Evaluation of the formal quality of data/service documentation

Report by Task 3.2: European NAPs data quality

Status: draft

Version: 0.7.1

Date: 21 October 2024

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Document information

Project acronym	NAPCORE
Full project title	National Access Point Coordination Organisation for Europe
Grant Agreement No.	MOVE/B4/SUB/2020-123/SI2.852232
Activity no. and title	WG 3 NAP content and accessibility
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Related to Milestone no.	M3.8
External Milestone	no

Document history

Version	Date	created/ modified by	Comments
0.2	06.04.2022	Petr Bureš (CZ/TTR)	The initial version of the project InQMS Machine translated
0.3	27.04.2022	Petr Bureš (CZ/TTR)	Initial Revision of the text for the project NAPCORE and comment resolution
0.4	12.05.2022	Petr Bureš (CZ/TTR)	Revision based on received comments
0.5	16.02.2024	Petr Bureš (CZ/TTR)	Further revisions and additions to the document.
0.6	24.6.2024	Petr Bureš (CZ/TTR)	dataset type list added, introduction list, and reference to the CMC to the evaluation form, reflecting this methodology change here. Few textual changes.
0.7	2.10.2024	Petr Bureš (CZ/TTR)	Conversion to the NAPCORE template.
0.7.1	21.10.2024	Petr Bureš, Chrysostomos Mylonas	few additions of evaluation details after the methodology trial of 39 data sets.

Action Requested

☒ To be revised by partners involved in the preparation of the document

☐ For review/ approval by the Core Alignment Team

☐ For approval by the NAPCORE Steering Committee

Abstract

This deliverable by NAPCORE subWG 3.2 introduces the first cross-domain quality (CDQ) assessment method from the basic framework for evaluating the CDQ of datasets and services published at National Access Points (NAPs). This method focuses on evaluating the quality of service/data documentation during the planning phase, based on metadata provided by the content provider to the NAP, including any additional materials such as documentation, samples, and schemas. The evaluation is performed manually before the actual data is retrieved and aims to assess the formal quality of the documentation. This document is complemented by an MS Excel template where the evaluation results are recorded and the overall quality score is calculated

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Abbreviations

Abbreviation	Meaning
CDQ	Cross-Domain Quality
EC	European Commission
InQMS	Integrated Quality Management System
NAP	National Access Point
NAPCORE	National Access Point Coordination Organisation for Europe
QF	Quality Framework
WG	Working Group
GUID	Globally Unique Identifier
URI	Uniform Resource Identifier
URL	Uniform Resource Locator
GML	Geographical Markup Language

Definitions

Catalogue record

Data portal

Data set

Service

….

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4.3 [PRODUCTION] Evaluation during data collection ..... **Chyba! Záložka není definována.**

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1 Introduction

The purpose of this evaluation [web/manual/doc/formal] is to **manually** check **how well the data is described (metadata)**. Better and more complete descriptions allow content providers to navigate the many datasets available on the NAP more easily and provide a basis for deciding if the data is useful to a content consumer, fits their expectations, and aids in the technical and organizational preparation of the subscription.

This is evaluation, assessing the availability, completeness and usability of the information that should be available at NAP (metadata) for the data/service under test, including:

- Identification and a brief description of the content (data/service)
- Identification of the content provider and owner
- Description of the main concepts, structure, and content
- Samples and validation schemas
- Technical and organizational details, licensing, and subscription description

During the assessment, all the above information is collected for use in further/subsequent evaluations of the data/service via the CDQ. The parameters assessed in this evaluation are derived from metadata defined by the Coordinated Metadata Catalogue [1], findings of the InQMS[1] project [2], the NAPCORE project [3], and quality recommendations by W3C and open data portals [6].

This evaluation mostly focuses on a parameter being present or not and in the expected format. However, there are cases where this is not enough. In such cases, based mainly on finding other that CMC, the evaluator directly assesses the degree of compliance of the parameter with the expected level of detail.

Topics from the mobilityDCAT-AP specification [4] and MQA methodology [5] are not considered, as we believe they are largely consistent. We plan to introduce an addition to this methodology covering these topics.

In the methodology, most parameters have predefined values (defined in [1]). Free text descriptions must be kept short, with longer and more complex descriptions linked to external files.

1 https://inqms.tamtamresearch.com/

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2 Methodology

The following table outlines the **formal quality evaluation** procedure

Table 1 Formal quality evaluation procedure

Item	Description
Evaluation type, evidence collection	**Manual**. All evidence required for the test is manually collected by the evaluator from the documentation supplied by the provider or retrieved via NAP and **filled into** the prescribed template (form).
Evaluation frequency	**Once**. At the beginning of the source evaluation (1x).
Proposed storage	ALL collected evidence is stored along with the filled-in form.
Evaluation method	Manual assessment of all parameters against the evaluation criteria, e.g., allowed/recommended values, set up in this document or the additional documentation (Coordinated Metadata Catalogue [1], CMC).
Presentation method	A report where for each item there is information about meeting the criterion, not meeting it, or a warning about a possible error.

2.1 Inputs

The inputs include all documents that the evaluator can retrieve about the dataset or service under test from the NAP. These inputs **should be** provided in a form compliant or interoperable with the CMC 2019 [1], either directly as part of easily identifiable metadata or indirectly as extrapolated information from the available documentation.

Example of input:

The evaluator is given a link to the data source at NAP (e.g., https://registr.dopravniinfo.cz/en/sources/cz-ndic_d2-fcd-v2/) and retrieves and stores every page and linked documents for manual inspection.

2.2 Outputs

The evaluation outputs include the filled-in form (Report) and collected documentation.

2.2.1 Report (Evaluation Form)

The evaluator fills in the “data and evaluation” sheet for the report (MS Excel).

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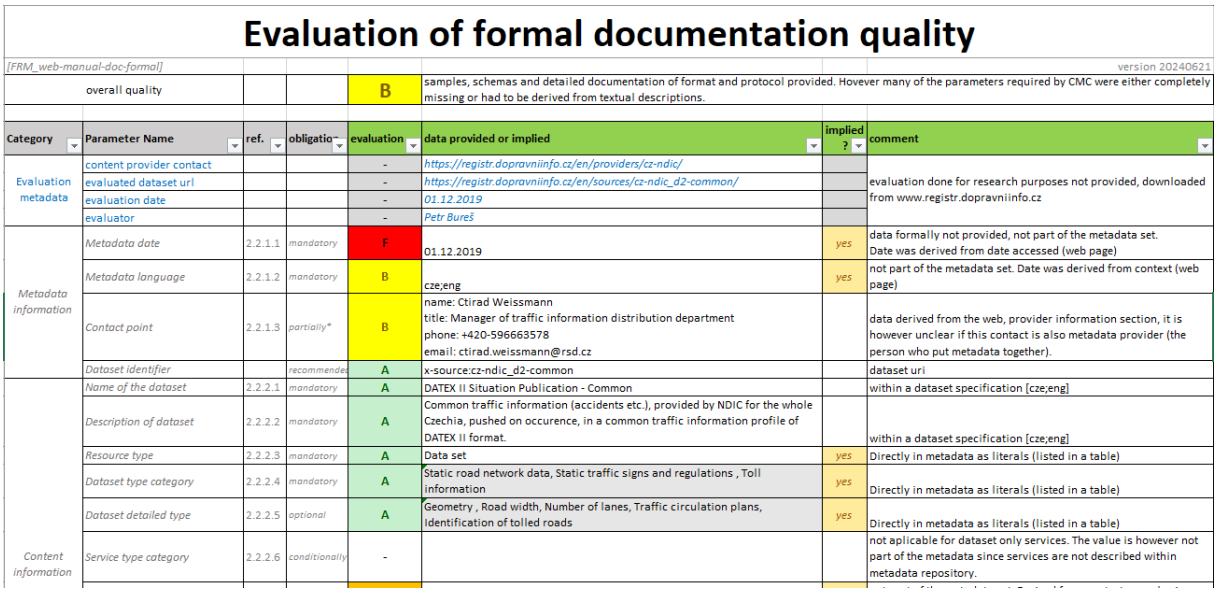

