SDG metadata model for the article 10 and the descriptions of the public services - Specification

# Table of Contents

[1. Introduction 5](#_Toc52901433)

[1.1. Exchanging public service data between public administrations 5](#_Toc52901434)

[1.2. How is the Single Digital Gateway Regulation (SDGR) linked to this? 6](#_Toc52901435)

[1.3. Scope and objectives 7](#_Toc52901436)

[1.4. Approach 8](#_Toc52901437)

[1.5. Structure of this document 8](#_Toc52901438)

[2. SDG data Model: classes and properties 10](#_Toc52901439)

[2.1. Distinction between the Core and the Extended SDG Data Model 13](#_Toc52901440)

[2.2. The Public Service Class 13](#_Toc52901441)

[2.2.1. Identifier 14](#_Toc52901442)

[2.2.2. Name 14](#_Toc52901443)

[2.2.3. Description 14](#_Toc52901444)

[2.2.4. Publication Date 15](#_Toc52901445)

[2.2.5. Update/Modification Date 15](#_Toc52901446)

[2.2.6. Language 15](#_Toc52901447)

[2.2.7. Has Criterion 15](#_Toc52901448)

[2.2.8. Has Competent Authority 16](#_Toc52901449)

[2.2.9. Has Input 16](#_Toc52901450)

[2.2.10. Produces 16](#_Toc52901451)

[2.2.11. Spatial 17](#_Toc52901452)

[2.2.12. Has Contact Point 17](#_Toc52901453)

[2.2.13. Has Channel 17](#_Toc52901454)

[2.2.14. Has Cost 17](#_Toc52901455)

[2.2.15. Is Described At 17](#_Toc52901456)

[2.2.16. Is Classified By 18](#_Toc52901457)

[2.3. The Action Class 18](#_Toc52901458)

[2.3.1. Name 18](#_Toc52901459)

[2.3.2. Description 18](#_Toc52901460)

[2.3.3. Target processing time 19](#_Toc52901461)

[2.3.4. Processing time 19](#_Toc52901462)

[2.3.1. Follows 19](#_Toc52901463)

[2.3.2. Delivers 20](#_Toc52901464)

[2.4. The Event Class 20](#_Toc52901465)

[2.4.1. Type 20](#_Toc52901466)

[2.5. The Business Event Class 20](#_Toc52901467)

[2.6. The Life Event Class 21](#_Toc52901468)

[2.7. The Public Service Dataset Class 21](#_Toc52901469)

[2.7.1. Count Assistance Request 22](#_Toc52901470)

[2.7.2. Response time 22](#_Toc52901471)

[2.8. The Criterion Requirement Class 22](#_Toc52901472)

[2.8.1. Name 22](#_Toc52901473)

[2.8.2. Description 22](#_Toc52901474)

[2.9. The Evidence Class 23](#_Toc52901475)

[2.9.1. Name 23](#_Toc52901476)

[2.9.2. Description 23](#_Toc52901477)

[2.9.3. Type 23](#_Toc52901478)

[2.10. The Output Class 24](#_Toc52901479)

[2.10.1. Type 24](#_Toc52901480)

[2.11. The Cost Class 24](#_Toc52901481)

[2.11.1. Description 24](#_Toc52901482)

[2.11.2. Value 24](#_Toc52901483)

[2.11.3. Currency 25](#_Toc52901484)

[2.12. The Channel Class 25](#_Toc52901485)

[2.12.1. Type 25](#_Toc52901486)

[2.12.2. Has contact point 25](#_Toc52901487)

[2.12.3. Language 25](#_Toc52901488)

[2.13. The Link Class 26](#_Toc52901489)

[2.13.1. ID 26](#_Toc52901490)

[2.13.1. URL 26](#_Toc52901491)

[2.13.1. Name 26](#_Toc52901492)

[2.13.1. Description 26](#_Toc52901493)

[2.13.1. URL Type 27](#_Toc52901494)

[2.13.1. Content Type 27](#_Toc52901495)

[2.13.1. Information Area 27](#_Toc52901496)

[2.13.1. Country 27](#_Toc52901497)

[2.13.2. Internal Location 27](#_Toc52901498)

[2.14. The Agent Class 28](#_Toc52901499)

[2.14.1. Name 28](#_Toc52901500)

[2.15. The Public Organisation Class 28](#_Toc52901501)

[2.15.1. Preferred label 29](#_Toc52901502)

[2.16. Organisation 29](#_Toc52901503)

[2.17. Business 29](#_Toc52901504)

[2.18. Person 29](#_Toc52901505)

[2.18.1. EU citizenship 30](#_Toc52901506)

[2.19. The Contact Point Class 30](#_Toc52901507)

[2.19.1. Phone number 30](#_Toc52901508)

[2.19.2. Email address 30](#_Toc52901509)

[2.20. The Concept Class 30](#_Toc52901510)

[2.20.1. SDG type 31](#_Toc52901511)

[3. Recommended Controlled Vocabularies 32](#_Toc52901512)

[4. Namespaces and Prefixes 33](#_Toc52901513)

[Annex I. Key Concepts used throughout this document 34](#_Toc52901514)

List of Figures

[Figure 1 – Example of a public service (application form for licensing / a protected occupational title) 12](#_Toc42859790)

[Figure 2 – Example of a public service, top of the form 14](#_Toc42859791)

[Figure 3 – Elements mapped for the top of the form 14](#_Toc42859792)

[Figure 4 – Example of a public service, body of the form 16](#_Toc42859793)

[Figure 5 – Elements mapped for the body of the form (1st part) 16](#_Toc42859794)

[Figure 6 – Example of a public service, body of the form (2) 17](#_Toc42859795)

[Figure 7 – Elements mapped for the body of the form (2nd part) 18](#_Toc42859796)

[Figure 8 – Example of a public service, evidence 19](#_Toc42859797)

[Figure 9 – Example of a public service, evidence 19](#_Toc42859798)

[Figure 10 – Example of a public service, end of the form 20](#_Toc42859799)

[Figure 11 – Example of a public service, end of the form 21](#_Toc42859800)

[Figure 12 – Example of a public service, contact details 21](#_Toc42859801)

[Figure 13 – Mapping of the contact details 22](#_Toc42859802)

[Figure 14 - Graphical representation of the relationships between the classes and properties of the proposed SDG Data Model 25](#_Toc42859803)

[Figure 15 - Graphical representation of the relationships between the classes and properties of the proposed Core SDG Data Model 26](#_Toc42859804)

List of Tables

[Table 1: Namespaces and Prefixes 47](#_Toc42859805)

[Table 2: Definition of key concepts 48](#_Toc42859806)

# Introduction

## Exchanging public service data between public administrations

Citizens and businesses are entitled to public services. To receive these services, they often have to take actions such as requesting a certificate, requesting a subsidy or simply asking for information about their rights. For all those actions, information about the public services is needed. The information covers for example:

* The webpage where the information can be found;
* The criteria that must be met to be entitled to the service;
* The cost of the service;
* The evidence needed to receive this service, such as an ID card;
* ...

