✓	✓	✓	✓		
17	Lack of authorised distributor of data	• Establish data quality layer around the system of record to perform validation, cleansing, monitoring and control of data flowing into the system. • Central data quality reporting should be published on a regular basis and shared with bank-wide data users to provide confidence concerning the quality of data stored in the system of record and the subsequent MI and Reporting driven from it. • Ensure a robust issue identification and resolution process is in place as a clear route for data quality issues to be investigated and resolved.		✓				✓	✓
24	Lack of control over systems of ingestion	• Define data quality standard and methodology to inform control requirements on the system of ingestion as an actor of the ingestion process. • Establish data quality project to perform data profiling, assessment and cleansing of existing data within the organisation and new data attributes introduced into the bank in the future. • Establish reporting mechanism around the system of ingestion to monitor and control data quality at source.	✓	✓	✓	✓	✓	✓	✓
27	Lack of control over critical data processes	• Implement data quality controls around critical data processes. • Define data quality metrics for monitoring in BAU. • Establish issue identification, escalation and resolution process to prioritise and support issue remediation associated with critical data processes.						✓	✓

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Data Quality Management

Target State

Data Quality Management Vision

The vision for Data Quality is one where all stakeholders have a consistently high level of confidence in the data they rely on for running their businesses, making decisions and delivering products and services to satisfied clients.

Data quality capabilities constitute a steady state operating environment that actively defines, manages, measures, and improves the quality of data critical to key business processes throughout BBB.

Current State — *Target State*

	1 - Minimal	2 - Basic	3 - Proactive	4 - Optimised
Data Quality Management	• Data quality issues are identified by errors in process. • Little or no quality criteria defined for data elements. • No processes for identifying and remediating data quality issues.	• Informal processes exist for issue identification and remediation. • Cleansing and remediation activities performed for critical areas. • Quality criteria defined for some critical data elements.	• Centralised data quality management team exists with formal roles assigned. • Formal processes exist to profile, identify, track and remediate data quality issues. • Quality criteria defined for all critical data elements. • Specialist data quality tools used within key business areas.	• Effective data quality issue prioritisation mechanism across the organisation • Reporting on data quality issue identification and remediation communicated to appropriate stakeholders and forums. • Specialist data quality tools available to all business areas and used as required.

DQM component	Target state
DQ Management Methodology	A detailed methodology is in place that helps towards the execution and monitoring of data quality projects and quality assessments.
DQ Profiling Data Quality Assessment Data Cleansing	Implemented across all critical datasets.
Issues Reporting & Resolution	Detailed process in place to track data quality issues and subsequently a process of escalation and monitoring of the issues to remediate them exists.
DQ Monitoring & Control	Dashboard and metrics are in place to effectively monitor issues reporting and tracking as well as data quality issues entailing completeness, timeliness or accuracy.

Data Management Capabilities

Metadata Management

Metadata Management

Overview

Metadata Management Overview

- Business Metadata
- Technical Metadata
- Operational Metadata
- Metadata Management Components

Business metadata

Assists business associates and non-technical users in understanding the data e.g.:

- Stakeholders – owners / stewards
- Business data definitions, calculations, business rules
- Data quality statements, such as confidence and completeness indicators

Technical metadata

Describes all the technical details of the data elements as they exist in the source systems and the data warehouse environment e.g.:

- Audit controls and balancing information
- Data archiving and retention rules
- Relationships between the data models and the data warehouse/marts

Operational metadata

Describes the events and processes that occur to an object when a job is run in a technology environment e.g.:

- Data involved with workflow and automated job control systems
- Data logged during execution such as start time, end time, CPU usage, disk reads, error logs etc.

Metadata Management Components

Aspects across dimensions of people, process, technology and data required to effectively manage metadata:

Components in Process are further organised across:
- **Development** – Defines processes for metadata creation with established development methodologies.
- **Maintenance** – Creates and enforces maintenance processes for metadata.

Components in People are further organised across:
- **Organisation** – Develops roles related to metadata across the enterprise.
- **Change Leadership** – Develops training and communication plans on metadata.

Components in Technology are further organised across:
- **Metadata Repository** – Central location for all metadata for the enterprise.
- **Information Delivery Layer** – Provides user access and reporting capabilities.

Components in Data are further organised across:
- **Metadata Standards** – Establishes metadata minimum requirements and tools standards.

Pyramid (top to bottom): Process, People, Technology, Data

Metadata Management

Observations (1/2)

	Issue Summary	Issue Description	Domain Impacted	Overall Impact	Challenge Caused
1	Wide adoption of EUC solutions for manual processing of standard workflows	Data processes are dependent on a number of EUCs that are manually operated.	Cross-domain	H	• EUCs are currently widely adopted across the bank, being used as tactical solutions to bridge gaps, such as the lack of workflow tools, lack of systems of record, challenge with rigid BI warehouse data model, scattered information across various different sources, etc. Manual effort is required to operate such EUC solutions. • There is a lack of documentation around how many EUCs are currently in use, where they are stored and all operations they perform on the data due to such solutions being developed in the past and continuously evolving and changing hands over time. • Data stored in such EUC solutions are sometimes considered to be the source of truth.
2	Disparate data processes	Inconsistent processes exist within business functions and across the bank.	Cross-domain	M	• Common data tasks are being performed by separate teams due to localisation of operational processes. There is generally a lack of consistant approach to such tasks driving manual consolidation effort downstream. • Often times, such tasks are performed using EUCs, adding to the burden of issue 1.
4	Systems of record are not designated across all data domains, with data duplicated and tactical solutions required	Data available to the bank, but not visible to central BI function. It is common for master copies of data to reside in EUCs.	Cross-domain	H	• The lack of adequate systems of record for critical data domains have led to the adoption of EUCs as source of truth. • BI warehouse has been established to ingest data from different parts of the bank, however it is not widely recognised as EUC replacements from a record keeping perspective. As a result, updates made may not feed into BI, leading to multiple versions of truth causing confusion further downstream.
6	Lack of metadata and limited uptake of metadata documentation	The bank owns very limited amount of metadata about its data landscape. A business glossary was developed without an enterprise level review of critical data elements, and as a result, does not cover all critical data elements. The updake of the business glossary is also limited. Maintenance of the glossary is reliant on one key person within the organisation.	Cross-domain	M	• The lack of precise data definition has led to bad quality data being provided by delivery partners. Downstream impact of this is potential confusion for data consumers as they encounter such data elements when conducting analysis.
15	Data not stored anywhere, reliance on knowledge within the team	Data captured through interactions are often not updated. No process is defined for such capturing of updates at source. Product teams tend to rely on knowledge of relationship managers within the team for contract terms and key persons contact details.	Contract, Entity	H	• Manual effort required for teams to source the most updated information to support critical processes. This has been considered as less of an impact for product teams but has a more significant impact on other teams, such as finance, marketing, strategy and economics teams, for the purpose of resolving queries, reaching out to third parties for programme evaluations or getting feedback on third party journey experience.
22	BI data model inflexibility and complexity	BI data model is too complex and rigid to adapt to new business needs, such as the introduction of new data attributes.	Cross-domain	H	• BI is not able to cater for new data requirements and act as the trusted source for MI Reporting, driving the dependency on tactical EUC solutions to plug the gap.

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Observations (2/2)

	Issue Summary	Issue Description	Domain Impacted	Overall Impact	Challenge Caused
25	Key person dependency for critical data processes	Critical data processes known to a group of resources. Knowledge of how these processes are run are not widely known across the bank, creating key person dependency on those that have built and are running these processes.	Cross-domain	M	• This dependency on knowledge known to a limited number of resources is a risk towards business continuity. This have been observed in both product teams for the credit risk and finance models as well as IT for the BI warehouse that have grown to be too complex to maintain or update by anyone other than the individuals who have built or run them since the start.
26	Lack of standardised approach to modelling and reporting	Disparate data processes across product teams have led to different approaches applied to modelling and reporting.	Modelling, MI Reporting	H	• It creates challenges on downstream report compilation tasks when consolidating and standardising outputs that are based on different assumptions and have gone through different transformations. • It creates extra effort in validating the underlying assumptions and transformation logic, as multiple processes need to be validated, as opposed to one consistent approach.

