US Customer Master Data Management

Enterprise Information Architecture

Classification:	Confidential
Author	Nishit Ajwaliya
Date	June 2021
Version	v1.4
Status	DRAFT

nationalgrid | information technology

Contents

01

Why Master Data Management?

nationalgrid | information technology

Why Master Data Management (MDM)?

As per the “Fixing Data” paper presented in April 2020 to executives by Chief Data Officer Charles Zentay at a time, unless we “Fix Data” our security, major programs, and financial and operational performance are at risk. The paper was based work by Boston Consulting Group BCG). As per the paper National Grid rates “low” or “very low” across the three major components of Data (Master Data Solutions, Data Governance, and Data Tools & Platforms). BCG’s study, that looked into a subset of the Data domains at National Grid, estimated the costs of bad Data are $73-98M. Given the limited scope of their review, they concluded that the full cost is likely much higher.”

Diagram 1: Current High-Level Assessment by BCG of Data Components at National Grid

Components	Current Maturity Level (1 = Low 5 = High)	Details
Master Data Solutions	Very Low (1 of 5)	• ***Master Data generally does not exist and has not been defined.*** *Data* is stored in multiple disparate places causing issues • ***Lack of Operating Model and Funding Model*** *to drive sustainable enterprise approach to meet business needs for Data* • ***Data and the Business Processes that use it are generally not clearly designed together*** *- instead Programs focus on technology implementation without clarity of end-to-end data/process needs*

To addresses these issues, we need three key components to “Fix Data”:

1. **Master Data Solutions – for each data domain, establish a data master**
2. Data Governance & Stewardship – Business ownership of data, accelerated by BMS
3. Data Tools & Capabilities – One, common approach to Enterprise Data solutions

Business Demand for the Master Data Management

US Business Domain Demand

- **US Customer** – MDM requirement to build high quality, consistent, accurate, and complete master customer and meter data from numerous US customer systems of record like CRIS, CIS, CRM etc. and make them available to enterprise e.g. Customer Transformation, GBE, AMI, Digital Enablement (On My Way), Energy Efficiency/Clean Energy initiative, Smart Target initiative, Consolidation of Customer Data Sources to scalable centralized repository etc.
- **US Asset** – MDM requirement to build high quality, consistent, accurate, and complete master asset data from numerous US asset systems of record like Power Plan, GIS, Cascade, Computapole, STORMS, Maximo etc. and make them available to enterprise eg AMI, GridMod, Digital Enablement (FutureNow, VMO) etc.

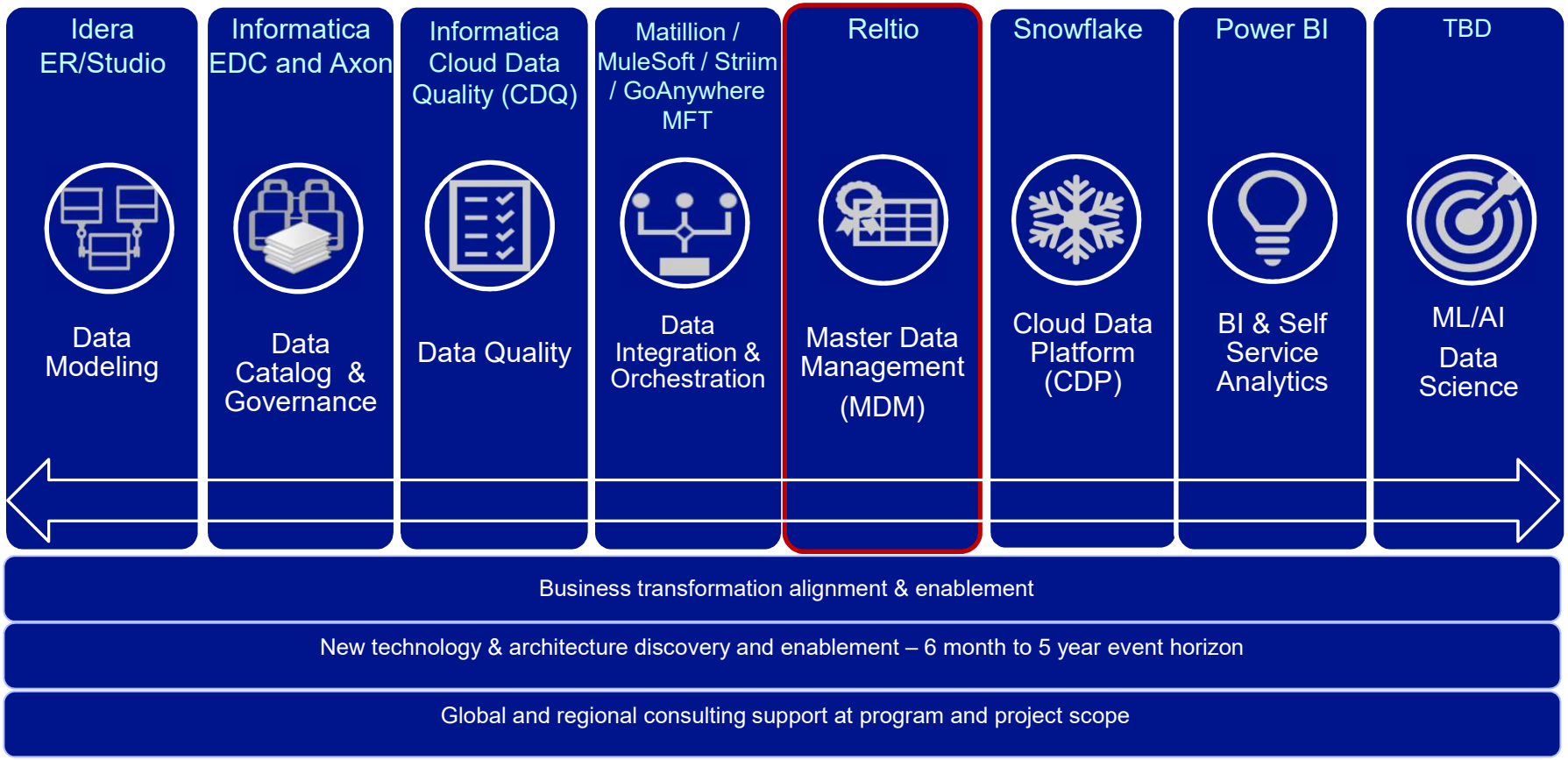
UK Business Domain Demand

- **UK Customer –** MDM requirement to build high quality, consistent, accurate, and complete master customer data from numerous UK B2B customer systems of record CRM, SAP etc. and make them available enterprise wide eg ESO etc.
- **UK Asset –** MDM requirement to build high quality, consistent, accurate, and complete master asset data from numerous UK asset systems of record like Ellipse, FieldReach, GeoGrid, ET Power Factory etc. and make them available to enterprise eg ESO, RIIO T2 based UK GT and UK ET initiatives etc.

