SC414DI07171

D02.02 – Core Public Service Vocabulary Application Profile 2.1

CPSV-AP 2.1

Document Metadata

|  |  |
| --- | --- |
| Property | Value |
| Release date | 2017-11-10 |
| Status | For acceptance |
| Version | 1.00 |
| Authors | Michiel De Keyzer – PwC EU Services  Ana Fernández de Soria Risco – PwC EU Services |
| Reviewed by | Nikolaos Loutas – PwC EU Services |
| Approved by |  |

# 

This report was prepared for the ISA Programme by:

PwC EU Services

Disclaimer:

The views expressed in this report are purely those of the authors and may not, in any circumstances, be interpreted as stating an official position of the European Commission.

The European Commission does not guarantee the accuracy of the information included in this study, nor does it accept any responsibility for any use thereof.

Reference herein to any specific products, specifications, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favouring by the European Commission.

All care has been taken by the author to ensure that s/he has obtained, where necessary, permission to use any parts of manuscripts including illustrations, maps, and graphs, on which intellectual property rights already exist from the titular holder(s) of such rights or from her

# Table of Contents

[1. Introduction 8](#_Toc498349757)

[1.1. Scope and objectives 8](#_Toc498349758)

[1.2. Process and methodology 9](#_Toc498349759)

[1.3. Structure of this document 10](#_Toc498349760)

[2. Use cases 11](#_Toc498349761)

[2.1. Use Case 1 – Finding information about public services more easily 11](#_Toc498349762)

[2.2. Use Case 2 – Building user-centric catalogues of public services at all levels from regional to a European federated catalogue 11](#_Toc498349763)

[2.3. Use Case 3 – Managing portfolios of public services 12](#_Toc498349764)

[2.4. Use case 4 – Finding information of generic and specialised public services 13](#_Toc498349765)

[3. Core Public Service Vocabulary Application Profile (CPSV-AP) 14](#_Toc498349766)

[3.1. Mandatory and optional classes and properties of CPSV-AP 19](#_Toc498349767)

[3.2. The Public Service Class 20](#_Toc498349768)

[3.2.1. Identifier 20](#_Toc498349769)

[3.2.2. Name 20](#_Toc498349770)

[3.2.3. Description 20](#_Toc498349771)

[3.2.4. Keyword 20](#_Toc498349772)

[3.2.5. Sector 21](#_Toc498349773)

[3.2.6. Type 21](#_Toc498349774)

[3.2.7. Language 21](#_Toc498349775)

[3.2.8. Status 21](#_Toc498349776)

[3.2.9. Is Grouped By 21](#_Toc498349777)

[3.2.10. Requires 22](#_Toc498349778)

[3.2.11. Related 22](#_Toc498349779)

[3.2.12. Has Criterion 22](#_Toc498349780)

[3.2.13. Has Competent Authority 22](#_Toc498349781)

[3.2.14. Has Participation 23](#_Toc498349782)

[3.2.15. Has Input 23](#_Toc498349783)

[3.2.16. Has Formal Framework 23](#_Toc498349784)

[3.2.17. Produces 23](#_Toc498349785)

[3.2.18. Follows 24](#_Toc498349786)

[3.2.19. Spatial 24](#_Toc498349787)

[3.2.20. Has Contact Point 24](#_Toc498349788)

[3.2.21. Has Channel 24](#_Toc498349789)

[3.2.22. Processing time 25](#_Toc498349790)

[3.2.23. Has Cost 25](#_Toc498349791)

[3.2.24. Is Described At 25](#_Toc498349792)

[3.3. The Event Class 26](#_Toc498349793)

[3.3.1. Identifier 26](#_Toc498349794)

[3.3.2. Name 26](#_Toc498349795)

[3.3.3. Description 26](#_Toc498349796)

[3.3.4. Type 26](#_Toc498349797)

[3.3.5. Related Service 27](#_Toc498349798)

[3.4. The Business Event Class 27](#_Toc498349799)

[3.5. The Life Event Class 27](#_Toc498349800)

[3.6. The Public Service Dataset Class 27](#_Toc498349801)

[3.6.1. Identifier 28](#_Toc498349802)

[3.6.2. Publisher 28](#_Toc498349803)

[3.6.3. Name 28](#_Toc498349804)

[3.6.4. Landing Page 28](#_Toc498349805)

[3.7. The Participation Class 28](#_Toc498349806)

[3.7.1. Identifier 29](#_Toc498349807)

[3.7.2. Description 29](#_Toc498349808)

[3.7.3. Role 29](#_Toc498349809)

[3.8. The Criterion Requirement Class 29](#_Toc498349810)

[3.8.1. Identifier 29](#_Toc498349811)

[3.8.2. Name 29](#_Toc498349812)

[3.8.3. Type 30](#_Toc498349813)

[3.9. The Evidence Class 30](#_Toc498349814)

[3.9.1. Identifier 30](#_Toc498349815)

[3.9.2. Name 30](#_Toc498349816)

[3.9.3. Description 31](#_Toc498349817)

[3.9.4. Type 31](#_Toc498349818)

[3.9.5. Related Documentation 31](#_Toc498349819)

[3.9.6. Language 31](#_Toc498349820)

[3.10. The Output Class 31](#_Toc498349821)

[3.10.1. Identifier 31](#_Toc498349822)

[3.10.2. Name 32](#_Toc498349823)

[3.10.3. Description 32](#_Toc498349824)

[3.10.4. Type 32](#_Toc498349825)

[3.11. The Cost Class 32](#_Toc498349826)

[3.11.1. Identifier 32](#_Toc498349827)

[3.11.2. Value 32](#_Toc498349828)

[3.11.3. Currency 32](#_Toc498349829)

[3.11.4. Description 33](#_Toc498349830)

[3.11.5. Is Defined By 33](#_Toc498349831)

[3.11.6. If Accessed Through 33](#_Toc498349832)

[3.12. The Channel Class 33](#_Toc498349833)

[3.12.1. Identifier 33](#_Toc498349834)

[3.12.2. Owned By 34](#_Toc498349835)

[3.12.3. Type 34](#_Toc498349836)

[3.12.4. Has Input 34](#_Toc498349837)

[3.12.5. Opening Hours 34](#_Toc498349838)

[3.12.6. Availability restriction 35](#_Toc498349839)

[3.13. The Opening Hours Specification Class 35](#_Toc498349840)

[3.14. The Rule Class 35](#_Toc498349841)

[3.14.1. Identifier 36](#_Toc498349842)

[3.14.2. Description 36](#_Toc498349843)

[3.14.3. Language 36](#_Toc498349844)

[3.14.4. Name 36](#_Toc498349845)

[3.14.5. Implements 36](#_Toc498349846)

[3.15. The Formal Framework Class 36](#_Toc498349847)

[3.15.1. Name 37](#_Toc498349848)

[3.15.2. Identifier 37](#_Toc498349849)

[3.15.3. Description 37](#_Toc498349850)

[3.15.4. Language 37](#_Toc498349851)

[3.15.5. Status 37](#_Toc498349852)

[3.15.6. Subject 38](#_Toc498349853)

[3.15.7. Territorial Application 38](#_Toc498349854)

[3.15.8. Type 38](#_Toc498349855)

[3.15.9. Related 38](#_Toc498349856)

[3.16. The Agent Class 38](#_Toc498349857)

[3.16.1. Name 38](#_Toc498349858)

[3.16.2. Identifier 39](#_Toc498349859)

[3.16.3. Plays Role 39](#_Toc498349860)

[3.16.4. Has Address 39](#_Toc498349861)

[3.17. The Public Organisation Class 39](#_Toc498349862)

[3.18. The Contact Point Class 40](#_Toc498349863)

[4. Recommended Controlled Vocabularies 41](#_Toc498349864)

[5. Example description of a public service with CPSV-AP 46](#_Toc498349865)

[5.1. Public Service class 46](#_Toc498349866)

[5.2. Business Event class 48](#_Toc498349867)

[5.3. Evidence 48](#_Toc498349868)

[5.4. Output 49](#_Toc498349869)

[5.5. Channel 49](#_Toc498349870)

[5.6. Public Organisation 50](#_Toc498349871)

[6. Conformance Statement 51](#_Toc498349872)

[6.1. Provider requirements 51](#_Toc498349873)

[6.2. Receiver requirements 51](#_Toc498349874)

[7. Accessibility and Multilingual Aspects 52](#_Toc498349875)

[8. Namespaces and Prefixes 53](#_Toc498349876)

[9. Acknowledgements 54](#_Toc498349877)

[10. Change Log 56](#_Toc498349878)

[Annex I. Detailed list of mandatory and optional classes and properties 58](#_Toc498349879)

[Annex II. The Core Public Service Vocabulary 62](#_Toc498349880)

[Annex III. Key Concepts used throughout this document 64](#_Toc498349881)

[Annex IV. Description of 1st level life events 66](#_Toc498349882)

[Annex V. Description of 2nd level business events 68](#_Toc498349883)

[Annex VI. Description of output types 70](#_Toc498349884)

List of Figures

[Figure 1 - Request handling 9](#_Toc498349885)

[Figure 2 - Graphical representation of the relationships between the classes and properties of the full Core Public Service Vocabulary Application Profile 15](#_Toc498349886)

[Figure 3 - The classes and properties in the CPSV-AP that define the service itself. 16](#_Toc498349887)

[Figure 4 - The classes of the CPSV-AP related to the formal (usually legal) basis for the provision of the service. 17](#_Toc498349888)

[Figure 5 - The classes of the CPSV-AP related to communication with a Public Service 18](#_Toc498349889)

[Figure 6 - CPSV diagram representation of current data model 62](#_Toc498349890)

List of Tables

[Table 1: CPSV-AP controlled vocabularies 41](#_Toc498349891)

[Table 2: Example of Public Service class – Human readable 46](#_Toc498349892)

[Table 3: Example of Public Service class – Machine readable 47](#_Toc498349893)

[Table 4: Example of Business Event class – Human readable 48](#_Toc498349894)

[Table 5: Example of Public Service class – Machine readable 48](#_Toc498349895)

[Table 6: Example of Evidence class – Human readable 48](#_Toc498349896)

[Table 7: Example of Evidence class – Machine readable 48](#_Toc498349897)

[Table 8: Example of Formal Framework class – Human readable 49](#_Toc498349898)

[Table 9: Example of Output class – Machine readable 49](#_Toc498349899)

[Table 10: Example of Channel class 1 – Human readable 49](#_Toc498349900)

[Table 11: Example of Channel class 2 – Human readable 49](#_Toc498349901)

[Table 12: Example of Channel class – Machine readable 49](#_Toc498349902)

[Table 13: Example of Public Organisation class – Human readable 50](#_Toc498349903)

[Table 14: Example of Public Organisation class – Machine readable 50](#_Toc498349904)

[Table 15: Namespaces and Prefixes 53](#_Toc498349905)

[Table 16: CPSV-AP Working Group Members 54](#_Toc498349906)

[Table 17: Mandatory and optional classes and properties 58](#_Toc498349907)

[Table 18: Definition of key concepts 64](#_Toc498349908)

[Table 19: Description of 1st level life events 66](#_Toc498349909)

[Table 20: Description of 2nd level business events 68](#_Toc498349910)

[Table 21: Description of output types 70](#_Toc498349911)

# Introduction

The original CPSV-AP was prepared in the context of Action 2016.29 – Accessing Member State information resources at European level – Catalogue of Services[[1]](#footnote-2) of the European Commission’s Interoperability for European Public Administrations (ISA) programme[[2]](#footnote-3). The CPSV-AP has been seen as a first step for creating a model for describing public services related to business and life events, to facilitate the set-up of catalogues of services oriented to businesses and citizens.

This document defines an update to the Core Public Service Vocabulary Application Profile version 2.0 (CPSV-AP v2.0[[3]](#footnote-4)). The update finds its motivation in the experience of implementing version 2.0 of the CPSV-AP by different MSs and stakeholders and consequent requests received from them, as detailed in “D02.01-Analysis on several possibilities to enhance the data model” of the SC414.