Metadata Management

Benefit Analysis

	Issue Summary	Metadata Management	Business	Technical	Operational
1	Wide adoption of EUC solutions for manual processing of standard workflows	• Document operations performed on data elements for those that are manipulated through EUCs. • Capture EUCs in data lineage. • Maintain records of EUC usage as operational metadata. • Apply data retention schedule to data stored in EUCs.	✓	✓	✓
2	Disparate data processes	• Create and maintain data lineage capturing data flows across the organisation and map to applications and systems.	✓	✓	
4	Systems of record are not designated across all data domains, with data duplicated and tactical solutions required	• Stand up central metadata repository and information delivery layer to make available the metadata assets to the organisation, including data definitions and locations of critical data elements.	✓	✓	
6	Lack of metadata and limited uptake of metadata documentation	• Document business metadata, including data definitions, relationships between data elements, ownership and location information. • Store business metadata centrally and make available to the organisation through information delivery layer. Promote use of metadata, take away confusion, clarify requirements and bring benefit to all parties involved in the data processing lifecycle. • Take a similar approach with technical and operational metadata	✓		
15	Data not stored anywhere, reliance on knowledge within the team	• Establish data catalogue to capture ownership and location details of data elements and make available to the organisation to promote self-service. • This should clarify the ownership of data and facilitate with issue resolution if data gaps are identified downstream.	✓		
22	BI data model inflexibility and complexity	• Capture physical data model and data lineage as part of the metadata documentation to facilitate understanding of the data transformation happening in BI.		✓	
25	Key person dependency for critical data processes	• Establish data catalogue to capture business and technical metadata surrounding data processes as documentation of knowledge and make available to the rest of the bank and facilitate knowledge transfer between team members. This should alleviate the dependency on key resources.	✓	✓	
26	Lack of standardised approach to modelling and reporting	• Document definitions of critical data elements to avoid confusion around similar terms and supporting data elements to facilitate new model / report construction. • As model / report has been approved and deployed for BAU running, document data lineage to outline transformations applied to data points. • Use metadata documented around existing models / reports as reference point for future model / reports (such as the incorporation of a new product / programme) and facilitate the standardisation of approach across BBB.	✓	✓	

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Metadata Management

Target State

Metadata Management Vision

The Metadata Model will support the management and maintenance of data across BBB and contribute to organizational compliance for records identification and management as well as regulatory compliance. Terminology should provide a consistent and standard understanding across business functions, through agreed to naming and descriptions. Mandatory metadata elements will be minimized to ensure flexibility and allow for quick and easy input.

	Current State 1 - Minimal	2 - Basic	3 - Proactive	*Target State* 4 - Optimised
Metadata Management	• Limited or no metadata is maintained.	• Some technical metadata is maintained in silos and primarily used by IT. • Business metadata (business vocabulary) is maintained for some terms.	• Technical, business and operational metadata is proactively maintained for key business units. • Business metadata is maintained for key terms.	• Technical, business and operational metadata is proactively maintained and published. • Business metadata is maintained enterprise-wide. • Metadata is used in context for ongoing business operations and change projects. • Metadata management tools are used.

MM component	*Target State*
Processes	• Processes are defined to specify how metadata is created and updated. • Metadata users should be assigned appropriate access rights and privileges. Information management security should include provision for preventing unauthorised access to the metadata repository.
People	• "Business Owners" are assigned to maintain business metadata, including business rules, organisational metadata and transformational metadata. • Business Owner supports accuracy, timeliness, relevancy, consistency and validity of metadata. • Technical Owner supports application metadata maintenance, including technical and operational metadata.
Technology	• Metadata is controlled and documented in an approved and published metadata repository and metadata backup/restore procedures are in place. • A Business Glossary, Data dictionary and Metadata tool is implemented to support a structured and procedural foundation for data governance (stewardship) activities and enable BBB to systemically document common enterprise metadata and maintain/share in a collaborative manner.
Data	• Metadata standards around minimum metadata capture requirements are defined. • Minimum metadata is collected and maintained for all critical data elements and adopted.

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Master Data Management

Overview (1/2)

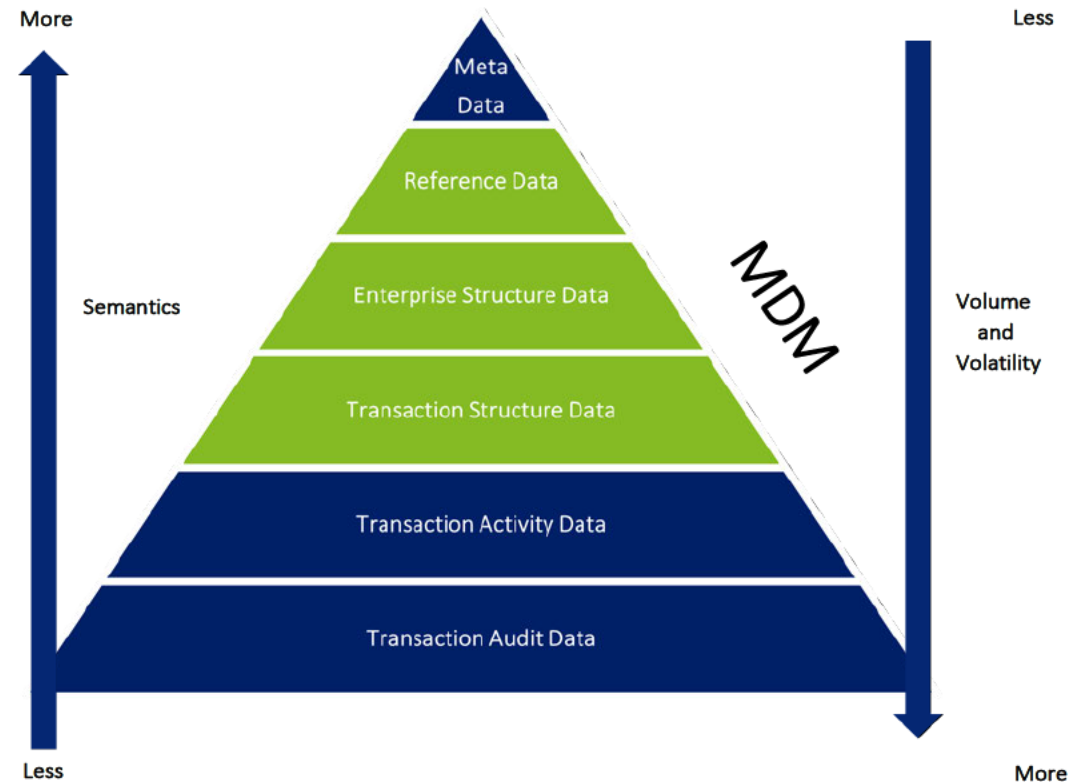## Master Data Management Overview

What is Master Data?

Master data is a subset of structured data characterised as:

- Uniquely identifiable (for example, customers, products, policies, agents)
- Not dependent on the existence of other internally created data
- Shared across business functions and/or externally
- Agreed upon universally across the organisation

Types of structured data:

- Metadata — Structure, meaning, and relationships of data. (column 'emname' stands for employee name and has a size)
- Reference Data* — Data describing state and behaviour of business entities and transactions. (list of countries, status of suppliers, etc.)
- Enterprise Structure Data* - Data describing the enterprise hierarchy, such as programme alignment to business unit.
- Transaction Structure Data* — Business entities in which transactions act upon (customer data, programme data, product data)
- Transaction Activity Data — Business transactions used in operations (commitment, drawdown, claims, etc.)
- Transaction Audit Data — The string of transactions executed to bring about business operations (transaction logs showing execution of trades)

More / Less

Semantics

MDM

Volume and Volatility

Meta Data
Reference Data
Enterprise Structure Data
Transaction Structure Data
Transaction Activity Data
Transaction Audit Data

Less / More

*Master Data is a union of reference data, enterprise structure data, and transaction structure data

Master Data Management

Overview (2/2)

## Master Data Management Overview

What is Master Data management (MDM)?

MDM is accomplished through the implementation of data governance, data quality, data architecture, and enabling technologies – these capabilities are addressed via other data strategy domain sections. Identifying trusted sources and ensuring data consumers use the correct source is a fundamental requirement of a managed data architecture, and is the focus of this MDM strategy section.

Covered in other strategy capabilities

Technology defines and creates the data architecture that enables MDM. This includes defining, selecting, deploying, monitoring, and maintaining technologies for tasks such as data cleansing, data integration, and performance monitoring.