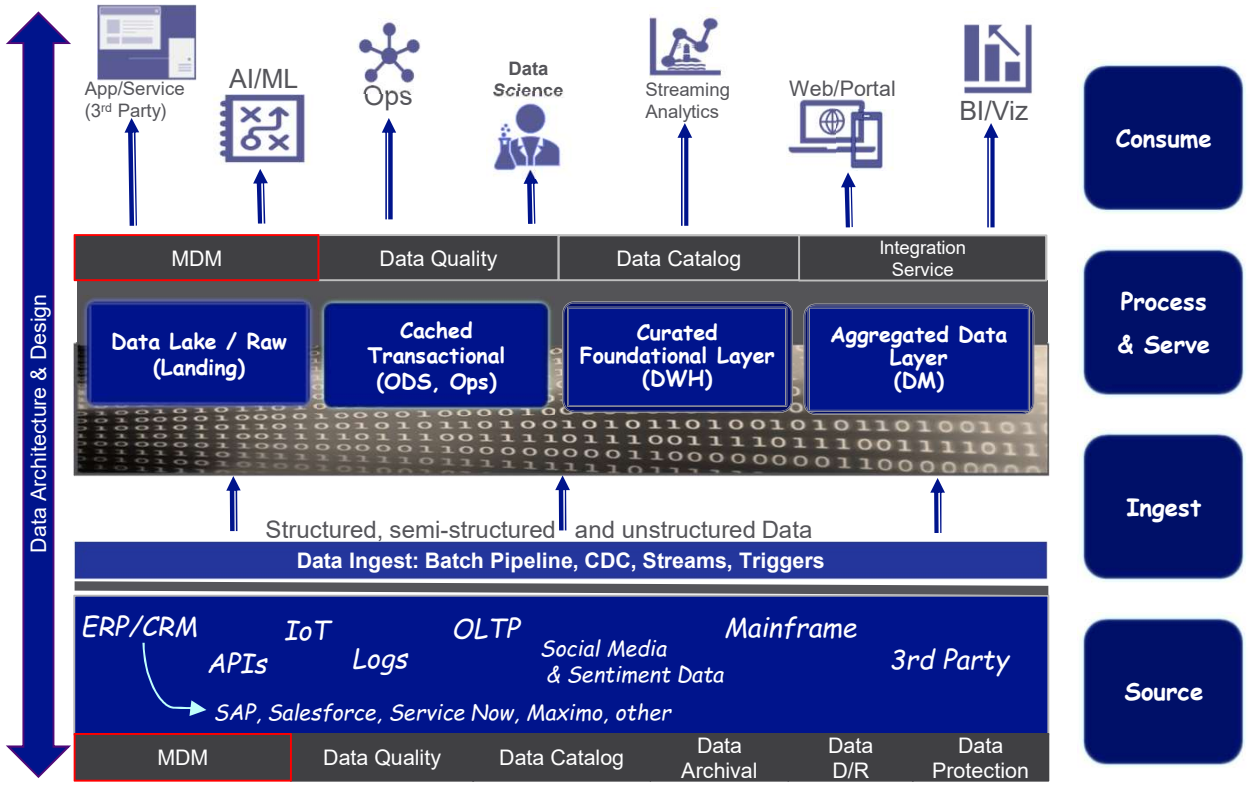
Global Business Domain Demand

- **Workforce** – MDM requirement to build high quality, consistent, accurate, and complete master workforce (Employee, Contingent worker/Contractor, and Managed Service Provider/MSP workers) data from numerous workforce systems of record like MyHub/ SuccessFactor, FieldGlass, US/UK SAP etc. and make them available to enterprise e.g. Workforce Data Domain, IAM, GBE, Digital Enablement (On My Way) etc.

Digital Transformation – Information Capabilities Pillars



Enterprise Data Platform



02

What is Master Data?

nationalgrid | information technology

Meta Data, Master Data, Transaction Data

Meta Data

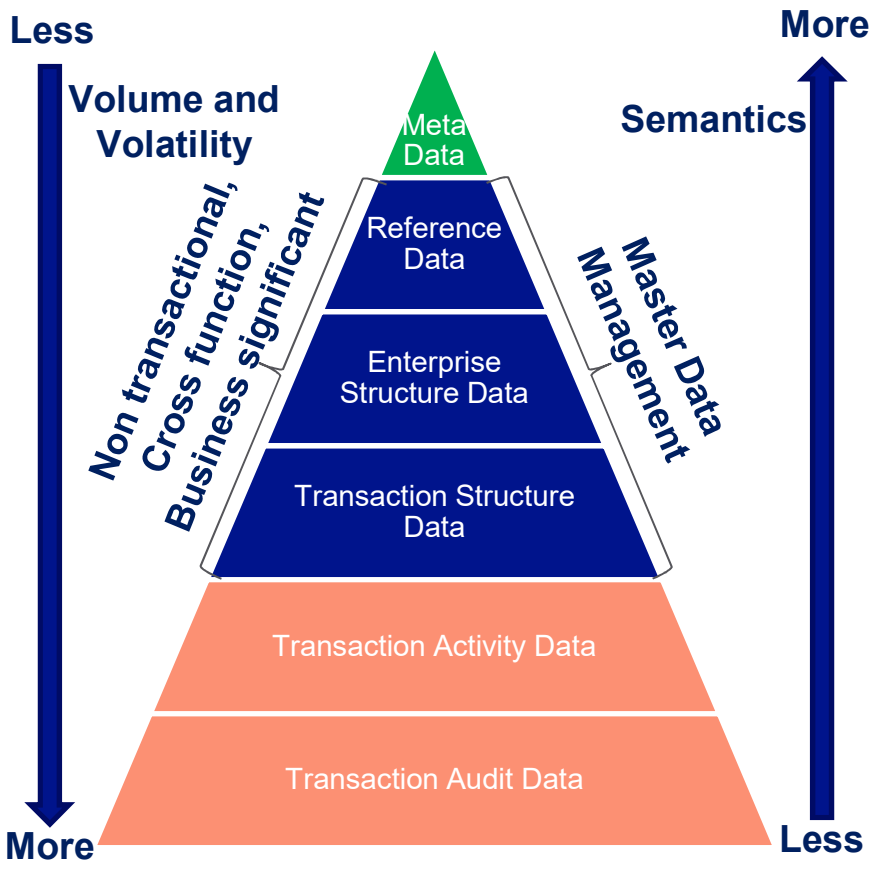
- **Meta Data**
  - Data about data like structure, meaning, and relationships of data
  - E.g. Column CUST_ID is a Customer ID and has a size of 10 characters