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[FRM_web-manual-doc-formal] version 20240621

overall quality			B	samples, schemas and detailed documentation of format and protocol provided. Hovever many of the parameters required by CMC were either completely missing or had to be derived from textual descriptions.	

Category	Parameter Name	ref.	obligatio~	evaluation	data provided or implied	implied ?	comment
Evaluation metadata	content provider contact			-	https://registr.dopravniinfo.cz/en/providers/cz-ndic/		
	evaluated dataset url			-	https://registr.dopravniinfo.cz/en/sources/cz-ndic_d2-common/		evaluation done for research purposes not provided, downloaded from www.registr.dopravniinfo.cz
	evaluation date			-	01.12.2019		
	evaluator			-	Petr Bureš		
Metadata information	Metadata date	2.2.1.1	mandatory	F	01.12.2019	yes	data formally not provided, not part of the metadata set. Date was derived from date accessed (web page)
	Metadata language	2.2.1.2	mandatory	B	cze;eng	yes	not part of the metadata set. Date was derived from context (web page)
	Contact point	2.2.1.3	partially*	B	name: Ctirad Weissmann title: Manager of traffic information distribution department phone: +420-596663578 email: ctirad.weissmann@rsd.cz		data derived from the web, provider information section, it is however unclear if this contact is also metadata provider (the person who put metadata together).
	Dataset identifier		recommende	A	x-source:cz-ndic_d2-common		dataset uri
Content information	Name of the dataset	2.2.2.1	mandatory	A	DATEX II Situation Publication - Common		within a dataset specification [cze;eng]
	Description of dataset	2.2.2.2	mandatory	A	Common traffic information (accidents etc.), provided by NDIC for the whole Czechia, pushed on occurence, in a common traffic information profile of DATEX II format.		within a dataset specification [cze;eng]
	Resource type	2.2.2.3	mandatory	A	Data set	yes	Directly in metadata as literals (listed in a table)
	Dataset type category	2.2.2.4	mandatory	A	Static road network data, Static traffic signs and regulations , Toll information	yes	Directly in metadata as literals (listed in a table)
	Dataset detailed type	2.2.2.5	optional	A	Geometry , Road width, Number of lanes, Traffic circulation plans, Identification of tolled roads	yes	Directly in metadata as literals (listed in a table)
	Service type category	2.2.2.6	conditionally	-			not aplicable for dataset only services. The value is however not part of the metadata since services are not described within metadata repository.

Figure 1 Screenshot of the evaluation sheet of the report

The data and evaluation sheet contains:

- Overall grade and comment
- Information about the evaluation itself (category: evaluation metadata)
- A section for each evaluated metadata category, with individual evaluated parameters:
  - **Parameter name:** Contains individual parameters to be evaluated
  - **Reference:** A reference to the section of the CMC 2019 [1]
  - **Obligation:** Information on whether the parameter is obligatory or not
  - **Evaluation:** A, B, C, F, and - grading (F = fail, – = not relevant)
  - **Data provided or implied:** Data from the supplied documentation to support the evaluation
  - **Implied?:** Indicates whether the parameter value is explicitly stated in the collected evidence or derived/extrapolated from the evidence
  - **Comment:** Evaluator's comment (on which the grade is based)

2.2.2 Collected Evidence

The collected evidence includes:

- Textual (Word, PDF) materials describing the data/service, its format, and its protocol
- Textual (Word, PDF) materials describing how to obtain the data, including licensing terms if needed
- Technical materials in the form of samples, schemas, and descriptions of WSDL services
- Other relevant materials

2.3 Filling in Individual Parameters

The evaluator fills in information from the provided documentation parameters into the data and evaluation sheet of the evaluation form [01 FRM_web-manual-doc-form.xls], either

- Directly or
- Indirectly (by extrapolation from implied information)

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2.3.1 Directly stated metadata

If the information is:

- explicitly stated in the collected evidence (see Figure 2) **AND**
- in the expected format,

the evaluator **directly fills in the parameter** (into the "data" column).

Example: The expected parameter "category" with predefined values (Road work; Unexpected road events and conditions; Real-time traffic data) is found in the metadata on the NAP.