Governance specifies the policies and procedures maintaining the master data, it establishes accountability, sets goals for the organisation, and defines monitoring and enforcement.
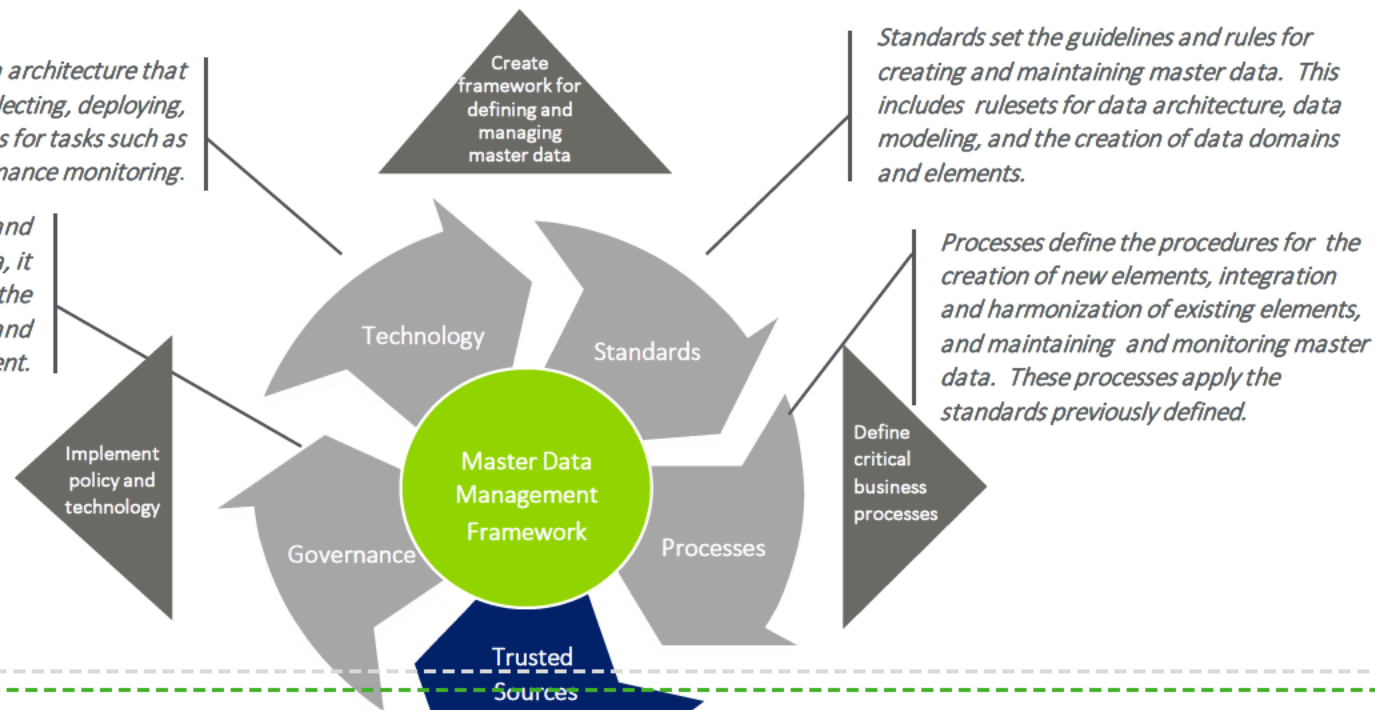
Standards set the guidelines and rules for creating and maintaining master data. This includes rulesets for data architecture, data modeling, and the creation of data domains and elements.

Processes define the procedures for the creation of new elements, integration and harmonization of existing elements, and maintaining and monitoring master data. These processes apply the standards previously defined.

Create framework for defining and managing master data

Technology

Standards

Implement policy and technology

Master Data Management Framework

Define critical business processes

Governance

Processes

Trusted Sources

Focus for this capability

Identifying trusted sources and ensuring data consumers use the correct source is a fundamental requirement of a managed data architecture. Trusted Source framework to drive towards identifying and managing approved trusted sources.

Identify trusted sources

Master Data Management

Observations

	Issue Summary	Issue Description	Domains Impacted	Overall Impact	Challenge Caused
11	Records not being maintained over time in core systems	Records inputted into the system but not maintained over time, causing them to go out of date.	Entity	H	• Inadequate maintenance of records lead to data quality issues. This creates discrepancy between what the product team knows as the truth and the copy downstream data consumers can have access to. This drives up manual remediation effort. • This also creates a challenge in establishing the trusted source of truth.
12	Multiple versions of truth	Multiple versions of truth exist across business functions.	Portfolio, Transactions	M	• Different areas of the bank see different versions of truth. This discrepancy creates confusion and challenges across product and enterprise level reporting, driving up unnecessary reconciliation requirements.
15	Data not stored anywhere, reliance on knowledge within the team	Data captured through interactions are often not updated. No process is defined for such capturing of updates at source. Product teams tend to rely on knowledge of relationship managers within the team for contract terms and key persons contact details.	Contract, Entity	H	• Manual effort required for teams to source the most updated information to support critical processes. This has been considered as less of an impact for product teams but has a more significant impact on other teams, such as finance, marketing, strategy and economics teams, for the purpose of resolving queries, reaching out to third parties for programme evaluations or getting feedback on third party journey experience.
16	Data users not having direct access to the master data copy	Users do not have direct access to system of record therefore relying on manual data extracts stored in excel.	Cross-domain	M	• The user access issue creates the requirement to have a manual process around the solution and promotes the use of EUCs. • There lacks central data oversight over who's using what, impacting the ability to ensure all data users have access to the most accurate and up-to-date copy of information to feed into their use cases. Potential risk of introducing discrepancies into multiple copies of the same data and driving up reconciliation effort downstream.
17	Lack of authorised distributor of data	The publishing of dashboards and reports are performed in siloes across business functions. There is no recognition of an autorised distributor.	Cross-domain	H	• Anyone can publish anything. There is no consistancy across multiple publishers of the same information, robustness of the output may be in question due to the lack of central governance, and the scenario promotes siloed data processes.
19	Leverage additional third party data sources to enrich BBB's dataset	Source 3rd party data, such as survey data, specialist data providers data and publicly available data sources to enrich existing BBB datasets.	Reference Data	M	• Having a richer dataset as foundation to conduct data analytics.
23	Minimal control and management of reference data	Different business functions have their own approach of consuming reference data: manually accessing 3rd party website to get live information, consuming reference data from excel that is stored on G Drive, manually map reference data onto BBB's datasets.	Reference Data	M	• Risk of different parts of the bank using different versions of reference data, leading to potential discrepancies and driving up reconciliation effort. The lack of governance around sharing and use of reference data such as FX rates generates concerns around the accuracy of reporting produced.

Master Data Management

Benefit Analysis

	Issue Summary	Master Data Management	System of Record	Golden Source	Authorised Distributor
11	Records not being maintained over time in core systems	• Define golden source standard as part of metadata standard. • Identify golden source and consider accuracy as part of the assessment criteria when reviewing systems of record relevant for the data domain.	✓	✓	
12	Multiple versions of truth	• Identify systems of record per data domain. • Identify golden source through scoring systems of record based on a number of pre-defined assessment criteria. • Ensure the golden source is fit for purpose and master copy data is well maintained. • Remove alternative sources when possible, or keep alternative sources up to date as the master version is updated. • Establish controls around the authorised distributor to ensure it mirrors data captured in golden source.	✓	✓	✓
15	Data not stored anywhere, reliance on knowledge within the team	• Define golden source standard as part of metadata standard. • Identify golden source and consider availability and completeness as part of the assessment criteria when reviewing systems of record relevant for the data domain.		✓	
16	Data users not having direct access to the master data copy	• Establish controls around the authorised distributor to ensure it mirrors data captured in golden source. • Promote the use of authorised distributor for MI Reporting and Analytics.			✓
17	Lack of authorised distributor of data	• Establish controls around the authorised distributor to ensure it mirrors data captured in golden source. • Promote the use of authorised distributor for MI Reporting and Analytics.			✓
19	Leverage additional third party data sources to enrich BBB's dataset			✓	✓
23	Minimal control and management of reference data	• Identify Golden Sources for different reference datasets. • Ingest them into the bank and store in the reference data hub. • Establish the reference data hub as the authorised distributor of reference data to the rest of the bank for reporting and analytics.		✓	✓

