DG DIGIT / ISA Programme

D02.02 – Definition and development of a data model for description of the services related to key business events

CPSV-AP

Action 1.3 Catalogue of Services

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0.02	2014-09-18	Update template	Update
0.01	2014-09-15	Initial draft	Creation

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1. INTRODUCTION

1.1. Context and problem statement

This document has been prepared in the context of Action 1.3 – Accessing Member State information resources at European level – Catalogue of Services[1] of the European Commission's Interoperability for European Public Administrations (ISA) programme[2].

In the process of implementing the Services Directive[3], Member States have implemented electronic Points of Single Contact (PSC), in the form of e-Government portals that allow businesses to:

1. Find information about business events and related public services, for example which are the rules to be followed, the prerequisites to be fulfilled, the formalities to be completed and the legislation that is governing a particular business event and its related public services; and

2. Execute the public services online (wherever possible).

These electronic PSCs are currently facing several challenges:

- **Lack of coordination between the electronic PSCs within the same country.** Often there are different platforms within the same country, of which the interconnection and coordination can be improved. For example, the same public services are described several times on different locations, the content is organised following different ways, and information is represented in different ways, i.e. using different data models, and following different formalisms. In fact, according to a SPOCS study in the area of PSCs[4], there is no obligation to maintain consistency in the presentation of the content on regional portals.

- **Fragmentation of responsibilities.** The same SPOCS study revealed that the competent authorities are responsible for preparation of descriptions for 36 PSCs (11 national, 15 regional); however in the case of 20 one-stop-shops there is more than one entity in charge of that task. A similar situation is noted for the information updating task, although with stronger involvement by the PSCs (45%). The difficulty and effort in preparing the proper information depends partly on the way the PSC is organized, as some one-stop-shops provide just general information, with details available on the website of competent authorities.

- **Heterogeneous descriptions of public services and business events.** Different electronic PSCs provide descriptions of public services and business events that differ not only in terms of the vocabulary used, but also in terms of depth and detail provided. The description of the same public service

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[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

[2] European Commission. Interoperability for European Public Administrations (ISA). http://ec.europa.eu/isa/index_en.htm

[3] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32006L0123

[4] SPOCS LSP (2011), Points of Single Contact Research Study, Available at: http://ec.europa.eu/internal_market/services/docs/services-dir/studies/spocs_en.pdf

and/or business event is usually created more than once by different authorities.

- **Lack of multilingual descriptions.** Although progress is made towards this direction, there are many cases where only few languages are supported. We observed that in some cases languages of neighbouring countries are supported in addition to the national language and English.

- **Administration-centric vs. business centric-approach.** In some PSCs the information is organised following the organisational/functional structure of public administration, and not according to key business events. This hampers the usability of those portals.

- **National vs. cross-border public service provision.** There is not always a clear indication between public services that apply to national and to cross-border contexts. This hampers the access to the right information of EU businesses who wish to do business in country other than the one they are registered in.

- **Lack of pan-European single window for business events and related public services.** There is no pan-European one-stop-shop for businesses that would foster healthy competition between countries and regions on improving the provision of information about their business events. It would also lower the information access barriers for third country nationals, allowing them to find their way and invest in an EU Member State.

1.2.   Proposed solution

Within the Member States, there is a strong need for harmonising the way business events and related public services, falling under the scope of the Service Directive, are described. This can be achieved by means of a common data model for representing business events and public services. Such a common data model will enable Member States to coordinate the provision of information about business events and public services, which is currently scattered on electronic PSCs, but also on regional and local portals and other one-stop shops for entrepreneurs.

The development and usage of a common data model is beneficial for the Member States in several ways and allows them to improve the modus operandi of their electronic PSCs in terms of ease of use and usability, business-centricity, efficiency and interoperability.

