



SDAIA

الهيئة السعودية للبيانات
والذكاء الاصطناعي
Saudi Data & AI Authority

National Data Index

Operational Excellence (OE)

Support Handbook

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1 Glossary

Term	Description
DMP	Data Marketplace
GSB	Government Service Bus
NDB	National Data Bank
NDL	National Data Lake
NDC	National Data Catalog
NDI	National Data Index
NDMO	National Data Management Office
NIC	National Information Center
ODP	Open Data Platform
RDP	Reference Data Management Platform
SDAIA	Saudi Data and AI Authority

2 Introduction

The Saudi Data & AI Authority (SDAIA) is on a mission to develop a data-driven economy and foster the data literacy level across the government entities for operational efficiency and decision-making in the Kingdom of Saudi Arabia. To this end, SDAIA has launched the National Data Index (NDI) framework that aims at measuring the efforts and progress in transforming the data into a vital economic resource for unlocking innovation, driving economic growth and transformation, and improving the national competitiveness in an organized and accelerated manner.

NDI encompasses the National Data Management Office (NDMO) Data Management and Personal Data Protection Framework prescribed domains and is composed of three essential components: Compliance, Maturity, and Operational Excellence (OE). Each government entity will be measured on a regular basis across these three components.

This Support Handbook adopts a question and answer (Q&A) format to deliver key insights related to the Operational Excellence (OE) component, offering clear and concise answers to support the understanding of the OE metrics. It complements the main OE document by providing additional context and practical insights, helping stakeholders navigate key concepts with confidence.

Section 3 provides supplementary clarity and contextual details on the OE component in general, covering its fundamental concept and overall mechanics, whereas Section 4 elaborates on the key metrics under consideration, detailing their calculation methods, supported by examples, along with clear explanations of terms specific to each metric.

3 Operational Excellence Component

This section lists all the key general questions related to the OE component.

What is “Operational Excellence (OE)”?

OE is a framework for measuring the performance of the government entities in the data management and governance area through the national data platforms developed and managed by SDAIA.

What is the relationship of OE with the National Data Index (NDI)?

NDI consists of three essential components: Compliance, Maturity, and OE.

How many metrics does OE have in total?

OE has 24 metrics spreading across six data management domains as follows:

Data Management Domain	Metric Count
Data Sharing and Interoperability	5
Open Data	5
Data Catalog and Metadata Management	5
Reference and Master Data Management	3
Data Quality	3
Data Operations	3

Note that more metrics will be added in the future based on the arising needs.

What do you mean by “National Data Platforms”?

A national data platform is a digital platform that government entities are required to use for data management, governance, and/or sharing of national data assets.

The following platforms are considered as national data platforms:

- **Government Service Bus (GSB):** A central platform that enables the government entities in the Kingdom to integrate and interlink to share standardized transactional data on demand for facilitating government business processes.
- **National Data Lake (NDL):** A reliable central repository for preserving, processing, and cleansing national data and then sharing it securely with the beneficiaries to enable them to build decision-support systems and platforms.
- **Collaborative Data Labs (CDL):** Secure labs that enable employees of government entities to access the data hosted in the National Data Lake through an environment equipped with the latest data analytics and AI technologies to discover, explore, and analyze the data and generate the required insights and reports.
- **Data Marketplace (DMP):** A platform that offers automated data-sharing processes across entities in the Kingdom. It enables them to browse the data-sharing services and subscribe to what suits them in an automated manner in accordance with the national data governance policies.
- **National Data Catalog (NDC):** A platform that serves as an inventory of the metadata of the government entities’ systems, with the definitions of their Key Performance Indicators (KPIs) and metrics and the list of business-critical data fields linked with their certified source entities, in addition to the data policies and standards.

- **Reference Data Platform (RDP):** A platform that offers the features to support extensive curation capabilities for standardizing, classifying, and defining the certified source entities for the reference data at a national-level and ensures completeness, accuracy, and consistency of the available reference data.
- **Open Data Platform (ODP):** A platform that enables individuals, government, and non-government entities to publish their open data and make it available to end users, such as entrepreneurs, to enable them to develop innovative products that contribute to building a digital economy in the Kingdom.
- **Tawakkalna:** A national super app that unifies government services in one platform, organizing services, information, documents, and posts to make them easier to use and improve the quality of life in Saudi Arabia in line with the objectives of Vision 2030.

How is the OE final score calculated?