This need for information brings forward important challenges in all Member States. Public service information is often scattered over multiple portals, as citizens and businesses are entitled to a mix of local, regional, national public services. Additionally, within these levels of government, the information is also often scattered over multiple departments. This not only requires from citizens and businesses to navigate this complex environment to access the information they are looking for or to provide several times the same information for different services, it also requires from public administrations to describe, publish, maintain and align their information.

To tackle this issue, a large number of e-catalogues and e-Government portals have been implemented throughout Europe. However, in many cases, the development of these catalogues has not been harmonised. This means that information is structured in different ways and formats, making the exchange of information difficult and of low quality. The creation of a unique catalogue of public services, user-friendly and easily maintained, would be extremely expensive without a minimum layer of common understanding.

In this context, the ISA² Action “Catalogue of Services” supports the creation of catalogues with an integrated view on life events, business events and their related public services. The most important output of this action is the CPSV-AP model, an information model structuring the information needed to describe a public service. By analysing information describing a public service, granular concepts were identified such as ‘**contact point**’ (the contact details of a public service or a public organisation), the ‘**currency**’ and ‘**value**’ of the ‘**cost**’ of a public service (for example, the cost of requesting a new ID card is 25 (value) euro (currency).

|  |
| --- |
| CPSV-AP is a flexible model |
| There are only a few mandatory elements that any public services must have in their descriptions, such as the name of the ‘public service’ and the ‘competent authority’ that delivers it. This gives Member States the flexibility to adapt the model to their own needs (some public services are structured in a very complex way, that cannot be captured in a simple model). |

Additionally, the model is set up using ‘Linked Data’ techniques. It means that once the description is made available and publicly accessible, for example through APIs, any administrations or other actors could reuse it directly. The impact for public administrations is important since they need to describe public services only once and sharing it can be automated.

To stress the importance of this advantage in the data model, we give the example of a description made available as pdf by a public administration. Even though the public administration structures public service information in the CPSV-AP model (e.g. splitting the information in granular concepts such as ‘cost’, ‘value’ and ‘currecy’), if it is then published in a pdf, this will still hamper the exchange of information greatly. Another public administration using for example Excel would need to manually reformat the pdf file as an Excel. Using a Linked Data format (e.g. RDF[[1]](#footnote-2)), this data exchange becomes straighforward and thus much cheaper.

To conclude, the advantage of using an information model like CPSV-AP is twofold. Public service information can be:

* structured using a mature model, meaning that a Member State (region) does not have to spend money on making a model from scratch; and
* shared easily to public administrations within the Member State and outside.

## How is the Single Digital Gateway Regulation (SDGR) linked to this?

The SDGR pursues the same objective as the Catalogues of Services action: improving the search for public services (information) by the citizens and businesses. To achieve this, the SDGR describes a list of requirements for public service information. For example, in article 10 (d), the regulation describes that the information – where applicable – has to contain information on the ‘**type**’ and ‘**format**’ of ‘**evidence**’. The challenge for Member States looking at this requirement is to align their comprehensions: what could be the different formats of evidence? Should they be described in abbreviations or full-word? What are the common types of evidence among countries? Etc.

The SDG data model aims to structure these elements logically, making it easier for Member States to implement the regulation with a common approach.

In addition to describing their public services in alignement with the requirements from the regulation, Member States have to share and maintain in a common repository the links pointing to the relevant information within their country. Those links could be the URLs of the different Web pages where the information is published. This would require from the Member States to indicate for each description the relevant link. Every time the description is moved to another page or if anything comes to modify the URL, the Member States will have to adapt the links within the repository. At the European level, it would also mean that the Commission will know on which page the description is published but without knowing exactly where in that page. With Web scraping, it would be possible to retrieve the information in a structured way. However, Web scraping methods require some investments to be set up and would need to be adapted with any change within the page or with the link. This would also be without considering potential errors in the retrieving process. When you multiply those manual interventions by the estimated number of descriptions (and their links) needed for the SDG, you quickly start to think about an alternative solution.

What if we changed our focus? Instead of looking at the user interfaces in the different countries, which are only made to display the descriptions publicly, we could directly retrieve the descriptions from their databases. With unique and persistent identifiers (URIs) provided for each piece of information within a description, the SDG model gives us an opportunity to point directly to the right information, independently from where it is published. And similar models have already been applied:

* At European level for statistics with the DCAT-AP model used for collecting information from all Member States in one central portal[[2]](#footnote-3);
* At national and sub-national levels for public services with the extensions of the CPSV-AP model.

The advantage of the SDG metadata model is that it is reusing the best practices from years of experience of the CPSV-AP model while only keeping the elements that are needed for implementing the regulation.

Therefore, we advise you to reuse this model maximally within your Member State as this will be a benefit for you:

* No need to identify the SDGR granular concepts;
* Less manual work and thus less costs;
* Being compliant with the information needed for the ‘Repository of Links’;
* Being compliant with the SDGR (applicable in 2020);
* Structuring your information in a way that could be reused for future applications (e.g. chatbot, profiling etc.);
* Using a model that could be easily adapted and/or extended to your own needs.

If you are interested in applying this model but you do not know where to start, do not hesitate to go through the methodology described on the European Data Portal[[3]](#footnote-4) or to contact us[[4]](#footnote-5).

## Scope and objectives

This document proposes a first version of the SDG metadata model, to be used to structure the data exchanges for the European Single Digital Gateway. The model tries to reuse existing elements to the maximum extent possible. The majority of elements are aligned with CPSV-AP[[5]](#footnote-6), but also DCAT-AP[[6]](#footnote-7) and the e-government Core Vocabularies[[7]](#footnote-8) and the different standards they point to.

The objective of this document is to give you both a first understanding of the model through a practical example as well as detailed descriptions of each element of the model.

This document should give you sufficient information to review the model and provide your comments on GitHub[[8]](#footnote-9).

## Approach

Firstly, we identified all granular concepts in the text of the SDG Regulation that are important from a semantic point of view for describing and exchanging information about public services in the context of the SDG.

Then we mapped those concepts to existing data models to reuse maximally existing information already applied by different public organisations.

We also prioritised the concepts to be included within the model based on the deadlines expressed in the regulation.

After internal reviews and discussions, we created a metadata model, based on the previous analysis.