Data Strategy

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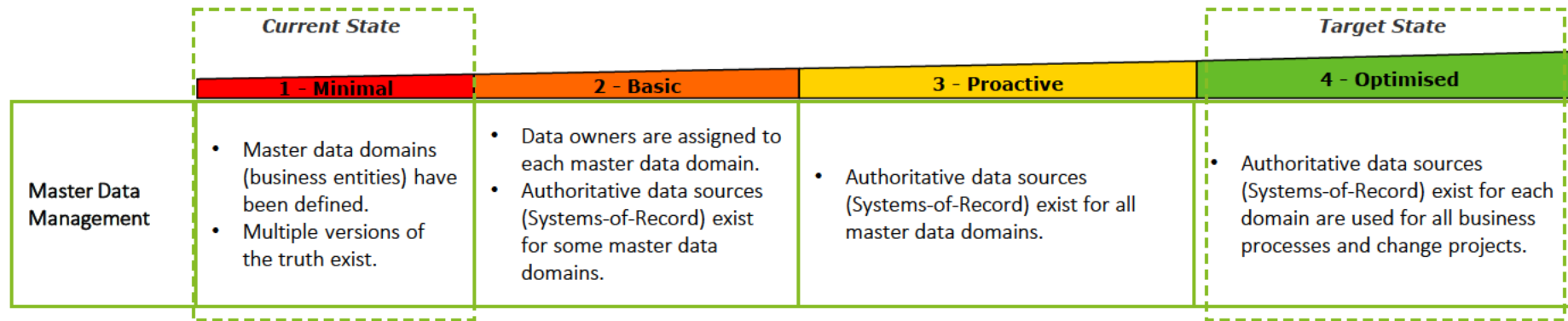Data Architecture

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Master Data Management

Target State

Master Data Management Vision

BBB should not only ensure data is accurate and fit for purpose across the firm, but also drive standard behaviours across access, use and distribution of data going forwards.

In order to allow for this, data elements must have a well-defined, certified and known golden source. Additionally, reference data must be fit for purpose and owned, governed, mastered and distributed from a golden source.

	Current State			Target State
	1 - Minimal	**2 - Basic**	**3 - Proactive**	**4 - Optimised**
Master Data Management	• Master data domains (business entities) have been defined. • Multiple versions of the truth exist.	• Data owners are assigned to each master data domain. • Authoritative data sources (Systems-of-Record) exist for some master data domains.	• Authoritative data sources (Systems-of-Record) exist for all master data domains.	• Authoritative data sources (Systems-of-Record) exist for each domain are used for all business processes and change projects.

MDM component	Target State
Trusted source framework	• Master data domains are defined across the bank. • For each domain, subdomain, and usage pattern defined, trusted source systems are identified (scored against defined architecture and design characteristics, resulting in a "recommended source"). • Trusted source information is easily available to business users who are sourcing data exclusively from trusted sources.

Data Management Capabilities

Data Risk & Control

Data Risk & Control

Overview

Data Risk and Risk Taxonomy

- Include Data Risk as part of the enterprise Risk Taxonomy

**Alignment to Operational Risk Management Framework**

- Include data risk and control as part of the lines of defence model.

Data Risk Owners

- Identification and assignment of data risk stakeholders including risk owners, through the assignment of owners, stewards and custodians.

Data controls

Data control types implemented across the data lifecycle:

Data Risk and Risk Taxonomy
Alignment to Operational Risk Management Framework
Data Risk Owners
Data Controls
Key Control Indicators
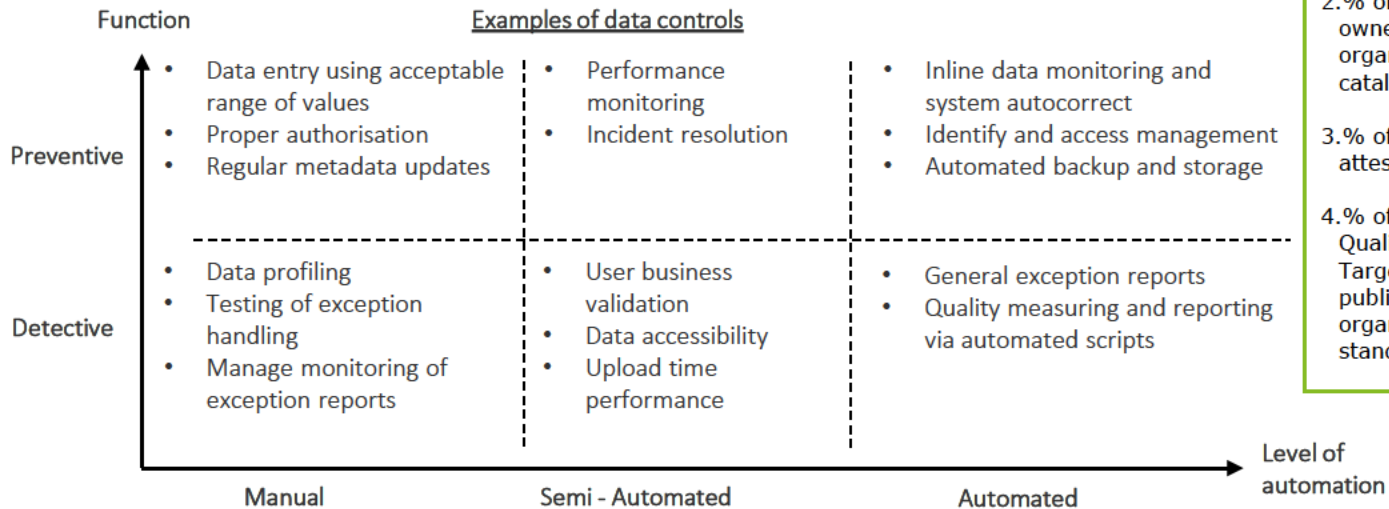
Key control indicators

- Indicators and metrics to support monitoring of control effectiveness and position against thresholds and risk appetite.

- Illustrative key control indicators:

CDEs are identified and under management	Data Quality metrics
Proposed Key Control Indicators (KCIs) 1. % of CDEs on-boarded and published for governance in the organisation data catalogue. 2. % of CDEs with data owners published in the organisation data catalogue. 3. % of Data Owner attestations. 4. % of CDEs with Data Quality Requirements and Targets defined and published in the organisation data quality standard.	**Proposed Key Control Indicators (KCIs)** 1. % of CDEs being Data Quality measured against standard Data Quality requirements and Data Quality threshold. 2. % of CDEs Data Quality Measurement meeting Data Quality thresholds.

Function

Examples of data controls

Preventive
- Data entry using acceptable range of values
- Proper authorisation
- Regular metadata updates
- Performance monitoring
- Incident resolution
- Inline data monitoring and system autocorrect
- Identify and access management
- Automated backup and storage

Detective
- Data profiling
- Testing of exception handling
- Manage monitoring of exception reports
- User business validation
- Data accessibility
- Upload time performance
- General exception reports
- Quality measuring and reporting via automated scripts

Manual — **Semi - Automated** — **Automated** → **Level of automation**

Data Risk & Control

Observations (1/2)

	Issue Summary	Issue Description	Domains Impacted	Overall Impact	Challenge Caused
1	Wide adoption of EUC solutions for manual processing of standard workflows	Data processes are dependent on a number of EUCs that are manually operated.	Cross-domain	H	• EUCs are currently widely adopted across the bank, being used as tactical solutions to bridge gaps, such as the lack of workflow tools, lack of systems of record, challenge with rigid BI warehouse data model, scattered information across various different sources, etc. Manual effort is required to operate such EUC solutions, and the lack of controls around them posses concerning operational risks around EUC outputs. • There is a lack of documentation around how many EUCs are currently in use, where they are stored and all operations they perform on the data due to such solutions being developed in the past and continuously evolving and changing hands over time. • Data stored in such EUC solutions are sometimes considered to be the source of truth.
4	Systems of record are not designated across all data domains, with data duplicated and tactical solutions required	Data available to the bank, but not visible to central BI function. It is common for master copies of data to reside in EUCs.	Cross-domain	H	• The lack of adequate systems of record for critical data domains have led to the adoption of EUCs as source of truth. • BI warehouse has been established to ingest data from different parts of the bank, however it is not widely recognised as EUC replacements from a record keeping perspective. As a result, updates made may not feed into BI, leading to multiple versions of truth causing confusion further downstream.
9	Poor data quality at ingestion and lack of conformance to standard data definitions / rules	For relationship considerations or delivery window pressure, product teams often tend to push back on requirements from other parts of the bank in relation to collecting data attributes from delivery partners at programme outset, or resolving data quality issues caused by delivery partners with live programmes.	Funds, Portfolio, Transactions	H	• Downstream teams such as Operations, BI teams have to work with bad quality data. This leads to unnecessary manual effort required to cleanse and wrangle data. • Unavailability of critical data attributes act as blockers on downstream functions. They are forced to seek alternative data sources, conduct surveys, and in some cases, base analysis on qualitative factors as opposed to quantitative evidence. • Analysis and reporting can be impacted by this issue and lead to inaccurate understanding of the bank's risk exposure, programme evaluations and market insights.
11	Records not being maintained over time in core systems	Records inputted into the system but not maintained over time, causing them to go out of date.	Entity	H	• Inadequate maintenance of records lead to data quality issues. This creates discrepancy between what the product team knows as the truth and the copy downstream data consumers can have access to. This drives up manual remediation effort. • This also creates a challenge in establishing the trusted source of truth.
12	Multiple versions of truth	Multiple versions of truth exist across business functions.	Portfolio, Transactions	M	• Different areas of the bank see different versions of truth. This discrepancy creates confusion and challenges across product and enterprise level reporting, driving up unnecessary reconciliation requirements.
17	Lack of authorised distributor of data	The publishing of dashboards and reports are performed in siloes across business functions. There is no recognition of an authorised distributor.	Cross-domain	H	• Anyone can publish anything. There is no consistancy across multiple publishers of the same information, robustness of the output may be in question due to the lack of central governance, and the scenario promotes siloed data processes.