The OE metrics' scores have different measurement units (e.g., time and percentage), and hence, to normalize these units, each metric output is mapped to a predefined scale as follows:

Scale Level	Scale Value
Unacceptable	0
Low	1
Fair	2
Good	3
Excellent	4
Leader	5

The OE score of an entity is calculated using the following weighted sum equation:

$$OE\ Score = \sum_{i=1}^{|L|} w_i * S_i$$

Where $L = \{m_1, m_2, \dots\}$ is the list of metrics considered for the assessment round, S_i represents the score/scale value of the entity for metric m_i , and w_i represents the weight of that metric.

How many metrics were targeted for the previous assessment periods/rounds?

In the first assessment round, six metrics were targeted, which are: Systems integrated with NDL, datasets published in ODP, systems cataloged in NDC, business attributes defined and linked in NDC,

responsiveness of GSB API calls, and responsiveness of the integration solution with NDL. In the second assessment round, nine metrics were targeted; in addition to the metrics covered in the first round, three new ones were introduced: Reporting assets defined in NDC, publishing reference entities, and conformance to data standards in NDL.

What is the assessment period for this current third OE round?

The assessment period for the current third OE round spans from January 1 to December 31, 2026. Entities are required to complete all obligations related to the metrics before the closing date.

Note that some obligations require processing time from the platform teams and such processing activities must be completed before the closing date in order for the entity's work to be marked as complete. For instance, if an entity is required to publish 15 datasets on the Open Data Platform (ODP), it is essential that the entity ensure that all activities related to uploading the datasets, reviewing and approving them by the platform team must be completed before December 31st, 2026. The entity must ensure that the datasets are uploaded to the ODP reasonably earlier than the closing date to allow ample time for the ODP team to conduct the final review, validation, and publication activities.

How many metrics are targeted for the third round/year of the assessment, and what were their weights?

For the third round, 13 metrics are targeted which are listed below along with their weights:

Metric ID	Metric Name	Platform	Metric Weight
DSI.OE.02	Systems integrated with NDL	NDL	0.20
DO.OE.03	Responsiveness of the integration solution with NDL	NDL	0.05
DQ.OE.02	Conformance to data standards in NDL	NDL	0.05
DO.OE.02	Responsiveness of GSB API calls	GSB	0.10
DSI.OE.01	Adherence to the Data Sharing Policy	GSB	0.05
RMD.OE.01	Publishing reference entities	RDP	0.10
OD.OE.01	Datasets published in ODP	ODP	0.15
OD.OE.05	Response effectiveness to new open dataset requests	ODP	0.05

MCM.OE.01	Systems cataloged in NDC	NDC	0.05
MCM.OE.02	Business attributes defined and linked in NDC	NDC	0.05
MCM.OE.03	Reporting assets defined in NDC	NDC	0.05
DSI.OE.05	Attributes Availability for Correction in Tawakkalna	Tawakkalna	0.05
DQ.OE.03	Attributes published in Tawakkalna	Tawakkalna	0.05

What does it signify when a metric is marked as “NA” (‘Not Applicable’) for an entity, and how is the overall result subsequently calculated?

If a metric is marked as “NA,” it indicates that the entity is exempted from evaluation on that particular metric for the current assessment round. Consequently, the overall weight distribution will be recalibrated, reallocating the weights of the excluded metrics proportionally across the remaining applicable ones, thereby increasing their individual weights. For example, given the original metrics and their weights shown in the previous table, assuming DO.OE.02 and DSI.OE.01 are marked as “NA”, the adjusted weights after redistribution will be:

Metric ID	Metric Name	Platform	Metric Weight
DSI.OE.02	Systems integrated with NDL	NDL	0.24
DO.OE.03	Responsiveness of the integration solution with NDL	NDL	0.06
DQ.OE.02	Conformance to data standards in NDL	NDL	0.06
RMD.OE.01	Publishing reference entities	RDP	0.12
OD.OE.01	Datasets published in ODP	ODP	0.18
OD.OE.05	Response effectiveness to new open dataset requests	ODP	0.06
MCM.OE.01	Systems cataloged in NDC	NDC	0.06
MCM.OE.02	Business attributes defined and linked in NDC	NDC	0.06

MCM.OE.03	Reporting assets defined in NDC	NDC	0.06
DSI.OE.05	Attributes availability for correction in Tawakkalna	Tawakkalna	0.06
DQ.OE.03	Attributes published in Tawakkalna	Tawakkalna	0.06

This adjustment ensures that the total weight of all metrics remains one and that the entity is only evaluated on applicable metrics.