Lastly, we identified the elements from the model without which implementing the repository of links will be impossible. Those elements are representing the core model or the elements that every Member State should comply with. We recommend you however to implement all the elements from the model if possible since all of them are required for implementing the SDG regulation.

The ongoing step of this work is to receive input from multiple stakeholders, with the SDG National Coordinator teams and the CPSV-AP Working Group as most important stakeholders.

The next steps will be to:

* analyse the comments on the specification (including the metadata model and the classifications);
* propose solutions to be discussed during the next webinar of the 5th of February;
* share a new proposition with the Member States to be discussed and agreed during the workshop of 21st of February.

## Structure of this document

This document consists of the following sections.

* In section 2 we give an example, illustrating how the SDG metadata model can be used in practice for describing a public service;
* The classes and properties defined for the Application Profile are identified in section 3, including an explanation on the distinction between the proposed core and extended SDG Data Model;
* In section 3.20.1, controlled vocabularies are proposed for use as value sets for a number of properties, this section refers to the Excel file that contains the proposed classifications;
* Namespaces and prefixes used throughout the specifications are listed in section 5;

# SDG data Model: classes and properties

The specification of the SDG data model is represented in a UML class diagram. Figure 14 shows the full profile which includes:

* The classes and properties that define the service itself: the necessary inputs, possible outputs, the responsible public authority and the events that trigger service use;
* The classes and properties that describe the context in which the service is offered. This includes relevant legislation and rules of operation for the service; and
* The interface between the service and its users: how and when it can be accessed.

Figure 14 - Graphical representation of the relationships between the classes and properties of the proposed SDG Data Model

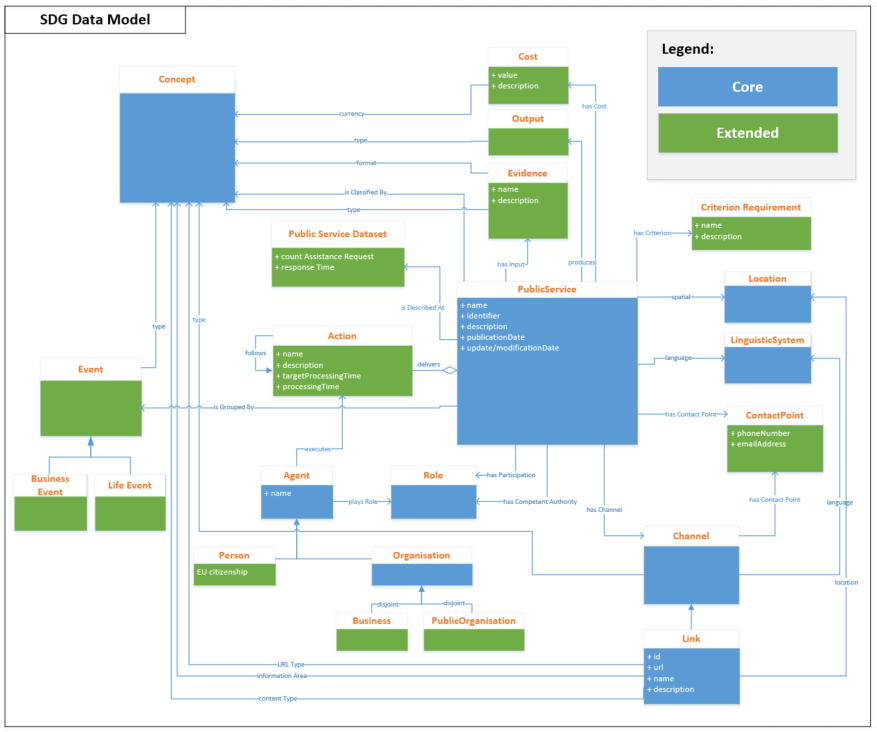
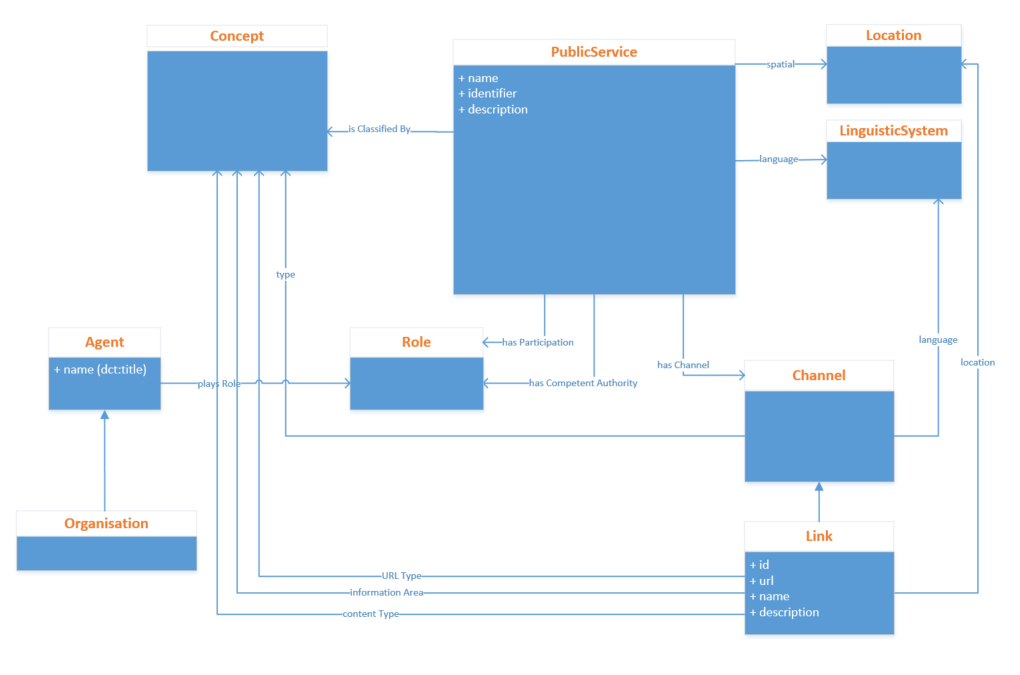


Figure 15 - Graphical representation of the relationships between the classes and properties of the proposed Core SDG Data Model



## Distinction between the Core and the Extended SDG Data Model

The European Commission has defined a distinction between a Core SDG Data Model and an Extended SDG Data Model. This distinction is important since it will help Mmeber States to know what to start with. The Core Model describes the minimum elements identified as necessary for linking the repository of links data model proposed[[9]](#footnote-10) and information most of the Member States have about public services. By structuring the elements following this Core SDG Data Model, Member States will more easily reuse their descriptions to exchange in a compliant manner with the repository.