Data Risk & Control

Observations (2/2)

	Issue Summary	Issue Description	Domains Impacted	Overall Impact	Challenge Caused
23	Minimal control and management of reference data	Different business functions have their own approach of consuming reference data: manually accessing 3rd party website to get live information, consuming reference data from excel that is stored on G Drive, manually map reference data onto BBB's datasets.	Reference Data	M	• Risk of different parts of the bank using different versions of reference data, leading to potential discrepancies and driving up reconciliation effort. The lack of governance around sharing and use of reference data such as FX rates generates concerns around the accuracy of reporting produced.
24	Lack of control over systems of ingestion	Data ingestion pipelines into BBB have minimal validation or controls.	Funds, Portfolio, Transactions	H	• Bad quality data gets ingested as a result of lack of control over systems of ingestion. Issues are not identified soon enough for timely resolution, leading to delays in data ingestion or even bad quality data being ingested.
26	Lack of standardised approach to modelling and reporting	Disparate data processes across product teams have led to different approaches applied to modelling and reporting.	Modelling, MI Reporting	H	• It creates challenges on downstream report compilation tasks when consolidating and standardising outputs that are based on different assumptions and have gone through different transformations. • It creates extra effort in validating the underlying assumptions and transformation logic, as multiple processes need to be validated, as opposed to one consistent approach.
27	Lack of control over critical data processes	Significant manual effort involved in running critical data processes, such as the approving and processing of transactions.	Cross-domain	H	• Increased operational risk around critical business processes, prone to human error and requires manual effort for validation and reconciliation.

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Benefit Analysis (1/2)

	Issue Summary	Data Risk & Control	Data Risk Owners	Risk Controls Implementation	Key Control Indicators
1	Wide adoption of EUC solutions for manual processing of standard workflows	For approved EUC solution use cases or during the transition period: • Assign EUC ownership across the bank • Implement manual controls around EUC operation (for example, four eyes checks on the input and output of EUCs before output is released to downstream data users, regular sample checking of active EUC output, version control) • Define KCI to track the number of active EUCs being used across the bank at a point in time and over the transition period. Ongoing monitoring in BAU	✓	✓	✓
4	Systems of record are not designated across all data domains, with data duplicated and tactical solutions required	• Assign business data owners as data risk owners • Implement data quality control points around systems of record to actively identify duplicate records • Implement manual controls around tactical solutions such as EUCs – see above for example control mechanisms • Define control indicators around duplicate records to monitor quality of data over time	✓	✓	✓
9	Poor data quality at ingestion and lack of conformance to standard data definitions / rules	• Assign business data owners as data risk owners to be accountable for issue resolution within their team • Implement data quality controls around the system of ingestion: business rules, acceptable values, data types, lengths, availability of mandatory fields, completeness, timeliness of data arrival and time taken to ingest • Conduct tests against the error handling and exceptions process • Define data quality metrics to track against	✓	✓	✓
11	Records not being maintained over time in core systems	• Monitor record update history and track against review cycle (for example, KYC is to be conducted once every year, flag the record to be valid for at most a 12 month period. Any records that have not been re-certified as valid / not updated beyond that period are considered out of date) • Refine KCI to track % of out of date records in systems of record		✓	✓
12	Multiple versions of truth	• Implement data reconciliation across systems of record, investigate into the issue and correcting the erroneous record		✓	✓
17	Lack of authorised distributor of data	• Define data quality and governance control points around BI • Implement data quality project to profile, cleanse and monitor the quality of data stored in BI • Regularly report on key data quality metrics associated with data housed in BI • Implement user access controls to restrict access to data • Establish BI as the authorised distributor of MI and reporting data ensure data quality metrics are maintained at a satisfactory level		✓	✓

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Data Risk & Control

Benefit Analysis (2/2)

	Issue Summary	Data Risk & Control	Data Risk Owners	Risk Controls Implementation	Key Control Indicators
23	Minimal control and management of reference data	• Assign reference data domain owner as the data risk owner • Develop reference data hub to store up-to-date versions of reference data from (external) golden sources • Implement controls around the data mart to monitor timeliness and completeness of the data	✓	✓	✓
24	Lack of control over systems of ingestion	• Implement data quality controls around the systems of ingestion: business rules, acceptable values, data types, lengths, availability of mandatory fields, completeness, timeliness of data arrival and time taken to ingest • Assign product team data risk owners to own the controls around the systems of integration • Conduct tests against the error handling and exceptions process • Define data quality metrics to track against	✓	✓	✓
26	Lack of standardised approach to modelling and reporting	• Enterprise and Financial risk teams define requirements for modelling and reporting policy and standard • Identify first line data owners as data risk owners to implement policy and standard • Implement governance controls such as model input and assumptions, model validation	✓	✓	
27	Lack of control over critical data processes	• Identify data owners as data risk owners accountable for the process input / output relevant to their teams • Implement technical controls around the process by developing workflow tools to support the critical process and remove the requirement for manual workaround where possible • Implement manual check points to quality assure process output • Define control indicators to support the control mechanisms and feed into central data governance function as data governance and quality metrics	✓	✓	✓

Data Risk & Control

Target State

Data Risk & Control Vision

The Data Risk & Control framework should equip BBB with the frameworks and mechanisms to govern all critical data elements and processes.

A layered approach should be adopted to cover controls around Data Quality, Data Governance and IT. This layered approach increase the assurance over the data journey, ensuring it is fit for process and has the necessary investigation, remediation and escalation protocols. This will in turn help BBB manage its growing data sets and data management capabilities.

	Current State			*Target State*
	1 - Minimal	**2 - Basic**	**3 - Proactive**	**4 - Optimised**
Data Risk & Control	• Minimal control framework with Risk and Control owners not identified	• Data quality and process controls exist with data quality escalation and remediation protocols	• Data control points, indicators, metrics and MI implemented across all CDEs • Defined Risk roles and responsibilities	• Layered control approach adopted across the organisation • Automated and monitored controls across critical processes with Risk Control Assessments in place

Data Risk & Control Component	*Target State*
Data Risk & Control Framework	• The data governance roles proposed (data owner, data custodian, data steward) act as the risk owner, control owner and control monitor as the first line of defence under a risk management framework • Clarity on who owns the controls along the data journey • CDEs are identified and under management with supporting metadata collected • Automated control points at various stages through the critical processes • Robust overarching Governance framework to tackle issue escalation and remediation