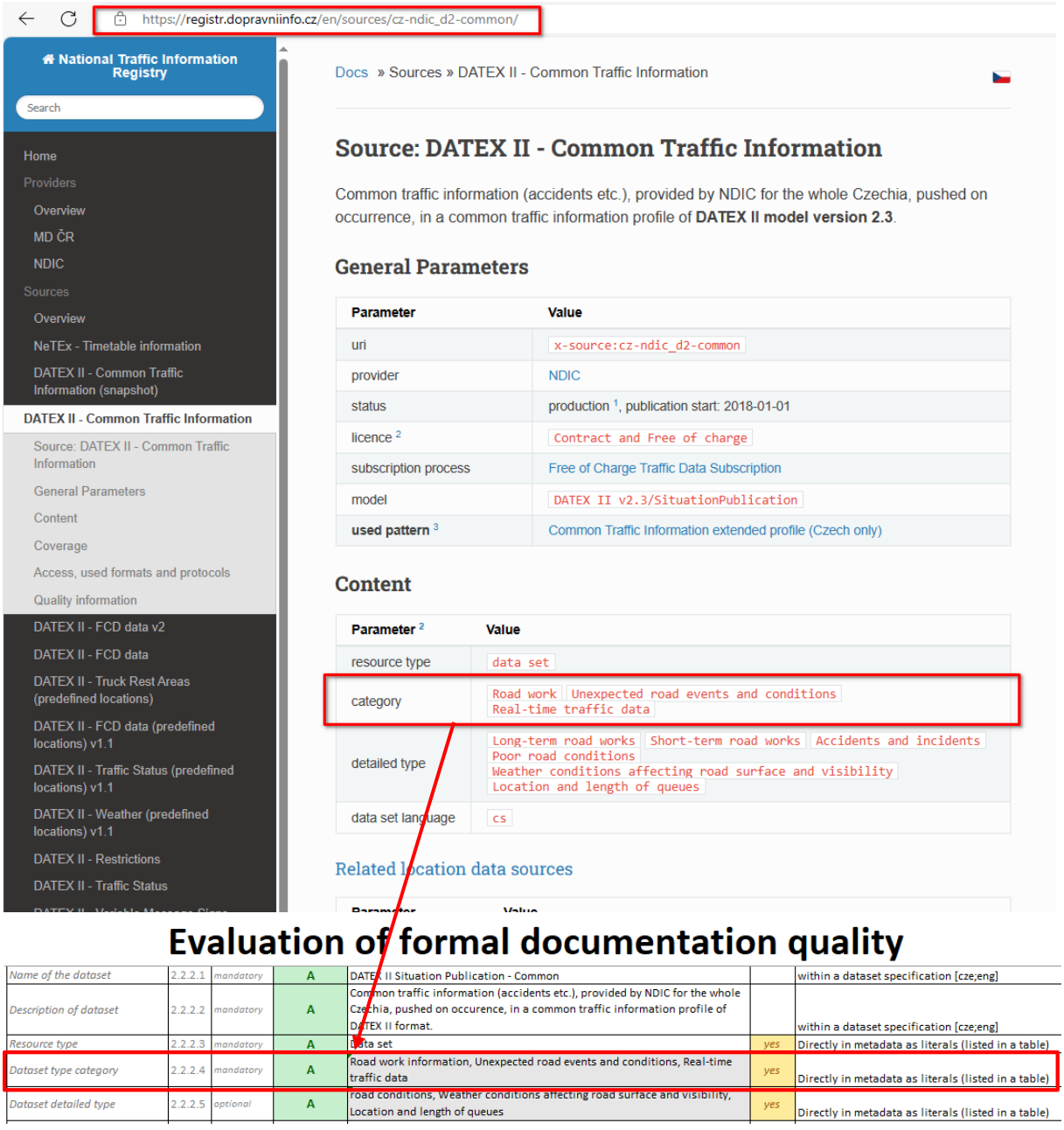

Figure 2 Fill in the parameter "category" explicitly stated in the collected evidence in the evaluation form.

2.3.2 Indirectly stated metadata

If the information is:

- **NOT** explicitly stated in the collected evidence **AND/OR**

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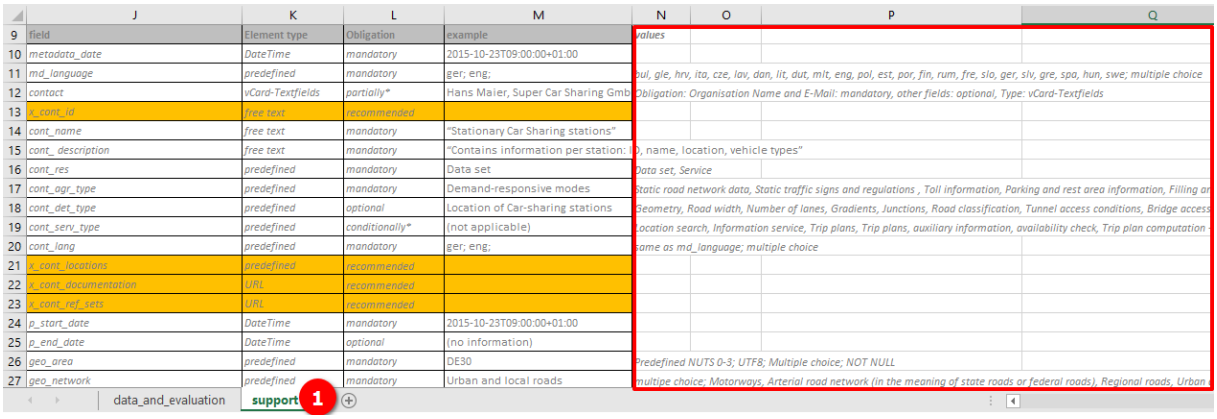
- **NOT** having expected values of the parameter according to expectation (expected values are stated in the list supporting data (see Figure 3)) **BUT**
- **COULD** be extracted from, e.g., a textual description of the dataset, provided documentation of the dataset, sample, etc.,

the evaluator **fills in the expected value of the parameter** (into the "data" column), checks the column implied with "yes" and fills in the note any additional information.

The grade is based on the ease of the extrapolation of the parameter, see the next chapter.



	J	K	L	M	N	O	P	Q
9	field	Element type	Obligation	example	values			
10	metadata_date	DateTime	mandatory	2015-10-23T09:00:00+01:00				
11	md_language	predefined	mandatory	ger; eng;	bul, gle, hrv, ita, cze, lav, dan, lit, dut, mlt, eng, pol, est, por, fin, rum, fre, slo, ger, slv, gre, spa, hun, swe; multiple choice			
12	contact	vCard-Textfields	partially*	Hans Maier, Super Car Sharing GmbH	Obligation: Organisation Name and E-Mail: mandatory, other fields: optional, Type: vCard-Textfields			
13	x_cont_id	free text	recommended					
14	cont_name	free text	mandatory	"Stationary Car Sharing stations"				
15	cont_ description	free text	mandatory	"Contains information per station:	), name, location, vehicle types"			
16	cont_res	predefined	mandatory	Data set	Data set, Service			
17	cont_agr_type	predefined	mandatory	Demand-responsive modes	Static road network data, Static traffic signs and regulations , Toll information, Parking and rest area information, Filling a			
18	cont_det_type	predefined	optional	Location of Car-sharing stations	Geometry, Road width, Number of lanes, Gradients, Junctions, Road classification, Tunnel access conditions, Bridge access			
19	cont_serv_type	predefined	conditionally*	(not applicable)	Location search, Information service, Trip plans, Trip plans, auxiliary information, availability check, Trip plan computation			
20	cont_lang	predefined	mandatory	ger; eng;	same as md_language; multiple choice			
21	x_cont_locations	predefined	recommended					
22	x_cont_documentation	URL	recommended					
23	x_cont_ref_sets	URL	recommended					
24	p_start_date	DateTime	mandatory	2015-10-23T09:00:00+01:00				
25	p_end_date	DateTime	optional	(no information)				
26	geo_area	predefined	mandatory	DE30	Predefined NUTS 0-3; UTF8; Multiple choice; NOT NULL			
27	geo_network	predefined	mandatory	Urban and local roads	multipe choice; Motorways, Arterial road network (in the meaning of state roads or federal roads), Regional roads, Urban			

data_and_evaluation | support 1

Figure 3 Using the supporting data list in the evaluation form to correctly fill in the inspected metadata tab

2.4 Evaluation of Individual Parameters

After filling in the parameter value, the evaluator manually assesses the ease of finding the parameter by

- Providing **a mandatory evaluation** (A, B, C, F, or not relevant (-)) **AND**
- Providing a **mandatory comment** describing how and where the parameter was found, and any other useful information in the comment column in the evaluation list.

Comments next to each evaluated parameter generally describe how the parameter was found in the collected evidence or highlight important findings regarding the **incompleteness or non-relevance of the parameter**.