However, by December 2020, when the first part of the SDGR will be applicable, the Member States will need to share a lot of information (specified in the SDGR) on their national or regional online portals. The Extended SDG Data Model is a proposition made to the Member States to describe further their information and publish it on their national websites in an harmonised way. The Extended model comprises most of the mandatory data elements of the SDGR except some data elements which were not included because of ongoing discussions within other actions (e.g. feedback or statistics data elements).

Neither the Core or Extended model are mandatory for the Member States to implement. However, both models pursue the same objective: harmonising the descriptions of public services between administrations and for its end-users. This harmonisation would add value to the user experience and to the comprehension of administrations exchanging information.

In the following subsections, all proposed classes and properties are listed and described.

## The Public Service Class

|  |  |  |
| --- | --- | --- |
| From Data Model | Core / Extended | Reasoning Core / Extended |
| CPSV-AP | Core | The concept of public service is at the core of the entire model. In combination with the new class Action, public administrations should be able to cover both the administration’s and the end-users’ perspectives. |

This class represents the Public Service itself, as it is described in a public service catalogue. A Public Service is a mandatory or discretionary set of activities performed, or able to be performed, by or on behalf of a public organisation, publicly funded and arise from public policy. Services may be for the benefit of an individual, a business, or other public authority, or groups of any of these. A service exists whether it is used or not, and the term 'benefit' may apply in the sense of enabling the fulfilment of an obligation. As defined in the revised version of the European Interoperability Framework[[10]](#footnote-11), a European public service comprises any service provided by public administrations in Europe, or by other organisations on their behalf, to businesses, citizens or others public administrations.

|  |  |
| --- | --- |
| Class name | URI |
| Public Service | cpsv:PublicService |

The following subsections define the properties of the Public Service class.

### Identifier

This property represents a formally-issued Identifier for the Public Service. Each Public Service must have an identifier but, as part of the SDG, this identifier may be assigned by the European Commission.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| identifier | dct:identifier | dct:identifier | 1..1 |

### Name

This property represents the official Name of the Public Service. As part of the Single Digital Gateway, public administrations will have different official names for one single procedure of Annex II of the regulation. The official name of the Public Service, as valid within the authoritative area of the Organisation responsible for it, should be used. The categorisation of the procedure will be part of the classifiers under the class Concept.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| name | dct:title | Text | 1..1 |

### Description

This property represents a free text Description of the Public Service. The description is likely to be the text that potential users of the Public Service see in any public service catalogue. Public administrations are encouraged to include a reasonable level of detail in the description, for instance including basic eligibility requirements for the particular Public Service and contact information.

With the introduction of the classes Action and Link within the data model, this description may be replicated partially or totally.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| description | dct:description | Text | 1..1 |

### Publication Date

This property contains the date of formal issuance (e.g. publication) of the Public Service.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| publicationDate | dct:issued | xsd:date OR  xsd:dateTime | 0..1 |

### Update/Modification Date

This property contains the most recent date on which the Public Service was modified.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| update/modificationDate | dct:modified | xsd:date OR  xsd:dateTime | 0..1 |

### Language

This property represents the language(s) in which the Public Service is available. This could be one language or multiple languages, for instance in countries with more than one official language. The possible values for this property are described in a controlled vocabulary. This property needs to be differentiated from the language of the Channel. The second represents the language(s) in which information about the Public Service is available through different channels such as a webpage of via phone. Some public administrations may provide a help line in more languages than the official languages in which the Public Service is available.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| language | dct:language | dct:LinguisticSystem | 0..n |

### Has Criterion

Links a Public Service to a class that describes the criteria for needing or using the service, such as residency in a given location, being over a certain age etc. The Criterion class is defined in the Core Criterion and Core Evidence Vocabulary[[11]](#footnote-12). It is important to note that, as part of the Once-Only Principle part of the SDG, the exchange of evidence and the Criterion and Evidence Rule Base are currently being defined. The relation between a Public Service and Criterion may change in the coming months.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| hasCriterion | cv:hasCriterion | Criterion Requirement | 0..n |

### Has Competent Authority

This property links a Public Service to a Public Organization, which is the responsible Agent[[12]](#footnote-13) for the delivery of the Public Service. Whether the particular Public Organization provides the public service directly or outsources it is not relevant. The Public Organization that is the Competent Authority of the service is the one that is ultimately responsible for managing and providing the public service.

The term Competent Authority is defined in the Services Directive (2006/123/EC) in the following way:

“Any body or authority which has a supervisory or regulatory role in a Member State in relation to service activities, including, in particular, administrative authorities, including courts acting as such, professional bodies, and those professional associations or other professional organisations which, in the exercise of their legal autonomy, regulate in a collective manner access to service activities or the exercise thereof”.

Please note that while only one Competent Authority should be considered as legally responsible for one Public Service within its geographic area, this does not require the same Public Service to be provided by this authority or by a single Organisation.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| hasCompetentAuthority | cv:hasCompetentAuthority | Public Organisation | 1..1 |

### Has Input

The Has Input property links a Public Service to one or more instances of the Evidence class (see section 3.9). A specific Public Service may require the presence of certain pieces of Evidence in order to be delivered. If the evidence required to make use of a service varies according to the channel through which it is accessed, then Has Input should be at the level of the Channel (section 3.12.2). Similarly to has Criterion, this relationship and the class Evidence may change in the coming months.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| hasInput | cpsv:hasInput | Evidence | 0..n |

### Produces

The Produces property links a Public Service to one or more instances of the Output class (see section 3.10), describing the actual result of executing a given Public Service. Outputs can be any resource, for instance a document, artefact or anything else being produced as a result of executing the Public Service.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| produces | cpsv:produces | Output | 0..n |

### Spatial

A Public Service is likely to be available only within a given area, typically the area covered by a particular public authority. The possible values for this property are described in a controlled vocabulary.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| spatial | dct:spatial | Location | 0..n |

### Has Contact Point

A contact point for the service is almost always helpful. The value of this property, the contact information itself, should be provided using schema:ContactPoint. Note that the contact information should be relevant to the Public Service which may not be the same as contact information for the Competent Authority or any Participant.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| hasContactPoint | cv:hasContactPoint | Contact Point | 0..n |

### Has Channel

This property links the Public Service to any Channel through which an Agent provides, uses or otherwise interacts with the Public Service, such as an online service, phone number or office. See section 3.12.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| hasChannel | cv:hasChannel | Channel | 0..n |

### Has Cost

The Has Cost property links a Public Service to one or more instances of the Cost class (see section 3.11). It indicates the costs related to the execution of a Public Service for the citizen or business related to the execution of the particular Public Service.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| hasCost | cv:hasCost | Cost | 0..n |

### Is Described At

The Is Described At property links a Public Service to the Public Service Dataset(s) (see 3.7) in which it is being described (see section 3.7).