Is there a possibility of adding new domains or metrics in OE in the future?

Yes, new domains or metrics will be added in the future based on the arising needs. However, those domains and metrics will be communicated with the entities in advance to prepare for the evaluation.

Can the weight of a metric be changed?

Yes, based on the priority and importance of the metric, weights for any metric can be changed. This provides NDI with flexibility to cater to the high-priority domains and metrics. It will also help entities focus on the areas of improvement. However, it is important to note that the weights for metrics can possibly be changed in the subsequent rounds and will remain unchanged for the current round.

Is there any requirement for submitting proofs or evidences from the entity pertaining to OE metrics?

No, there is no expectation from the entities to submit any materials or evidence. The national data platforms shall be used to collect the evidence and required data for progress measurement.

4 Data Domain Metrics

This section lists the key questions related to the OE metrics included in the current assessment round, organized according to their respective data domains to enhance readability and facilitate better comprehension.

4.1. Data Sharing and Interoperability (DSI)

4.1.1. Metric (DSI.OE.01): Adherence to the Data Sharing Policy

This metric assesses whether entities share data on the GSB in compliance with the data sharing policy. It helps ensure that data is shared only by the data sources or authorized entities with appropriate classification applied on the published APIs.

What are the weights associated for the two evaluation criteria: Number of certified attributes and the API classification?

The weight of the first criteria is 0.8 whereas the weight of the second one is 0.2 respectively.

Please show an example of how the metric is calculated.

Suppose an entity has published three APIs on the GSB and the details of these APIs, such as their attribute count, the number of their certified attributes (i.e., attributes where the publisher is the same as the source/authorized entity), and their classification status are as shown in the table below.

API	Version	Number of API Attributes	Number of Certified Attributes	API Classification Complete?
API 1	1	70	68	Yes
API 2	3	30	25	Yes
API 3	1	20	17	No

Based on the status above, the metric score is calculated as follows:

- Adherence of API 1 = $((68 / 70 * 0.8) + (1 * 0.2)) * 100 = 97.7\%$
- Adherence of API 2 = $((25 / 30 * 0.8) + (1 * 0.2)) * 100 = 86.6\%$
- Adherence of API 3 = $((17 / 20 * 0.8) + (0 * 0.2)) * 100 = 68.0\%$

Then, the adherence score for the entity is calculated as the average adherence score for the APIs as follows = $(97.7\% + 86.6\% + 68.0\%) \div 3 = 84.1\%$

Scale Interval = Good

4.1.2. Metric (DSI.OE.02): Systems integrated with NDL

This metric reflects the share of systems fully integrated with the National Data Lake (NDL), based on requests from the NDL team. Integration counts only if all requirements (e.g., currency of data and adherence to the integration method) are met, ensuring the data is usable and reliable.

What do you mean by “systems integrated with NDL”?

This metric will calculate the percentage of systems integrated with NDL against the total number of systems requested by the NDL team at the beginning of the data integration project. Note that a system will be considered integrated only if it adheres to the following three conditions:

- Entity and NDL are connected and a staging database at the entity side is made accessible to NDL through a secure connectivity.
- The integration method shared by the NDL team is completely followed and an email confirming adherence to the method is sent by the entity to the NDL team.
- The database tables, which are part of the integration, are refreshed or updated regularly on a defined schedule.

Ensuring compliance with the above-mentioned conditions is the responsibility of the entity. SDAIA is not required to inform the entities if any evidence of non-compliance is discovered.

It is important to emphasize that the entities will be assessed on any system under their ownership, irrespective of whether these systems are developed and/or operated internally or by another government entity or a system integrator/partner.

Please show an example of how the metric is calculated.

The following example illustrates the method for calculating the metric. Suppose that the NDL team has requested five systems to integrate with and that the integration status of these systems is as follows:

System	Integration Implemented?	Following Integration Method?	Data Updated Regularly?
System 1	Yes	Yes	Yes
System 2	Yes	No	Yes
System 3	Yes	Yes	No
System 4	Yes	Yes	Yes
System 5	No	No	No

Based on the integration status above, only System 1 and System 4 are considered integrated and hence the metric score is calculated as follows:

$$\text{Score} = (\text{Fully Integrated Systems} / \text{Total Number of Systems}) * 100 = 2/5 * 100 = 40\%$$

Scale Interval = Unacceptable

When will the “Integration Implemented?” column be marked as “Yes”?