Master Data

- **Reference Data**
  - Codes describing state and behaviour of organization entities and transactions
  - E.g. Status codes, Reason codes, Type codes, Classification codes, Country, State, Zip/Postal codes
- **Enterprise Structured Data**
  - Hierarchies within the enterprise
  - E.g. Organization Hierarchy (Company, Business Unit, Division, Department etc)
- **Transaction Structure Data**
  - Organization entities in which the transactions act upon
  - E.g. Customer, Workforce, Asset, Product, Vendor etc

Transaction Data

- **Transaction Activity Data**
  - Operational transactions typically automated in applications
  - E.g. Customer Billing and Payment, Work Request, Work Order, Worker Learning and Salary/Payment
- **Transaction Audit Data**
  - Logs of transactions executed to bring about a process flow
  - E.g. transaction logs of create, update, and view of customer data



Example: US Customer Gas Bill

Gas Bill Database Table

Table: GAS_BILL		
BILL_NUM	NOT NULL	CHAR(50)
ACCT_ID	NOT NULL	CHAR(11)
CUST_ID	NOT NULL	CHAR(15)
PREV_BILL_NUM	NULL	CHAR(50)
CURR_METER_READ	NOT NULL	NUMBER(10)
...	...	...
CREATED_DATETIME	NOT NULL	DATE
CREATED_BY	NOTNULL	CHAR(50)

Gas Bill Table Data

BILL_NUM	ACCT_ID	....	CREATED_DATETIME	CREATED_BY
123456-7890-100	123456-67890	....	7/8/2020	SYSTEM

Legend

Transaction Structure Data | Transaction Activity Data

Reference Data | Transaction Audit Data

Metadata

US Customer actual Gas Bill

nationalgrid

Service To
JOHN DOE
1 MAIN ST
WOBURN, MA
01801

HSE

Account Number
12345-67890

Rate R-3
Res. Heating

Next Meter Reading
Aug 10 '20

Bill Date
Jul 14 '20

For Customer Assistance
Please call (781) 751-3000

CURRENT BILL ITEMIZED

In 34 days you used 30 therms:	
Jul 14 2020 reading ACTUAL	5044
Jun 10 2020 reading ACTUAL	5015
CCF Used for METER# 00X123456	29
Thermal Factor	x1.0289
Total therms used	30
Your Cost is determined as follows:	
Minimum Charge	$13.60
$.4000 per day for 34 days First 106.0 therms @ $.2794	8.38
Distribution Adjustment: 106 therms x 0.25040 per therm	7.51
GAS DELIVERY CHARGE	$29.49
GAS SUPPLY CHARGE @ $.32510 /therm	9.75
TOTAL CURRENT CHARGES	$39.24

SUMMARY OF CHARGES

Total Current Charges	$39.24
Amount Due Last Bill	50.71
Your Total Payments Since Last Bill. Thank You!	-50.71
PLEASE PAY BY Jul 28	$39.24

GAS USE HISTORY

	Days		Therms		Days		Therms
Jul 20	34	Act	30	May 19	34	Act	72
Jun 20	24	Act	39	Apr 19	28	Act	84
Oct 19	27	Act	31	Mar 19	28	Act	119
Sep 19	31	Act	26	Feb 19	33	Act	144
Aug 19	26	Act	26	Jan 19	31	Act	114
Jul 19	26	Act	26	Dec 18	31	Act	111
Jun 19	40	Act	40	Nov 18	29	Act	65

03

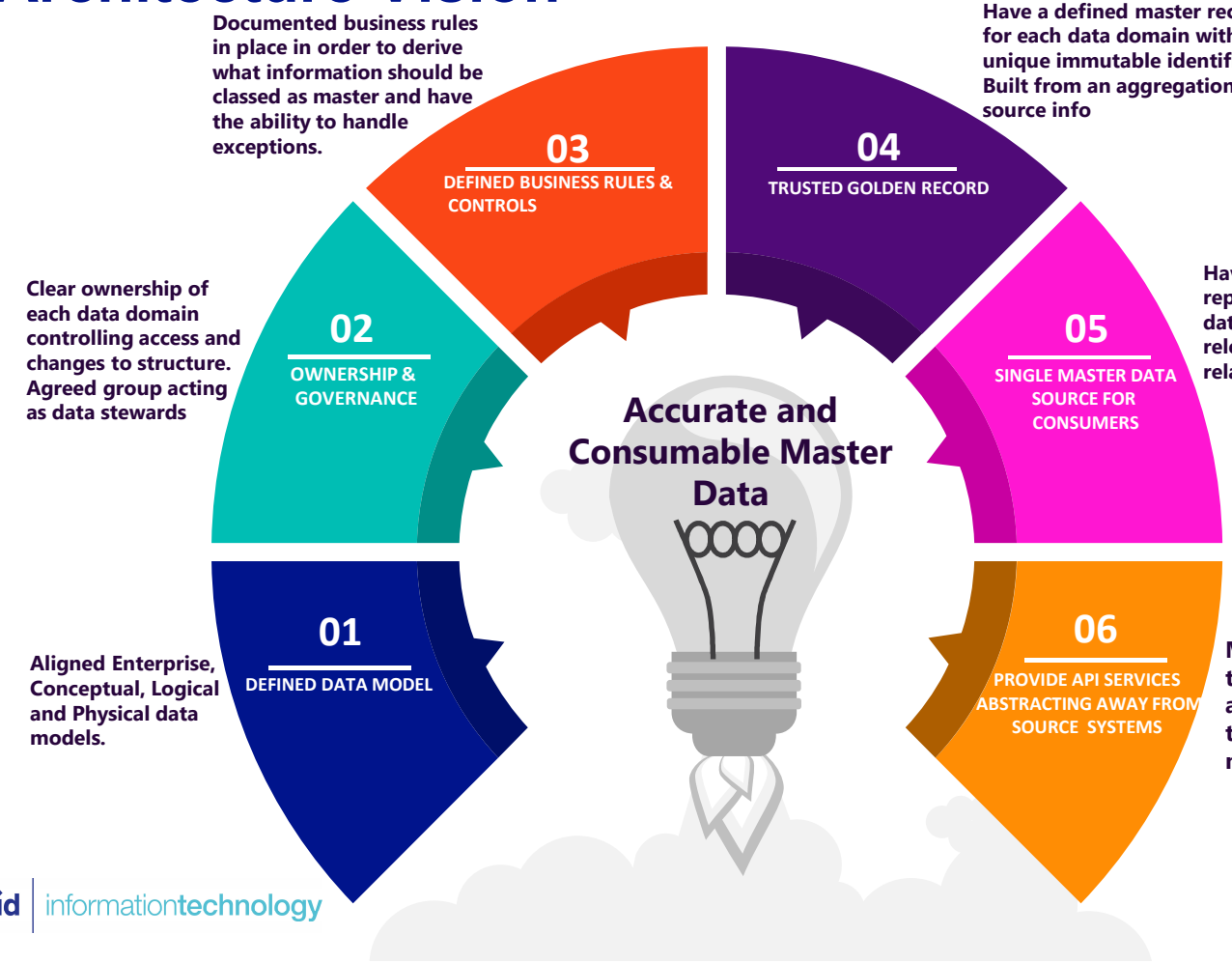
What is Master Data Management?