First, it allows mapping different data models used in the Member States to describe key business events and public services to a common model, enabling the information exchange and building a federating platform. This enables to describe key business events and public services only once, because information exchange between the different PSCs and other one-stop shops is made easier through the use of a common standard. Additionally, the common data model should help modelling and providing the information in a more business-centric way, through grouping public services in key business events. All this leads to high-quality information provision to the users, saving costs and reducing administrative burden.

Businesses, on the other hand, benefit from the usage of a common data model because it lowers the administrative burden, while also improving their access to and experience of digital public services. On top it improves their efficiency and lower costs in taking care of administrative procedures. All this should lead to a better perception of public administration.

1.3.   Scope

The objective of this specification is to define a common data model describing business events and public services under the scope of the Service Directive, with a particular focus on the electronic Points of Single Contact.

This work focuses ultimately on improving the provision of information about key business events and public services on established electronic PSCs. In particular, this common data model enables to document public services relevant in the context of business events that comprise the business life cycle. Typical examples of such business events (also called business episodes or business life-events) are[5]:

- Starting a business;
    - o Starting a company;
    - o Starting a new activity;
    - o Applying for licenses, permits and certificates;
- Starting cross-border business;
    - o Registering a company abroad;
    - o Starting a new branch;
- Doing business;
    - o Financing a business;
    - o Staffing;
    - o Reporting and notifying authorities;
    - o Paying taxes;
- Closing a business;
    - o Closing down the company;
    - o Closing a branch;
    - o Merging you company;
    - o Selling your company
    - o Bankruptcy;

1.4.   Process and methodology

This common data model is being defined as an **Application Profile of the ISA Core Public Service Vocabulary**[6] (henceforth referred to as the CPSV-AP). An Application Profile[7] 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.

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[5] http://ec.europa.eu/idabc/servlets/Doc2bb8.pdf?id=1675
[6] https://joinup.ec.europa.eu/asset/core_public_service/description
[7] http://dublincore.org/documents/2001/04/12/usageguide/glossary.shtml#A

The work is being conducted according to the **ISA process and methodology**[8] for developing Core Vocabularies. The process involves the set-up of a Working Group and the publication of drafts of the specification with external review. The CPSV-AP is being developed under the responsibility of the European Commission's ISA Programme[9] which was also chairing the Working Group. The Working Group[10] was responsible for defining the specifications and was established from (part of) the members of the EUGO Network and TIE Cluster representatives.

The **methodology** describes how the specification process has ran. The methodology concerned 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.

In practice, the specification of the CPSV-AP started following a bottom-up approach. We therefore started by reviewing and analysing the state-of-the-art in the MSs concerning the models being used for describing business events and public services on the electronic PSCs of the Member States. This analysis led to the documentation of the classes and properties of each model being used in the MSs. The participating MSs were asked to review and validate the analysis of the documented data model for their country.

Subsequently, these data models for describing business events and public services were compared in order to identify differences and commonalities. As a result of this comparison, we identified possible new classes and properties for the CPSV-AP. These were suggested as a proposal to the Working Group.

Besides adding new classes and properties to the CPSV, CPSV-AP also includes a set of recommended controlled vocabularies for different properties (section 5), with a primary focus on the identification of a common controlled vocabulary for public service types, which can then be linked to key business events. These controlled vocabularies were also subject to the approval of the Working Group.

Finally, the participating MSs are being asked to contribute to and validate the creation of a (machine-readable) mapping of their model to the classes, properties and values of the controlled vocabularies of the CPSV-AP, in order to enable the semi-automatic exchange of information related to public services and key business events.