The system integration process spans over interconnected and dependent activities expected from the entity and the NDL team. In order to mark the column as “Yes”, the entity and NDL’s activities

must be completed successfully and error free prior to the end of the assessment round. As a first step, the entity must complete the integration solution from its side. Then, the NDL team will start completing the subsequent activities, which may take up to 30 working days. Once the NDL team completes its activities successfully, the system can now be marked as “Yes” in the “Integration Implemented?” column.

When will the “Following Integration Method?” column be marked as “Yes”?

It is marked as “Yes” only if the entity fully adheres to the integration method (provided by the NDL team at the integration project’s outset) upon implementing the integration solution from their side, and an email confirming the adherence is sent by the entity to the NDL team.

When will the “Data Updated Regularly?” column be marked as “Yes”?

It is marked as “Yes” only if the data in the entity’s staging database are updated in line with the agreed-upon update frequency. Note that if the update frequencies for certain tables have not been communicated or agreed upon, a default frequency (which is 2 days) will be assumed and applied for the metric evaluation.

Note that a monitoring tool (developed by the NDL team) automatically checks the update activities and validates them against the specified frequencies. Although, support is provided to entities by the NDL team through periodic reports on the data currency by the NDL, the entities remain fully responsible for ensuring timely updates to their data.

Note that if a system is decommissioned from the entity’s side and its data is no longer updated in the staging data, the period starting from when the updates stopped till the replacement/new system is fully integrated into the NDL will be considered as a stale period. Hence, it is important for the entities to ensure that replacement systems are integrated into NDL before their old versions are decommissioned to ensure that data updates are continuous.

4.2. Open Data (OD)

4.2.1. Metric (OD.OE.01): Datasets published in ODP

This metric measures the percentage of required datasets fully published by the entity on the Open Data Platform (ODP). A dataset is only counted if it has been uploaded to ODP and approved by the platform team for publishing.

What do you mean by “total number of published datasets”?

It is the number of the new datasets that have been uploaded to ODP by the entity and have received approval from the ODP team during the assessment round. Note that the refresh or update of existing datasets will not be considered as new datasets and hence will not be part of the calculation of this metric.

What do you mean by “total number of datasets required to be published in ODP by the entity”?

This refers to the number of open datasets the entity is expected to publish during the assessment period. This target is set in coordination with SDAIA and the entity, based on the nature of the entity's data, and it will serve as the basis for the metric evaluation.

Please show an example of how the metric is calculated.

Given that the assessment period of the third OE round is from January 1, 2026, until December 31, 2026, and assuming the following:

- The number of required datasets for the year 2026 is 25
- The entity has published 21 datasets in the same year

Then, the score is calculated as follows:

$$\text{Score} = (21/25) * 100 = 84\%$$

Scale Interval = Good

4.2.5. Metric (OD.OE.05): Response effectiveness to new open dataset requests

This metric measures the time taken by the entity to respond to new open dataset requests on the Open Data Platform (ODP). A request is considered processed only when the dataset is either published or formally rejected with clear justification.

How is the time taken by the entity to process a request calculated?

Each request received by the entity through the Open Data Platform (ODP) must be processed as per the defined expected processing time (Service Level Agreement (SLA)) approved by NDMO, which is as follows:

- Once the entity receives a request, it should either initially accept it or reject it and categorize it (if initially accepted) as “Easy”, “Medium”, or “Complex” within 3 days.
- Initially accepted requests should then be processed (by publishing the requested dataset on ODP) within 4 days for easy requests, 8 days for medium requests, and 12 days for complex requests.

The metric then calculates the average response effectiveness by measuring the time taken by the entity to process each request—by approval or rejection—against the approved SLA.

Please show an example of how the metric is calculated.

Suppose the entity has received nine requests submitted during the assessment period.

The first two requests fall under the “New” category (which indicates that the entity has not taken any action on them). The first one was rejected after 4 days, whereas the second one was rejected after 2 days. The remaining six (Requests 3 – 9) were initially accepted by the entity and then processed based on their complexity levels as follows:

Request ID	Complexity Level	Duration (Time to process the request)
Request 3	Easy	5
Request 4	Easy	6
Request 5	Easy	4
Request 6	Easy	7
Request 7	Medium	10
Request 8	Medium	9
Request 9	Complex	16

The response effectiveness of a request is calculated as follows = $(1 - ((\text{Time taken by the entity to process the request} - \text{SLA}) / \text{SLA})) * 100$. The table below shows the response effectiveness for all requests.