nationalgrid | information technology

Master Data Management (MDM)

- MDM is used for building reliable, accurate, non-duplicative master data that National Grid business can use for effective decision making and digital transformation
- MDM is a set of policies, standards, processes, governance, stewardships, and tools that combined create a commonly trusted, consistent, accurate, and controlled set of “master data” for critical business from across internal and external data sources and applications
- Core master data entities include Customer, Workforce, Asset, Location, Product, Vendor, Reference etc.

MDM Architecture Vision



MDM implementation Style

1. Registry

Build an MDM index with limited key identifier fields and the full data stays in source system

Pros:

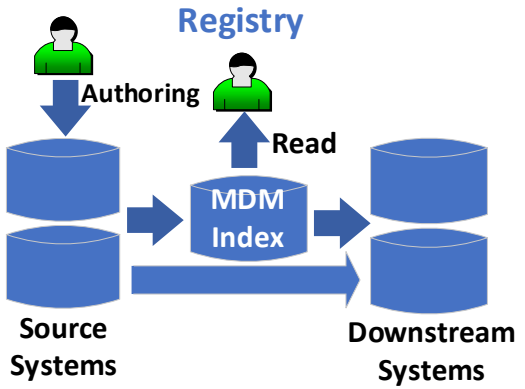
- Less intrusive as no impact to source systems
- Quick and inexpensive to set up

Cons:

- Complex to build 360 view if more source systems
- Require most MDM configuration
- Requires retrieving master data from the source systems

Possible NG use cases:

- When only one or two source systems for system of record/truth



2. Consolidating

Build an MDM centralized repository with curated master data, allow data stewards to correct data in the MDM tool. Cleansed master data is not sync up with source systems

Pros:

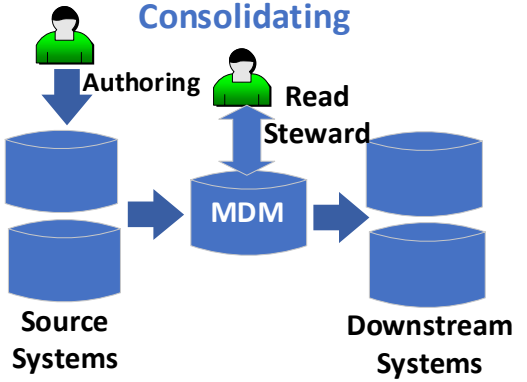
- Less intrusive as no impact to source systems
- Quick and inexpensive to set up
- MDM is a repository for Golden master record
- Standard MDM Configuration

Cons:

- Possible to have data discrepancies between source systems and the MDM tool
- Requires manual updates in source systems for data quality issues

Possible NG use cases:

- When multiple source systems and they are not able load cleansed data automatically



MDM implementation Style

3. Co-Existence

Build an MDM centralized repository with curated master data, allows Data Steward to correct data in the MDM tool, cleansed master data is synced with source systems

Pros:

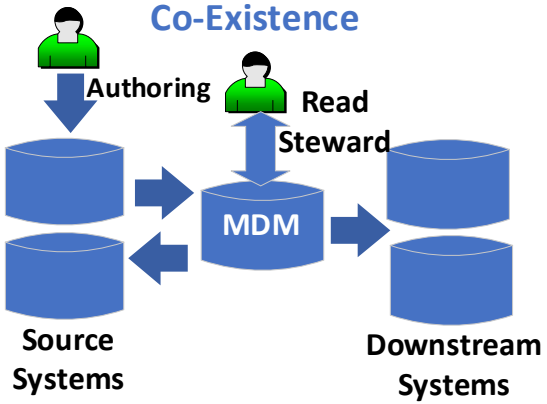
- Cleanse master data are in sync between MDM and source systems
- Standard MDM Configuration

Cons:

- More intrusive as impacts source systems

Possible NG use cases:

- When multiple source systems and systems can load/take cleansed data automatically



4. Transaction/Centralized

No source system so MDM tool is the source of record

Pros:

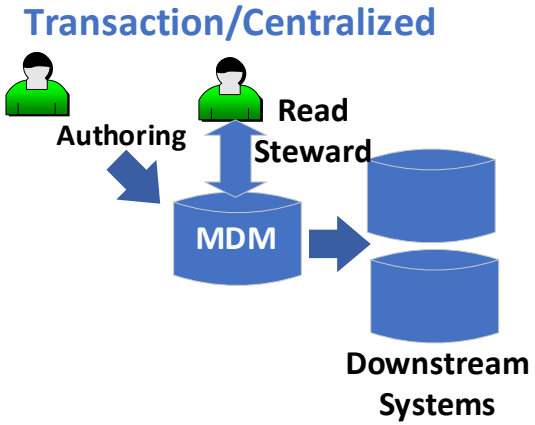
- MDM is the system of truth and source system