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| isDescribedAt | cv:isDescribedAt | Public Service Dataset | 0..n |

### Is Classified By

The Is Classified By property allows to classify the Public Service with any Concept (section 3.20). It is a generic property which can be further specialised to make the classification explicit, for instance for classifying public services according to different levels of digitisation, type of audience …

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| isClassifiedBy | cv:isClassifiedBy | Concept | 0..n |

## The Action Class

|  |  |  |
| --- | --- | --- |
| From Data Model | Core / Extended | Reasoning Core / Extended |
| - | Extended | This class is an important part of the SDGR as it details the steps of the procedure to be followed in order to deliver the Public Service. This reconciles the procedure and the service perspectives into one model. This is part of the extended model as the priority of the model now lies in providing the basic information of a public service in the repository of links. |

This class represents the different actions that, taken together, deliver the Public Service itself. A simplified example:

* Action 1: an EU citizen [class Person] requests a birth certificate [Public Service] via an official portal [Channel]
* Action 2: a public organisation provides the birth certificate [Output]

### Name

This property represents the name of the action.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| name | dct:title | Text | 1..1 |

### Description

This property represents the description of a granular action.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| description | dct:description | Text | 1..1 |

### Target processing time

This property represents the estimated period of time required to conduct the action:

* E.g. a form needs to be filled in by a user within 100 days.
* E.g. a public administration needs to provide a document within two weeks.

It uses the same syntax than processingTime (described below).

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| targetProcessingTime | cv:processingTime | Duration | 0..1 |

### Processing time

The value of this property is the official time needed for executing a Public Service. The information might be fixed in certain cases by law. The actual information is provided using the ISO8601 syntax for durations. Some examples are provided below:

|  |  |
| --- | --- |
| Duration | Syntax |
| 5 years | P5Y |
| 1 month | P1M |
| 3 days | P3D |
| 2 days 4 hours | P2DT4H |

Durations begin with an uppercase P followed by the number and the relevant designator, formally: P[n]Y[n]M[n]DT[n]H[n]M[n]S, where Y is for years, M for months etc. Note that days and times are separated by an uppercase T which also disambiguates M as meaning month (P2M means 2 months) or minute (PT2M means 2 minutes). Durations may also be defined as a number of weeks so P4W means 4 weeks. A full explanation is provided in the Wikipedia page[[13]](#footnote-14) that references the official ISO standard[[14]](#footnote-15).

This approach is consistent with both schema.org and the W3C OWL Time Ontology.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| processingTime | cv:processingTime | Duration | 0..1 |

### Follows

The Follows property one or more actions with each other. More complex (or non-linear) processes can be described by adding an additional properties[[15]](#footnote-16) such the conditionality or whether the Action is optional or mandatory.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| follows | TBD | Action | 0..n |

### Delivers

The Delivers property links and aggregates one or more actions to the Public Service class (see section 3.2). To execute a Public Service one or more actions must be taken to initiate and deliver a public service.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| delivers | TBD | PublicService | 0..n |

## The Event Class

|  |  |  |
| --- | --- | --- |
| From Data Model | Core / Extended | Reasoning Core / Extended |
| CPSV-AP | Extended | We did not put the emphasis of this model on the class Event. However, considering the importance to have a common approach for grouping and finding public services, it is important that the class remains available for any public administration who would like to use it. |

This class represents an event that can be of any type that triggers, makes use of, or in some way is related to, a Public Service. It is not expected to be used directly, rather, one or other of its subclasses should be used. The properties of the class are, of course, inherited by those subclasses.

The Event class is used as a hook either to a single related Public Service, such as diagnosis of illness being related to application for sickness benefit; or to a group of Public Services, such as all those related to the establishment of a new business.

|  |  |
| --- | --- |
| Class name | URI |
| Event | cv:Event |

### Type

The type property links an Event to a controlled vocabulary of event types and it is the nature of those controlled vocabularies that is the major difference between a business event, such as creating the business in the first place and a life event, such as the birth of a child.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| type | dct:type | Concept | 0..n |

## The Business Event Class

|  |  |  |
| --- | --- | --- |
| From Data Model | Core / Extended | Reasoning Core / Extended |
| CPSV-AP | Extended | Not a priority at this time. |

This class represents a Business Event, which specialises Event. A Business Event is a specific situation or event in the lifecycle of a business that fulfils one or more needs or (legal) obligations of that business at this specific point in time. A Business Event requires a set of public services to be delivered and consumed in order for the associated business need(s) or obligation(s) to be fulfilled. Business Events are defined within the context of a particular Member State.

In other words, a Business Event groups together a number of public services that need to be delivered for completing that particular event.

|  |  |
| --- | --- |
| Class name | URI |
| Business Event | cv:BusinessEvent |

## The Life Event Class

|  |  |  |
| --- | --- | --- |
| From Data Model | Core / Extended | Reasoning Core / Extended |
| CPSV-AP | Extended | Not a priority at this time. |

The Life Event class represents an important event or situations in a citizen's life where public services may be required. Note the scope: an individual will encounter any number of 'events' in the general sense of the word. In the context of the CPSV-AP, the Life Event class **only** represents an event for which a Public Service is related. For example, a couple becoming engaged is not a CPSV-AP Life Event, getting married is, since only the latter has any relevance to public services. We reuse the same logic as part of the SDG.

|  |  |
| --- | --- |
| Class name | URI |
| Life Event | cv:LifeEvent |

## The Public Service Dataset Class

|  |  |  |
| --- | --- | --- |
| From Data Model | Core / Extended | Reasoning Core / Extended |
| DCAT-AP | Extended | Not a priority at this time. |

The Public Service Dataset, is a specialisation of the Dataset class of the Data Catalog Vocabulary (DCAT)[[16]](#footnote-17) and inherits all its properties. The class describes the metadata of where the dataset is being described, for instance on a regional public service portal and/or a national eGovernment portal.

|  |  |
| --- | --- |
| Class name | URI |
| Public Service Dataset | cv:PublicServiceDataset |

### Count Assistance Request

This property refers to the number of requests for assistance and problem-solving services.

### Response time

This property refers to the average response time for different requests for assistance and problem-solving services.