Request ID	SLA	Duration (Time to process the request)	Response Effectiveness
Request 1	3	4	66.66

Request 2	3	2	133.33
Request 3	7	5	128.57
Request 4	7	6	114.28
Request 5	7	4	142.85
Request 6	7	7	100.00
Request 7	11	10	109.09
Request 8	11	9	118.18
Request 9	15	16	93.33

The metric score is calculated as the average effectiveness for all the requests, which is equal to = 111.81

Scale Interval = Leader

Note that since each entity is expected to receive a high number of requests, the details of this metric in the final report will be shown as follows:

Category	SLA	Number of Requests	Average Duration (Time to process the request)	Average Response Effectiveness
New	3	2	3	100
Easy	7	4	5.5	121.43
Medium	11	2	9.5	113.64
Complex	15	1	16	93.33

The final metric score is then calculated as follows = $((2 * 100) + (4 * 121.43) + (2 * 113.64) + (1 * 93.33)) / 9 = 111.81$

Scale Interval = Leader

4.3. Data Catalog and Metadata (MCM)

4.3.1. Metric (MCM.OE.01): Systems cataloged in NDC

This metric measures the percentage of critical systems cataloged by the entity in the National Data Catalog (NDC). A system is only counted when its technical metadata is fully scanned and uploaded.

What do you mean by “critical system”?

A critical system is a type of application that is essential to operate a business function effectively. A critical system holds the following characteristics:

- It is involved in frequently used high-level reporting and summaries for managers and executives of the entity.
- Its data is considered essential for running a business and making decisions by those responsible for managing the core business functions of the entity.
- It contains high potential value and outcomes for government, industry, or the community.

What systems must be cataloged in NDC?

Each entity is required to catalog all of its critical systems that fall under its ownership, irrespective of whether these systems are developed and/or operated internally or by another government entity or a system integrator/partner.

When is a system considered cataloged?

A system is considered cataloged if it is added in NDC under the system facet along with its sub-systems, and all its technical metadata is uploaded in NDC.

Please show an example of how the metric is calculated?

Suppose that the critical systems that the entity is required to catalog are added in the NDC as shown in the table below.

#	System	Parent System
1	System A	-
2	System B	-
3	System B.1	System B
4	System B.2	
5	System B.3	
6	System B.4	
7	System C	-

Since System B is a system that has sub-systems, the technical metadata is required to be provided for the following six systems only: (System A, System B.1, System B.2, System B.3, System B.4, and

System C) are counted. However, suppose the technical metadata of System C cannot be extracted from its own databases due to technical difficulties.

System	Technical Metadata Provided?
System A	Yes
System B.1	Yes
System B.2	No
System B.3	Yes
System B.4	Yes
System C	N/A

Based on the status above, the metric score is calculated as follows:

$$\text{Score} = (\text{Number of Systems Cataloged} / \text{Number of Systems Required to be Cataloged}) * 100 = 4/5 * 100 = 80\%$$

Scale Interval = Fair

How will the calculation be performed for this metric?

The calculation of this metric (and all metrics under the MCM domain) will be performed based on the metadata items that the entity has published in the NDC prior to the end of the assessment period. Note that any item will not be considered complete unless it is fully uploaded to NDC and approved by the NDC team. Note also that any metadata items (except for the technical metadata files) submitted through emails or in the form of letters will not be entertained and included in the calculation of the metric.

What should entities consider when planning to discontinue/decommission a system existing in the NDC?

If entities plan to discontinue a system currently existing in NDC, they must communicate with the NDC team via the designated workflow to request the decommissioning of that system. Otherwise, the system will remain subject to the assessment.

4.3.2. Metric (MCM.OE.02): Business attributes defined and linked in NDC

This metric measures the percentage of required business attributes that are defined in the National Data Catalog (NDC).

What do you mean by “technical column”?

A technical column is a type of metadata that describes the technical properties of a database's physical column, such as the data type, field length, content profiling, and lineage. The following table provides examples of a technical column.

Physical Column Name	Datatype	Storage (Bytes)	Format	Constraint
Dt_of_birth	DATE	1	YYYY-MM-DD	NOT NULL
Blood_grp_cd	TINYINT	4	NONE	> 0

What do you mean by “business attribute”?