In order to facilitate the discussions in the Working Group, 4 webinars are being organised. The first 3 webinars took place on the following dates:

- **Webinar 1:** Monday 3 November 2014 - 14:00-16:00 CET
- **Webinar 2:** Wednesday 19 November 2014 - 14:00-16:00 CET
- **Webinar 3:** Monday 11 December 2014 – 14:30-16:30 CET

Between Webinar 3 and Webinar 4 a public review period, inviting the public to review the specification, is being organised. This public review period runs from

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[8] European Commission. Joinup. Process and Methodology for Developing Core Vocabularies. https://joinup.ec.europa.eu/node/43160
[9]

[10] https://joinup.ec.europa.eu/node/104619

10th of February and ends on the **2nd of March**. The following stakeholders are being invited to provide their feedback during the public review period:

- ISA TIE Cluster Representatives
- EUGO Network Representatives
- Your Europe (DG GROW)
- eSENS Large Scale Pilot (LSP)
- CPSV Working Group
- CPSV-AP Working Group

After the public review period a fourth webinar (**webinar 4**) will be organised on **Thursday 12th of March 2015 (10:00-12:00 CET)**.
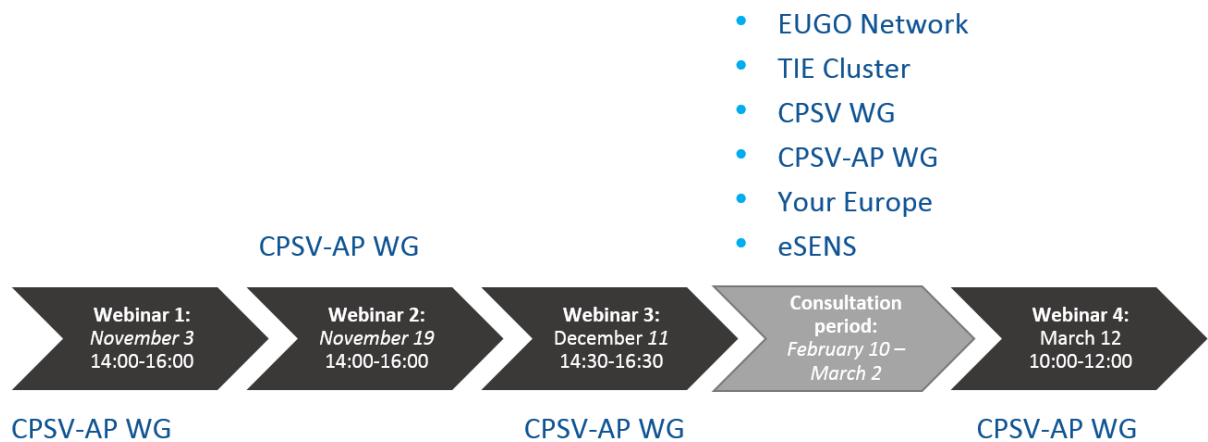
Figure 1 - Planning for defining the CPSV-AP

Before the first webinar an initial version of the specification was made available to the Working Group. The Working Group was invited to review the specification and submit comments and suggestions. These comments and suggestions were logged in the issue tracker[11]. The proposed solutions for the issues were elaborated in a new version of the specification, which was again made available for review to the Working Group and discussed in the next webinar. Subsequently, comments and suggestions can again be submitted by the Working Group. This process was repeated until the release of the final version after the last webinar.

The methodology that is being followed for defining the CPSV-AP is summarised in Figure 2.

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[11] https://joinup.ec.europa.eu/asset/cpsv-ap/issue/all
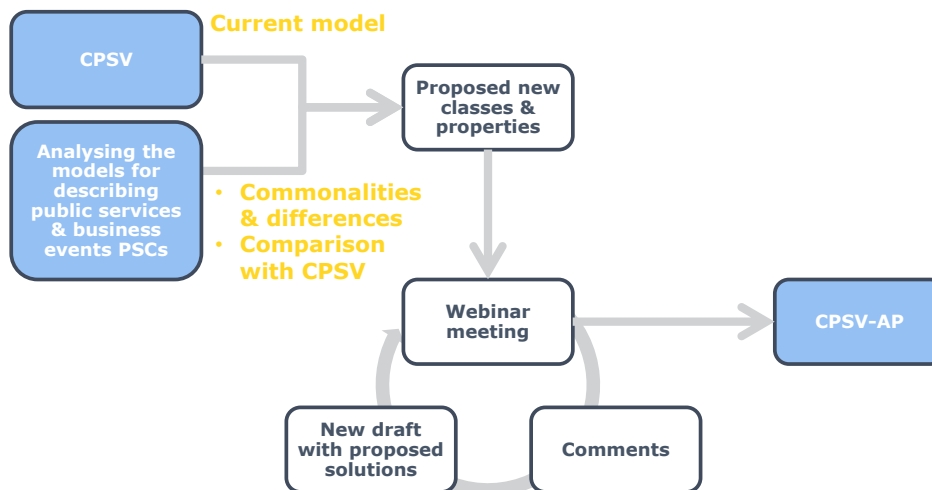
Figure 2 - Process and methodology