The evaluation grade focuses on the correctness of the metadata completion. It validates whether the parameter is present and if its value is from the expected set of possible values. The set of values in certain cases refer to quality of how the parameter is provided, especially because simple YES or NO does not describe the evaluator's objective experience. The "expected set of values" is then described more broadly, allowing the evaluator to reach the evaluation result in a consistent manner. The expected values and formats for each parameter are specified either in this document or in the Coordinated Metadata Catalogue [1]. Each parameter is assessed separately, with the resulting mark provided in Table 2.

Table 2 Parameter evaluation methodology (more detail provided in each parameter)

grade	Value	Description
A	1	Metadata is provided in the expected format with prescribed values as defined by the relevant standard (i.e., CMC). = Parameter value(s) in the metadata exactly as expected.
B	2	Metadata is provided as part of easily identifiable substructures. It does not have to be directly in the expected format (e.g., contact data in different forms, different wordings of the keywords), but it is semantically compatible.

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Table 2 Parameter evaluation methodology (more detail provided in each parameter)

grade	Value	Description
		= Parameter value(s) in the metadata, in a different form than expected but semantically compatible.
C	3	Metadata **is not** provided directly but is inferable from the collected evidence. It does not "fit" in terms of format and structure. = Parameter value(s) are not in the metadata, but findable elsewhere and semantically compatible.
F	4	Metadata **is not** provided and **cannot be** "easily" derived from the collected evidence (including samples and schemas provided). = Parameter value(s) are not found/filled in. Assumptions and guessing are needed to fill in the item, and correctness is not assured.
-	0	(Not relevant) The item is not evaluated because it makes no sense in the context.

Only a few parameters can be graded as "not relevant." This is because the metadata provider does not know the parameter, it is outside their area of responsibility, or it does not make sense, as it contradicts other parameters. Such parameters are not scored.

Individual parameters that could be set as not evaluated since conditional:

- Dataset type category
- Dataset detailed type
- Service type category
- Conditions for use
- Communication method
- National body assessment status
- Related linked data sources

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3 Evaluated Parameters

The tables in the subchapters below outline the individual parameters to be evaluated, along with their expected sample values and brief definitions, as referenced in CMC 2019 [1]. Most of these parameters and their values are derived from the Coordinated Metadata Catalogue (including Appendix 1 and Appendix 2).

All possible values for each parameter are listed in the respective parameter row on the evaluation form's "support" sheet (see Figure 3), without further explanation. Parameters highlighted in orange are not derived from CMC 2019 [1] but are based on other inputs to the methodology, including the InQMS project [4].

For clarity, if the parameters' textual content is available in multiple languages, provide it in English here. If English is not one of the options, translate the content to English and note in the comments that the parameter was not originally available in English.

Parameters are grouped into categories, presented below in individual subchapters.

3.1 Evaluation metadata

Information about the evaluation itself. This part is not evaluated.

Table 3 Evaluation metadata

Parameter	Example of a value	Definition, comments
evaluated catalogue record URL	https://data.gov.eu/dataset1	Link to the catalogue record of the data under the test, it is link to metadata at the NAP, (not data access URL).
evaluation date	18.5.2024	Date when the evaluation was completed. (ideally in standardised format)
evaluator	Jan Novak, jan@novak.cz	Name, surname, and email contact to the evaluator.
comment	This is a test	Any information about the evaluation (not about its result) that the evaluator wants to share with the content provider.

3.2 Metadata information

Information about the metadata includes its age, the provider, and the language(s) in which it is available.

Table 4 Metadata information

Parameter	Example of a value	Definition, comments
Metadata date	2023-10-23T09:00:00+01:00	The time when the metadata was created. Expected format DateTime; **ref. CMC 2.2.1.1** Could be part of the metadata or "last changed" information of the evaluated dataset URL (web page).

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Table 4 Metadata information

Parameter	Example of a value	Definition, comments
Metadata language	cs; en	Language in which the metadata is described. 2 code of metadata language. , multiple choice **ref. CMC 2.2.1.2** Could be multiple languages, either part of the metadata content or implied by having a language switch present and working on the webpage). The actual language used vs metadata indication is not evaluated, only noted in comments. In the comment provide info about other translations (language code, existence of the translation).
Contact point	Petr Bures, petr.bures@tamtamresearch.com,	The organization, or person, who is responsible for the creation and maintenance of the metadata. vCard-Textfields with the expected level of details (name, email, telephone, company, position, address) **ref. CMC 2.2.1.3** Could be part of the organization data or directly in the dataset description, could be contact info not in vCard format.
Data set identifier	x-source:en-ndic_d2-common; D834B1C7; 249ddb42-3b9a-44fc-b965-8e7dc8325fb2	The identifier that different from the URL that could be used to refer to the dataset. **Ref. NONE** Could be a URI or GUID, usually it is part of the URL specific to the data source.

3.3 Content information

The dataset information includes its name, short description, type, category, detailed category, language(s), location referencing, documentation, and referenced datasets.

Table 5 Content information

Parameter	Example of a value	Definition, comments
Name of the dataset	DATEX II Situation Publication - Common Traffic Information; Rest areas static information; etc	Very short dataset description. Free text. Mandatory. **ref. CMC 2.2.2.1** Part of the metadata and heading on the dataset-related webpage. If in more languages, give only English, but in the comment provide info about other translations (language code, is the translation ok?).
description of dataset (perex)	Common traffic information (accidents etc.), provided by NDIC for the whole Czechia, pushed on occurrence, in a common traffic information profile of DATEX II format.	Gives the user more information about the content of the dataset or service, a brief description. Free text. Mandatory **ref. CMC 2.2.2.2** Part of the metadata and short text just below the name of the dataset. If in more languages, give only English, but in the comment provide info about other translations (language code, is the translation ok?). Provide in comment how extensive and descriptive the description is.

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Table 5 Content information

Parameter	Example of a value	Definition, comments
Resource type	Data set	Classifies the resource of the publication, depending on if it is a "data set" or a "service" (referring to the ability of NAPs to allow discovery of services) `enumeration (data set; service)`. Mandatory. **ref. CMC 2.2.2.3** Either present in the metadata or could be inferred from the download URL of other filled metadata items that are not relevant to the dataset or service.
Dataset type category	Road work, Unexpected road events and conditions, Real-time traffic data	A description of a dataset type as a category is important for data seekers who are interested in a particular type of data. As per CMC only one category per dataset shall be selected. `enumeration (Static road network data; Static traffic signs and regulations; Toll information; Parking and rest area information; Filling and charging stations; Freight and logistics; Dynamic traffic signs and regulations; Road work; Unexpected road events and conditions; Real-time traffic data; General information for trip-planning; Public transport: location information; Public transport: operational information; Public transport: fare and purchase information; Cycle network data; Pedestrian network data; Demand-responsive modes)`. Mandatory. **ref. CMC 2.2.2.4, defined in a separate list "dataset_type"** If the resource type = "service" then this parameter is not relevant. Could be derived from name, description, and documentation if not present in metadata directly. *For evaluation "tick" in the sheet "dataset_type" relevant categories.*
Dataset detailed type	Long-term road works, Short-term road works, Accidents and incidents, Poor road conditions, Weather conditions affecting road surface and visibility, Location and length of queues	Describes the classification of the data set content on a detailed level. It is used to concretize the element "Dataset type category" enumeration (82 enumerations sorted into categories above). Mandatory. **ref. CMC 2.2.2.5, defined in a separate list "dataset_type"** If the resource type = "service" then this parameter is not relevant. Could be derived from name, description, and documentation if not present in metadata directly. If present, it shall fit the category listed above. *For evaluation "tick" in the list "dataset_type" relevant categories.*
Service type category	Location search, Information service, Trip plans	If the resource type is "service". Describes the classification of a service, following possible services listed in EU Delegated Regulation 2017/1926 `enumeration (Location search; Information service; Trip plans; Trip plans, auxiliary information, availability check; Trip plan computation - scheduled modes transport; Dynamic Passing times, trip plans and auxiliary information; Dynamic Information service; Dynamic availability check)`. Mandatory. **ref. CMC 2.2.2.6, defined in a separate list "dataset_type"**