Business attribute is a type of metadata that describes the meaning of a physical column by providing a context with respect to the business function. Business attributes help users find and understand data, as well as govern and manage it effectively. The following table provides examples of a business attribute.

Physical Column Name	Attribute Name	Attribute Definition	Business Constraint
Dt_of_birth	Date of Birth	The date on which the person was born	- It must be less than the current date - It cannot have a future date
Blood_grp_cd	Blood Group Code	The numerical code assigned to the blood group	Codes must be from the defined list of blood groups

What is the way to determine the “total number of business attributes”?

The number of business attributes required for a system should be at least 10% of the number of technical columns of that system. For next years, this percentage may change due to the scale and complexity of the systems.

Please show an example of how the metric is calculated.

The following example illustrates the method for calculating this metric.

System	Number of Technical Columns	Number of Required Business Attributes	Number of Defined Business Attributes
System 1	270	27	21

System 2	1080	108	92
System 3	360	36	29

The completion percentage of System 1 is calculated as follows = Number of Defined Business Attributes / Number of Required Business Attributes * 100 = 21 / 27 * 100 = 77%

Similarly, the completion percentage of System 2 and System 3 are 85% and 80% respectively. Hence, the overall score of the metric is calculated as the average completion percentage of the three systems as follows:

$$\text{Score} = (77\% + 85\% + 80\%) / 3 = 80.6\%$$

Scale Interval = Good

Note that if a system has business attributes in NDC but does not have technical columns uploaded, the number of technical columns is estimated to be the average technical column counts from all entity systems. This estimation is used solely for calculating the expected number of business attributes.

What is the meaning of “linked in NDC”?

It means that a business attribute in NDC must be linked with a unique technical column of the system uploaded to NDC to define a relationship between the business attribute and the technical column. The following example shows the linking of a business attribute with a technical column.

Business Attribute	Physical Column
Date of Birth	Dt_of_birth
Blood Group Code	Blood_grp_cd

Note that entities are not required to link the business attributes with technical columns for the third round of the assessment.

How will the calculation be performed for this metric?

The calculation of this metric (and all metrics under the MCM domain) will be performed based on the metadata items that the entity has published in the NDC prior to the end of the assessment period. Note that any item will not be considered complete unless it is fully uploaded to NDC and approved by the NDC team. Note also that any metadata items (except for the technical metadata files) submitted through emails or in the form of letters will not be entertained and included in the calculation of the metric.

4.3.3. Metric (MCM.OE.03): Reporting assets defined in NDC

This metric measures the percentage of required reporting assets (KPIs/metrics) documented by the entity in the National Data Catalog (NDC). Assets are only counted if they are fully defined and accessible from NDC.

What do you mean by “reporting assets”?

Reporting assets (Key Performance Indicators (KPIs) or metrics) are forms of data that are organized using various facts, indicators, and measures used for business decision-making. They are related to the core functions of the entity. Note that any operational performance KPIs and metrics related to internal processes/functions of the entity will not be considered in this metric calculation.

What is “the total number of reporting assets required to be published by the entity”?

The total number of reporting assets (KPIs/metrics) required from each entity should be at least three times the number of systems that are required to be cataloged. For the reporting assets to be considered complete, the associated measures must be uploaded to NDC and approved by the NDC team.

Note that the number of required reporting assets will increase in the subsequent rounds to capture more reporting assets.

Please show an example of how the number of systems that are required to be cataloged is counted.

Suppose that the critical systems that the entity is required to catalog are added in the NDC as shown in the table below.

#	System	Parent System
1	System A	-
2	System B	-
3	System B.1	System B
4	System B.2	
5	System B.3	
6	System B.4	
7	System C	-

Since System B is a system that has sub-systems, only these systems (System A, System B.1, System B.2, System B.3, System B.4, System C), and hence the number of systems that are required to be cataloged is six.

Please show an example of how the metric is calculated.

Suppose that the critical systems that the entity is required to catalog are added in the NDC, as shown in the table above in the previous question, and that the entity has defined 14 KPIs on NDC.

The metric score will be calculated as follows = $14 / (6 * 3) * 100 = 78\%$

Scale Interval = Fair

How will the calculation be performed for this metric?

The calculation of this metric (and all metrics under the MCM domain) will be performed based on the metadata items that the entity has published in the NDC prior to the end of the assessment period. Note that any item will not be considered complete unless it is fully uploaded to NDC and approved by the NDC team. Note also that any metadata items (except for the technical metadata files) submitted through emails or in the form of letters will not be entertained and included in the calculation of the metric.

