



Harmonization of EU NAP architectures and first layout of potential NAP federation

Milestone 2.9: Annex B Interoperability Documents

Document history

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2 Introduction

The interoperability document is any type of document that could be beneficial in implementation or upgrade of NAP. The benefit lies in the recommended / practiced approach to do something. It spans from recommendations to use terminology, naming conventions of data sets, keywords, used metadata catalogues, profiles, protocols or data location content.

The documents are NOT created by WG2, these documents already exist in other NAPCORE groups, the WH2 encourages its use as a recommended resource.

First part of this annex is the list of interoperability documents followed by the documents itself (if they exists) last part names resources used to identify interoperability documents. Each Interoperability document is in a separate chapter or is referred to as a standalone document.

3 List of Interoperability documents

This Annex contains links to 3 currently identified interoperability documents:

- Terminology
- Data Definitions
- Metadata catalogue

Further development of the annex in milestone report M2.11 involves the identification of interoperability documents, including the author of the idea, a precise title for the guideline, the rationale behind the guideline and its beneficiaries, the task within NAPCORE responsible for the guideline, and the distinction between essential and desirable interoperability aspects. It also includes a description of the measures planned to achieve interoperability.

4 Terminology

Terminology is collected from all NAPCORE WGs and their deliverables. It focuses commonly used definition as well as on the specific ones, e.g. terms used in architecture development.

Each is defined in following structure:

Term	
Acronym	
Definition	As define in the specific source
Source	Generic source like the DR
Keywords	Related keywords, topics; must be kept short, purpose is sorting terms into overlapping clusters (e.g. general, FRAME, technical, functional, legal...)
Usage Context	This is an example of how this term is used / NOT ALL terms must have this
Additional Notes	Any additional observation or comment
Internal note	Internal note in master database about the term (not exported)
Status	Status note: DRAFT, IN REVIEW, FINAL
date	Date of last update of the term

The terms are collected and managed in MS excel terms-database.xlsx (master file). Any commenting and proposing and development of terms is done within MS Word file, since it has better reviewing features. For converting excel file to word file we are using a template. After reviewing the terms are manually copied back to the master file.

While collecting terms we also where possible define one term instead of several same terms if the meaning is the same try to harmonize terminology (e.g. 4 access point into one if not fundamentally different). Status of completion of term definition is indicated by

- DRAFT = is copied into the master and will need revision (all newly copied term status)
- IN REVIEW = exported in some fragment files undergoing revision
- FINAL = term either after revision of as it was taken from legal text (no revision)

Reference to the common terminology file: [NAPCORE Terminology 20240131.xlsx](#) (available internally at the NAPCORE SharePoint, as of 31.1.2024)

5 Data Definitions

A data dictionary provides harmonized definitions to its users, thereby facilitating a higher level of interoperability. By offering standardized definitions, the data dictionary ensures that all users have a common understanding of the data elements and their meanings within the ITS. This common understanding is essential for effective communication and collaboration among different ITS components and systems.

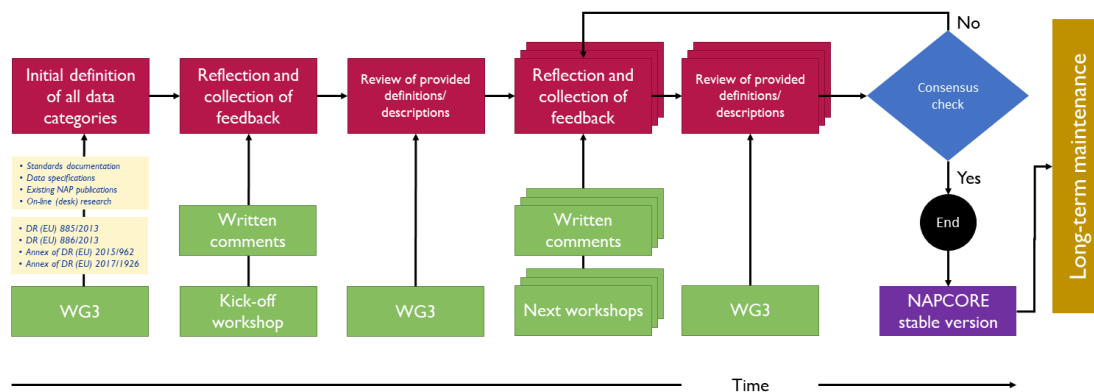


Figure 1 Data Dictionary development process in NAPCORE (source: NAPCORE WG3)