## Scope and objectives

Since the publication of the CPSV-AP, several Member States and European projects started to reuse and extend the data model for their own needs. The usage of this data model in national or regional contexts, has led to the identification of potential areas of improvement and extension. In undertaking to respond to the feedback received, version 2.1 has been developed with three primary aims:

* To add the concept of catalogue in order to cover the metadata of the origin of the sources of those public service descriptions that are collected into a common database;
* To extend the specifications to allow the relationship between generic, defined for instance on the national level, and specific public service descriptions with different costs, channels but also the titles and descriptions of the public service itself, for instance defined on the regional or local level;
* To cover additional change requests collected from different MSs and stakeholders that implemented or evaluated the CPSV-AP.

This work also keeps into account the current implementations of the CPSV-AP by different entities, trying to keep the specifications as stable as possible.

Once finalised reading this document, a user should be able to describe public service descriptions taking into account the caveats provided in Section 6 to be in conformance with the CPSV-AP.

## Process and methodology

This common data model has been defined as an **Application Profile of the ISA Core Public Service Vocabulary**[[4]](#footnote-5) (henceforth referred to as the CPSV-AP). An Application Profile[[5]](#footnote-6) is a specification that re-uses terms from one or more base standards, adding more specificity by identifying mandatory, recommended and optional elements to be used for a particular application, as well as recommendations for controlled vocabularies to be used.

The identification and handling of change requests follows the “Change management release and publication process for structural metadata specifications developed by the ISA Programme”. In particular this deliverable covers the request handling of the change management process.

Figure 1 - Request handling

CPSV-AP 2.1 is developed under the responsibility of the European Commission's ISA2 Programme[[6]](#footnote-7) and the chairs of the Working Group. The Working Group is responsible for defining the specifications and is established from:

* Members of the EUGO Network;
* MS representatives from other eGovernment portals;
* Members of the CPSV Working Group;
* ISA² Committee representatives;
* Experts on government and modelling of life events and public services; and
* European Institutions and initiatives (e.g. DG GROW, YourEurope, eSENS…).

The methodology explains the specification process and its approach. It describes the elements that should be included in the specification, including use cases and definition of terms (i.e. classes and properties) and recommended controlled vocabularies, based on the research and review of existing solutions.

Naturally, the specification of the CPSV-AP 2.01 began with the original CPSV-AP version 2.0 and input from Member States and organisations who had first-hand experience of using it. That input is collected and analysed in “D02.01-Analysis on several possibilities to enhance the data model”. Work done for that analysis, and subsequent interviews with users of the CPSV-AP has led to the recording of a number of specific change requests.

In the context of deliverable D02.01 of SC414, we have analysed cases that have already reused the CPSV or the CPSV-AP. Looking at these cases was interesting in order to see whether the data model that has been defined for describing public services can be implemented in practice. In general, the feedback received was positive. Of course, implementing it in the national context implied the need for adapting the model to the corresponding context. In most cases the CPSV(-AP) was extended with additional classes, properties, controlled vocabularies…

## Structure of this document

This document consists of the following sections.

* Section 2 defines the main use cases that drive the specification of the Application Profile;
* The classes and properties defined for the Application Profile are identified in section 3;
* In section 4, controlled vocabularies are proposed for use as value sets for a number of properties;
* An example, helping to show how the CPSV-AP can be used in practice for describing a public service, is being described in section 5;
* Section 6 contains the Conformance Statement for this Application Profile;
* Accessibility and multilingual issues are addressed in section 7;
* Namespaces and prefixes used throughout the specifications are listed in section 8;
* Acknowledgements related to the development of this Application Profile are contained in section 9;
* Finally, in section 10, an overview of changes to the specification is provided in the change log.

# Use cases

The CPSV-AP is designed to meet the use cases described below. These are modified versions of the use cases that motivated the development of the original CPSV-AP, taking into account citizens' life events as well as business events. Although the core motivation remains the same, the scope is wider than the original set.

## Use Case 1 – Finding information about public services more easily

In several countries (e.g. Austria, Spain, Germany, Belgium…) different local and regional electronic Points of Single Contact (PSCs) and eGovernment portals may exist. These national, regional or local one–stop-shops for public services may have different ways for making information about public services and the business or life event they correspond to, available.

Information on public services is often structured according to the organisational structure of public administration within a Member State or organised by service providers. Businesses, however, expect to find information organised according to their needs or based on the business lifecycle, and thus structured according to business events. This gap makes the discovery of relevant information on the PSCs harder for businesses.

The same is true for individuals seeking services relevant to life events. A citizen is unlikely to begin his or her search by examining the organisational structure of the local public administrations. Much more likely it is a search based on a change in their immediate situation, such as a birth, a child approaching school age, planning a home extension, etc.

A common data model for describing public services and making it possible to group them logically into business and life events, such as the CPSV-AP, would assist public authorities in providing high-quality descriptions of public services from a user-centric perspective. In this way, businesses and citizens can find the relevant information on public services to be executed in the context of a particular event or context, without having to know how the public administration is organised.

In the light of these, it is useful to have a single digital gateway for information on events and related public services, especially in the context of cross-border service delivery. A common data model for business events, life events and public services, such as the CPSV-AP, enables the flexible exchange and integration of the different public service descriptions and facilitates the publication of this information on the single digital gateway.

## Use Case 2 – Building user-centric catalogues of public services at all levels from regional to a European federated catalogue

A prerequisite of the EU Single Market is the free movement of goods, services and capital across the EU. In this context, the Services Directive foresees simplification measures, such as the PSCs and eGovernment portals, to increase transparency for businesses and citizens when they want to provide or use services in the single market.

In this light, PSCs and eGovernment portals have been established at the national and regional level in the Member States. The CPSV-AP is designed to make this easier at all levels from regional to pan-European. Currently, the Your Europe Portal[[7]](#footnote-8) provides the EU rules for running a business in Europe, for example. Additionally, MSs are obliged to provide information on the transposition of these rules in their country. This information is also being provided by Your Europe.

A pan-European Single Digital Gateway, federating harmonised descriptions of business and life events and related public services from the MSs, could further enhance the cross-border access to these public services. Such a platform, which could extend the work of Your Europe, would then provide a unified view of public services related to business and life events across the EU Member States. It would facilitate the discovery and comparison of services, and allow businesses to make informed decisions about their investments. This would not only improve the discoverability of information within the EU, it would also lower the information access barriers for third country nationals to find their way and invest in an EU Member State.

Using a common data model such as the CPSV-AP for describing public services, enables the flexible exchange and integration of service descriptions between the national/regional authorities and pan-European one-stop-shops. This way, the common data model acts as a bridge, a common language that enables mapping all different ways of describing public services, and the business and life events for grouping them, to one common basis.

## Use Case 3 – Managing portfolios of public services

In most countries, the ownership and management of public services is split amongst different public administrations leading to different ways of managing their lifecycle. This makes it difficult to have a complete view of the public services offered within the context of a Member State, and to have a holistic approach for their management and the way the public services are grouped into business and life events.

Public service portfolio management allows a public administration to apply a holistic and systematic management to their investments in public service provision in order to optimise their coverage of citizens’ and businesses’ needs against the overall value of their investments.

Public service portfolio management improves the management of the lifecycle of public services e.g. by:

* Identifying for which domain, sector, business or life event public services are missing;
* Identifying public services that are not used or outdated;
* Identifying redundant public services;
* Providing information on public services of higher quality, i.e. more detailed, complete, valid and timely description of public services and the events they are grouped by.

One of the key elements of any service portfolio management methodology is the use of a common data model for describing events and public services. In this vein, using a common data model, such as the CPSV-AP, provides a standardised way of documenting public services and business or life events for grouping these public services. Complete, reusable, machine-readable descriptions of public services and the events by which they are grouped will facilitate the measurement and quantification of their costs and benefits, and will enable their comparison, evaluation, monitoring, management and continuous improvement.

## Use case 4 – Finding information of generic and specialised public services

Several European countries (Germany, Austria, Belgium, Spain…) are divided into regions, municipalities, etc. In these countries, a subset of public services and their descriptions varies depending on the level of appliance (national, regional or local). Catalogues of public services can publish generic descriptions at national level and point to the regional or local specialisation of the public service description on the local or regional level to get further detailed information. For instance, the cost of the public service, the service provider at local level, but also the descriptive elements of the public service itself (title, description...) etc.

Using a common data model that allows describing and relating generic and specific public service descriptions helps public administrations linking the information and offering it to citizens and businesses according to the user needs. The CPSV-AP covers the relationship of different instances of public service descriptions at national, regional or local level. This way, the information can be linked throughout portals at different levels, guiding the user to the most detailed information about a public service depending on the level or location of appliance.

# Core Public Service Vocabulary Application Profile (CPSV-AP)

The specification of the Core Public Service Vocabulary Application Profile is represented in a series of UML class diagrams. Figure 2 shows the full profile and this is broken down into related sections in the following diagrams to ease understanding:

* Figure 3 shows 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;
* Figure 4 shows 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
* Figure 5 is about the interface between the service and its users: how and when it can be accessed.

Figure 2 - Graphical representation of the relationships between the classes and properties of the full Core Public Service Vocabulary Application Profile

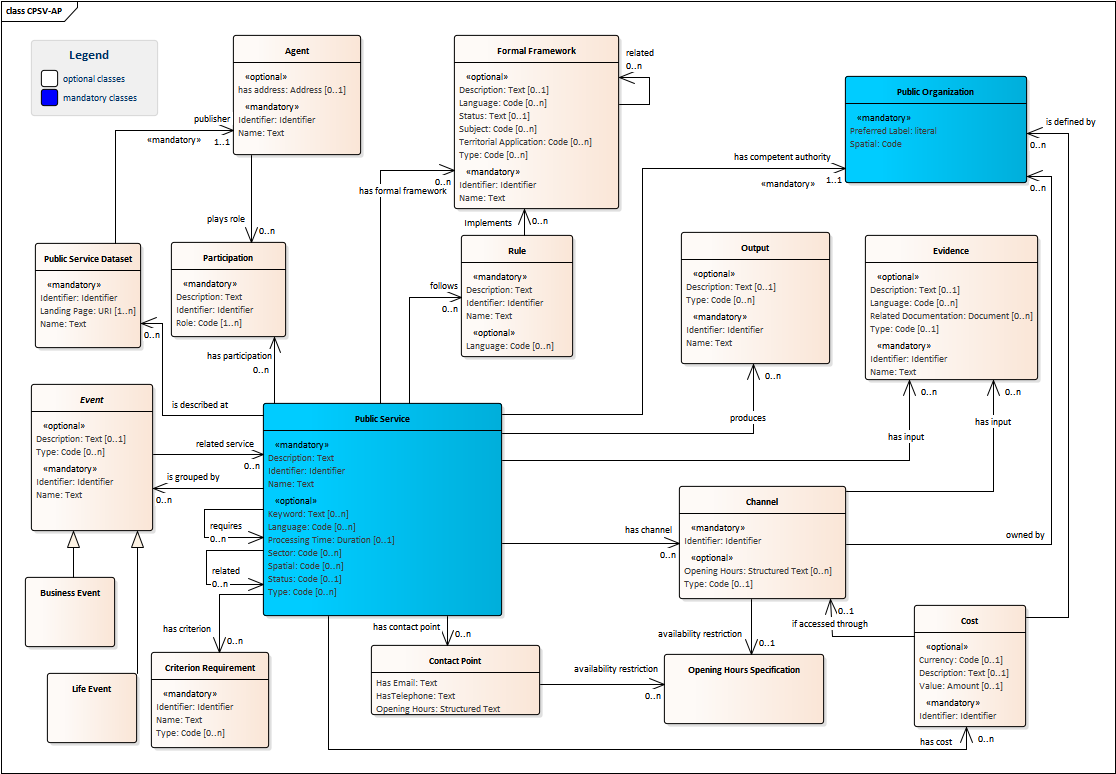


Figure 3 - The classes and properties in the CPSV-AP that define the service itself.