4.4. Reference and Master Data Management (RMD)**4.4.1. Metric (RMD.OE.01): Publishing reference entities**

This metric measures the percentage of standardized reference entities (tables) published by the entity on the Reference Data Platform (RDP). A table is only counted if it is fully onboarded into the RDP and adheres to the data standards.

What is the “total number of reference tables that are expected to be published by the entity”?

The entity should contact the RDP team to initiate collaboration on identifying the reference tables required to be published on RDP. The entity is responsible for the standardization, classification, data completeness, and accuracy of these reference tables, as well as uploading and maintaining them within RDP.

Please show an example of how the metric is calculated.

Suppose that the number of reference tables that the entity is required to publish on RDP is 10, and that the entity has added only four tables prior to the end of the assessment period, then the score is calculated as follows:

Score = Number of reference tables added in RDP during the assessment period / Total number of reference tables required to be added during the assessment period * 100 = $4 / 10 * 100 = 40\%$

Scale Interval = Unacceptable

4.5. Data Quality (DQ)

4.5.2. Metric (DQ.OE.02): Conformance to data standards in NDL

This metric calculates the conformance of the entity's data integrated into the National Data Lake (NDL) to the data standards published on the National Data Catalog (NDC). Only a sample of the entity's attributes are analyzed and assessed to calculate the metric score.

What are the data quality rules that will be applied on the entity's data?

This metric evaluates the conformity of an entity's data stored in NDL against the data standards published in NDC by examining a sample of the attributes (Critical Data Elements (CDEs)) stored in the NDL. These standards are published in NDC in the Glossary facet filtered by "type" = " National Standard". The standards are:

Domain Code in NDC	Domain Name
2295	National Identifier
2303	Date and Time
2308	GeoLocation
2311	Measures
2313	Person Name
2305	Email Address
2312	Monetary Value
13996	Uniform Resource Locator

Note that this metric is independent of the stages and milestones of the NDL integration project. That is, the evaluation is not conducted on the entity's data prior to finalizing the project. Instead, it is performed as a post-step to measure the conformance of the entity's data to the National Standards published in the NDC.

Please show an example of how the metric is calculated.

For each of the entity's integrated systems, a sample of CDEs falling under domains such as Date, National ID numbers, and Email is checked against the predefined rules from the corresponding National Standards in the NDC. Each CDE's conformance score is measured across all records of the

data table. For example, suppose that the CDE is a date attribute that exists in a table that has 800 records. Now suppose that there are 200 nulls values in this attribute, and that 450 values conform to the data standard whereas the remaining 150 do not. The score for this attribute is then calculated as follows:

$$\text{Score} = \text{Number of clean values} / (\text{Total number of values} - \text{Number of null values}) = 450 / (800 - 200) = 75\%$$

Using the same method, the system conformance score is calculated as the average score for all its CDEs. Now suppose that the entity has three integrated systems, and the number of sample CDEs and conformance score for each system are as shown in the table below:

System	Number of CDEs	Conformance Score
System 1	12	33.33
System 2	19	63.16
System 3	29	39.35

The entity's overall compliance score is then calculated as the average of these scores:

$$\text{Score} = (33.33\% + 63.16\% + 39.35\%) / 3 = 45.28\%$$

Scale interval = Unacceptable

4.6. Data Operations (DO)

4.6.2 Metric (DO.OE.02): Responsiveness of GSB API calls

This metric measures the responsiveness of the entity's APIs published on the GSB by calculating the percentage of failed calls compared to the total API calls.

What is considered a "failed API call"?

Any API call that receives an error type/code from the list below will be classified as a failed API call caused by the service provider.

- Failed to establish backend connection.
- General system error.
- Internal error occurred.

- General error.
- Internal system error.
- Providers reply schema validation failure.
- Database error.
- Provider certificate failed in validation.

Please note that any issues or error codes arising from the client-side or the GSB platform itself will not be considered in this metric calculation, as they are not classified as failures attributable to the service provider. Additionally, all previous errors remain visible from the provider entity's side, with the following exceptions:

- Failed to establish backend connection.
This error occurs when the network connection to the service provider is interrupted or a security certificate issue.
- Provider reply schema validation failure.
This error occurs when the response from the provider does not match the agreed-upon structure or format.

It is important to note that the provider entity is responsible for monitoring the performance of its service or API and addressing any errors or issues promptly.