Reference to the latest data dictionary file: [Data dictionary_MASTER.docx](#) (available internally at the NAPCORE SharePoint, as of 31.1.2024)

6 Metadata catalogue

Metadata is a crucial building block for the accessibility and reusability of datasets, as offered on NAPs and other mobility data portals. It provides a structured, interoperable and harmonized approach to describing and exchanging metadata about datasets and about access for such datasets related to mobility, and in particular related to Intelligent Transport Systems (ITS). Its primary goal is to enhance the cross-border and cross-sectorial discoverability of ITS and mobility-related datasets published on relevant data portals.

mobilityDCAT-AP is an extension of DCAT-AP for describing mobility datasets, dataset series, and services. It provides an RDF syntax binding for the union of metadata elements defined in the National Access Points across Europe. Its basic use case is to make mobility datasets, data series, and services searchable on general data portals, thereby making mobility information better searchable across borders and sectors.

The website referenced below contains an online documentation of the mobilityDCAT-AP specification, including a human-readable vocabulary description; a set of usage notes; a set of machine-readable serialization formats to allow IT systems process the vocabulary; and schemas for automated conformance validation. In addition, user support is provided via a dedicated GitHub repository where users can interact with the editors, for example by raising questions and issues.

Reference to the latest version of the mobilityDCAT-AP documentation:
<https://w3id.org/mobilitydcat-ap/releases/> (open access webpage, including links to development at GitHub <https://github.com/mobilityDCAT-AP/mobilityDCAT-AP/>)

7 Specific inputs from NAPCORE WGs

This section addresses the outcomes and ongoing works from NAPCORE WGs that are useful for the development of T2.3. Some of the inputs will serve to change and adapt NAP reference architecture while the other will serve as interoperability documents to be linked by the NAP reference architecture but not directly processed by it.

7.1 Inputs from T2.1 Description of NAP Level of Services

7.1.1 NAP Typologies

T2.3 defined 2 NAP types: Data Platform and Metadata Directory. The first provides real data or data services to data user or data services through the NAP, the other, in turn, provides metadata (description of data sets and data sources in a predefined way) to end user or data service provider. Other tasks, including 2.1 approach typology differently, it is important to align these naming conventions, understand differences so that the architecture can be described based on the NAP type.

7.1.2 Description of the feature categories

The NFKL framework works with 7 feature categories. For the NAP reference architecture (NAR), it is important to know the subjects addressed by each of the categories, so that the content of all these categories is covered by the model architecture. The feature categories are Access, Communication, Data Discovery, Maintenance and update, Dataset Information, Interoperability and Data exchange and operational policy.

7.1.3 KPI approach

Each feature category is constituted by a set of KPIs, KPIs enable to assess the level of maturity of a certain NAP, through a scoring method. This could be used to define minimum functionality, i.e. all KPIs need to be analysed, transferred into architecture and feedback provided to T2.1 so both NLKF and NAR are aligned.

7.1.4 KPIs' description and score

It might be important to have a general (or detailed?) overview on the KPIs' contents/description, as well as the possible scores and requirements for achieving those scores. Thereby, the architecture could be elaborated in a manner that would make it easier for the operators to organize the data according to their NAP level of service/development, and to improve such a level.

7.2 Inputs from Sub T2.2 Definition of requirements concerning data standards, reference profiles and metadata and support tools

7.2.1 Which Standards are preferred by the EC

The task compiles the list of data standards addressed mentioned in the DRs and NAPCORE WG4 (Data Exchange Standards), as well as the open data standards such as such as GTFS and family, along with rail and air data models.

7.2.2 Standards used in NAPs

It may be important to understand which standards are used for each data category. It is also worth it to be aware of how much each standard is used. Such information can be extracted from the reports from T2.2, which demonstrate the percentage use of each data standard, for each of the use cases/data categories. Understanding the scenario of standard usage might help to develop the NAP architecture.