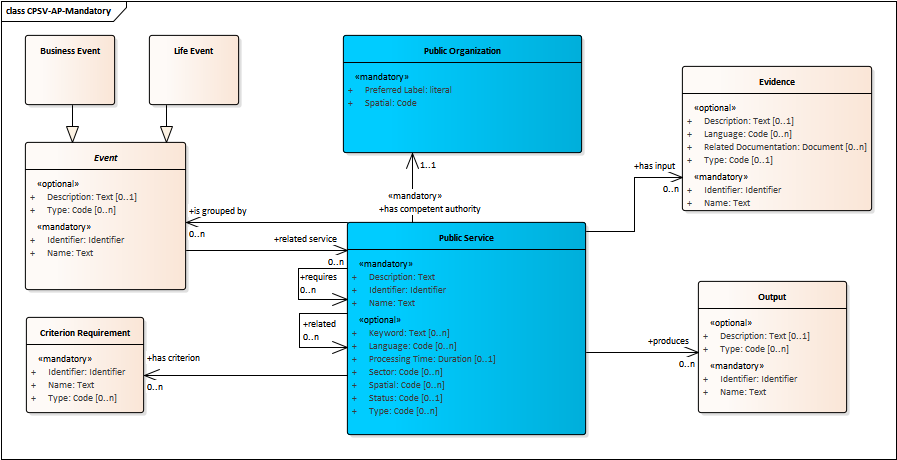


Figure 4 - The classes of the CPSV-AP related to the formal (usually legal) basis for the provision of the service.

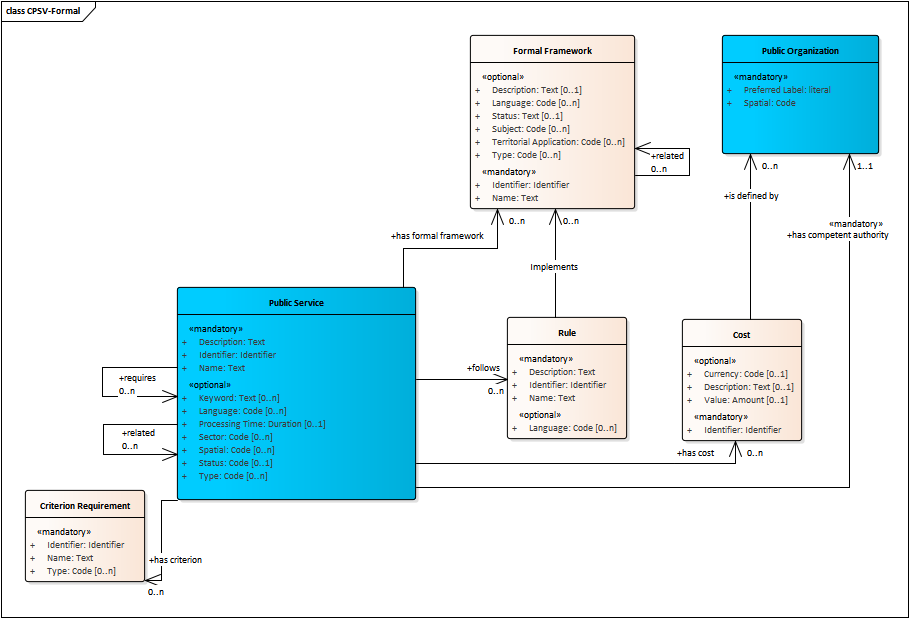
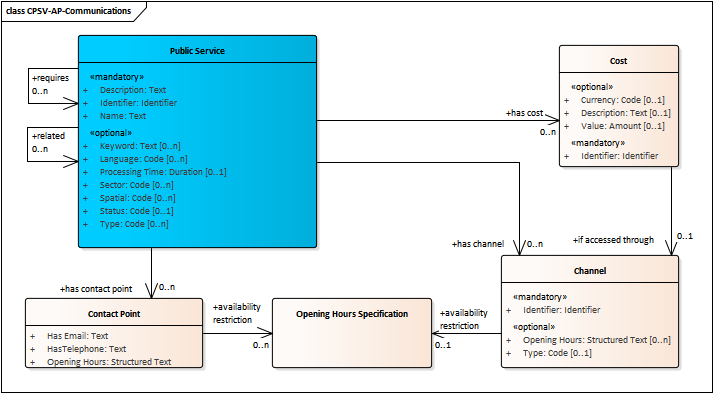


Figure 5 - The classes of the CPSV-AP related to communication with a Public Service



## 

## Mandatory and optional classes and properties of CPSV-AP

To indicate the minimum requirements to comply with the CPSV-AP, the classes and properties are being classified as being mandatory or optional. A minimal implementation of the CPSV-AP at least provides information on the mandatory properties of the mandatory classes. Optional classes can still have mandatory properties for which information should be provided when the particular class is used in the description of the public services and the business events.

The terms mandatory class, optional class, mandatory property and optional property have the following meaning:

* **Mandatory class**: a receiver of data MUST be able to process information about instances of the class; a sender of data MUST provide information about instances of the class.
* **Optional class**: a receiver MUST be able to process information about instances of the class; a sender MAY provide the information but is not obliged to do so.
* **Mandatory property**: a receiver MUST be able to process the information for that property; a sender MUST provide the information for that property. In case the corresponding class is classified as being optional, a receiver MUST be able to process the information for that property; a sender MUST provide the information for that property if it uses the corresponding class.
* **Optional property**: a receiver MUST be able to process the information for that property; a sender MAY provide the information for that property if it is available.

All classes include the mandatory property of identifier that in Linked Data/RDF encodings will be IRIs. Where the entities do not exist independently of the Public Service, it is permissible for these to be local to the implementation, i.e. blank nodes are explicitly allowed. Global IRIs SHOULD be assigned to the Public Service itself, public organisations, events, outputs, agents, evidence and formal frameworks.

The meaning of the terms MUST, MUST NOT, SHOULD and MAY in this section and in the following sections are as defined in RFC 2119[[8]](#footnote-9).

In the given context, the term "processing" means that receivers must accept incoming data and transparently provide these data to applications and services. It does neither imply nor prescribe what applications and services finally do with the data (parse, convert, store, make searchable, display to users, etc.).

“Detailed list of mandatory and optional classes and properties” gives an overview of which classes are classified as mandatory or optional. For each class an overview is given of which properties are classified as being mandatory and for which ones the usage is optional.

Additionally the proposal in “Detailed list of mandatory and optional classes and properties” has been discussed with the Working Group.

## The Public Service Class

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[[9]](#footnote-10), 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 | Mandatory/Optional | URI |
| Public Service | Mandatory | 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.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| Identifier | dct:identifier | Text[[10]](#footnote-11) | 1..1 |

### Name

This property represents the official Name of the Public Service.

|  |  |  |  |
| --- | --- | --- | --- |
| 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.

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

### Keyword

This property represents a keyword, term or phrase to describe the Public Service.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| Keyword | dcat:keyword | Text | 0..n |

### Sector

This property represents the industry or sector a Public Service relates to, or is intended for. For example: environment, safety, housing. Note that a single Public Service may relate to multiple sectors. The possible values for this property are provided as a controlled vocabulary. The recommended controlled vocabularies are listed in section 4.

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

### Type

This property represents the type of a Public Service as described in a controlled vocabulary, for instance social protection, health, recreation, culture and religion, economic affairs... The recommended controlled vocabularies are listed in section 4.

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

### 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. The recommended controlled vocabularies are listed in section 4.

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

### Status

Indicates whether a Public Service is active, inactive, under development etc. according to a controlled vocabulary.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| Status | adms:status | Concept | 0..1 |

### Is Grouped By

This property links the Public Service to the Event class (section 3.2.24). Several Public Services may be associated with a particular Event and, likewise, the same Public Service may be associated with several different Events.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| Is Grouped By | cv:isGroupedBy | Event | 0..n |

### Requires

One Public Service may require, or in some way make use of, the output of one or several other Public Services. In this case, for a Public Service to be executed, another Public Service must be executed beforehand. The nature of the requirement will be described in the associated Rule or Input.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| Requires | dct:requires | Public Service | 0..n |

### Related

This property represents a Public Service related to the particular instance of the Public Service class.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| Related | dct:relation | Public Service | 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).

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

### Has Competent Authority

This property links a Public Service to a Public Organisation, which is the responsible Agent for the delivery of the Public Service. Whether the particular Public Organisation provides the public service directly or outsources it is not relevant. The Public Organisation 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”.

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

### Has Participation

The CPSV-AP defines the two basic roles of Competent Authority and Service Provider, but this simple model can be extended if required using the Has Participation property that links to the Participation class (see section 3.6).

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| Has Participation | cv:hasParticipation | Participation | 0..n |

### 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 3.12.4).

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

### Has Formal Framework

The Has Formal Framework property links a Public Service to a Formal Framework. It indicates the Formal Framework (e.g. legislation) to which the Public Service relates, operates or has its legal basis.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| Has Formal Framework | cv:hasFormalFramework | Formal Framework | 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 |

### Follows

The follows property links a Public Service to the Rule(s) under which it operates. The definition of the Rule class is very broad. In a typical case, the competent authority that provides the public service will also define the rules that will implement its own policies. The CPSV-AP is flexible to allow for significant variation in such a scenario.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| Follows | cpsv:follows | Rule | 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.

A common usage of the spatial property will be to define the Administrative Territorial Unit(s) – typically a country or region – in which a Public Service is available. The Publications Office of the European Union offers a URI set[[12]](#footnote-13) that is suitable for this purpose, e.g. Malta is identified by <http://publications.europa.eu/resource/authority/atu/MLT>,

West Flanders by <http://publications.europa.eu/resource/authority/atu/BEL_PR_WVL> and so on.

N.B. The spatial restriction is not meant to be used to describe eligibility or the speed of operation of the service. These aspects will be covered by the Criterion class.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| Spatial | dct:spatial | Concept | 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 |
| Has Contact Point | 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 |
| Has Channel | cv:hasChannel | Channel | 0..n |

### Processing time

The value of this property is the (estimated) time needed for executing a Public Service. 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 |
| Processing Time | cv:processingTime | Text | 0..1 |

### 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. Where the cost varies depending on the channel through which the service is accessed, it can be linked to the channel using the If Accessed Through relationship (section 3.11.6).

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

### Is Described At

The Is Described At property links a Public Service to the Public Service Dataset(s) (see 3.6) in which it is being described (see section 3.6).

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

## The Event Class

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 (section 3.3.5); or to a group of Public Services, such as all those related to the establishment of a new business (see section 3.2.9).

|  |  |  |
| --- | --- | --- |
| Class name | Mandatory/Optional | URI |
| Event | Optional | cv:Event |

### Identifier

This property represents an Identifier for the Event.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| Identifier | dct:identifier | Text[[15]](#footnote-16) | 1..1 |

### Name

This property represents the Name (or title) of the Event.

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

### Description

This property represents a free text description of the Event. The description is likely to be the text that a business or citizen sees for that specific Event when looking for relevant Public Services. Public administrations are therefore encouraged to include a reasonable level of detail in the description.

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

### 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 |

### Related Service

This property links an event directly to a public service that is related to it.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| Related Service | dct:relation | Public Service | 0..n |

## The Business Event Class

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 | Mandatory/Optional | URI |
| Business Event | Optional | cv:BusinessEvent |

## The Life Event Class

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.

|  |  |  |
| --- | --- | --- |
| Class name | Mandatory/Optional | URI |
| Life Event | Optional | cv:LifeEvent |

## The Public Service Dataset Class

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 | Mandatory/Optional | URI |
| Public Service Dataset | Optional | cv:PublicServiceDataset |

The properties being described in the following sections define the mandatory properties if the class is being instantiated. We refer to DCAT for the definition of the other properties being inherited.

### Identifier

This property represents an Identifier for the Public Service Dataset.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| Identifier | dct:identifier | Text[[17]](#footnote-18) | 1..1 |

### Publisher

This property represents the Publisher of the Public Service Dataset, i.e. an entity (organisation) responsible for making the Public Service Dataset available.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| Publisher | dct:publisher | Agent | 1..1 |

### Name

This property contains a name given to the Public Service Dataset. This property can be repeated for parallel language versions of the name.