## The Criterion Requirement Class

|  |  |  |
| --- | --- | --- |
| From Data Model | Core / Extended | Reasoning Core / Extended |
| CPSV-AP | Extended | In almost all cases, obtaining the provision of a public service requires to answer first to some requirements. This class specifies the requirements. |

Not all public services are needed or usable by everyone. For example, the visa service operated by European countries is not needed by European citizens but is needed by some citizens from elsewhere, or public services offering unemployment benefits and grants are targeting specific societal groups. The CPSV reuses the Core Criterion and Core Evidence Vocabulary[[17]](#footnote-18) for this class. The CCCEV provides more details about the three mandatory properties of the Criterion Requirement class.

|  |  |
| --- | --- |
| Class name | URI |
| Criterion Requirement | cv:CriterionRequirement |

### Name

This property represents the name of the Criterion Requirement.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| name | dct:title | Text | 1..1 |

### Description

This property represents the description of a Criterion Requirement.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| description | dct:description | Text | 1..1 |

## The Evidence Class

|  |  |  |
| --- | --- | --- |
| From Data Model | Core / Extended | Reasoning Core / Extended |
| CPSV-AP | Extended | For each requirement defined, one or more evidence must be provided to the relevant authority. |

The Evidence class is defined in the Core Criterion and Core Evidence vocabulary (CCCEV) as any resource that can document or support a criterion response. It contains information that proves that a criterion requirement exists or is true, in particular evidences are used to prove that a specific criterion is met.

Although the wording of the definition is different, the semantics are an exact match for CPSV's Input class which it replaces.

Evidence can be any resource - document, artefact – anything needed for executing the Public Service. In the context of Public Services, Evidence is usually administrative documents or completed application forms. A specific Public Service may require the presence of certain Evidence or combinations of Evidence in order to be delivered.

|  |  |
| --- | --- |
| Class name | URI |
| Evidence | cv:Evidence |

### Name

This property represents the name of the piece of Evidence.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| name | dct:title | Text | 1..1 |

### Description

This property represents the description of a piece of Evidence.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| description | dct:description | Text | 1..1 |

### Type

This property represents the type of Evidence which could be described in a controlled vocabulary.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| type | dct:type | Concept | 0..1 |

## The Output Class

|  |  |  |
| --- | --- | --- |
| From Data Model | Core / Extended | Reasoning Core / Extended |
| CPSV-AP | Extended | Not a priority at this time. |

Outputs can be any resource - document, artefact – anything produced by the Public Service. In the context of a Public Service, the output provides an official document or other artefact of the Competent Authority (Public Organization) that permits/authorises/entitles an Agent to (do) something.

|  |  |
| --- | --- |
| Class name | URI |
| Output | cv:Output |

### Type

This property represents the type of Output as defined in a controlled vocabulary.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| type | dct:type | Concept | 0..n |

## The Cost Class

|  |  |  |
| --- | --- | --- |
| From Data Model | Core / Extended | Reasoning Core / Extended |
| CPSV-AP | Extended | Not a priority at this time. |

The Cost class represents any costs related to the execution of a Public Service that the Agent consuming it needs to pay.

|  |  |
| --- | --- |
| Class name | URI |
| Cost | cv:Cost |

### Description

This property represents the description of the Cost.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| description | dct:description | Text | 1..1 |

### Value

This property represents a numeric value indicating the amount of the Cost.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| value | cv:value | Number | 0..1 |

### Currency

This property represents the currency in which the Cost needs to be paid and the value of the Cost is expressed. The possible values for this property are described in a controlled vocabulary.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| currency | cv:currency | Concept | 0..1 |

## The Channel Class

|  |  |  |
| --- | --- | --- |
| From Data Model | Core / Extended | Reasoning Core / Extended |
| CPSV-AP | Core | Necessary class as it defines the type of the channel, such as the web page. This information is needed to be defined in the Repository of Links. |

The Channel class represents the medium through which an Agent provides, uses or interacts in another way with a Public Service. Typical examples include online services, phone, walk-in centres etc.

|  |  |
| --- | --- |
| Class name | URI |
| Channel | cv:Channel |

### Type

This property represents the type of Channel as defined in a controlled vocabulary.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| type | dct:type | Concept | 0..1 |

### Has contact point

A contact point for the service is almost always helpful and definitely in the context of the Repository of Links. For example, there is a contact point needed that maintains specific URLs. The value of this property, the contact information itself, should be provided using schema:ContactPoint. Note that the contact information should be relevant to the Public Service which may not be the same as contact information for the Competent Authority or any Participant.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| hasContactPoint | cv:hasContactPoint | Contact Point | 0..n |

### Language

This property represents the language(s) of the channel in which information related to a Public Service is available. This could be one language or multiple languages, for instance in countries with more than one official language. The possible values for this property are described in a controlled vocabulary. For the repository of links, ISO will be used as controlled vocabulary.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| language | dct:language | dct:LinguisticSystem | 0..n |

## The Link Class

|  |  |  |
| --- | --- | --- |
| From Data Model | Core / Extended | Reasoning Core / Extended |
| CPSV-AP | Core | Necessary information for the Repository of Links. Key information to refer users on the SDG to the relevant web page. |

This class represents a Link, which specialises Channel. A Link is an online page or set of online pages with information related to a public service.

|  |  |
| --- | --- |
| Class name | URI |
| Link | TBD |

### ID

This property refers to the identifier or ID of a Link. In the context of the repository of links, the European Commission will directly assign an ID to each link provided.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| ID | dct:identifier | Text | 1..1 |

### URL

This property refers to the Uniform Resource Locator specifying the location of the web resource (webpage, domain) in which the descriptions required by the Single Digital Gateway is publicly available.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| URL | schema:url | URL | 1..1 |

### Name

This property represents the name of the Link given by the responsible authority.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| name | dct:title | Text | 0..1 |

### Description

This property represents the description of a Link given by the responsible authority.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| description | dct:description | Text | 0..1 |

### URL Type

This property refers to the type of web resource the URL is retrieving. It defines if the URL submitted is a webpage or a folder within a domain, or it can also be the main folder, meaning the domain itself.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| URLType | dct:type | Concept | 1..1 |

### Content Type

The indication if the Link is retrieving information, a procedure or a database.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| ContentType | dct:type | Concept | 1..1 |

### Information Area

The information area from Annex I under which the Link and the information it retrieves can be classified.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| informationArea | dct:type | Concept | 1..n |

### Country

The country to which the Link is refering to. For the repository of links, the ISO 2-digit code will be used. For public administrations using the Named Authority List for country[[18]](#footnote-19), a mapping is available online.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| country | dct:spatial | Location | 1..1 |

### Internal Location

Any other internal geographical area or location this link is refering to, within a certain country. We recommend the standards in the following order:

We propose here to point to (in that order of preference):

NUTS - levels 2 (provinces) and 3 (arrondissement)[[19]](#footnote-20) which is also available in RDF[[20]](#footnote-21)

EU Vocabularies Places Named Authority List[[21]](#footnote-22). It provides at the same time a mapping between the ISO code and the EU NAL code and also includes extra elements which are not part of ISO (cf. entire description of NAL)

Geonames[[22]](#footnote-23)

Other controlled vocabularies if the previous ones are not sufficient.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| internalLocation | dct:spatial | Location | 0..1 |