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Table 5 Content information

Parameter	Example of a value	Definition, comments
		If the resource type = ”data set” then this parameter is not relevant. Could be derived from name, description, and documentation if not present in metadata directly.
Dataset language	cze	Describes the language of the dataset contents (free text fields, enumerations, etc.). 2 or 3-letter code of metadata language. (2-letter is preferred), multiple choice. Mandatory. **ref. CMC 2.2.2.7** Could be multiple languages, either stated in the metadata content or implied by having multiple languages present in a data sample (if provided). The actual language used vs metadata indication is not evaluated, only noted in comments. In the comment provide info about other translations (language code, is the translation ok?). Provide in comment how extensive and descriptive the description is.
Georeferencing method	coordinates, mileage, ALERT-C, OpenLR	Describes what location referencing methods are used by the dataset. The names could be derived from DATEX II. `Enumeration (see DATEX II location referencing methods: AREA: AlertCArea; TpegGeometricArea; TpegNamedOnlyArea; NamedArea; GmlMultiPolygon; OpenlrCircleLocationReference; OpenlrRectangleLocationReference; OpenlrGridLocationReference; OpenlrPolygonLocationReference; OpenlrClosedLineLocationReference LINEAR: LinearWithinLinearElement; AlertCMethod2Linear; AlertCMethod4Linear; AlertCLinearByCode; TpegLinearLocation; OpenlrLinear; GmlLineString; SupplementaryPositionalDescription POINT: PointByCoordinates; PointAlongLinearElement; TpegSimplePoint; TpegFramedPoint; AlertCMethod2Point; AlertCMethod4Point; OpenlrGeoCoordinate; OpenlrPoiWithAccessPoint; OpenlrPointAlongLine).` Recommended. **Ref. NONE** Could be present as a part of the metadata or it can be inferred from samples of documentation (if present).
Dataset documentation	../cs/sources/en-ndic_d2-common/	A separate file describing context, concepts, usage, guidelines, and examples, provides clarification of how the dataset is handled, information about architectural decisions, profiling, extensions, etc. Recommended. URL to a document **Ref. NONE** Shall be present as a link to an external file.
Related linked data sources	x-source:en-ndic_d2-predefined-location-set	A dataset might for location referencing purposes refer to another dataset using identifiers from that data set). Such dataset-containing locations shall be accessible and shall be identified as a requirement for the successful decoding of the primary dataset.

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Table 5 Content information

Parameter	Example of a value	Definition, comments
		It is either URL or URI of the location dataset. Recommended **Ref. NONE** Is the identification of these datasets present? Is it dereferenceable? It can be inferred from a sample if such datasets are used, if not then this parameter is not relevant. When present, it is in the expected form?

3.4 Temporal information

Information about the start and stop of the publication (when it becomes available to consumers and when it is removed).

Table 6 Temporal information

Parameter	Example of a value	Definition, comments
Start date of publication	2023-10-23T09:00:00+01: 00	Describes from which date on, the data delivery is applicable. No entry means that the publication gets valid immediately and the timestamp is the same as the metadata timestamp Format: DateTime. Mandatory **ref. CMC 2.2.3.1** Either in the metadata or in case of missing parameter, inferred from the metadata date.
End date of publication		Describes the date when data delivery to this publication terminates. Format: DateTime; Optional **ref. CMC 2.2.3.2** Could not be provided If the date is not known; then it shall be set to not relevant. Should be known however for static data (the date of planned replacement).

3.5 Geographical coverage

Information about the area and network coverage of the data set.

Table 7 Geographical coverage

Parameter	Example of a value	Definition, comments
Area covered by publication	CZ0	Describes the geographic area covered by a data set. Data sets can be valid for more than one region, for that reason a multiple-choice selection should be applied. NUTS identifiers are used; only the lowest possible levels are used, e.g. if one region is covered then the NUTS code of this region is provided, not also the NUTS code of the whole territory. Format: NUTS codes http://data.europa.eu/nuts/ (viewer); or GML. Mandatory **ref. CMC 2.2.4.1** This is either in metadata directly or partially inferred from the name and description of the dataset or from documentation (if available). Some

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Table 7 Geographical coverage

Parameter	Example of a value	Definition, comments
		datasets have coverage area expressed in GML (polygons, rectangles) using ETRS (GPS) coordinates. This is equivalate to the NUTS codes.
Network coverage	Motorways, Arterial road network, Regional roads, Urban and local roads	Describes the part of the transport network that is covered by data sets. `enumeration: (Motorways; Arterial road network (in the meaning of state roads or federal roads); Regional roads; Urban and local roads; Rail (long-distance or heavy-rail); Metro or light-rail network; Other public transport network; Waterways; Air network; other). Mandatory` **ref. CMC 2.2.4.2** This is either in metadata directly or partially inferred from the name and description of the dataset or from documentation (if available).
Network coverage description	the whole territory of the Czech Republic	Describes details of the transport network in addition to the element "Network coverage". Free text; optional **ref. CMC 2.2.4.3** Could be in detail provided in documentation together with a map. If a textual description is given, in which languages? In the comment provide info about other translations (language code, is the translation ok?). Provide in comment how extensive and descriptive the description is.

3.6 Transportation system

Information about transport mode that is covered by the dataset/service.

Table 8 Transportation system

Parameter	Example of a value	Definition, comments
Transport modes covered	Personal / car, truck	Describes the transportation mode covered by a data set. Data sets can be valid for more than one transportation mode. Format: `enumeration: (Air, rail (including high speed rail), conventional rail, light rail, long-distance coach, maritime (including ferry), metro, tram, bus, trolley-bus, shuttle bus, shuttle ferry, taxi, car-sharing, car-pooling, car-hire, bike-sharing, bike-hire, car, truck, motorcycle, cycle, pedestrian);` Multiple choice. Mandatory **ref. CMC 2.2.5.1** This is either in metadata directly or partially inferred from the name and description of the dataset or from documentation (if available).

3.7 Responsibilities

Information about data owner and publisher.