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

### Landing Page

This property refers to a web page that provides access to the Public Service Dataset. It is intended to point to a landing page at the original data provider, not to a page on a site of a third party, such as an aggregator.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| Landing Page | dcat:landingPage | Document | 1..n |

## The Participation Class

The CPSV-AP recognises a common role connected with public services, i.e. the Competent Authority (section 3.2.13). However, this simple structure does not allow statements to be made about those participants, such the start and end date of a contract, nor does it support the inclusion of other roles. The Participation class supports this extra complexity if required, for instance, the description of a service user or a service provider. The model is consistent with the CPOV which in turn is based on the W3C Organization Ontology that supports the common cases simply but allows the complex cases where necessary. The Participation class can be mapped to the Organization Ontology’s Membership class that allows more complex relationships and richer metadata to be applied to a role filled by a given Agent.

|  |  |  |
| --- | --- | --- |
| Class name | Mandatory/Optional | URI |
| Participation | Optional | cv:Participation |

### Identifier

This property represents an Identifier for the Participation.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| Identifier | dct:identifier | Text[[18]](#footnote-19) | 1..1 |

### Description

A free text description of the Participation.

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

### Role

Provides the role played. This should be provided using a controlled vocabulary. Since this is an extension mechanism for the CSPV-AP, the controlled vocabulary should be decided to suit local implementations.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| Role | cv:role | Concept | 1..n |

## The Criterion Requirement Class

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[[19]](#footnote-20) for this class. The CCCEV provides more details but the Criterion Requirement class has three mandatory properties.

|  |  |  |
| --- | --- | --- |
| Class name | Mandatory/Optional | URI |
| Criterion Requirement | Optional | cv:CriterionRequirement |

### Identifier

This property represents an Identifier for the Criterion Requirement.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| Identifier | dct:identifier | Text[[20]](#footnote-21) | 1..1 |

### Name

This property represents the official Name of the Criterion Requirement.

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

### Type

This property represents the type of Criterion Requirement as described in a controlled vocabulary. The recommended controlled vocabularies are listed in section 4.

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

## The Evidence Class

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.

In some cases, the Output of one service will be Evidence for another service. Such relationships should be described in the associated Rule(s).

|  |  |  |
| --- | --- | --- |
| Class name | Mandatory/Optional | URI |
| Evidence | Optional | cv:Evidence |

### Identifier

This property represents an Identifier for the piece of Evidence.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| Identifier | dct:identifier | Text[[21]](#footnote-22) | 1..1 |

### Name

This property represents the official Name of the piece of Evidence.

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

### Description

This property represents a free text Description of the piece of Evidence.

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

### Type

This property represents the type of Evidence as described in a controlled vocabulary. The recommended controlled vocabularies are listed in section 4.

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

### Related Documentation

This property represents documentation that contains information related to the Evidence, for instance a particular template for an administrative document, an application or a guide on formatting the Input.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| Related Documentation | foaf:page | Document | 0..n |

### Language

Indicates the language(s) in which the Evidence must be provided.

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

## The Output Class

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 Organisation) that permits/authorises/entitles an Agent to (do) something.

In some cases, the Output of one Public Service will be used as evidence to fulfil a criterion requirement of another Public Service. Such relationships should be described in the associated Rule(s).

|  |  |  |
| --- | --- | --- |
| Class name | Mandatory/Optional | URI |
| Output | Optional | cv:Output |

### Identifier

This property represents an Identifier for the Output.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| Identifier | dct:identifier | Text[[22]](#footnote-23) | 1..1 |

### Name

This property represents the official Name of the Output.

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

### Description

This property represents a free text Description of the Output.

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

### Type

This property represents the type of Output as defined in a controlled vocabulary. The recommended controlled vocabularies are listed in section 4.

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

## The Cost Class

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

|  |  |  |
| --- | --- | --- |
| Class name | Mandatory/Optional | URI |
| Cost | Optional | cv:Cost |

### Identifier

This property represents an Identifier for the Cost.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| Identifier | dct:identifier | Text[[23]](#footnote-24) | 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. The recommended controlled vocabularies are listed in section 4.

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

### Description

This property represents a free text description of the Cost.

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

### Is Defined By

This property links the Cost class with one or more instances of the Public Organisation class (section 3.17). This property indicates which Public Organisation is the Competent Authority for defining the costs associated with the delivery of a particular Public Service.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| Is Defined By | cv:isDefinedBy | PublicOrganisation | 0..n |

### If Accessed Through

Where the cost varies depending on the channel used, for example, if accessed through an online service cf. accessed at a physical location, the cost can be linked to the channel using the If Accessed Through property.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| If Accessed Through | cv:ifAccessedThrough | Channel | 0..1 |

## The Channel Class

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 | Mandatory/Optional | URI |
| Channel | Optional | cv:Channel |

### Identifier

This property represents an Identifier for the Channel.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| Identifier | dct:identifier | Text[[24]](#footnote-25) | 1..1 |

### Owned By

This property links the Channel class with one or more instances of the Agent class (section 3.16). This property indicates the owner of a specific Channel through which a Public Service is being delivered. Note that Public Organisation is a sub class of Agent so that if the owner is the Public Organisation, the ownedBy property can link to it.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| Owned By | cv:ownedBy | Public Organisation | 0..n |

### Type

This property represents the type of Channel as defined in a controlled vocabulary. The recommended controlled vocabularies are listed in section 4.

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

### Has Input

In the majority of cases, the evidence required to use a Public Service will be independent of the channel through which the service is accessed. The Has Input property should normally be used to link a Public Service directly to one or more pieces of Evidence (see section 3.9). However, where the type of Evidence required varies according to the channel used to access the Public Service, then the Has Input property may be used at the Channel level. For example, a digital signature may be required for an online channel, whereas a physical signature may be required for a face to face service provision.

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

### Opening Hours

This property represents the normal opening hours of a channel. The value should follow the flexible format defined for schema.org's opening hours property[[25]](#footnote-26). Following that structure, days of the week are represented by two letter codes (Mo, Tu, We, Th, Fr, Sa, Su). Lists should be comma separated (for example: Mo, We, Fr) and periods separated by a hyphen (for example: Mo-Fr).

If it is appropriate to add opening hours then this follows the day so if a phone service is available 08:00 – 20:00 Monday to Saturday and 08:00 – 18:00 on Sundays that would be encoded as Mo-Sa 08:00-20:00, Su 08:00-18:00.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| Opening Hours | schema:openingHours | Text | 0..n |

### Availability restriction

This property links a channel to information about when the channel is *not* available, overriding the general opening hours information (3.12.5). The details are provided using the Opening Hours Specification class (section 3.13).

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| Availability Restriction | schema:hoursAvailable | Opening Hours Specification | 0..1 |

## The Opening Hours Specification Class

The CPSV-AP makes use of schema.org’s openingHours property (section 3.12.5) to provide details of regular operations. The Opening Hours Specification[[26]](#footnote-27) class can be used to provide details of exceptional circumstances, such as being closed on public holidays, which is encoded (in Turtle), thus:

ex:PublicHolidayClosed a schema:OpeningHoursSpecification;

schema:dayOfWeek <http://schema.org/PublicHoliday>.

Note that the property schema:opens is not used, therefore the contact point is closed. More specific closures can be indicated by including the schema:validFrom and schema:validThrough properties, for example:

ex:ChristmasClosed a schema:OpeningHoursSpecification;

schema:validFrom “2016-12-24T012:00Z”;

schema:validThrough “2017-01-02T09:00Z”.

|  |  |  |
| --- | --- | --- |
| Class name | Mandatory/Optional | URI |
| Opening Hours | Optional | schema:OpeningHoursSpecification |

## The Rule Class

The Rule class represents a document that sets out the specific rules, guidelines or procedures that the Public Service follows. It includes the terms of service, licence, and authentication requirements of the Public Service.

Instances of the Rule class are FRBR Expressions, that is, a concrete expression such as a document, of the more abstract concept of the rules themselves. The CPSV-AP does not envisage instances of the Rule class as machine-readable business rules.

Detailed modelling of the rules related to Public Services is out of scope of the CPSV-AP.

|  |  |  |
| --- | --- | --- |
| Class name | Mandatory/Optional | URI |
| Rule | Optional | cpsv:Rule |

### Identifier

This property represents an Identifier for the Rule.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| Identifier | dct:identifier | Text[[27]](#footnote-28) | 1..1 |

### Description

This property represents a free text Description of the Rule.

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

### Language

This property represents the language(s) in which the Rule is available. This could be one 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. The recommended controlled vocabularies are listed in section 4.

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

### Name

This property represents the name of the Rule.

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

### Implements

The Implements property links a Rule to relevant legislation or policy documents i.e. the Formal Framework under which the Rules are being defined (see section 3.15).

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| Implements | cpsv:implements | Formal Framework | 0..n |

## The Formal Framework Class

This class represents the legislation, policy or policies that lie behind the Rules that govern the service.

The definition and properties of the Formal Framework class in the CPSV-AP are aligned with the ontology included in “Council conclusions inviting the introduction of the European Legislation Identifier (ELI)”[[28]](#footnote-29).

|  |  |  |
| --- | --- | --- |
| Class name | Mandatory/Optional | URI |
| Formal Framework | Optional | cpsv:FormalFramework |

### Name

This property represents the Name of the Formal Framework.

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

### Identifier

This property represents a formally-issued Identifier for the Formal Framework. Similarly, as in ELI, this can be a Local Identifier, which is the unique identifier used in a local reference system. Also this can be a URI following the URI-path as defined in ELI.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| Identifier | dct:identifier | Text[[29]](#footnote-30) | 1..1 |

### Description

This property represents a free text Description of the Formal Framework.

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

### Language

This property represents the Language(s) in which the Formal Framework is available. The possible values for this property are described in a controlled vocabulary. The recommended controlled vocabularies are listed in section 4.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| Language | eli:language | Concept | 0..n |

### Status

This property represents the Status of the Formal Framework, for instance in force, not in force, partially applicable, implicitly revoked, explicitly revoked, repealed, expired, suspended, … The possible values for this property are described in a controlled vocabulary. The recommended controlled vocabularies are listed in section 4.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| Status | adms:status | Concept | 0..1 |

### Subject

This property represents the Subject of this Formal Framework. The possible values for this property are described in a controlled vocabulary. The recommended controlled vocabularies are listed in section 4.

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

### Territorial Application

This property represents the geographical scope of where the Formal Framework is applicable, for instance EU, country/Member State, region…

The values of this property come from a controlled vocabulary, for instance ATU NAL[[30]](#footnote-31). The recommended controlled vocabularies are listed in section 4.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| Territorial Application | cv:territorialApplication | Concept | 0..n |

### Type

This property represents the Type of a Formal Framework as described in a controlled vocabulary (e.g. directive, law, draft proposition, Parliamentary act, ministerial decision etc.). The possible values for this property are described in a controlled vocabulary. The recommended controlled vocabularies are listed in section 4.

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

### Related

This property represents another instance of the Formal Framework class that is related to the particular Formal Framework being described.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| Related | dct:relation | Formal Framework | 0..n |

## The Agent Class

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

|  |  |  |
| --- | --- | --- |
| Class name | Mandatory/Optional | URI |
| Agent | Optional | dct:Agent |

### Name

This property represents the Name of the Agent.