## The Agent Class

|  |  |  |
| --- | --- | --- |
| From Data Model | Core / Extended | Reasoning Core / Extended |
| CPV | Extended | Not a priority at this time. |

The Agent class is any resource that acts or has the power to act. This includes people, organisations and groups. The Public Organization class, defined in the Core Public Organisation Vocabulary, is a notable sub class of Agent.

|  |  |
| --- | --- |
| Class name | URI |
| Agent | dct:Agent |

### Name

This property represents the Name of the Agent.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| name | dct:title | Text | 1..1 |

## The Public Organisation Class

|  |  |  |
| --- | --- | --- |
| From Data Model | Core / Extended | Reasoning Core / Extended |
| CPOV | Core | This information is needed to know what organisation is responsible for a specific public service. Knowing this, users can get referred to the responsible public organisation. |

The SDG metadata model reuses the Core Public Organisation Vocabulary[[23]](#footnote-24) that defines the concept of a Public Organization and associated properties and relationships. It is largely based on the W3C Organization Ontology[[24]](#footnote-25).

|  |  |
| --- | --- |
| Class name | URI |
| Public Organisation | cv:PublicOrganisation |

### Preferred label

This property represents the preferred label of the Public Organization.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| preferredLabel | skos:prefLabel | Text | 1..1 |

## Organisation

|  |  |  |
| --- | --- | --- |
| From Data Model | Core / Extended | Reasoning Core / Extended |
| CPSV-AP | Extended | This class is a key concept to classify a public service in the SDGR. In this case, we choose not to use a classification, because in the future, properties could be added to the concept. |

This class represents an organisation. Organisation is a sub-class of the Agent class.

## Business

|  |  |  |
| --- | --- | --- |
| From Data Model | Core / Extended | Reasoning Core / Extended |
| CPSV-AP |  | This class is a key concept to classify a public service in the SDGR. In this case, we choose not to use a classification, because in the future, properties could be added to the concept. |

This is the key class for the Business Core Vocabulary (called ‘Legal Entity) and represents a business that is legally registered. A Legal Entity is able to trade, is legally liable for its actions, accounts, tax affairs etc.

This makes legal entities distinct from the concept of organisations, groups or sole traders. Many organisations exist that are not legal entities yet to the outside world they have staff, hierarchies, locations etc. Other organisations exist that are an umbrella for several legal entities (universities are often good examples of this). This vocabulary is concerned solely with registered legal entities and does not attempt to cover all possible trading bodies.

Business is a sub class of the more general 'Agent' class that does encompass organisations, natural persons, groups etc. - i.e. an Agent is any entity that is able to carry out actions.

## Person

|  |  |  |
| --- | --- | --- |
| From Data Model | Core / Extended | Reasoning Core / Extended |
| CPSV-AP | Extended | This class is a key concept to classify a public service in the SDGR. In this case, we choose not to use a classification, because in the future, properties could be added to the concept. |

This class represents a natural person. Person is a sub-class of the Agent class.

### EU citizenship

This property contains the confirmation whether or not a Person is a citizen from the European Union.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| EU citizenship | TBD | Boolean | 0..1 |

## The Contact Point Class

|  |  |  |
| --- | --- | --- |
| From Data Model | Core / Extended | Reasoning Core / Extended |
| CPSV-AP | Extended | Not a priority at this time. |

This class represents the contact information for a Public Service, Channel, Public Organization, etc. It is defined in the Core Public Organisation Vocabulary and is provided as a schema:ContactPoint.

|  |  |
| --- | --- |
| Class name | URI |
| Contact Point | schema:ContactPoint |

### Phone number

This property represents the phone number for the Public Service and Channel.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| phoneNumber | schema:telephone[[25]](#footnote-26) | Text | 0…n |

### Email address

This property represents the email address for the Public Service and Channel.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Range |
| emailAddress | vcard:email | Text | 0…n |

## The Concept Class

|  |  |  |
| --- | --- | --- |
| From Data Model | Core / Extended | Reasoning Core / Extended |
| CPSV-AP | Core | A public service should be classified by three classifications: the rights, obligations and rules, the procedures and the assistance and problem-solving services. To make this possible, the concept class is part of the Core model. |

This class represents any concept that can be used for classifying the Public Service and which relates to the Public Service through the property Is Classified By (section 3.2.16). This class is included in the SDG model for classifying the different classes included in the model.

In this context the SDG model reuses the Concept[[26]](#footnote-27) class as defined in the SKOS Simple Knowledge Organization System[[27]](#footnote-28). For describing the attributes of a Concept (labels, preferred labels, alternative labels, definition …) we refer to SKOS.

|  |  |
| --- | --- |
| Class name | URI |
| Concept | skos:Concept |

### SDG type

This property represents the SDG type of service described. It is an overarching categorisation of more granular and specific classifications such as information areas, procedures, or Assistance and problem solving services. Depending on the classification, the SDGR requires different levels of details to be provided. The possible values for this SDG type property are: Information Area, SDG Procedure, Assistance and problem solving service.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| SDGType | To be defined | Concept | 1..n |

# Recommended Controlled Vocabularies

In order to facilitate the exchange of information on Public Services grouped into business events or life events, controlled vocabularies are intended to harmonise the possible values for certain properties. This improves the interoperability of the descriptions and eases the integration of information coming from different sources. Public Organisations can map the values of the controlled vocabularies they use for describing Public Services in their MS, to the specific values of the controlled vocabularies suggested below.

It is important to mention that the recommended controlled vocabularies are not mandatory. Therefore, other controlled vocabularies which are more suitable or tailored to the national context may be used. They can also be extended by the MSs in order to meet their specific needs. In particular, this can be useful for recommended controlled vocabularies of which only high-level values have been defined. For example, for the property “Thematic Area” of the class “Business Event”, a MS can extend this particular controlled vocabulary by adding additional events or providing additional levels of granularity.

The proposed recommended vocabularies of the core and extended SDG Data model, including the reasoning behind this distinction, can be found in the attached Excel sheet – SDG Classifications.

# Namespaces and Prefixes

This specification uses the following prefixes and namespaces.

Table 1: Namespaces and Prefixes

|  |  |
| --- | --- |
| Prefix | Namespace |
| cv | http://data.europa.eu/m8g/ |
| cpsv | http://purl.org/vocab/cpsv# |
| adms | http://www.w3.org/ns/adms# |
| eli | http://data.europa.eu/eli/ontology# |
| dct | http://purl.org/dc/terms/ |
| dcat | http://www.w3.org/ns/dcat# |
| skos | http://www.w3.org/2004/02/skos/core# |
| schema | https://schema.org/ |
| locn | http://www.w3.org/ns/locn# |
| foaf | http://xmlns.com/foaf/0.1/ |

1. Key Concepts used throughout this document

The working terminology in the table below was defined for the original CPSV-AP in the context of the work of ISA Action 1.3 based on an analysis of existing work and related studies.