Cons:

- Most intrusive as MDM becomes source system
- Most MDM configuration

Possible NG use cases:

- When there are no source systems e.g. Reference data like Postal data



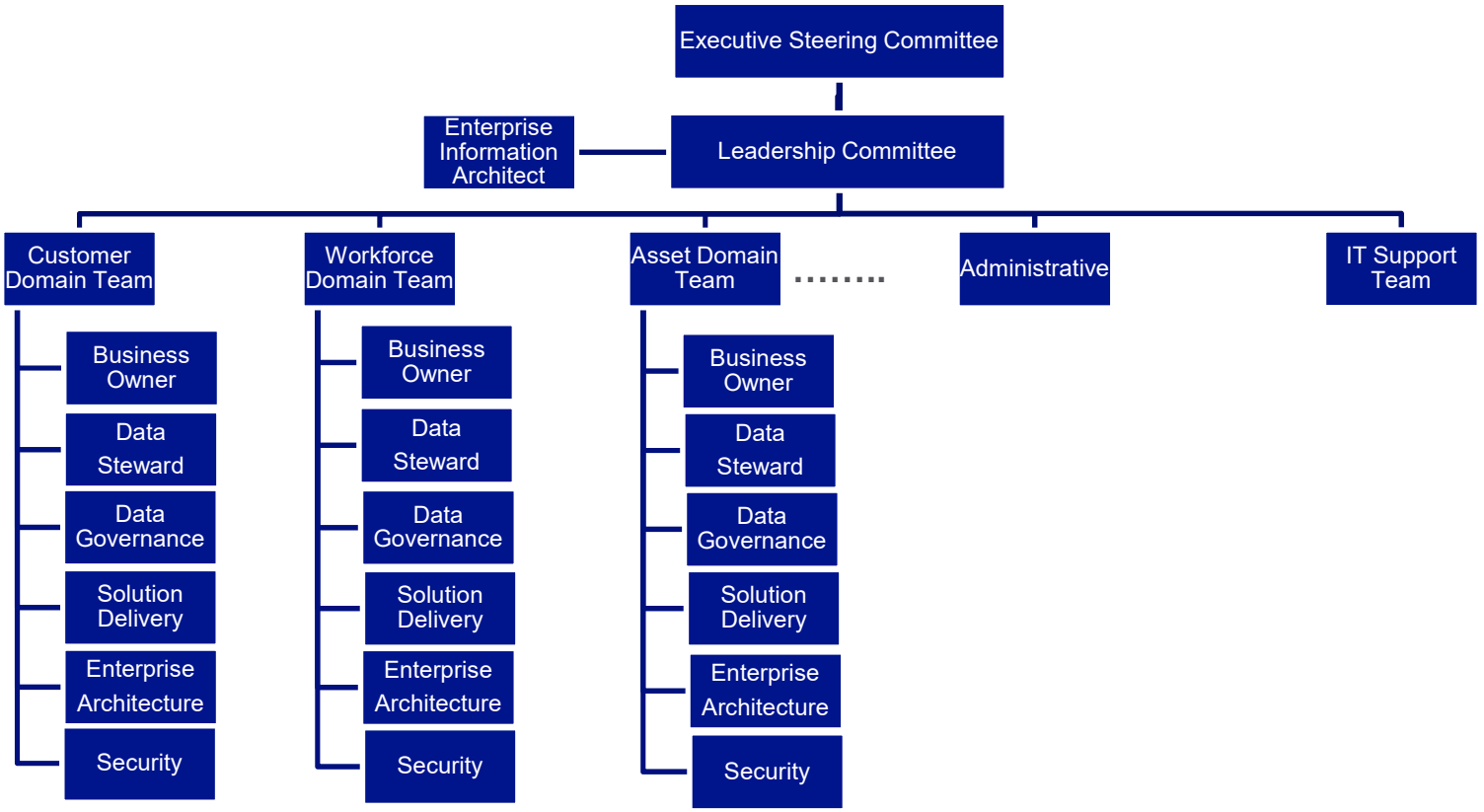
Benefits of Master Data Management

- Centralized multi domain master data repository
- An enterprise unique persistent identifier for each master data domain entity
- Avoid master data duplication
- Increase master data accuracy
- Improve master data quality
- Improve master data consistency and data standardization
- Provide better data compliance
- Enable data governance and data stewardship
- Offer better secure data access
- Provide an API service for consumers of this curated data

Master Data Management Use Cases

Use Case	Benefit
MDM1 – Centralized data repository for multi-domain master data	All master data from multiple domains in one place, one governance and shared enterprise control process
MDM2 – System of record for unique enterprise persistent identifier for each master data entity	MDM can create a single unique identifier for each master data entity like Worker, Position, Customer, Asset, and Location etc. that is required by multiple business processes
MDM3 – Allow data quality improvements, remove data duplication, and allow data steward to see data issues and help them correcting them	Consistently maintain data quality and remove duplicate records of the Worker, Position, Customer, Asset, and Location master data entities
MDM4 – Create and maintain golden record of master data and sync cleanse and standardize data back to source systems of record	Remove data discrepancy between different source systems and have an authoritative and a reliable source of Customer, Workforce, Asset master data that solves the one biggest pain point of multiple business areas
MDM5 – Source for Master data for Common Enterprise API/Services, MuleSoft, CDP/Data Lake (Snowflake), or any other downstream systems and improve performance by reducing dependency of source systems	Consistent clean accurate master data for Common Enterprise API/Services, MuleSoft, Cloud Data Platform/Data Lake (Snowflake), or any other downstream systems