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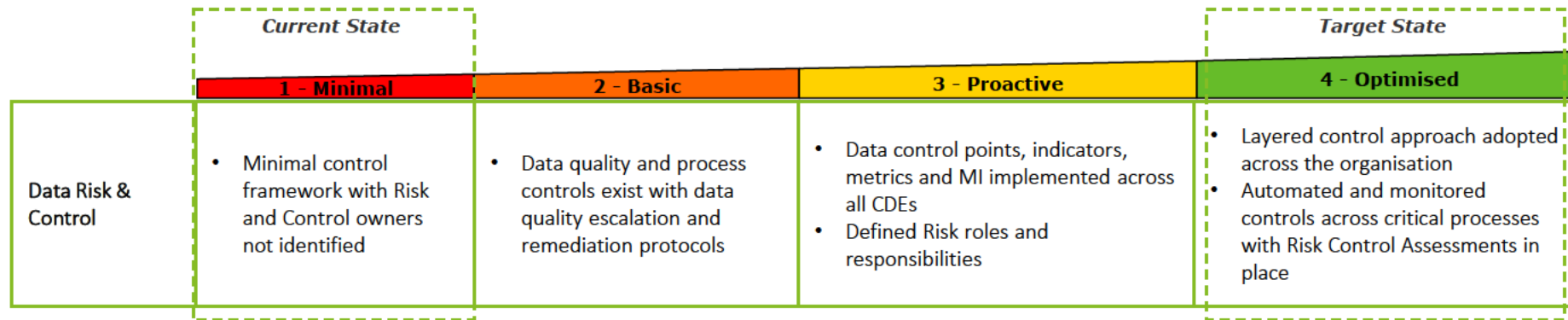
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Data Management Capabilities

Data Architecture
Refer to Data Architecture Blueprint for detailed review and design

Data Architecture

Overview

Data Architecture Overview

CAPTURE DATA & INTERACTIONS
- Sharefile
- BBB Platforms
- Non-BBB Platforms

Delivery Partner Submissions

- Entity Data
- Product and Portfolio Data
- Transaction Data

Systems of Record

- Market Data
- Counterparty Data
- Industry Standards

Third Party Reference Data

Unstructured Data

CLEANSE DATA
- Data Wrangling and Standardisation Layer
- Automated processing .... Rejected file handling process

STORE DATA
- Operational Data Stores (e.g. CRM)
- Portfolio Data Store
- BI Data Warehouse
- Finance and Risk

ANALYSE DATA
- Data Discovery (BI Insight)
- Analytics (and AI use cases)

PROCESS DATA
- Data Processing Workflow Tools
- Batch / ETL Processes (inc. Data Factory)
- Self Service Portals

CONSUME DATA
- Delivery Partners, Investees, Investors (Web browser/Sharefile/Email)

Services layer
- Workflow Solutions
- Transaction Processing
- Automated Reporting
- Insight and Analytics
- AI / Machine Learning

Staff Platforms (Web browser)

GOVERN DATA

| Data Access Controls | Business Glossary | Data Quality and Cleanse | Data modelling | Risk Management |

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Observations (1/2)

	Issue Summary	Issue Description	Domains Impacted	Overall Impact	Challenge Caused
1	Wide adoption of EUC solutions for manual processing of critical workflows	Data processes are dependent on a number of EUCs that are manually operated.	Cross-domain	H	• EUCs are currently widely adopted across the bank, being used as tactical solutions to bridge gaps, such as the lack of workflow tools, lack of systems of record, challenge with rigid BI warehouse data model, scattered information across various different sources, etc. Manual effort is required to operate such EUC solutions, and the lack of controls around them posses concerning operational risks around EUC outputs. • There is a lack of documentation around how many EUCs are currently in use, where they are stored and all operations they perform on the data due to such solutions being developed in the past and continuously evolving and changing hands over time. • Data stored in such EUC solutions are sometimes considered to be the source of truth.
3	Lack of standardised integration between core systems	There is a lack of oversight and control from data management perspectives over change projects.	Cross-domain	M	• The lack of integration creates the requirement to have a manual process around transferring data from one application to another. • This promotes the use of EUCs.
4	Systems of record are not designated across all data domains, with data duplicated and tactical solutions required	Data available to the bank, but not visible to central BI function. It is common for master copies of data to reside in EUCs.	Cross-domain	H	• The lack of adequate systems of record for critical data domains have led to the adoption of EUCs as source of truth. • BI warehouse has been established to ingest data from different parts of the bank, however it is not widely recognised as EUC replacements from a record keeping perspective. As a result, updates made may not feed into BI, leading to multiple versions of truth causing confusion further downstream.
9	Poor data quality at ingestion and lack of conformance to standard data definitions / rules	For relationship considerations or delivery window pressure, product teams often tend to push back on requirements from other parts of the bank in relation to collecting data attributes from delivery partners at programme outset, or resolving data quality issues caused by delivery partners with live programmes.	Funds, Portfolio, Transactions	H	• Downstream teams such as Operations, BI teams have to work with bad quality data. This leads to unnecessary manual effort required to cleanse and wrangle data. • Unavailability of critical data attributes act as blockers on downstream functions. They are forced to seek alternative data sources, conduct surveys, and in some cases, base analysis on qualitative factors as opposed to quantitative evidence. • Analysis and reporting can be impacted by this issue and lead to inaccurate understanding of the bank's risk exposure, programme evaluations and market insights.
12	Multiple versions of truth	Multiple versions of truth exist across business functions.	Portfolio, Transactions	M	• Different areas of the bank see different versions of truth. This discrepancy creates confusion and challenges across product and enterprise level reporting, driving up unnecessary reconciliation requirements.
14	Lack of comprehensive change history to enable point in time, historical analysis	Historic view of data stored in older version of files, and corrections applied to data are not captured in many cases. Corrections to historic data requires significant manual effort.	Cross-domain	H	• Future references to historical data can be inaccurate, hindering the ability to conduct investigations and respond to queries coming from the bank's stakeholders (for example, queries from government organisations and European funding providers).
16	Data users not having direct access to the master data copy	Users do not have direct access to system of record therefore relying on manual data extracts stored in excel.	Cross-domain	M	• The user access issue creates the requirement to have a manual process around the solution and promotes the use of EUCs. • There lacks central data oversight over who's using what, impacting the ability to ensure all data users have access to the most accurate and up-to-date copy of information to feed into their use cases. Potential risk of introducing discrepancies into multiple copies of the same data and driving up reconciliation effort downstream.
17	Lack of authorised distributor of data	The publishing of dashboards and reports are performed in siloes across business functions. There is no recognition of an authorised distributor.	Cross-domain	H	• Anyone can publish anything. There is no consistency across multiple publishers of the same information, robustness of the output may be in question due to the lack of central governance, and the scenario promotes siloed data processes.

Data Architecture

Observations (2/2)

	Issue Summary	Issue Description	Domains Impacted	Overall Impact	Challenge Caused
18	Improve file upload process in BI	Current file upload process picks up 3rd party feed files and performs basic validation against the content of the files. The validation process is designed for files to be rejected by the system once any error is picked up, without validating against the rest of the files, leading to multiple iterations of file updates before it is finally ingested by BI. This validation process should be improved to scan through the entire file before it is rejected to minimise the number of iterations required for a successful file upload. The current file upload process is adopted by Regional Investments.	Funds, Portfolio, Transactions	M	• An improved file upload process should benefit file ingestion by minimising the number of iterations required to achieve successful file upload; reducing delays associated with error handling and exceptions processes and improving Delivery Partner experience.
20	Develop reporting and analytics capabilities and become an insight enabled organisation	Apply data analytics to use cases to extract insight out of BBB's datasets.	Cross-domain	M	• Having the technical capability to draw deeper insight into market demands, demonstrate the impact on customers, regional economies and sectors of interest. • This feeds into #19.
21	Uplift functionalities of core systems to remove dependencies on EUCs	A number of core systems are being used by business functions as data repository for reporting purposes only as opposed to supporting critical business workflows.	Cross-domain	H	• Developing the capabilities of core systems enables streamlining of critical business processes, removes reliance on tactical EUC solutions, reduces operational risk and inefficiencies, have better quality data for reporting and analysis.
22	BI data model inflexibility and complexity	BI data model is too complex and rigid to adapt to new business needs, such as the introduction of new data attributes.	Cross-domain	H	• BI is not able to cater for new data requirements and act as the trusted source for MI Reporting, driving the dependency on tactical EUC solutions to plug the gap.
27	Lack of control over critical data processes	Significant manual effort involved in running critical data processes, such as the approving and processing of transactions.	Cross-domain	H	• Increased operational risk around critical business processes, prone to human error and requires manual effort for validation and reconciliation.