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Table 9 Responsibilities

Parameter	Example of a value	Definition, comments
Publisher	John Doe, john.doe@data.eu, http://www.data.eu	The organization or person that publishes the data sets and is responsible for the given information and concluding a contract if applicable. vCard-Textfields with the expected level of details (name, email, telephone, company, position, address). Mandatory **ref. CMC 2.2.6.1** Could be part of the organization data or directly in the dataset description, could be contact info not in vCard format.
Data owner	(copy from "publisher")	Describes the company that owns the data set and is responsible for the content and quality of the data set. Could be the same as the publisher vCard-Textfields with the expected level of details (name, email, telephone, company, position, address). Mandatory **ref. CMC 2.2.6.2** Could be part of the organization data or directly in the dataset description, could be contact info not in vCard format.

3.8 Conditions for use

Information about contract or license and conditions for use.

Table 10 Conditions for use

Parameter	Example of a value	Definition, comments
Contract or licence	License and Free of charge	Describes the condition of use: whether an unrestricted use is possible, a contract has to be concluded or a licence has to be agreed on to use a dataset. `Enumeration: (No licence – No contract; Licence and Free of charge; Licence and Fee; Contract and Free of charge; Contract and Fee; Not relevant)`. Mandatory **ref. CMC 2.2.7.1** Shall be part of the metadata structure, but could be inferred from the dataset description of documentation.
Conditions for use	.../cs/providers/en-ndic/#process-ddrcontract	If the option “Licence” or “Contract” in element “Contract or licence” is selected, the condition of use has to be clarified. Here a sample contract or the terms of use need shall be provided This field may contain an URL to a document, which contains all important information, or describe the conditions explicitly. Conditionally **ref. CMC 2.2.7.2** If the option “Licence” or “Contract” in NOT selected in the element “Contract or licence” then this parameter is not relevant. Should also refer to standardized licenses, e.g. CC-BY-4.0, or to custom-made documents, in this case, a link to the document is necessary.

3.9 Access information

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Information about the format and encoding of the provided dataset, as well as about the sample and validation schema and protocol information

Table 11 Access information

Parameter	Example of a value	Definition, comments
Data format - encoding	UTF-8	This describes the atomic element of the transfer syntax description. Systems that can go down to single bits are called "binary". Systems that are specified based on character standards where a single character has more than one bit are specified by the name of the character standard used. `Enumeration: (ASCII; UTF-8; UTF-16; ISO-8859-1; ISO-8859-15; other)`. Optional **ref. CMC 2.2.8.1** If not specified in metadata it could be inferred from the provided sample encoding.
Data format - syntax	XML	This describes the base standard that specifies syntactically correct documents. On this level, only base elements of building documents properly are specified and can be proved by syntax checks. `Enumeration: (XML; JSON; CSV; ASN.1 encoding rules; Protocol buffers; Other)`. Mandatory **ref. CMC 2.2.8.2** If not specified in metadata it could be inferred from the provided sample syntax.
Data format - grammar	XSD	This describes standards on top of the elementary syntax that describe data structures in the dataset used for validation purposes. `Enumeration: (XSD; JSON Schema; ASN.1; Protocol buffers; other);` Optional **ref. CMC 2.2.8.3** If not specified in metadata it could be inferred from the provided sample syntax.
Data format - Data Model	DATEX II profile	This describes concrete data models that use the specification elements so far to specify specific data models. The NAP should keep references to the concrete data model used for a dataset, e.g. including model versions. `Enumeration (many possible values including DATEX, NETEX, OCIT, GTFS, KML, OpenAPI, and others). Mandatory` **ref. CMC 2.2.8.4** If not specified in metadata it could be inferred from the provided sample grammar.
Data format description	DATEX II v2.3/SituationPublication Extends: networkLocation	Used to provide additional information on the data format, e.g. are extensions used? On which class is the profile based, additional version information. Free text, but in a short and structured way; Conditionally **ref. CMC 2.2.8.5** If not specified in metadata it could be inferred from the provided documentation and partially from the provided sample content.

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Table 11 Access information

Parameter	Example of a value	Definition, comments
format documentation		TODO, link, description especially useful for API? Or is it protocol?
Data sample	.../cs/formats/en-ndic_d2-common-v1.1/samples/xxx	A link to a file with a sample content of the data set, that allows consumers to evaluate how the real data would look like. The format is URL to an existing file; Recommended **ref. NONE** Could be replaced by real data if freely available (the parameter is then inferred). A sample is preferred because it clarifies the intention of the data owner and tries to provide a complete set of expected information.
Data schema / validation	.../cs/formats/en-ndic_d2-common-v1.1/schemas/xxx	A link to a file with a validation schema that is used to validate the structure of the data set (and the sample). This is very important since the schema provides information about all potential values of the data elements and informs the consumer about pruning the model has undergone. The format is URL to an existing file. Mandatory **ref. NONE** Could be replaced by a validation schema of the whole model, BUT a real specific schema is much better because it provides the intention of the data owner. If the schema has to be inferred by the tools from the sample, then it is the same as if it is missing (grade F), such inferred schema is only a guess that real data will be the same and it is by no means a commitment by the data holder/owner.
Access interface – application layer protocol	HTTP/HTTPS	Describes the IT protocol of the data interface that will be used to transfer data. `Enumeration: (SOAP; OTS2; HTTP/HTTPS; FTP; RSS; AMQP; MQTT; gRPC; other). Mandatory` **ref. CMC 2.2.8.6** If not specified in metadata it could be inferred from the provided documentation.
Security mechanisms	IP filter	Describes security mechanisms in place to protect the integrity and access to the data set. Could be a multiple choice `Enumeration: (none; IP filter; basic; digest; certificate; url parameters; other);` recommended **Ref. NONE** Could be present as a part of the metadata or it be inferred from documentation.
Communication method	Push on occurrence	Describes the transmitting procedure from data provider to data receiver. It differs between push and pull. Multiple choice, if it is provided by more methods! `Enumeration: (Push; Push on occurrence; Pull);` conditionally **ref. CMC 2.2.8.7**

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Table 11 Access information

Parameter	Example of a value	Definition, comments
		If not specified in metadata it could be inferred from the provided documentation. If the resource type is set to "service then this parameter is not relevant.
Protocol documentation	../cs/protocols/en-ndic_push-v1.0/xxx	Describes the protocol implementation and complements and extends information about application layer protocol, security mechanism, communication method, and others. Allows data users to program interface for data retrieval, which could be an example code. Format: link to the document (or a web page) with detailed description and potential attachments (code); recommended **Ref. NONE** Could be present as a part of the metadata or it be inferred from documentation.
Access URL	https://datex.rsd.cz	Provides a general link for access to the current data set or a connection link to a service. If the access URL is unique for every single relation between the data owner and the data receiver, the access URL is linked to a subscription that enables access to the publication Format: url; conditional **ref. CMC 2.2.8.8** If not specified in the metadata of the data set it could be inferred from the generic metadata of the publisher (e.g., linking to the distribution interface of the provider)

3.10 Quality information

Information about update frequency, data availability, collection method, verification method, reaction time, quality, national body assessment, and delegated regulations that this dataset partially satisfies.