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

### Identifier

This property represents an Identifier for the Agent.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| Identifier | dct:identifier | Text[[31]](#footnote-32) | 1..1 |

### Plays Role

This property links an Agent to the Participation class. The Participation class is defined in section 3.6 and facilitates the detailed description of how an Agent participates in or interacts with a Public Service and may include temporal and spatial constraints on that participation.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| Plays Role | cv:playsRole | Participation | 0..n |

### Has Address

This property represents an Address related to an Agent. Asserting the address relationship implies that the Agent has an Address.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| Has Address | cv:hasAddress | Address | 0..1 |

## The Public Organisation Class

The CPSV-AP reuses the Core Public Organisation Vocabulary[[32]](#footnote-33) that defines the concept of a Public Organisation and associated properties and relationships. It is largely based on the W3C Organization Ontology[[33]](#footnote-34).

|  |  |  |
| --- | --- | --- |
| Class name | Mandatory/Optional | URI |
| Public Organisation | Mandatory | cv:PublicOrganisation |

Within the CPSV-AP the following properties are mandatory:

* preferred label
* spatial

The value of the latter should be a URI from the Administrative Territorial Units[[34]](#footnote-35) Named Authority List maintained by the Publications Office's Metadata Registry.

|  |  |  |  |
| --- | --- | --- | --- |
| Property | URI | Range | Cardinality |
| Preferred label | skos:prefLabel | Text | 1..1 |
| Spatial | dct:spatial | Concept | 1..1 |

## The Contact Point Class

This class represents the contact information for a Public Service, Channel, Public Organisation etc. It is defined in the Core Public Organisation Vocabulary and is provided as a schema:ContactPoint. Like Channel, a Contact Point may have regular opening hours (section 3.12.5) that are then overridden by, for example, public holidays, using the Opening Hours Specification class (section 3.13).

|  |  |  |
| --- | --- | --- |
| Class name | Mandatory/Optional | URI |
| Contact Point | Optional | schema:ContactPoint |

# 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. As for the CPSV-AP Domain Model described in section 3, 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 in CPSV-AP 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 “Type” of the class “Business Event”, a MS can extend this particular controlled vocabulary by adding additional events or providing additional levels of granularity.

Where possible, Table 1 provides a suggestion for the controlled vocabularies for the properties included in the CPSV-AP. For elaborating the overview, controlled vocabularies that have been developed in the context of European initiatives or other supra-national initiatives (e.g. EL, Named Authority Lists, Eurovoc, NACE, COFOG…) and that have already been used in multiple applications, are maximally being re-used. Also, in order to align with existing Core Vocabularies, the controlled vocabularies already used there are maximally reused in this application profile. Also, existing controlled vocabularies in the Member States are also taken into account.

Specifically for the list 1st and 2nd level business events, 1st level life events and output types, the suggested controlled vocabulary was based on an analysis done in the context of deliverable “D02.01-Analysis on the needs for the description of public services” of SC270. For this, data was collected from literature and existing public service portals, and this data was compared, interpreted and analysed in order to come up with a proposal. This proposal was discussed in a meeting of the WG, and the feedback received was processed into amended versions which have been added to this specification as recommended controlled vocabularies for:

* Business event type;
* Life event type; and
* Output type.

A more detailed description of the approach has been described as part of deliverable “D02.01-Analysis on the needs for the description of public services” of SC270.

Table 1: CPSV-AP controlled vocabularies

| Class | Property | Controlled vocabulary |
| --- | --- | --- |
| Event | Type | Business Event  Life Event |
| Business Event | Type[[35]](#footnote-36) | Starting business   * Registering a company * Needing a licence, permit or certificate to start or continue an activity * Registering Intellectual Property * Registering a branch * Starting a new activity * Financing a company * Hiring an employee   Starting cross-border business   * Registering a cross-border business * Registering a branch   Doing business   * Financing a company * Needing a licence, permit or certificate to start or continue an activity * Registering Intellectual Property * Hiring an employee * Participating in public procurement * Notifying and reporting to authorities * Starting a new activity * Registering a branch * Having problems in paying creditors   Closing business   * Restructuring of a company * Dissolution of a company |
| Life Event | Type[[36]](#footnote-37) | Having a child  Becoming a (social) caretaker  Starting education  Looking for a new job  Losing/quitting a job  Looking for a place to live  Changing relationship status  Driving a vehicle  Travelling abroad  Moving to/from the country  Going into military service  Facing an emergency / health problem  Facing a crime  Retirement  Death of a relative |
| Public Service | Type | COFOG taxonomy[[37]](#footnote-38) |
| Language | European Publications Office's Languages Named Authority List (NAL)[[38]](#footnote-39) |
| Sector | List of NACE codes[[39]](#footnote-40) |
| Spatial | MDR Continents Named Authority List[[40]](#footnote-41), MDR Countries Named Authority List[[41]](#footnote-42), MDR Places Named Authority List[[42]](#footnote-43), Geonames[[43]](#footnote-44) |
| Status | ADMS Status vocabulary[[44]](#footnote-45) |
| Participation | Role | TBC |
| CriterionRequirement | Type | TBC |
| Evidence | Type | TBC |
| Language | European Publications Office's Languages Named Authority List (NAL)[[45]](#footnote-46) |
| Output | Type[[46]](#footnote-47) | Declaration  Physical object  Code  Financial obligation  Financial benefit  Recognition  Permit |
| Cost | Currency | European Publications Office's Currencies Named Authority List (NAL)[[47]](#footnote-48) |
| Channel | Type | E-mail  Homepage  Fax  Assistant  Telephone  Mobile App  Digital TV  Mail  Service Bureau  Client's Location |
| Rule | Language | European Publications Office's Languages Named Authority List (NAL) [[48]](#footnote-49) |
| Formal Framework | Language | European Publications Office's Languages Named Authority List (NAL) [[49]](#footnote-50) |
| Status | European Legislation Identifier[[50]](#footnote-51):  in force  not in force  partially applicable  implicitly revoked  explicitly revoked  repealed  expired  suspended  other |
| Subject | Eurovoc domains[[51]](#footnote-52) |
| Territorial Application | NUTS taxonomy[[52]](#footnote-53) |
| Type | Resource Types Named Authority Lists (NAL)[[53]](#footnote-54) |
| Public Organisation | Spatial | MDR Continents Named Authority List[[54]](#footnote-55), MDR Countries Named Authority List[[55]](#footnote-56), MDR Places Named Authority List[[56]](#footnote-57), Geonames[[57]](#footnote-58) |

# Example description of a public service with CPSV-AP

This section includes an example description of a public service and its main properties and associated classes. The example that has been described starts from describing the public service (5.1).

Some of the properties of a public service are actually an association with another class. In the case of “has competent authority” for instance, this links the Public Service class with the Public Organisation class. In the example “has competent authority” gets a URI as a value, and the Public Organisation itself is described in section 5.6. In the example description of a public service, this also applies to “is grouped by” (5.2), “has input” (not described in detail in this example), “produces” (5.4), “has channel” (5.5) and “has cost” (not described in detail in this example).

The example provides data in two different formats:

* Human readable: described in a table per class, where each row of a table is a property of the corresponding class for which the name of the property, cardinality and value are being provided; and
* Machine readable: for each class, the same information is also represented in RDF Turtle.

The data has been created based on an example public service from the Finnish Point of Single Contact[[58]](#footnote-59), but has been complemented with fictitious data where needed.

## Public Service class

Table 2: Example of Public Service class – Human readable

| Property | Value |
| --- | --- |
| Identifier | https://www.yrityssuomi.fi/en/palvelu/-/palvelu/electronicapplicationforatrademark?region=helsinki |
| Name | Electronic application for a trademark |
| Description | A trademark is a symbol that distinguishes goods and services from the similar goods and services of others.  A trademark is a symbol that distinguishes goods and services from the similar goods and services of others. A trademark is a symbol which distinguishes the goods and services of a company from the similar goods and services of other companies. A trademark acts as a means of distinction in the market.  A trademark is also an exclusive right. It gives the holder the exclusive right to use the mark in the marketing, packaging or business documents of the goods or services or in any other way, including orally.  There are different types of trademarks. A trademark can, for example be, a word, figure, slogan or even a sound.  When you register your trademark, you will obtain protection for it for ten years. The protection provided by registration begins on the date of application and can be renewed every ten years. |
| Has competent authority | https://www.yrityssuomi.fi/en/organisaatio?id=workspace://SpacesStore/8566c45a-8b9e-46d5-8371-81c8ad002362&region=helsinki |
| Language | http://publications.europa.eu/resource/authority/language/ENG |
| Is grouped by | http://europa.eu/youreurope/businessOntology#start-grow |
| Has input | https://www.prh.fi/input/form |
| Produces | https://www.prh.fi/output/result |
| Has channel | https://www.prh.fi/channel/online |
| Has channel | https://www.prh.fi/channel/mail |
| Has cost | https://www.prh.fi/input/cost |

Table 3: Example of Public Service class – Machine readable

|  |
| --- |
| <https://www.yrityssuomi.fi/en/palvelu/-/palvelu/electronicapplicationforatrademark?region=helsinki> a cpsv:PublicService ;  **dct:title** "Electronic application for a trademark" ;  **dct:description**  "A trademark is a symbol that distinguishes goods and services from the similar goods and services of others.  A trademark is a symbol that distinguishes goods and services from the similar goods and services of others. A  trademark is a symbol which distinguishes the goods and services of a company from the similar goods and  services of other companies. A trademark acts as a means of distinction in the market.  A trademark is also an exclusive right. It gives the holder the exclusive right to use the mark in the marketing,  packaging or business documents of the goods or services or in any other way, including orally.  There are different types of trademarks. A trademark can, for example be, a word, figure, slogan or even a sound.  When you register your trademark, you will obtain protection for it for ten years. The protection provided by  registration begins on the date of application and can be renewed every ten years" ;  **cv:hasCompetentAuthority** <https://www.yrityssuomi.fi/en/organisaatio?id=workspace://SpacesStore/  8566c45a-8b9e-46d5-8371-81c8ad002362&region=helsinki> ;  **dct:language** <http://publications.europa.eu/resource/authority/language/ENG> ;  **cv:isGroupedBy** <http://europa.eu/youreurope/businessOntology#start-grow> ;  **cpsv:hasInput** <https://www.prh.fi/input/form> ;  **cpsv:produces** <https://www.prh.fi/output/result> ;  **cv:hasChannel** <https://www.prh.fi/channel/online> ;  **cv:hasChannel** <https://www.prh.fi/channel/mail> ;  **cv:hasCost** <https://www.prh.fi/input/cost> . |

## Business Event class

Table 4: Example of Business Event class – Human readable

| Property | Value |
| --- | --- |
| Identifier | http://europa.eu/youreurope/businessOntology#start-grow |
| Name | Start & grow |
| Type | Registering intellectual property |
| Related service | https://www.yrityssuomi.fi/en/palvelu/-/palvelu/electronicapplicationforatrademark?region=helsinki |

Table 5: Example of Public Service class – Machine readable

|  |
| --- |
| <http://europa.eu/youreurope/businessOntology#start-grow> a cv:BusinessEvent ;  dct:title "Start & grow" ;  dct:type <http://127.0.0.1:3333/Registering+intellectual+property > ;  dct:relation <https://www.yrityssuomi.fi/en/palvelu/-  /palvelu/electronicapplicationforatrademark?region=helsinki> . |

## Evidence

Table 6: Example of Evidence class – Human readable

| Property | Value |
| --- | --- |
| Identifier | https://www.prh.fi/input/form |
| Name | Form to apply for a trademark |
| Description | The application must include the applicant's name or company name, domicile or registered office and address. A trademark can be applied for by either a company, an organisation or a private person. |
| Language | http://publications.europa.eu/resource/authority/language/FIN |
| Language | http://publications.europa.eu/resource/authority/language/SWE |
| Related documentation | https://www.prh.fi/stc/forms/tavaramerkin\_rekisterointihakemus.pdf |

Table 7: Example of Evidence class – Machine readable

|  |
| --- |
| <https://www.prh.fi/input/form> a cv:Evidence ;  dct:title "Form to apply for a trademark" ;  dct:description "The application must include the applicant's name or company name, domicile or registered office and address. A trademark can be applied for by either a company, an organisation or a private person" ;  dct:language <http://publications.europa.eu/resource/authority/language/FIN> ;  dct:language <http://publications.europa.eu/resource/authority/language/SWE> ;  foaf:page <https://www.prh.fi/stc/forms/tavaramerkin\_rekisterointihakemus.pdf> . |

## Output

Table 8: Example of Formal Framework class – Human readable

| Property | Value |
| --- | --- |
| Identifier | https://www.prh.fi/output/result |
| Name | Trademark |
| Type | Recognition |

Table 9: Example of Output class – Machine readable

|  |
| --- |
| <https://www.prh.fi/output/result> a cv:Output ;  dct:title "Trademark" ;  dct:type <http://127.0.0.1:3333/Recognition> . |