What is the process of decommissioning a published API on GSB?

Should a service or API be decommissioned, the provider entity must contact and notify the designated account manager at SDAIA to take appropriate action. Failed API calls will continue to be counted until the decommission request is officially processed, changes are implemented, and a formal confirmation is sent to the entity by SDAIA.

How is the metric calculated for decommissioned APIs?

The metric calculation will cover the period from the beginning of the assessment period until the API is officially decommissioned. For instance, if an entity requests API decommissioning and SDAIA sends the official confirmation on August 10, 2026, the calculation for this API will be performed from January 1, 2026, to August 9, 2026.

Please show an example of how the metric is calculated.

Suppose that the entity has five APIs published on GSB and that the number of calls and the number of failed calls on these APIs are as follows:

API	Version	Number of Calls on the API	Number of Failed Calls of the API	% of Successful Calls
API 1	1.0	100	3	97%
API 2	1.0	80	5	93.7%
API 3	1.0	150	6	96%
API 4	1.0	200	7	96.5%
API 4	2.0	30	7	76.6%

Based on the status above, the metric score is calculated as follows:

The successful percentage of API 1 is calculated as follows = (Total number of API calls – Number of API calls failed due to operational issues from the entity) / Total number of API calls * 100 = 97 / 100 * 100 = 97%.

Similarly, the successful percentage of API 2, API 3, API 4 v1.0, and API 4 v2.0 is 93.7%, 96%, 96.5%, and 97.7% respectively. Hence, the overall score of the metric is calculated as the average successful percentages of the five API versions as follows: Score = (97% + 93.7% + 96% + 96.5% + 76.66%) / 5 = 91.96%

Scale Interval = Unacceptable.

4.6.3 Metric (DO.OE.03): Responsiveness of the integration solution with NDL

This metric measures the percentage of failed data pipeline executions between the entity and the National Data Lake (NDL), caused by operational issues from the entity. Only executions with confirmed entity-side failures are counted.

What do you mean by “operational issues”?

Data tables from source systems are fetched on regular intervals. Each time a data acquisition job executes on the defined schedule, it is termed as an execution cycle.

If an execution cycle is triggered and the job is failed, the NDL operations team tries it multiple times to complete the data acquisition. In case two or more errors occur due to an issue from the entity side in that cycle, it is considered as an operational issue. It is important to note that multiple failures in an execution cycle are counted as only one issue.

For example, suppose that the data acquisition job is scheduled for a daily run, and it fails to connect with the entity’s staging database designated for NDL due to database unavailability. The NDL operations team will re-run it again and in case the job fails to complete successfully two or more

times in the same day, it will be classified as an operational issue and counted as one failure for that execution cycle.

Note that a maximum of one operational issue will be counted per table per day. This metric considers only the issues arising from the entity side only (e.g., database unavailability, altering the data types or column names, missing tables).

Please show an example of how the metric is calculated.

Suppose that the entity has prepared a staging database for NDL containing data from two systems: System 1 and System 2. Suppose that System 1 has two tables, and that the data acquisition jobs are scheduled on a daily basis for these two tables. Below is an example of the execution status for the tables for one month.

Table	Day	Total Execution Tries	Failed Execution Tries	Final Status	Operational Issues Count
Table 1	Day 1	3	3	Failed	1
Table 1	Day 2	2	1	Successful	0
Table 1	Day 3	3	2	Failed	1
Table 1	Day 4 – Day 29	26	0	Successful	0
Table 1	Day 30	3	3	Failed	1
Table 2	Day 1	2	1	Successful	0
Table 2	Day 2	2	1	Successful	0
Table 2	Day 3 - Day 30	28	0	Successful	0

Successful Percentage for System 1 = (Total number of data pipeline executions with the entity - number of failed pipeline executions caused by operational issues from the entity) / total number of data pipeline executions with the entity * 100 = 57 / 60 * 100 = 95%. Now, suppose that the successful percentage of System 2 is 93.7%.

Finally, the entity's total result is calculated by measuring the number of failed pipeline executions for both systems integrated with NDL caused by operational issues from the entity, as follows:

System	Number of Pipeline Executions	Number of Failed Pipeline Executions	% of Successful Executions
System 1	60	3	95%
System 2	80	5	93.7%

Hence, the overall score of the metric is calculated as the average successful percentages of the two systems as follows: $\text{Score} = (95\% + 93.7\%) / 2 = 94.35\%$

Scale Interval = Low.