Table 12 Quality information

Parameter	Example of a value	Definition, comments
Update frequency	On occurrence	Describes the update rate of the data set. If there is a specific time interval or data only provided on occurrence precise information should be given. `Enumeration: (On occurrence; Up to 1min; Up to 5min; Up to 10 min; Up to 15 min; Up to 30 min; Up to 1h; Up to 2h; Up to 3h; Up to 12h; Up to 24h; Up to Weekly; Up to Monthly; Up to every 3month; Up to every 6month; Up to yearly; Less frequent than yearly).` Mandatory **ref. CMC 2.2.9.1** If not specified in the metadata of the data set it could be inferred from documentation or description.
Availability	24/7	Describes expected time period availability of the data set / service as expected by the publisher in terms of hours/week. It is not actual

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Table 12 Quality information

Parameter	Example of a value	Definition, comments
		availability expressed in % (of the time when was service available / time when the service was expected to be available). Free text (24/7; other; …). Recommended **ref. NONE (part of the availability quality parameter)** If not specified in the metadata of the data set it could be inferred from documentation or description.
Data collection method	Sensor input, police, ...	Indication and description of potential data sources from which this data set was created. Free text describing data sources.; recommended **ref. NONE** If not specified in the metadata of the data set it could be inferred from documentation or description
Cross verification	Cross verified	Indicates whether data has been cross-verified with one or more additional sources. `Enumeration: (Cross verified, not cross-verified; other);` recommended **ref. NONE (part of the veracity quality parameter)** If not specified in the metadata of the data set it could be inferred from documentation or description.
Problem reporting process	../cs/providers/en-ndic/xxx	Description of how the problem reporting is handled, individual steps, contact. Free text describing the process or link to a description; recommended **ref. NONE** If not specified in the metadata of the data set it could be inferred from documentation. Is a textual description in multiple languages? Describe in a comment.
Reaction time to respond	3 working days	If a Problem reporting process is provided, it must not be empty. Describe when, on average, the reporter shall expect the first reaction. Free text; recommended **ref. NONE** If not specified in the metadata of the data set it could be inferred from documentation. Is a textual description in multiple languages? Describe in a comment.
Quality assessment	quality information is unknown	Describes the methods and results of a quality assessment. Within such an assessment, individual quality criteria of a data set are checked and compared with pre-defined quality requirements. Format: free text, containing a general description and possibly a link (URL) of the document with more information. mandatory **ref. CMC 2.2.9.2**

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Table 12 Quality information

Parameter	Example of a value	Definition, comments
		If not specified in the metadata of the data set it could be inferred from documentation or description. In the comment field, the evaluator shall comment on the languages of the quality information and its details
National body assessment status	-	Used to indicate the history and status of such an assessment. It may include the date and the result of the recent assessment procedure. Format: free text (date or a link (URL) of the document with more information); optional. **ref. CMC 2.2.9.3** Could not be provided If the assessment was not performed; then it shall be set to not relevant. (i.e. it is either present or not relevant).
Applicable DRs	SRTI, RTTI	Describe which delegated regulations (DR) are being fulfilled by the dataset, it might be just partial fulfilment and the dataset could, partially, fulfil more than one DR. `enumeration: (SSTP; SRTI; RTTI; MMTIS; AFIR)`; recommended **ref. NONE** If not specified in the metadata of the data set it could be inferred from documentation.

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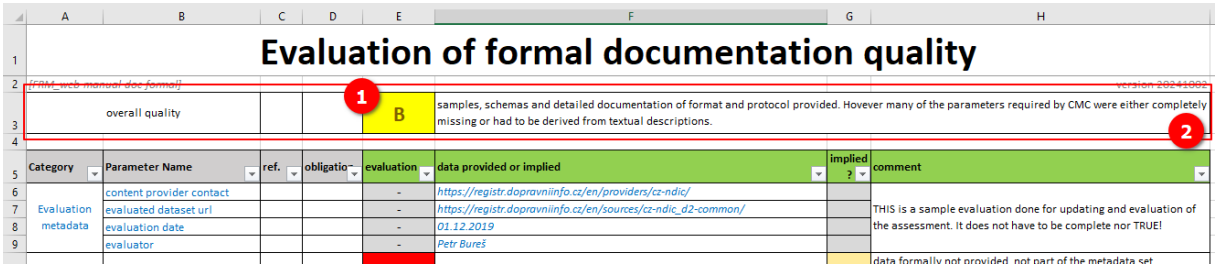
4 Overall evaluation

The overall evaluation is provided as

- overall evaluation grade (A, B, C, F, or -) and
- overall comments that summarize the main findings of the evaluator about the service.

See the figure below.



Evaluation of formal documentation quality

overall quality			1 B	samples, schemas and detailed documentation of format and protocol provided. Hovever many of the parameters required by CMC were either completely missing or had to be derived from textual descriptions. 2			
Category	**Parameter Name**	**ref.**	**obligatio**	**evaluation**	**data provided or implied**	**implied ?**	**comment**
Evaluation metadata	content provider contact			-	https://registr.dopravniinfo.cz/en/providers/cz-ndic/		
	evaluated dataset url			-	https://registr.dopravniinfo.cz/en/sources/cz-ndic_d2-common/		THIS is a sample evaluation done for updating and evaluation of the assessment. It does not have to be complete nor TRUE!
	evaluation date			-	01.12.2019		
	evaluator			-	Petr Bureš		

Figure 4 Final overall grade and commentary.

4.1 Overall commentary

The evaluator, in few sentences describes the background for the overall grade. This commentary highlights strongest and weakest point of the evaluated metadata.

Example:

Samples, schemas and detailed documentation of format and protocol provided. However, many of the parameters required by CMC were either completely missing or had to be derived from textual descriptions.

4.2 Overall grade computation

The overall grade (1) in the figure above is computed automatically from grades of individual parameters. The computation is performed in the Evaluation form on the sheet “support”. The mechanics of the computation is described in subchapters below.

4.2.1 Individual grades and their part in overall grade computation

Evaluation grades of each parameter, expressed as grades **A, B, C, and F**, by the evaluator, are converted into numeric values.

Table 13 Mapping from the mark A-F to a numeric value

classification	A	B	C	F	-
value	1	2	3	4	0

Each parameter contributes to the overall score differently based on its placement type (“obligation”) and importance, by weighing the parameter and masking the parameter for nonrelevant values, see next tables.

Table 14 Mapping of mandatory appearance to a value

“Obligation"	optional	recommended*	partial**	conditional	mandatory
value	1/4	1/2	3/4	1	1

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* Recommended is for parameters that are not originally from CMC, except schema which is set as mandatory

** Partial is for contact fields of a vCard type

Table 15 Mapping of a weight (importance) to a value

Importance (weight)	Normal	Important	Very important
Value	1	2	3

Most of the parameters are of normal importance and only a few are tagged "important".

Computation of the individual **score = classification*obligation*weight**; meaning that nonrelevant parameters (with classification = 0) are not counted, their value is 0.