## Channel

Table 10: Example of Channel class 1 – Human readable

| Property | Value |
| --- | --- |
| Identifier | https://www.prh.fi/channel/online |
| Owned by | https://www.yrityssuomi.fi/en/organisaatio?id=workspace://SpacesStore/8566c45a-8b9e-46d5-8371-81c8ad002362&region=helsinki |

Table 11: Example of Channel class 2 – Human readable

| Property | Value |
| --- | --- |
| Identifier | https://www.prh.fi/channel/mail |
| Owned by | https://www.yrityssuomi.fi/en/organisaatio?id=workspace://SpacesStore/8566c45a-8b9e-46d5-8371-81c8ad002362&region=helsinki |
| Has input | https://www.prh.fi/stc/forms/tavaramerkin\_rekisterointihakemus.pdf |

Table 12: Example of Channel class – Machine readable

|  |
| --- |
| <https://www.prh.fi/channel/online> a cv:Channel ;  cv:isOwnedBy <https://www.yrityssuomi.fi/en/organisaatio?id=workspace://SpacesStore/  8566c45a-8b9e-46d5-8371-81c8ad002362&region=helsinki> .  <https://www.prh.fi/channel/mail> a cv:Channel ;  cv:ownedBy <https://www.yrityssuomi.fi/en/organisaatio?id=workspace://SpacesStore/  8566c45a-8b9e-46d5-8371-81c8ad002362&region=helsinki> ;  cv:hasInput <https://www.prh.fi/stc/forms/tavaramerkin\_rekisterointihakemus.pdf> . |

## Public Organisation

Table 13: Example of Public Organisation class – Human readable

| Property | Value |
| --- | --- |
| Identifier | https://www.yrityssuomi.fi/en/organisaatio?id=workspace://SpacesStore/8566c45a-8b9e-46d5-8371-81c8ad002362&region=helsinki |
| Name | The Finnish Patent and Registration Office (PRH) |
| Preferred label | The Finnish Patent and Registration Office |
| Alternative label | PRH |
| Has address | http://www.prh.fi/address |
| Spatial | http://publications.europa.eu/resource/authority/atu/FIN |

Table 14: Example of Public Organisation class – Machine readable

|  |
| --- |
| <https://www.yrityssuomi.fi/en/organisaatio?id=workspace://SpacesStore/8566c45a-8b9e-46d5-8371-81c8ad002362&region=helsinki> a cv:PublicOrganisation ;  dct:title "The Finnish Patent and Registration Office (PRH)" ;  skos:prefLabel "The Finnish Patent and Registration Office" ;  skos:altLabel "PRH" ;  cv:hasAddress <http://ec.europa.eu/taxation\_customs/resources/documents/taxation/vat/traders/vat\_refunds/refund\_contact\_details\_table\_en.pdf#country/Belgium/Address> ;  spatial <http://publications.europa.eu/resource/authority/atu/FIN> |

# Conformance Statement

## Provider requirements

In order to conform to the Core Public Service Vocabulary Application Profile (CPSV-AP), any implementation MUST:

* Include at least all mandatory properties of all mandatory classes as indicated in “Detailed list of mandatory and optional classes and properties”;
* Include at least all mandatory properties of any optional class used for describing the Public Service, as indicated in “Detailed list of mandatory and optional classes and properties”;
* Not have more than one instance of those properties that have 1 as maximum cardinality as specified in each subsection from Section 3.2 to Section 3.18;
* Define each property value according to the type specified in section 3 (see the UML diagram in Figure 2, Figure 3, Figure 4 and Figure 5);
* Use the terms (classes and properties) in a way consistent with their semantics as declared in Section 3.

A conforming implementation of the Core Public Service Vocabulary Application Profile may include classes and properties from other data models (vocabularies). In addition, a conforming implementation of the Core Public Service Vocabulary Application Profile may include terms from recommended controlled vocabularies for the corresponding properties, as listed in section 4.

The Core Public Service Vocabulary Application Profile is technology-neutral and a publisher may use any of the terms defined in this document encoded in any technology although RDF and XML are preferred.

## Receiver requirements

In order to conform to the Core Public Service Vocabulary Application Profile, any application that receives metadata MUST be able to:

* Process information for all classes specified in Section 3;
* Process information for all properties specified in Section 3.
* Process information for all controlled vocabularies specified in Section 4.

"Processing" means that receivers must accept incoming data and transparently provide these data to applications and services. It does neither imply nor prescribe what applications and services finally do with the data (parse, convert, store, make searchable, display to users, etc.).

# Accessibility and Multilingual Aspects

The CPSV-AP can operate in any language as:

* In a multilingual context, all datatype properties with datatype “text” (for instance Name, Description…), where the value for that property may exist in multiple languages, the property has multiple instances which are tagged with a language identifier for each language in which the value for that property exists.
* The language(s) in which a service is available can easily be specified;
* The specification strongly encourages the use of URIs as identifiers and all URIs are 'dumb strings.' Although they clearly make use of English words, they do not convey those words - that is done by the human-readable labels which can be multilingual.
* The acronym URI is used throughout the document due to widespread familiarity. However, Internationalised Resource Identifiers (IRIs) are equally usable, and these can use any character in any script[[59]](#footnote-60).
* Translations of the labels used in the various terms can readily be added to the schema (please contact the working group if you can help with this). The CPSV Working Group[[60]](#footnote-61) has already provided multilingual labels and descriptions for classes and properties[[61]](#footnote-62).

# Namespaces and Prefixes

This specification uses the following prefixes and namespaces.

Table 15: 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 | http://schema.org/ |
| locn | http://www.w3.org/ns/locn# |
| foaf | http://xmlns.com/foaf/0.1/ |

# Acknowledgements

Table 16: CPSV-AP Working Group Members

| Name | Affiliation |
| --- | --- |
| Dominik Klauser | Austrian Federal Chancellery, Austria |
| Werner Vanborren | DG GROW, European Commission |
| Carolina Gario | Digital Single Market, European Commission |
| Bart Hanssens | Fedict, Belgium |
| Thomas D'haenens | Flemish Agency for Information, Belgium |
| Katrien De Smet |
| Thimo Thoeye | Stad Gent, Belgium |
| Eva Christina Andersson | CADF United Nations DR Congo External actions, Belgium |
| Neven Vrček | University of Zagreb, Croatia |
| Janek Rozov | Ministry of Economic Affairs and Communications, Estonia |
| Airi Reidi |
| Helena Lepp |
| Risto Hinno |
| Marco Latvanen | Suomi.fi, Finland |
| Konstantinas Pečiulis | Enterprise Lithuania, Lithuania |
| Themis Tambouris | University of Macedonia, Greece |
| Yannis Charalabidis |
| Alexandros Gerontas |
| Loukia Demiri | Ministry of Interior, Greece |
| Antonio Rotundo | AgID, Italy |
| Giorgia Lodi |
| Francesca Gleria | Trento PaT, Italy |
| Marco Combetto |
| Nicola Guarino | CNR, Italy |
| Dita Gabalina | VARAM, Latvia |
| Vytautas Juršėnas | Ministry of the Interior (national public service catalogue), Lithuania |
| Muriel Foulonneau | Institute of Science & Technology, Luxembourg |
| Joseph Azzopardi | Information Technology Agency, Malta |
| Marco Aarts | ICTU, The Netherlands |
| Andre van Brussel |
| Patrocinio Nieto | Ministry of Finance and Public Administrations, Spain |
| Ignacio Serrano |
| José Luis Guerrero |
| Cristina Ramos |
| Szymon Mamrot | Institute of Logistics and Warehousing (PSC), Poland |
| Deirdre Lee | Derilinx, Ireland |
| Hans Ekstål | Bolagsverket - Swedish Companies Registration Office, Sweden |
| Mikael Österlund |
| Eduards Cauna | Ministry of Environmental Protection and Regional Development, Latvia |
| Lyubomir Blagoev | USW, Bulgaria |
| Julien Silverio | Centre of Information Technologies of the State (CTIE), Luxembourg |
| Miguel Alvarez-Rodriguez | ISA, European Commission |
| Peter Burian |
| Sol Mateu |
| Phil Archer | W3C |
| Nikolaos Loutas | PwC EU Services |
| Michiel De Keyzer |
| Christophe Parrein |
| Ana Fernández de Soria |

# Change Log

Changes since the CPSV-AP 2.0 revision kick-off meeting (<https://joinup.ec.europa.eu/asset/cpsv-ap/event/cpsv-ap-v20-revision-wg-virtual-meeting-kick>).

* Removal of Type from Agent (in response to <https://joinup.ec.europa.eu/asset/cpsv-ap/issue/removal-type-property-agent-class>).
* Update the range of Public Service Language and Related Documentation of Evidence (in response to <https://joinup.ec.europa.eu/asset/cpsv-ap/issue/error-range-and-domain-certain-classes>).
* Update of the Related Documentation of Evidence and Has Participation property of Public Service in the specifications and RDF Schema (in response to <https://joinup.ec.europa.eu/asset/cpsv-ap/issue/error-range-and-domain-certain-classes>).
* Revision of the Public Service Class definition (in response to <https://joinup.ec.europa.eu/asset/cpsv-ap/issue/public-service-identifier-and-general-definition>).
* Addition of the Public Service Dataset Class as optional, and the mandatory properties Identifier, Name, Publisher and Landing Page (in response to <https://joinup.ec.europa.eu/asset/cpsv-ap/issue/add-new-class-cover-description-catalogue>). Addition also of the optional property Is Described At from the Public Service Class to the Public Service Dataset Class.
* Update the Type property of the Criterion Requirement as optional (in response to <https://joinup.ec.europa.eu/asset/cpsv-ap/issue/criterion-requirement-class-cardinality-type-property>).
* Modify the range of every Identifier property as Text, adding a usage note indicating that it should be a URI if described in RDF (in response to <https://joinup.ec.europa.eu/discussion/errors-second-draft-cpsv-ap>).
* Update the range of the Language property of a Public Service to dct:LinguisticSystem (in response to <https://joinup.ec.europa.eu/discussion/error-range-and-domain-certain-classes>).
* Removal of service provider from the Public Service class (in response to https://joinup.ec.europa.eu/sites/default/files/event/attachment/d04.01-meeting\_minutes\_cpsv-ap\_final\_webinar\_-\_20161118\_v0.01.docx).
* Modify the cardinality of the Has Contact Point of a Public Service to 0..n (in response to <https://joinup.ec.europa.eu/discussion/cardinality-has-contact-point-property>).
* Revision of the Participation class definition to cover the different types of participation in a Public Service (in response to https://joinup.ec.europa.eu/sites/default/files/event/attachment/d04.01-meeting\_minutes\_cpsv-ap\_final\_webinar\_-\_20161118\_v0.01.docx).
* Modify the URI of the Related Documentation property of the Evidence class to foaf:page, and range to Document (in response to <https://joinup.ec.europa.eu/discussion/errors-second-draft-cpsv-ap>)..
* Correct the range of the Has Input property of a Channel, to cpsv:hasInput.
* Revision of the usage of the recommended controlled vocabularies in section 4. Update the conformance statement section as well (in response to <https://joinup.ec.europa.eu/discussion/type-formal-framework>).
* Alignment of the recommended controlled vocabularies of the Spatial property to the recommendation from DCAT-AP (in response to <https://joinup.ec.europa.eu/event/cpsv-ap-v20-revision-wg-virtual-meeting-webinar-3>).
* Fix existing errors in the example of the definition of a Public Organisation (in response to <https://joinup.ec.europa.eu/discussion/comments-example-included-cpsv-ap-v20>).