The Working Group is being supported with collaborative working tools, like:

- A **mailing list[12]** to exchange e-mails to the working group, including a **public mail archive[13]**;
- An **issue tracker[14]** to log and follow-up on the status and proposed solutions of suggestions of the Working Group;
- An **eLibrary[15]** to share documents amongst the members of the Working Group.

These tools and intermediate and final products of this work are accessible through the CPSV-AP project on Joinup:

https://joinup.ec.europa.eu/asset/cpsv-ap/description

All contributors to the specification were requested to sign the ISA Contributor Agreement v1.1[16]. This contributor agreement documents the rights granted by contributors to the European Union. This allows the EU to release the specification under the ISA Open Metadata Licence v1.1[17].

1.5. Structure of this document

This document consists of the following sections.
- In section 2, a set of some key concepts which will serve as a common working terminology for this work are defined.

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[12] cpsv-ap@joinup.ec.europa.eu

[13] http://joinup.ec.europa.eu/mailman/archives/cpsv-ap/
[14] https://joinup.ec.europa.eu/asset/cpsv-ap/issue/all

[15] https://joinup.ec.europa.eu/asset/cpsv-ap/communications/all

[16] https://joinup.ec.europa.eu/node/63578

[17] https://joinup.ec.europa.eu/category/licence/isa-open-metadata-licence-v11

- Section 3 defines the main use case that drives the specification of the Application Profile.
- The classes and properties defined for the Application Profile are identified in section 4.
- In section 5, controlled vocabularies are proposed for use as value sets for a number of properties.
- Section 6 contains the Conformance Statement for this Application Profile.
- Accessibility and multilingual issues are addressed in section 7.
- In section 8, some examples are included on how the information from the PSC of a Member State can be mapping to the CPSV-AP.
- Finally, acknowledgements related to the development of this Application Profile are contained in section 9.

2. DEFINITION OF A COMMON WORKING TERMINOLOGY FOR KEY CONCEPTS

In this section we define key concepts (Table 1) being used throughout the document. These concepts and there definitions will be used as common working terminology.

The approach for getting to these key concepts and their definitions, consisted of several steps. First we have identified and analysed related work. This work has been listed in "Annex I: Sources for defining the working terminology for key concepts" (Table 5). From this work we identified relevant concepts and definitions that could be used for defining the common working terminology. All relevant definitions that have been identified and their source are listed in "Annex I: Sources for defining the working terminology for key concepts" (Table 6). Finally, based on our analysis and comparison of these definitions, we came to the set of terms and definitions described in Table 1.

The list of Key Business Events has been defined in the context of "D02.01 – Definition of key business events". For this, we first looked at existing work related to defining a business lifecycle. Additionally, and most importantly, we also analysed what the most common Business Events are that are available on the PSCs of the Member States (D02.01). From this analysis, an initial list of Key Business Events was derived which was proposed to the CPSV-AP Working Group. Because of the differences in the business events are being defined on the MS's PSCs and in the granularity of these business events, the Working Group agreed on having a limited number of Key Business Events that are independent from the MS's context, the type of business, sector… For each Key Business Events a description has been elaborated. The list and descriptions have been included as part of the definition of Key Business Event in Table 1.

All concepts and their definitions mentioned below were subject of discussion and validation in the Working Group and can evolve throughout the work on defining the CPSV-AP.