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Benefit Analysis

#	Issue Summary	Data Architecture	System of Ingestion	System of Engagement	System of Record	System of Insight	System of Control
1	Wide adoption of EUC solutions for manual processing of critical workflows	• Deliver functional uplift to core BBB systems (system of engagement, system of record and system of insight) to support critical business processes and reduce reliance on manual EUC solutions. • Establish systems of control around critical workflows. • Migrate EUCs onto strategic systems and maintain a central register of active EUCs		✓	✓	✓	
3	Lack of standardised integration between core systems	• Expose interfaces of core BBB systems and leverage native integration functionalities. • Implement enterprise strategic data integration solution to establish integration pipelines and orchestrate data transfer activities.	✓				
4	Systems of record are not designated across all data domains, with data duplicated and tactical solutions required	• Identify and assess systems of record across BBB application landscape. • Designate golden sources for data domains. • Uplift functionality of golden sources and remove alternative systems of records when suitable.			✓		
9	Poor data quality at ingestion and lack of conformance to standard data definitions / rules	• Establish systems of ingestion and implement IT controls. • Implement systems of control (DQ tool) on top of the ingestion layer to perform profiling, assessment and monitoring of data quality. • Define data quality metrics to track against on an ongoing basis. Track metrics through DQ tool if possible.	✓				✓
12	Multiple versions of truth	• Enhance systems of record to be fit for purpose as golden sources for data domains and remove alternative systems of record. • Enhance and establish BI as the system of insight as source of truth for analytics and reporting. • Implement system of control to perform reconciliation where data transfer leads to the same data presence across multiple places.			✓	✓	✓
14	Lack of comprehensive change history to enable point in time, historical analysis	• Enhance BI to enable historic data corrections and capture change history to enable point in time analysis.				✓	
16	Data users not having direct access to the master data copy	• Expand the self-service capability of Power BI and make dashboards and reports available to end users with underlying data from the system of insight.				✓	
17	Lack of authorised distributor of data	• Advocate BI as the authorised distributor of data across BBB. Ensure data in BI are sourced from strategic systems of records and quality of data are assured with the support of systems of control throughout the data processing journey.			✓	✓	✓
18	Improve file upload process in BI	• Enhance system of ingestion for bulk file upload process into BI.	✓				
20	Develop reporting and analytics capabilities and become an insight enabled organisation	• Advocate BI as the authorised distributor of data across BBB. Ensure data in BI are sourced from strategic systems of records and quality of data are assured with the support of systems of control throughout the data processing journey.			✓	✓	✓
21	Uplift functionalities of core systems to remove dependencies on EUCs	• Deliver functional uplift to core BBB systems (system of engagement, system of record and system of insight) to support critical business processes and reduce reliance on manual EUC solutions. • Establish systems of control around critical workflows.		✓	✓		
22	BI data model inflexibility and complexity	• Enhance BI as the strategic system of insight by introducing a simplified and flexible data model in preparation for the introduction of new data attributes for future programme development.				✓	
27	Lack of control over critical data processes	• Establish system of control around critical data processes to mitigate operational risks as a result of manual processing. • Enhance system of engagement to support critical business workflow and build in inherit IT controls around the data processing.		✓			✓

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Target State

Data Architecture Vision

We believe it is an ambitious but achievable aim for BBB to become 'Proactive' with regards to data maturity in 2 years, with all critical processes using dedicated tooling and largely automated production of standard MI reports, allowing new projects able to focus on adding new value. Use of advanced analytics and machine learning to further optimise will be limited and focused on high priority, high value use cases.

Current State

Target State

	1 - Minimal	2 - Basic	3 - Proactive	4 - Optimised
Data Architecture	• High volume of data processes are completed using End User Computing solutions • High volume of point to point integrations, with limited • Change priority is to resolve issues with the existing architecture	• Dedicated platforms for each system category, but capabilities and flexibility is limited • Some level of manual data processing for core processes and reporting • Change is focused on enhancing existing architecture, rather than delivering new capabilities	• Data processed using dedicated tooling, tailored to business requirements • Clear designation of systems into the five system categories • Standardised reporting is largely automated, with self service capabilities for ad hoc reporting • Change is largely focused on enhancing the data architecture to provide improved services	• Data processes optimised for efficiency, data quality and risk mitigation, using automation, data flow monitoring etc. • Advanced AI and Analytics capabilities, above and beyond reliable MI reporting • Change is focused on innovation and capitalising on new opportunities • Data architecture is seen as a key source of value for the organisation

Data Architecture	Target State
Data Architecture	• Refer to Data Architecture Blueprint for detailed review and design

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Overview

Function and Process	Tooling	Description
Data Governance	Data Governance	• **Data Governance:** Tooling to support the setting of guidelines and rules for managing enterprise data
Data Architecture	Data Modeling	• **Data Modelling:** Tooling to support the documentation of application, project and enterprise level data models
Data Quality Management	Data Quality Platform / Issue Management Platform	• **Data Quality Platform:** Tooling to support the checking of accuracy, completeness and reliability of data • **Issue Management Platform:** Tooling to support the issue logging, prioritisation and tracking
Metadata Management	Business Glossary / Metadata Management / Data Lineage	• **Business Glossary:** Central repository for the common business definition of terms • **Metadata Management:** Tooling to support the documentation and sharing of business and technical metadata, can include: business glossary, data lineage, business rules • **Data Lineage:** Tooling to support the documentation and sharing of horizontal data lineage (source -> ingestion -> storage -> processing -> consumption)
Master and Reference Data Management	Master and Reference Data Management	• **Master and Reference Data Management:** Tooling to support the global identification, linking and synchronisation of master data across multiple data sources through reconciliation of master data.

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Observations

Function and Process	Tooling	Current State Summary	RAG
Data Governance	Data Governance	• **Data Governance:** The bank does not currently have a Data Governance tool.	(Red)
Data Architecture	Data Modeling	• **Data Modelling:** IDERA supports data modelling capabilities but is not currently used for this purpose. The DMO is confident with the	(Yellow)
Data Quality Management	Data Quality Platform / Issue Management Platform	• **Data Quality Platform:** Aperture Data Studio is recently adopted by BBB as the enterprise wide data quality platform. So far, only basic rules have been implemented. Training is rolled out across data experts to promote wider adoption of the tool. • **Issue Management Platform:** JIRA supports the issue management workflow, but the functionality has not yet been adopted for the purpose of data quality management, as the operational model and process behind data quality issue resolution has not yet been established.	(Yellow) / (Amber)
Metadata Management	Business Glossary / Metadata Management / Data Lineage	• **Business Glossary:** IDERA is used to develop a business glossary for a number of data elements captured as part of the Delivery Partner data ingestion template. Publishing of the business glossary is not supported directly through the tool, and is achieved through Power BI instead. • **Metadata Management:** The bank does not currently have a Metadata tool. • **Data Lineage:** The bank does not currently have a Data Lineage tool.	(Yellow) / (Red) / (Red)
Master and Reference Data Management	Master and Reference Data Management	• **Master and Reference Data Management:** The bank does not currently have a Master and Reference Data Management tool.	(Red)

Red: Tooling does not exist in the bank

Amber: Tooling with basic functionality exists. Further evaluation required to understand if tooling is suitable to roll out across the bank or additional/replacement tooling required to plug the gap.

Light Amber: Tooling with functionality exists and to be rolled out fully to support data management activities.

Green: Tooling with functionality exists and are fully adopted to support data management activities.

Technology & Tooling

Benefit Analysis

	Issue Summary	Technology & Tooling
6	Lack of metadata and limited uptake of metadata documentation	• Develop and maintain metadata • Implement central metadata repository and publish data catalogue to data users across BBB • Promote the use of data catalogue
7	Lack of data ownership formalisation	• Capture data ownership, stewardship and custodianship as part of business metadata
9	Poor data quality at ingestion and lack of conformance to standard data definitions / rules	• Implement data quality tooling layer on top of systems of ingestion for DQ profiling, assessment and ongoing DQ monitoring activities • Embed rules into the data quality tooling • Capture data definitions as metadata. Maintain and publish in the form of data catalogue
24	Lack of control over systems of ingestion	• Implement data quality tooling layer on top of systems of ingestion for DQ profiling, assessment and ongoing DQ monitoring activities
25	Key person dependency for critical data processes	• Capture technical metadata including data lineage • Promote the use of data catalogue for knowledge sharing and reduce key person dependencies
27	Lack of control over critical data processes	• Implement data quality controls around critical data processes through DQ rules • Implement data governance controls around critical data processes through KPIs, metrics

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Technology & Tooling

Target State

Over-Arching Considerations

Compatibility

Tools selected should be easy to integrate with systems across BBB's architecture landscape (including existing data management tools) and deploy on Azure as the bank's strategic infrastructure provider.