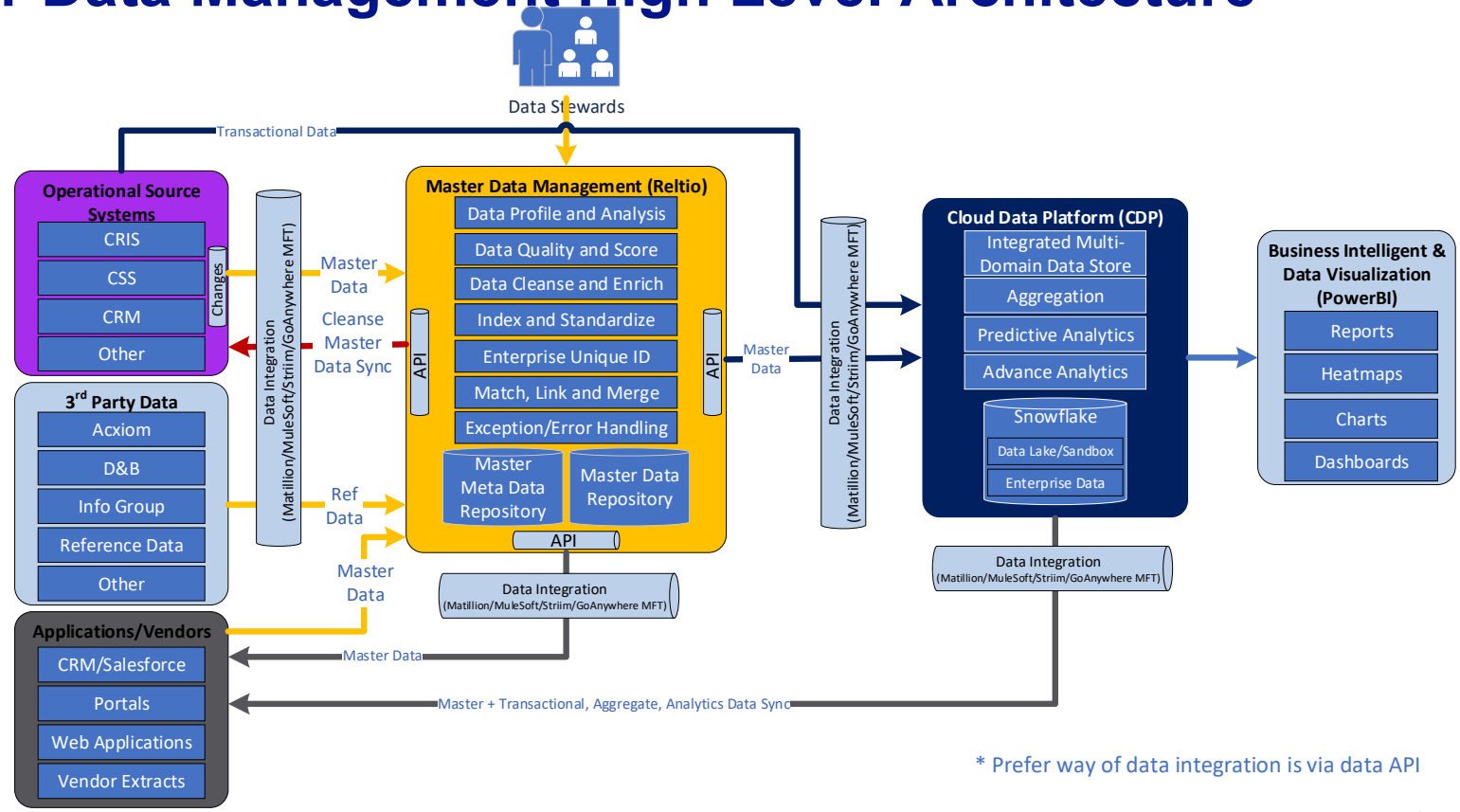
Master Data Management – Organization Structure (WIP)



Master Data Management – Roles and Responsibilities (RACI)

Phases/Tasks	Tool Selection	Tool Delivery	Architecture	Requirement & Planning	Design	Master Data Governance	Rules Configuration	Development & Implement	Operate & Maintain
	• Select the enterprise MDM tool	• Stand up MDM Environment	Document MDM Architecture and standard	• Appoint data stewards and other data owners	• Design solution for the requirement	Identify processes, roles, policies, standards, and metrics	• Select Architecture and Data Model	• Develop & implement the full solutions	• Operate and administer the MDM platform
Roles									
Business Owner	C	I	C	RA	I	A	C	I	A
Data Steward /SME	C	I	C	RA	I	R	A	I	C
Data Governance /SME	C	I	C	C	I	RA	CA	I	C
Enterprise Architect	RA	R	RA	C	R	A	CR	C	I
Data Solution Engineering	C	RA	C	R	RA	C	RA	RA	RA
Security	C	C	C	C	C	C	CR	C	C