Table 16 of parameters

Category	Element Name	*Classification*[2]	"obligation"	weight	Score
Metadata information	*Metadata date*	*4*	1	1	*4*
	Metadata language	*2*	1	1	*2*
	Contact point	*2*	0,75	1	*1,5*
	Dataset identifier	*1*	0,5	1	*0,5*
Content information	*Name of the dataset*	*1*	1	1	*1*
	Description of dataset	*1*	1	1	*1*
	Resource type	*2*	1	1	*2*
	Dataset type category	*3*	1	1	*3*
	Dataset detailed type	*3*	0,25	1	*0,75*
	Service type category	*0*	1	1	*0*
	Dataset language	*3*	1	1	*3*
	Georeferencing method	*2*	0,5	1	*1*
	Dataset documentation	*1*	0,5	1	*0,5*
	Related linked data sources	*1*	0,5	2	*1*
Temporal information	*Start date of publication*	*2*	1	1	*2*
	End date of publication	*0*	0,25	1	*0*
Geographical coverage	*Area covered by publication*	*2*	1	1	*2*
	Network coverage	*4*	1	1	*4*
	Network coverage description	*4*	0,25	1	*1*
Transportation system	*Transportation modes covered*	*4*	1	1	*4*
Responsibilities	*Publisher*	*1*	0,75	1	*0,75*
	Data owner	*2*	0,75	1	*1,5*
Conditions for use	*Contract or license*	*2*	1	1	*2*
	Conditions for use	*1*	1	1	*1*
Access information	*Data format - Encoding*	*3*	0,25	1	*0,75*
	Data format - Syntax	*3*	1	1	*3*
	Data format - Grammar	*3*	0,25	1	*0,75*
	Data format - Data Model	*3*	1	1	*3*

[2] These values are assigned by the evaluation during the evaluation

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Table 16 of parameters

Category	Element Name	*Classification*[2]	"obligation"	weight	Score
Quality information	*Data sample*	*1*	0,5	1	*0,5*
	Data schema / validation	*1*	1	2	*2*
	Data format description	*2*	1	1	*2*
	Access interface	*2*	1	1	*2*
	Security mechanisms	*3*	0,5	1	*1,5*
	Communication method	*1*	1	1	*1*
	Protocol documentation	*1*	0,5	1	*0,5*
	Access URL	*2*	1	2	*4*
	Update frequency	*3*	1	1	*3*
	Availability	*4*	0,5	1	*2*
	Data collection method	*3*	0,5	1	*1,5*
	Cross verification	*3*	0,5	1	*1,5*
	Problem reporting process	*4*	0,5	1	*2*
	Reaction time to respond	*4*	0,5	1	*2*
	Quality assessment	*4*	1	1	*4*
	National body assessment status	*4*	0,25	1	*1*
	Applicable DRs	*1*	0,5	1	*0,5*

4.2.2 Overall grade computation

The numerical overall evaluation is computed as the arithmetic average of all the grades awarded, with the possibility of assigning a weight to each grade:

- Numerical value = (**sum of scores) / (sum of placement * weight, where classification > 0)**

The final evaluation grade, expressed as **A, B, C, and F**, is converted from the numerical value according to the formula in next table.

Table 17 Mapping scoring 1-4 to the grade A-F

type/mark	A	B	C	F
mark	<1,1.5>	(1.5,2.5>	(2.5,3.5>	(3.5,4)

4.3 Method of presentation

The outputs are presented in Report (MS Excel format)

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Evaluation of formal documentation quality

[FRM_web-manual-doc-formal] v20240616

overall quality	B	samples, schemas and detailed documentation of format and protocol provided. Hovever many of the parameters required by CMC were either completely missing or had to be derived from textual descriptions.

Category	Parameter Name	evaluation	data provided or implied	implied	comment
Evaluation metadata	content provider contact	-	https://registr.dopravniinfo.cz/en/providers/cz-ndic/		evaluation done for research purposes not provided, downloaded from www.registr.dopravniinfo.cz
	evaluated dataset url	-	https://registr.dopravniinfo.cz/en/sources/cz-ndic_d2-common/		
	evaluation date	-	01.12.2019		
	evaluator	-	Petr Bureš		
Metadata information	Metadata date	F	01.12.2019	yes	data formally not provided, not part of the metadata set. Date was derived from date accessed (web page)
	Metadata language	B	cze;eng	yes	not part of the metadata set. Date was derived from context (web page)
	Contact point	B	name: Ctirad Weissmann title: Manager of traffic information distribution department phone: +420-596663578 email: ctirad.weissmann@rsd.cz		data derived from the web, provider information section, it is however unclear if this contact is also metadata provider (the person who put metadata together).
	Dataset identifier	A	x-source:cz-ndic_d2-common		dataset uri
Content information	Name of the dataset	A	DATEX II Situation Publication - Common		within a dataset specification [cze;eng]
	Description of dataset	A	Common traffic information (accidents etc.), provided by NDIC for the whole Czechia, pushed on occurence, in a common traffic information profile of DATEX II format.		within a dataset specification [cze;eng]
	Resource type	A	Data set	yes	Directly in metadata as literals (listed in a table)
	Dataset type category	A	Road work, Unexpected road events and conditions, Real-time traffic data	yes	Directly in metadata as literals (listed in a table)
	Dataset detailed type	A	Long-term road works, Short-term road works, Accidents and incidents, Poor road conditions, Weather conditions affecting road surface and visibility, Location and length of queues	yes	Directly in metadata as literals (listed in a table)
					not aplicable for dataset only services. The value is however not part of the metadata since

Figure 5 Presentation of the resulting evaluation in a FORM, (clipping)

The report serves as a record of the quality of the dataset information provided and is used for:

- internal checking of the correctness and integrity of the provided metadata,
- Feedback to the data owner/provider (here the ideal form is a table or text file).

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5 Conclusion

This evaluation is meant to be used as feedback to the data holder, the entity responsible for filling in metadata for the dataset / service for improvement. The main users of the methodology are:

- Data Holders = to do the in-house check
- National Bodies = when performing the compliance assessment of the data holder's dataset.

After, or in parallel with, the completion of this evaluation, it is possible to proceed to the assessment of the objective quality of the metadata and the respect of good practice examples [web/manual/doc/objective].

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6 References

The evaluation criteria are based on the following project results:

[1] CMC Coordinated Metadata Catalogue, describing agreed metadata developed by EU-EIP (https://gitlab.com/tamtamresearch/inqms/evaluation-procedures/-/tree/master/doc)

[2] Project InQMS evaluations and methodology (https://inqms.tamtamresearch.com/)

[3] NAPCORE project (https://napcore.eu)

[4] mobilityDCAT-AP, extended and consolidated metadata catalogue developed by NAPCORE (https://mobilitydcat-ap.github.io/mobilityDCAT-AP/releases/index.html)

[5] MQA, methodology for DCAT-AP metadata catalogue assessment, developed by SEMIC (https://data.europa.eu/mqa/methodology?locale=en)

[6] Quality recommendation by W3C and by open data portals (data.gov.cz and others) (https://opendata.gov.cz/%C5%A1patn%C3%A1-praxe:start)

This project has received funding from the European Commission's Directorate General for Transport and Mobility under Grant Agreement no. MOVE/B4/SUB/2020-123/SI2.85223