Re-usability

When possible, consider leveraging existing tooling adopted at BBB before searching for new options.

Simplicity

When suitable, adopt tools that package a range of functionalities to simplify the target architecture landscape.

Flexibility and scalability

Components should be flexible and scalable to support rapid volume expansions to meet growing data processing needs.

Automation

Data management tooling should be able to support automated workflows where possible.

Tooling	Proposed Owner	Considerations (In order of necessity)
Data Governance Tool / Metadata Management / Data Lineage Toolset	DMO	• Central repository for data governance policy and standard documentation • Ability to support data governance monitoring, control and reporting • Usability to support collaboration across business functions • Ability to map across processes, technology, people, projects and other dimensions to data lineage
Data Quality Platform / Issue Management Platform	DMO	• Aperture Data Studio – Roll out existing tooling for wider adoption • JIRA – Review existing tooling functionality against requirements to determine if suitable for rolling out across business functions
Business Glossary / Data Modeling Tool	DMO / EA	• IDERA – Review existing tooling functionality against below considerations to determine if there are significant functional gaps • Effort to integrate project level data model updates into enterprise level data models • Ability to support publishing and sharing of data models centrally • Ability to support vertical data lineage capture (conceptual – logical – physical) • Ability to integrate into Data Governance, Metadata Management and Data Lineage Toolset to link and publish data models with the rest of metadata
Master and Reference Data Management	N/A	• Requirement for dedicated tooling to be evaluated in the implementation phase • Activity can be carried out through building core applications to be golden sources of master data and constructing a single entity view across programmes and delivery partners in BI as well as standing up a reference data hub for reference data management

Follow on discussions are to be held in the implementation phase to: determine if existing tooling (IDERA, JIRA) has significant functionality gaps; define requirements for tooling to be procured (Data Governance, Metadata Management, Data Lineage); evaluate the business case for master data management tooling; and go through procurement followed with tooling implementation and rollout.
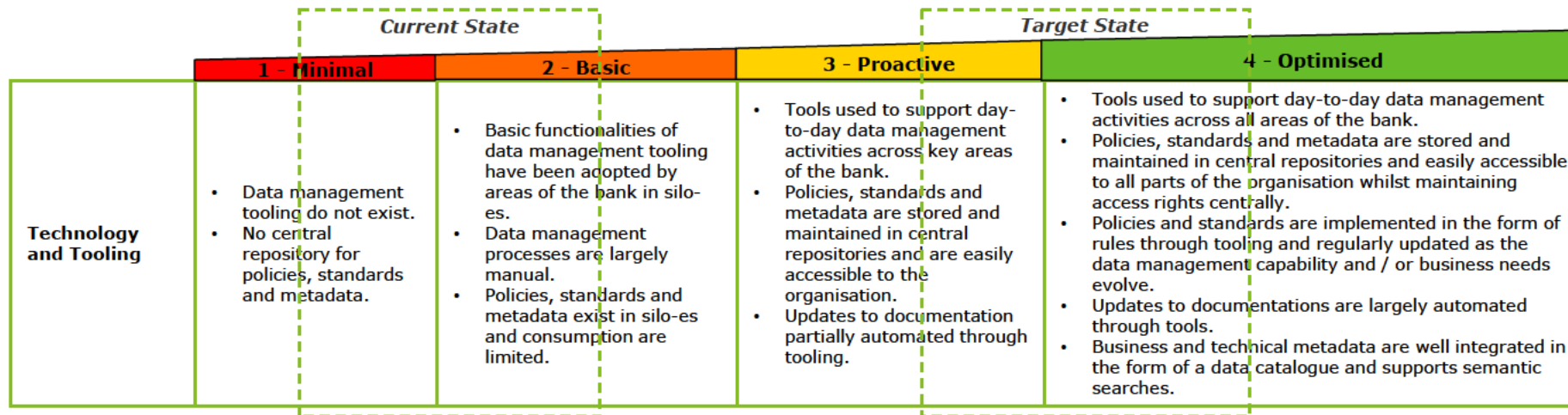
Technology & Tooling

Target State

Technology & Tooling

Data management tooling should be in place to support BAU data management activities, covering data governance, metadata management, data quality management, data risk & control and master data management.

Tooling should facilitate collaboration across business functions and serve as central repository of policies, standards, business glossary and technical metadata, implement policies and standards in the form of rules, implement rules for profiling, assessment, monitoring and reporting of key control indicators.

	Current State			*Target State*
	1 - Minimal	**2 - Basic**	**3 - Proactive**	**4 - Optimised**
Technology and Tooling	• Data management tooling do not exist. • No central repository for policies, standards and metadata.	• Basic functionalities of data management tooling have been adopted by areas of the bank in silo-es. • Data management processes are largely manual. • Policies, standards and metadata exist in silo-es and consumption are limited.	• Tools used to support day-to-day data management activities across key areas of the bank. • Policies, standards and metadata are stored and maintained in central repositories and are easily accessible to the organisation. • Updates to documentation partially automated through tooling.	• Tools used to support day-to-day data management activities across all areas of the bank. • Policies, standards and metadata are stored and maintained in central repositories and easily accessible to all parts of the organisation whilst maintaining access rights centrally. • Policies and standards are implemented in the form of rules through tooling and regularly updated as the data management capability and / or business needs evolve. • Updates to documentations are largely automated through tools. • Business and technical metadata are well integrated in the form of a data catalogue and supports semantic searches.

Tech & Tooling	Target state
Data Governance	Business glossary tooling in place to facilitate common understanding of data and enable sustainable maintenance of business metadata.
Data Quality	Data quality tooling in place to support profiling, assessment and cleansing activities. Issue management platform should be adopted to support the identification, investigation, escalation and resolution process.
Data Architecture	Data modelling tool in place to support the development and maintenance of technical metadata.
Metadata Management	Implement data catalogue as central repository of business and technical metadata to facilitate collaboration across the bank.
Data Risk & Control	Dashboards for tracking and reporting against key control indicators should be in place.
Master Data Management	Requirement for MDM tooling is not yet established. Further business case review is required to understand if there is a need for such tool.

Appendix

Stakeholder Interviews

Data Programme have engaged business functions across BBB to gather pain points and opportunities to feed into the current state assessment.

Business Function	Business Function Attendees	Date
GWS	███████	27th Jan 2021 3rd Feb 2021 8th Feb 2021 15th Feb 2021
BBI	███████	29th Jan 2021 4th Feb 2021
VS – ECF BPC – Venture, Growth	███████	2nd Feb 2021 5th Feb 2021
HR	███████	4th Feb 2021
SUL	███████	5th Feb 2021 10th Feb 2021
Regional Funds	███████	9th Feb 2021

Data Programme attendees: ███████
Deloitte Attendees: ███████

Stakeholder Interviews

Data Programme have engaged business functions across BBB to gather pain points and opportunities to feed into the current state assessment.

Business Function	Business Function Attendees	Date
Strategy and Economics	███████████	9th Feb 2021 15th Feb 2021
Risk and Compliance	███████████	10th Feb 2021 18th Feb 2021 25th Feb 2021
Marketing	███████████	10th Feb 2021 23rd Feb 2021 25th Feb 2021 3rd Mar 2021
UK Network	███████████	4th Mar 2021
UK Debt Funds	███████████	10th Feb 2021
Direct Investments	███████████	11th Feb 2021 18th Feb 2021
NSSIF – Accreditation	███████████	11th Feb 2021
FP&A	███████████	12 Feb 2021
Finance Ops	███████████	19th Feb 2021

Data Programme attendees: ███████████████████████████

Deloitte Attendees: ███████████

Stakeholder Interviews

Data Programme have engaged business functions across BBB to gather pain points and opportunities to feed into the current state assessment.

Business Function	Business Function Attendees	Date
FC&G	███████████	24th Feb 2021
Future Funds	███████████	15th Feb 2021 26th Feb 2021
Covid Guarantees (SUL and GWS)	██████████	16th Feb 2021
Angel and Legacy Regional Funds	███████████	17th Feb 2021
Policy and Government Relations	█████████	17th Feb 2021
NLF	██████████	17th Feb 2021
Portfolio Ops	███████████	1st Mar 2021
Compliance Ops	███████████	1st Mar 2021
BI	███████████	8th Feb 2021 9th Feb 2021 11th Feb 2021

Data Programme attendees: ████████████████████████████████████

Deloitte Attendees: ████████████████