1. Detailed list of mandatory and optional classes and properties

Table 17: Mandatory and optional classes and properties

| Class | Property | Mandatory/optional |
| --- | --- | --- |
| Public Service |  | Mandatory |
| Public Service | Identifier | Mandatory |
| Public Service | Name | Mandatory |
| Public Service | Description | Mandatory |
| Public Service | Keyword | Optional |
| Public Service | Sector | Optional |
| Public Service | Type | Optional |
| Public Service | Language | Optional |
| Public Service | Status | Optional |
| Public Service | Is Grouped By | Optional |
| Public Service | Requires | Optional |
| Public Service | Related | Optional |
| Public Service | Has Criterion | Optional |
| Public Service | Has Competent Authority | Mandatory |
| Public Service | Has Participation | Optional |
| Public Service | Has Input | Optional |
| Public Service | Has Formal Framework | Optional |
| Public Service | Produces | Optional |
| Public Service | Follows | Optional |
| Public Service | Spatial | Optional |
| Public Service | Has Contact Point | Optional |
| Public Service | Has Channel | Optional |
| Public Service | Processing Time | Optional |
| Public Service | Has Cost | Optional |
| Public Service | Is Described At | Optional |
| Event |  | Optional |
| Event | Identifier | Mandatory |
| Event | Name | Mandatory |
| Event | Description | Optional |
| Event | Type | Optional |
| Event | Related Service | Optional |
| Business Event |  | Optional |
| Life Event |  | Optional |
| Public Service Dataset |  | Optional |
| Public Service Dataset | Identifier | Mandatory |
| Public Service Dataset | Name | Mandatory |
| Public Service Dataset | Publisher | Mandatory |
| Public Service Dataset | Landing Page | Mandatory |
| Participation |  | Optional |
| Participation | Identifier | Mandatory |
| Participation | Description | Mandatory |
| Participation | Role | Mandatory |
| Criterion Requirement |  | Optional |
| Criterion Requirement | Identifier | Mandatory |
| Criterion Requirement | Name | Mandatory |
| Criterion Requirement | Type | Optional |
| Evidence |  | Optional |
| Evidence | Identifier | Mandatory |
| Evidence | Name | Mandatory |
| Evidence | Description | Optional |
| Evidence | Type | Optional |
| Evidence | Related Documentation | Optional |
| Evidence | Language | Optional |
| Output |  | Optional |
| Output | Identifier | Mandatory |
| Output | Name | Mandatory |
| Output | Description | Optional |
| Output | Type | Optional |
| Cost |  | Optional |
| Cost | Identifier | Mandatory |
| Cost | Value | Optional |
| Cost | Currency | Optional |
| Cost | Description | Optional |
| Cost | Is Defined By | Optional |
| Cost | If Accessed Through | Optional |
| Channel |  | Optional |
| Channel | Identifier | Mandatory |
| Channel | Owned By | Optional |
| Channel | Type | Optional |
| Channel | Has Input | Optional |
| Channel | Opening Hours | Optional |
| Channel | Availability Restriction | Optional |
| Opening Hours Specification |  | Optional |
| Rule |  | Optional |
| Rule | Identifier | Mandatory |
| Rule | Description | Mandatory |
| Rule | Language | Optional |
| Rule | Name | Mandatory |
| Rule | Implements | Optional |
| Formal Framework |  | Optional |
| Formal Framework | Identifier | Mandatory |
| Formal Framework | Name | Mandatory |
| Formal Framework | Description | Mandatory |
| Formal Framework | Language | Optional |
| Formal Framework | Status | Optional |
| Formal Framework | Subject | Optional |
| Formal Framework | Territorial Application | Optional |
| Formal Framework | Type | Optional |
| Formal Framework | Related | Optional |
| Agent |  | Optional |
| Agent | Identifier | Mandatory |
| Agent | Name | Mandatory |
| Agent | Plays Role | Optional |
| Agent | Has Address | Optional |
| Public Organisation |  | Mandatory |
| Public Organisation | Identifier | Mandatory |
| Public Organisation | Preferred Label | Mandatory |
| Public Organisation | Spatial | Mandatory |
| Contact Point |  | Optional |

1. The Core Public Service Vocabulary

The Core Public Service Vocabulary[[62]](#footnote-63) is a simplified, reusable and extensible data model that captures the fundamental characteristics of a service offered by public administration. It has been designed to make it easy to exchange basic information about individual public sector services. By using the vocabulary, **almost certainly augmented with sector-specific information**, organisations publishing data about their services will enable:

Easier discovery of those services with and between countries;

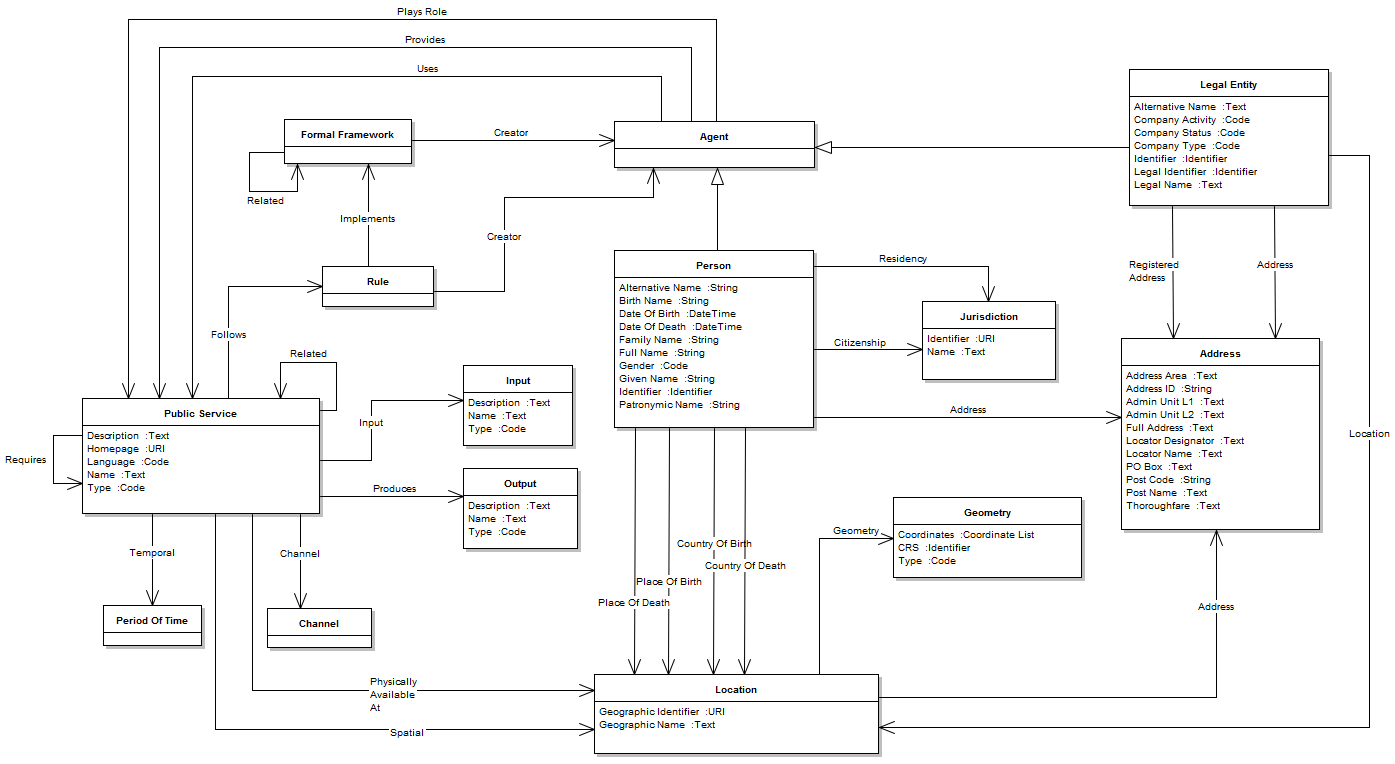
Easier discovery of the legislation and policies that underpin service provision;

Easier recognition of how services provided by a single organisation interrelate and are used either by other services or external users; and

Easier comparison of similar services provided by different organisations.

The diagram representation of the current data model of the CPSV can be found in Figure 6.

Figure 6 - CPSV diagram representation of current data model



Following the ISA Process and Methodology for Developing Core Vocabularies[[63]](#footnote-64), the CPSV Working Group was set up for the creation of the vocabulary. It consisted of the following types of stakeholders that partake in the public service provision process:

23 representatives of e-Government interoperability frameworks and strategies from the Member States and owners/managers of e-Government portals operating at different government levels;

5 experts from EU-funded Large Scale Pilot projects, e.g. SPOCS and representatives from EU Institutions.

5 representatives of standardisation bodies already active in service modelling, e.g. W3C, OASIS, The Open Group and OMG.

18 representatives of software vendors, IT companies and other private companies already active in service modelling, e.g. SAP and IBM.

18 experts on service modelling (SOA, service science) from research institutes and universities across Europe and beyond.

There following known implementation of the CPSV exist:

* **BE - Flemish Government.** The Flemish Government is piloting the CPSV (as part of its OSLO vocabulary[[64]](#footnote-65)) to publish its intergovernmental product and service catalogue[[65]](#footnote-66) as Linked Data.
* **EE – Integrated portfolio management of public services.** The Estonian Ministry of Economic Affairs created an extension[[66]](#footnote-67) of the CPSV to address local needs, as well as to cover the public service lifecycle. New classes and properties were introduced to cover information related to security, evaluation and the underlying Web Service(s) supporting the delivery of a public service. The extended CPSV is also the basis for the Estonian framework for the dynamic management of public service portfolios (focused on the evaluation of public services and the governance of their lifecycle).
* **FI – Service map for the City of Helsinki.** The City of Helsinki has described the services they offer to citizens and made them available through a Service Map[[67]](#footnote-68). It enables to search for services in different ways, locate them on a map and retrieve more information on particular services.
* **EU - ISA Programme.** The CPSV pilot “Describe your public service once to publish on multiple Government Access Portals”[[68]](#footnote-69) is a known implementation of the CPSV. It demonstrates that the Core Public Service can be used as a foundational RDF Vocabulary to homogenise public service data that originates from local, regional, and national e-Government portals. It also demonstrates that the definition of uniform HTTP URI sets for public services facilitates information management. Finally the implementation shows that a linked data infrastructure can provide access to homogenised, linked and enriched public service data. The pilot[[69]](#footnote-70) and report[[70]](#footnote-71) documenting the findings can be accessed through Joinup.

In this work, the CPSV will be extended to ensure that all relevant information concerning business events and public services from national, regional and/or local electronic PSCs can be captured.

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. The same terms are used here as in that work with the addition of the concept of a Life Event as described in section **Error! Reference source not found.**.

Table 18: 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[[71]](#footnote-72) | 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 organisations which, in the exercise of their legal autonomy, regulate in a collective manner access to service activities or the exercise thereof. |

1. Description of 1st level life events

Table 19: Description of 1st level life events

| 1st level life event | Description |
| --- | --- |
| Having a child | This life event groups public services related to becoming a caretaker for a child, for instance in case of giving birth, adopting, receiving a foster child… |
| Becoming a (social) caretaker | This life event groups public services related to the situation where you need to take care of another person (other than when you get a child), for instance for an elder, a disabled person… |
| Starting education | This life event groups any public service related to education, for example pre-school education, elementary school, higher education and university… |
| Looking for a new job | This life event groups public services for when someone looks for a new job or starts a new job. |
| Losing/quitting a job | This life event groups public services related to the situation when someone leaves or quits a particular jobs on his own, or when someone loses his job, for instance getting fired, collective dismissal, in case of failure of the company… |
| Looking for a place to live | This life event groups public services related to a person’s place of living, for instance, changing residence, buying a house or a piece of land, building, renting a house or apartment… |
| Changing relationship status | This life event groups public services related to a person’s official relationship, for instance marriage, registered partnership, divorce… |
| Driving a vehicle | This life event groups public services related to driving a vehicle, for instance car, motorcycle… Some example public services are getting your driver license, following driving lessons, registering your car… |
| Travelling abroad | This life events groups public services related to what you need to do when travelling abroad, for instance getting an international passport or driving license, getting a visa, getting vaccination… |
| Moving to/from the country | This life event groups public services that relate to when someone moves from one country to another. |
| Going into military service | This life event groups public services related to taking up a mandatory military or civil service. |
| Facing an emergency / health problem | This life event groups public services related to when someone faces an emergency, for instance in the case of an accident, or a severe health problem, for instance getting disabled. |
| Facing a crime | This life event groups public services related to a crime, for instance in case you are the committer of that crime, or the victim or witness of a particular crime. |
| Retirement | This life event groups public services related to when someone retires from his job or becomes a senior. |
| Death of a relative | This life event groups public services that relate to when a relative passes a way, and cover the public services directly related to the decease of that person (for instance notifying the authorities, arranging the funeral…), as well as related to settling inheritance and donations. |