Table 2: Definition of key concepts

|  |  |
| --- | --- |
| Term | Definition |
| Administrative formality | A Public Service that is mandatory in the context of given Business Event. |
| Public Service | A public service is the capacity to carry out a procedure and exists whether it is used or not. It is a set of deeds and acts performed by or on behalf of a public administration for the benefit of, or mandatory to be executed by a citizen, a business or another public administration. |
| Business Lifecycle | The Business Lifecycle is the lifecycle of a business from its creation until its termination. It is comprised of different situations or events a business can be in during its existence. These situations or events are called business events. |
| Business Event[[28]](#footnote-29) | A specific situation or event in the lifecycle of a business, which relates to one or more needs or obligations of that business at this specific point in time. A Business Event requires a set of public services to be delivered in order for the associated business need(s) or obligation(s) to be fulfilled. Business Events are defined within the context of a particular Member State. |
| Key Business Event | A generic situation or event in the lifecycle of a business, independent from a specific Member State’s legal context or the type and the activities of the business, during which any business carries out its business activities and interactions with Government. We identify the following Key Business Events:   1. Starting business:  All public services for local businesses until the business is eligible for operation. Some examples of events that would fall under this Key Business Event are “Starting a company”, “Starting a new activity”, "Applying for licenses, permits and certificates"… 2. Starting cross-border business:  All public services for foreign businesses (branches or temporary service provision) until the business is eligible for operation. Some examples of events that would fall under this Key Business Event are “Registering a company abroad”, “Starting a new branch”… 3. Doing business:  All public services for business operation, growth, expansion, staffing and taxes. Some examples of events that would fall under this Key Business Event are "Financing a business", "Staffing", "Reporting and notifying authorities", "Paying taxes"... 4. Closing business:  All public services related to closing a business. This covers also mergers and acquisitions. The criterion is a change in the registry that causes a termination of operation of a legal entity. Some examples of events that would fall under this Key Business Event are "Closing down a company", "Closing a branch", "Merging you company", "Selling your company", "Bankruptcy"… |
| Public Service Portfolio | The complete set of public services that are managed by a governmental service provider. The portfolio is used to manage the entire lifecycle of all public services, and includes services from all phases of that lifecycle: service pipeline (proposed or in development), service catalogue (live or available for deployment), and retired services. |
| Catalogue of Public Services | A catalogue of public services is a collection of descriptions of active public services that are provided by public administrations at any administrative level (i.e. local, regional, national or pan-European). All public service descriptions published in a catalogue of public services conform to a common data model for representing public services. |
| Competent Authority | Any body or authority which has a supervisory or regulatory role in a Member State in relation to service activities, including, in particular, administrative authorities, including courts acting as such, professional bodies, and those professional associations or other professional organizations which, in the exercise of their legal autonomy, regulate in a collective manner access to service activities or the exercise thereof. |

1. <https://en.wikipedia.org/wiki/Resource_Description_Framework> [↑](#footnote-ref-2)
2. <https://www.europeandataportal.eu/en/providing-data/how-to-be-harvested-by-us> [↑](#footnote-ref-3)
3. <https://www.europeandataportal.eu/en/providing-data/goldbook/putting-place-open-data-lifecycle> [↑](#footnote-ref-4)
4. [Miguel.ALVAREZ-RODRIGUEZ@ec.europa.eu](mailto:Miguel.ALVAREZ-RODRIGUEZ@ec.europa.eu) [↑](#footnote-ref-5)
5. <https://joinup.ec.europa.eu/solution/core-public-service-vocabulary-application-profile> [↑](#footnote-ref-6)
6. <https://joinup.ec.europa.eu/solution/dcat-application-profile-data-portals-europe> [↑](#footnote-ref-7)
7. <https://joinup.ec.europa.eu/solution/e-government-core-vocabularies> [↑](#footnote-ref-8)
8. <https://github.com/catalogue-of-services-isa/CPSV-AP/labels/SDG%20domain%20model> [↑](#footnote-ref-9)
9. <https://webgate.ec.europa.eu/fpfis/wikis/pages/viewpage.action?pageId=480283052> [↑](#footnote-ref-10)
10. <http://ec.europa.eu/isa/documents/isa_annex_ii_eif_en.pdf> [↑](#footnote-ref-11)
11. <https://joinup.ec.europa.eu/asset/criterion_evidence_cv/description> [↑](#footnote-ref-12)
12. We describe further the class Agent later on in this document. An Agent is any resource that acts or has the power to act. [↑](#footnote-ref-13)
13. https://en.wikipedia.org/wiki/ISO\_8601#Durations [↑](#footnote-ref-14)
14. http://www.iso.org/iso/catalogue\_detail?csnumber=40874 [↑](#footnote-ref-15)
15. <https://github.com/catalogue-of-services-isa/SDG-model/issues/3> [↑](#footnote-ref-16)
16. <https://www.w3.org/TR/vocab-dcat/#class-dataset> [↑](#footnote-ref-17)
17. https://joinup.ec.europa.eu/asset/criterion\_evidence\_cv/description [↑](#footnote-ref-18)
18. <https://op.europa.eu/en/web/eu-vocabularies/at-dataset/-/resource/dataset/country> [↑](#footnote-ref-19)
19. <https://ec.europa.eu/eurostat/web/nuts/nuts-maps> [↑](#footnote-ref-20)
20. <https://op.europa.eu/en/web/eu-vocabularies/at-dataset/-/resource/dataset/nuts> [↑](#footnote-ref-21)
21. <https://publications.europa.eu/en/web/eu-vocabularies/at-dataset/-/resource/dataset/place> [↑](#footnote-ref-22)
22. <http://sws.geonames.org/> [↑](#footnote-ref-23)
23. <https://joinup.ec.europa.eu/asset/cpov/asset_release/all> [↑](#footnote-ref-24)
24. <http://www.w3.org/TR/vocab-org/> [↑](#footnote-ref-25)
25. <https://schema.org/telephone> [↑](#footnote-ref-26)
26. https://www.w3.org/TR/skos-reference/#concepts [↑](#footnote-ref-27)
27. https://www.w3.org/TR/skos-reference/ [↑](#footnote-ref-28)
28. Definition has been based on the definition of a life event in «Reference Models for e-Services Integration based on Life-Events by Todorovski et al., 2006 : « A life event is a specific situation or event in the life of a citizen or a life cycle of an organization that requires a set of public services to be performed.» [↑](#footnote-ref-29)