Master Data Management High Level Architecture

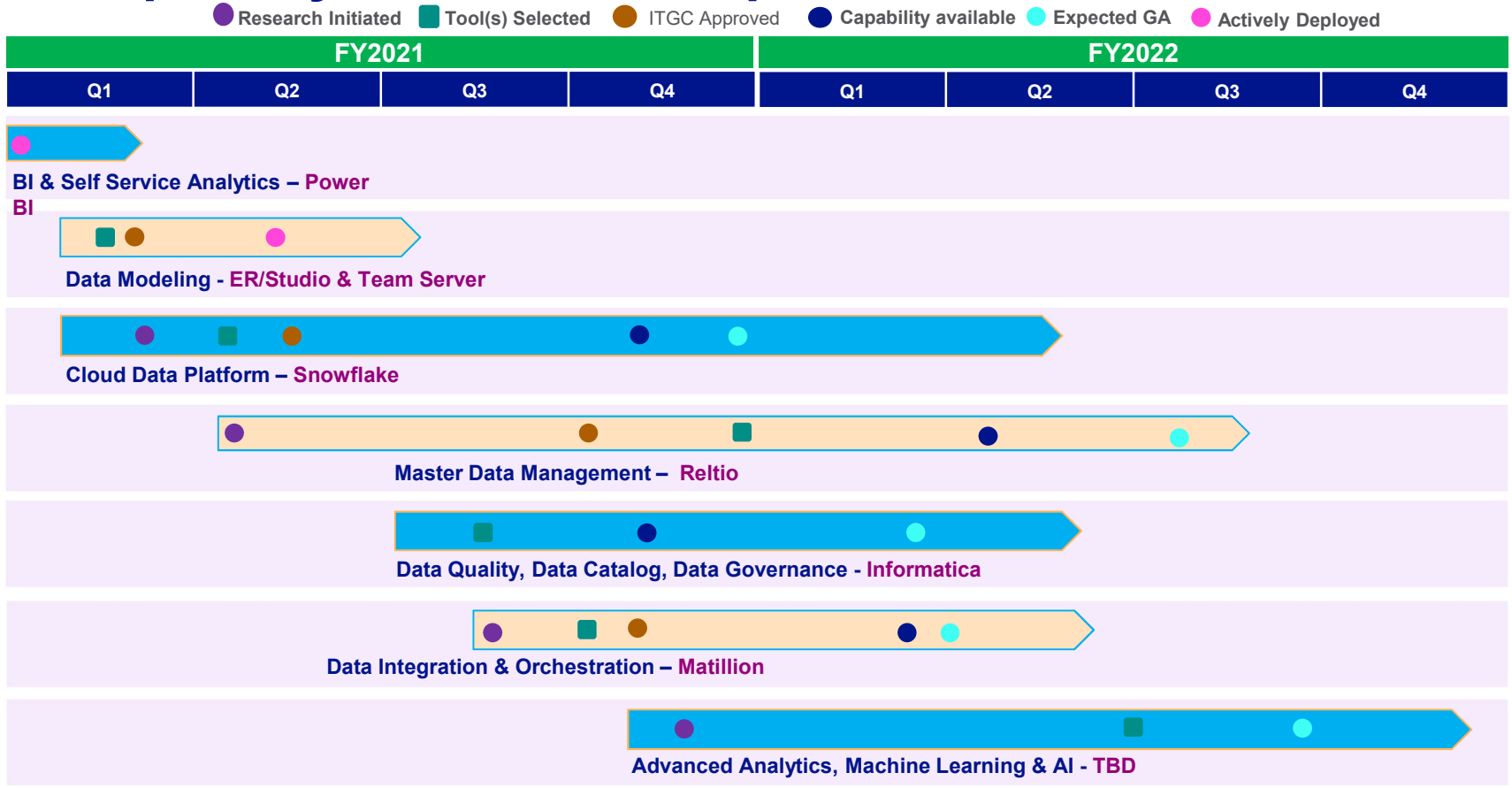


04

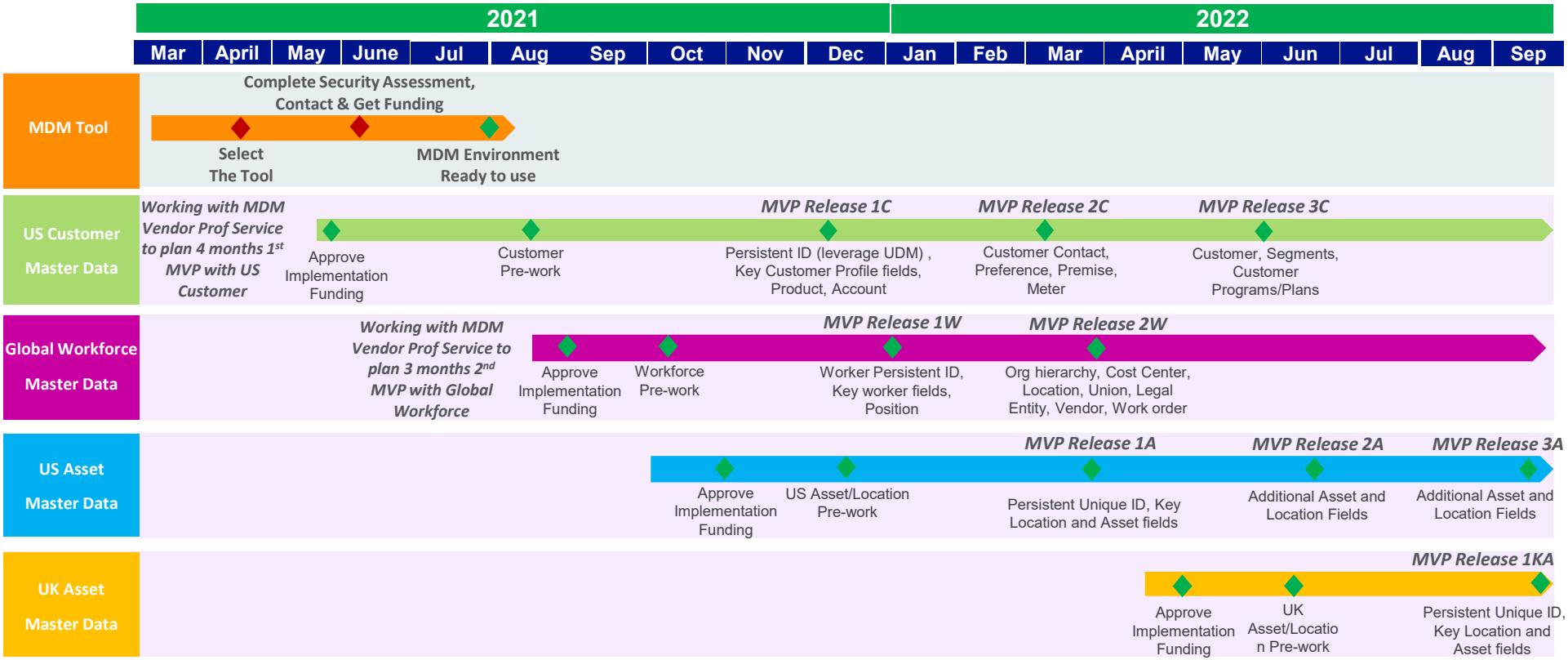
Roadmap

nationalgrid | information technology

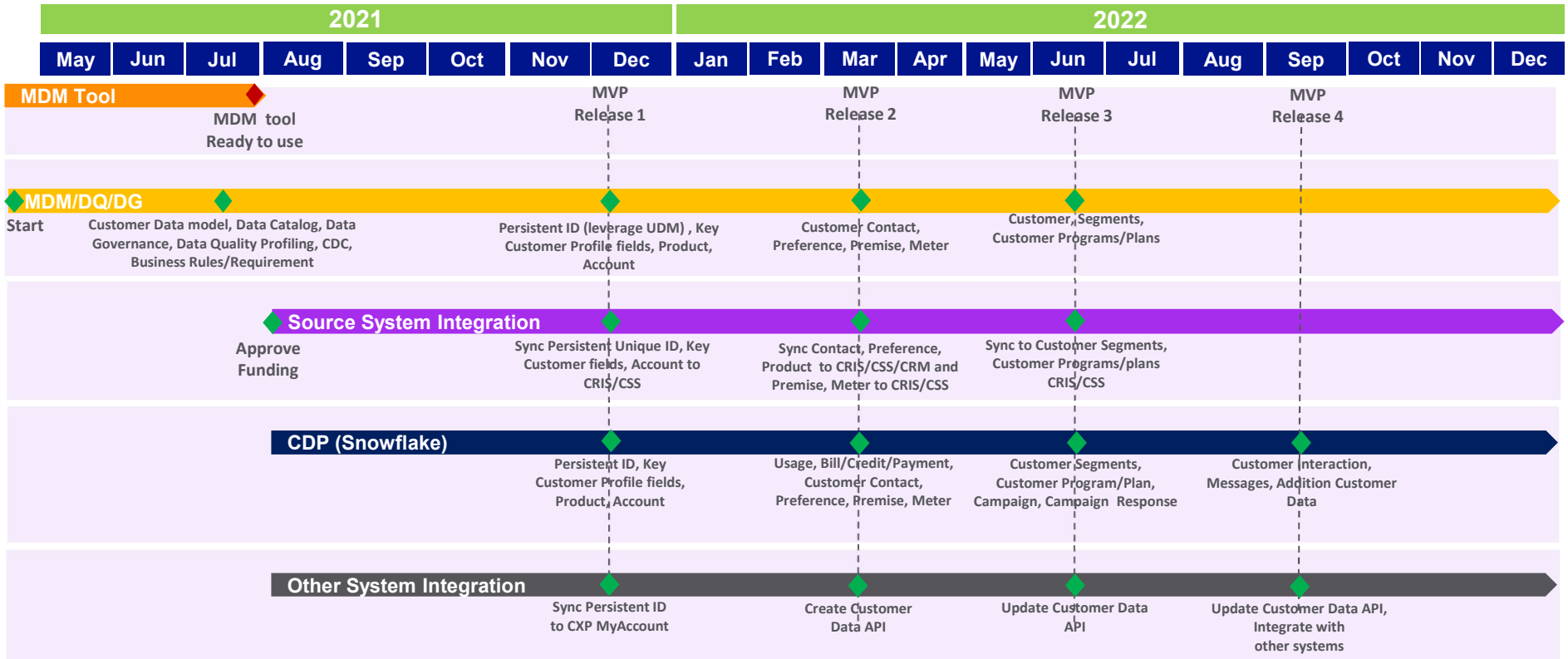
Data Capability Tools Roadmap (as of May 2021)



Master Data Management Proposed Roadmap (Draft)



US Customer MDM Proposed Roadmap (Draft)

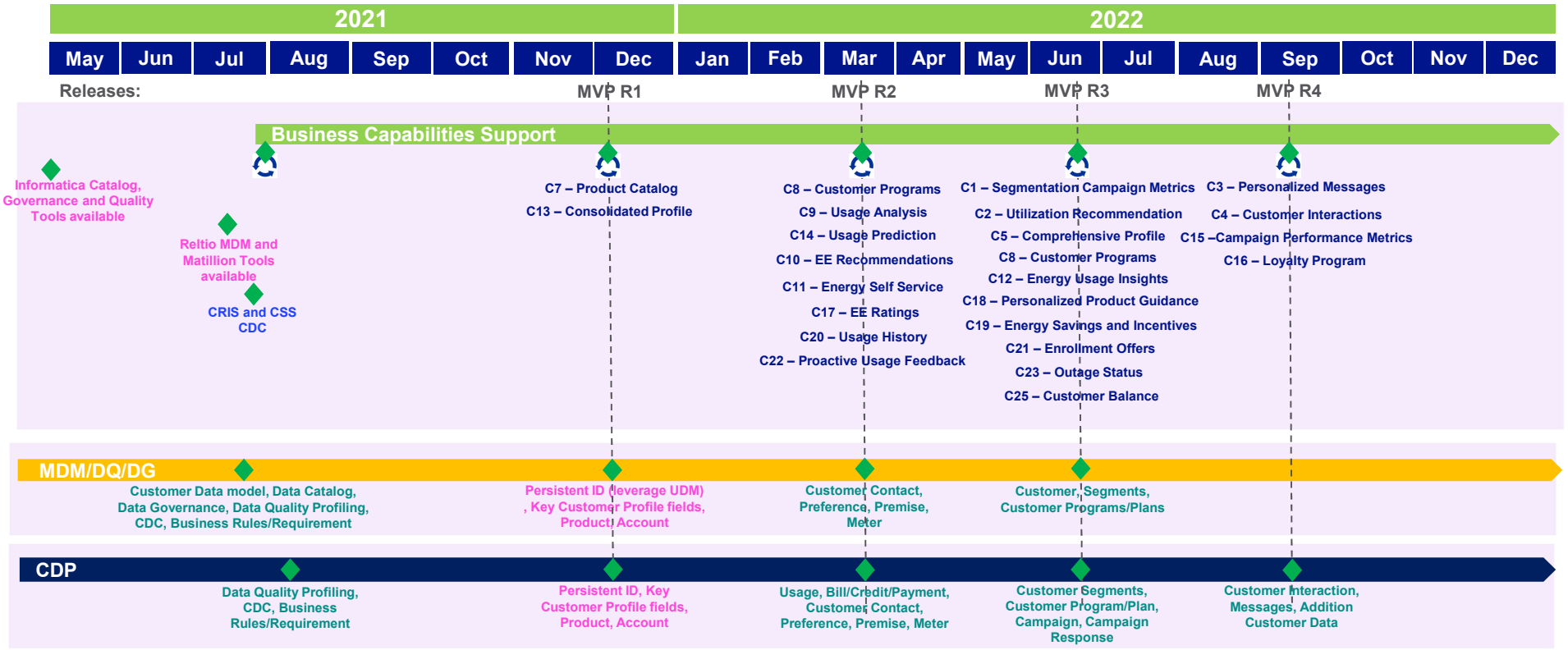


Note:

- **All Timelines are subject to budget approval**
- **Scope of each release will be finalized as per pre-work findings**
- **Future Release timeline will be changed based on the current release date change**
- **Each release pre-work will start ahead of the time**

US Customer Business Capabilities Proposed Roadmap (Draft)

Delivery / Value Streams:
- Data Management Foundational
- Customer Dara Foundational
- Customer Data Integration Services



Master Data Management Vendors/Tools

Finalists

- Informatica MDM
  - AWS, GCP, and Azure based single-tenant SaaS solution
- Reltio
  - 100% cloud native
  - AWS and GCP based multi-tenant SaaS solution (Azure support in Q2/Q3 2021)

Following 2 vendors are eliminated after first round

- Riversand
  - 100% cloud native
  - Azure based multi-tenant SaaS solution
- WinShuttle Enterworks
  - No SaaS solution
  - PaaS solution available


QUESTIONS