1. Description of 2nd level business events

Table 20: Description of 2nd level business events

| Business Event (1st level) | Business Event (2nd level) | Description |
| --- | --- | --- |
| Starting business | Registering a company | This business event groups public services that are related to different kind of activities that have to be done before the business is eligible to operate, for instance registering in the business register, registering as a VAT payer, notifying the residence of your company… |
| Needing a licence, permit or certificate to start or continue an activity | This business events groups public services related to the request of a licence, permit, certificate or other official document that have to be acquired before starting to execute a certain activity. |
| Registering Intellectual Property | This business event groups public services related to the registering inventions, patents, trademarks, copyrights. |
| Registering a branch | This business event groups public services relating to the start-up of a new activity, and that have to be done before you can start with the particular activity. |
| Starting a new activity | This business event groups public services for the start-up of a new activity, and that have to be done before you can start with the particular activity. |
| Financing a company | This business event groups public services related to different types of funding, grants, loans, subsidies that help to finance the business. |
| Hiring an employee | This business event groups public services for recruiting and registering employees, applying for a work permits, changes in employment. |
| Starting cross-border business | Registering a cross-border business | This business event groups public services that result in starting an international operations. |
| Registering a branch | This business event groups public services for opening affiliates and representative offices. |
| Doing business | Financing a company | This business event groups public services related to different types of funding, grants, loans, subsidies that help to finance the business. |
| Needing a licence, permit or certificate to start or continue an activity | This business events groups public services related to the request of a licence, permit, certificate or other official document that have to be acquired before starting to execute a certain activity. |
| Registering Intellectual Property | This business event groups public services related to the registering inventions, patents, trademarks, copyrights. |
| Hiring an employee | This business event groups public services for recruiting and registering employees, applying for a work permits, changes in employment. |
| Participating in public procurement | This business event groups public services related to participating in a public tender, or directly selling services/products to a public administration. |
| Notifying and reporting to authorities | Notifying authorities about different type of activitie, for instance environmental information nnual reports, accounting procedures... This business event also includes periodic activities, for instance declaring the profit of a company (and thus paying taxes). |
| Starting a new activity | This business event groups public services for the start-up of a new activity, and that have to be done before you can start with the particular activity. |
| Registering a branch | This business event groups public services relating to the start-up of a new activity, and that have to be done before you can start with the particular activity. |
| Having problems in paying creditors | This business event groups public services for starting the necessary (legal) procedures for getting protection when a company does not have enough cash flow for paying creditors. |
| Closing business | Restructuring of a company | This business event groups public services related to the reorganisation, merger, acquisition, any change on the legal status of the business. |
| Dissolution of a company | This business event groups public services related to the closing, deregistration, discontinuation, liquidation, bankruptcy and other procedures that end the existence of a business. |

1. Description of output types

Table 21: Description of output types

| Output type | Description |
| --- | --- |
| Declaration | A formal statement or document, which can be used for proving something. E.g. identity card, passport health card, declaration of honour… |
| Physical object | A tangible product coming out of the public service, of which the underlying value is not a declaration, recognition, permit, financial obligation, financial benefit or code e.g. buildings, container, birth gift, electronic devices… |
| Code | A series of alpha-numeric or other characters E.g. a microchip code, access code, social security number, enterprise number… |
| Financial obligation | The obligation of a citizen or business to pay a certain amount to public administrations or a subsidiary. E.g. Financial commitment, Premium, Imposition, Tax, Fine… |
| Financial benefit | The obligation of a public administration or subsidiary to pay a certain amount to a citizen or business. E.g. Payment declaration, Financial, benefit, Subsidy, Allowance, Compensation… |
| Recognition | A formal statement or document, which can be used for proving the capability or conformance with something of a citizen or business. E.g. certificate, diploma, recognition… |
| Permit | A formal statement or document, which officially allows a business or citizen to do something. E.g. Admission, Permit, Authorisation... |

1. European Commission. Interoperability for European Public Administrations (ISA). Accessing Member State information resources at European level. <http://ec.europa.eu/isa/actions/01-trusted-information-exchange/1-3action_en.htm> [↑](#footnote-ref-2)
2. European Commission. Interoperability for European Public Administrations (ISA). <http://ec.europa.eu/isa/index_en.htm> [↑](#footnote-ref-3)
3. <https://joinup.ec.europa.eu/asset/cpsv-ap/asset_release/core-public-service-vocabulary-application-profile-v20> [↑](#footnote-ref-4)
4. <https://joinup.ec.europa.eu/asset/core_public_service/description> [↑](#footnote-ref-5)
5. <http://dublincore.org/documents/2001/04/12/usageguide/glossary.shtml#A> [↑](#footnote-ref-6)
6. <https://ec.europa.eu/isa2/home_en> [↑](#footnote-ref-7)
7. http://europa.eu/youreurope/business/ [↑](#footnote-ref-8)
8. <https://www.ietf.org/rfc/rfc2119.txt> [↑](#footnote-ref-9)
9. <http://ec.europa.eu/isa/documents/isa_annex_ii_eif_en.pdf> [↑](#footnote-ref-10)
10. *This property should be a URI if it is modelled in RDF.* [↑](#footnote-ref-11)
11. <https://joinup.ec.europa.eu/asset/criterion_evidence_cv/description> [↑](#footnote-ref-12)
12. <http://publications.europa.eu/resource/authority/atu/> [↑](#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. *This property should be a URI if it is modelled in RDF.* [↑](#footnote-ref-16)
16. <https://www.w3.org/TR/vocab-dcat/#class-dataset> [↑](#footnote-ref-17)
17. *This property should be a URI if it is modelled in RDF.* [↑](#footnote-ref-18)
18. *This property should be a URI if it is modelled in RDF.* [↑](#footnote-ref-19)
19. https://joinup.ec.europa.eu/asset/criterion\_evidence\_cv/description [↑](#footnote-ref-20)
20. *This property should be a URI if it is modelled in RDF.* [↑](#footnote-ref-21)
21. *This property should be a URI if it is modelled in RDF.* [↑](#footnote-ref-22)
22. *This property should be a URI if it is modelled in RDF.* [↑](#footnote-ref-23)
23. *This property should be a URI if it is modelled in RDF.* [↑](#footnote-ref-24)
24. *This property should be a URI if it is modelled in RDF.* [↑](#footnote-ref-25)
25. http://schema.org/openingHours [↑](#footnote-ref-26)
26. http://schema.org/OpeningHoursSpecification [↑](#footnote-ref-27)
27. *This property should be a URI if it is modelled in RDF.* [↑](#footnote-ref-28)
28. <http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:52012XG1026%2801%29> [↑](#footnote-ref-29)
29. *This property should be a URI if it is modelled in RDF.* [↑](#footnote-ref-30)
30. http://publications.europa.eu/mdr/authority/atu-type/index.html [↑](#footnote-ref-31)
31. *This property should be a URI if it is modelled in RDF.* [↑](#footnote-ref-32)
32. https://joinup.ec.europa.eu/asset/cpov/asset\_release/all [↑](#footnote-ref-33)
33. <http://www.w3.org/TR/vocab-org/> [↑](#footnote-ref-34)
34. http://publications.europa.eu/mdr/authority/atu/ [↑](#footnote-ref-35)
35. The 2nd level business events might apply for different 1st level business events, leading to a many-to-many mapping between 1st and 2nd level business events. A description for each 2nd level business event has been included in “Description of 2nd level business events”. [↑](#footnote-ref-36)
36. The list currently only includes a 1st level for life events. A description for each 1st level life events has been included in “Description of 1st level life events”. [↑](#footnote-ref-37)
37. <http://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=4> [↑](#footnote-ref-38)
38. <http://publications.europa.eu/mdr/authority/language/index.html> [↑](#footnote-ref-39)
39. <http://ec.europa.eu/competition/mergers/cases/index/nace_all.html> [↑](#footnote-ref-40)
40. <http://publications.europa.eu/mdr/authority/continent/index.html> [↑](#footnote-ref-41)
41. <http://publications.europa.eu/mdr/authority/country/> [↑](#footnote-ref-42)
42. <http://publications.europa.eu/mdr/authority/place/index.html> [↑](#footnote-ref-43)
43. <http://sws.geonames.org/> [↑](#footnote-ref-44)
44. <http://purl.org/adms/status/> [↑](#footnote-ref-45)
45. <http://publications.europa.eu/mdr/authority/language/index.html> [↑](#footnote-ref-46)
46. A description for each output type has been included in “Description of output types”. [↑](#footnote-ref-47)
47. <http://publications.europa.eu/mdr/authority/currency/index.html> [↑](#footnote-ref-48)
48. <http://publications.europa.eu/mdr/authority/language/index.html> [↑](#footnote-ref-49)
49. <http://publications.europa.eu/mdr/authority/language/index.html> [↑](#footnote-ref-50)
50. <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52012XG1026(01)> [↑](#footnote-ref-51)
51. <http://eurovoc.europa.eu/drupal/?q=download/subject_oriented&cl=en> [↑](#footnote-ref-52)
52. <http://ec.europa.eu/eurostat/ramon/nomenclatures/index.cfm?TargetUrl=LST_NOM_DTL&StrNom=NUTS_22&StrLanguageCode=EN&IntPcKey=&StrLayoutCode=HIERARCHIC> [↑](#footnote-ref-53)
53. <http://publications.europa.eu/mdr/authority/resource-type/index.html> [↑](#footnote-ref-54)
54. <http://publications.europa.eu/mdr/authority/continent/index.html> [↑](#footnote-ref-55)
55. <http://publications.europa.eu/mdr/authority/country/> [↑](#footnote-ref-56)
56. <http://publications.europa.eu/mdr/authority/place/index.html> [↑](#footnote-ref-57)
57. <http://sws.geonames.org/> [↑](#footnote-ref-58)
58. <https://www.yrityssuomi.fi/en/?region=helsinki> [↑](#footnote-ref-59)
59. <http://www.ietf.org/rfc/rfc3987.txt> [↑](#footnote-ref-60)
60. <https://joinup.ec.europa.eu/node/52600/> [↑](#footnote-ref-61)
61. <https://docs.google.com/spreadsheet/ccc?key=0Arqf55JwcBx4dGpvVG5BcTVqaUNKTEFJX09xcXpaRUE&usp=drive_web#gid=3> [↑](#footnote-ref-62)
62. <https://joinup.ec.europa.eu/asset/core_public_service/description> [↑](#footnote-ref-63)
63. <https://joinup.ec.europa.eu/community/semic/document/isa-deliverable-process-and-methodology-developing-core-vocabularies> [↑](#footnote-ref-64)
64. <http://www.google.com/url?q=http%3A%2F%2Fdata.vlaanderen.be%2Fns%2Fdienst&sa=D&sntz=1&usg=AFQjCNGH7izltYOdIIDLohHJocHrmxXylw> [↑](#footnote-ref-65)
65. http://www.google.com/url?q=http%3A%2F%2Fdata.vlaanderen.be%2Fdoc%2Fapplicatieprofiel%2Fdienstencataloog&sa=D&sntz=1&usg=AFQjCNF822tdefDM-5nEivmP-Dvhpfp\_Xg [↑](#footnote-ref-66)
66. <https://www.mkm.ee/sites/default/files/study_-_integrated_portfolio_management_of_public_services_-_brief_summary.pdf> [↑](#footnote-ref-67)
67. <http://www.hel.fi/palvelukartta/Default.aspx?language=en&city=91> [↑](#footnote-ref-68)
68. <https://joinup.ec.europa.eu/node/63148> [↑](#footnote-ref-69)
69. <http://cpsv.testproject.eu/CPSV/> [↑](#footnote-ref-70)
70. <https://joinup.ec.europa.eu/node/63148> [↑](#footnote-ref-71)
71. 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-72)