7.2.3 Reference profiles

DATEX II provides a set of Recommended Reference Profiles (RRPs) and Recommended Service Profiles (RSPs). While the RRP is establish minimum set of data-elements required to provide the information meant by the specific data categories in the specific delegated regulation (SRTI, RRTI and MMTIS), the RSPs support harmonised uses cases for the provision of data from the road operator's point of view. For NeTEx, there is also a recommended profile – European Passenger Information Profile (EPIP). In addition to these, some MS build their own national profiles. T2.2 is collecting information regarding these national profiles to acquire more information.

7.3 Inputs from Sub T2.4 NAP service interoperability demonstrators

7.3.1 Metadata part of demonstrators

Concerning demonstrating metadata capabilities, this work is relevant for adopters of the mobility DCAT-AP into their NAPs, possibly creating tools for validating, entering, and incorporating metadata into standardized SW platforms. Lessons learned on how to fill in the metadata with what information in which languages, and how to harvest this metadata by external systems.

7.3.2 Data part of demonstrators

When demonstrator target data exchange user registration, data management data security, data distribution scenarios could be exploited to benefit future NAP alignment. Inputs from WG3 NAP content and accessibility

7.3.3 Data dictionary

A data dictionary provides harmonized definitions to its users, thereby facilitating a higher level of interoperability. By offering standardized definitions, the data dictionary ensures that all users have a common understanding of the data elements and their meanings within the ITS. This common understanding is essential for effective communication and collaboration among different ITS components and systems.

7.3.4 Data collection and provision

Data collection and data provision mechanisms for both dynamic and static data, as well as metadata. Minimization of the complexity of required activities to become a data provider. This concerns the complex procedure to become an authorized data provider in/for a NAP. NAPs may have an automated process to verify and validate data providers and that can be a functional component of the architecture.

7.3.5 NAP data content and packaging

How are data at NAPs packaged to publications, and what location referencing method they used for addressing the location of traffic problem. Different NAPs may employ diverse location referencing methods, each with its unique advantages and limitations. Understanding these methods and their implications on the accuracy and reliability of the location data is essential for optimizing the performance of the NAPs. This information could be leveraged in creating recommendations for NAPs.

7.3.6 Data exchange pattern – Static data and Dynamic data

Identify data exchange patterns. In some cases, especially traffic regulations, it is important to back-track the data. To ensure that it is legally binding. It is not a critical feature and might be part of data quality or metadata information. Some functions in the matter of data flows should be of concern (a track of used data flows).

7.3.7 Ensure minimum Level of quality for respective data

Where it is collected from, what type of data is collected, the arrangement of the data collected, the storage of that data, relevant policy, etc. Concern should be paid to harmonizing data regarding the respective quality criteria. Data quality assessment methodologies ensure that the data used in ITS meets a certain quality level, which is crucial for the reliability and effectiveness of the system. These methodologies involve processes for checking and validating data accuracy, completeness, timeliness, consistency, and relevance.

7.3.8 Offer tools for data conversion/harmonization

...or maybe just some reading support (Provide guidelines for data providers) since this isn't one of the roles of this architectural NAP.

7.3.9 Harmonized tags/labelling of data sets

Reference to standards (Provide guidelines). Data classification / tagging data by categories so that data provided should be more efficient used and searchable.

7.3.10 License equivalency

Understand which national license is equivalent (Identify common points) to which other nation's license or European equivalent. Provide guidelines for data providers. Clarify the user in case of "License Not Specified" or "No License" or "No Agreement", etc.

7.4 Inputs from WG4 Data Exchange Standards

7.4.1 Specification of data exchange formats and its use

While data and metadata formats developed by standardization working groups are important for harmonization, they often lack practical examples. Elaboration of examples for publishing of certain traffic information would lead to having same content used at multiple NAPs and will improve interoperability.

7.4.2 Architecture topics

All standardization groups have large management and usually act as system within a system. Reference architectures for certain NAP aspects could be used to improve NAP reference architecture.

7.5 Inputs from WG5 National bodies

7.5.1 Architecture topics

WG5 is 'working on the NB reference architecture, there is an opportunity for alignment of both architectures in terms of used terminology and proposed processes.

7.6 Further Inputs

NAPCORE is developing several harmonization actions which work over all activities or result from other actions. These findings may not be visible yet, but they will be recorded and will then be transferred to the reference architecture. Such a big field are usage requirements which results in descriptions and documentations.