Table 1 - 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[18]	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.

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[18] 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.»

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.

3. USE CASES

The CPSV-AP is designed to meet the use cases described below.

3.1. Use Case 1 – Managing portfolios of public services

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

Public service portfolio management allows public administration to apply holistic and systematic management to their investments on 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 public service and business event lifecycle, e.g. by:

- Identifying where public services and/or business events are missing;
- Identifying public services and/or business events that are not used or outdated;
- Identifying redundant public services and/or business events;
- Provision of information of higher quality (in terms of completeness, validity and timeliness) for business events and public services.

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

3.2. Use Case 2 – Publishing descriptions of public services and business events on the PSCs

In countries with strong autonomy for the regions (e.g. Austria, Spain, Germany, Belgium…) several electronic PSCs may exist. These regional or local one–stop-shops for business events may have different ways for making available information about key business events and related public services, which results in the following shortcomings:

- The same business events and public services are described several times, often in uncoordinated way, hence resulting in inconsistencies and in duplication of effort and costs.

- Businesses, especially foreign ones, need a single point of access to the business events provided by a Member State.

- The content on the electronic PSCs is organised following different patterns, hence creating a different experience and making navigation and use harder for the businesses that attempt to find information about key business events on those PSCs.

In light of the aforementioned shortcomings, we suggest that it is useful to have a single point of access for business events, especially in the context of cross-border service delivery in order to facilitate the access for other nationals. This single point of access does not have to affect the administrative organisation of PSCs in a specific country, but can be established through their federation and the exchange of information between the existing infrastructures. Using a common data model for key business events and public services, such as the CPSV-AP, enables the flexible exchange and integration of the different public service descriptions and facilitates the publications of this information on the single point of access. This way, the common data model acts as a bridge, a common language, which enables mapping all different ways of describing key business events and related public services to one common basis.

3.3. Use Case 3 – Finding information on the PSC more easily

Often PSCs publish information on business events and public services 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. This gap actually makes the discovery of relevant information on the PSCs harder for businesses.

A common data model for describing key business events and related public services, such as the CPSV-AP, would assist the PSC in providing high-quality descriptions of public services from a user-centric perspective by grouping them into key business events relating to the business lifecycle. This way, businesses can find the relevant information on public services to be executed in the context of a particular business event, without having to know how public administration is structured and organised in a specific country or region.

3.4. Use Case 4 – Building a European federated catalogue of PSCs

The implementation of an EU Single Market has as one of its prerequisites the free movement of goods, services and capital across the EU. In this context, the Service Directive foresees simplification measures, such as the PSCs, to facilitate life and increase transparency for businesses when they want to provide or use services in the single market.

In this light, PSCs have been established at the national and regional level in the Member States. A pan-European one-stop-shop for businesses, federating the national and regional ones, could further enhance the cross-border access to these public services. Such a platform, which could be built on and extend the work of YourEurope, would than provide a unified view on the provision of key business events across the EU Member States. It would allow businesses to find, see and compare how a generic business event is implemented in a number of Member States, and possibly take an informed decision about its investment based on this.

A pan-European one-stop-shop for businesses would therefore foster healthy competition between countries and regions on improving the provision of business events and related public services. 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 for key business events and public services, such as the CPSV-AP, enables the flexible exchange and integration of the descriptions of generic business events and related public service between the national/regional PSCs and the pan-European one-stop-shop for businesses. This way, the common data model acts as a bridge, a common language that enables mapping all different ways of describing key business events and related public services to one common basis.

4. CORE PUBLIC SERVICE VOCABULARY APPLICATION PROFILE (CPSV-AP)

The specifications of the Core Public Service Vocabulary Application Profile are represented in a graphical way (Figure 3) using the Unified Modelling Notation (UML) and are further elaborated on throughout this section. The classes and properties that are new and thus added to the former CPSV are coloured in blue.

Figure 3 - Graphical representation of the relationships between the classes and properties of the Core Public Service Vocabulary Application Profile
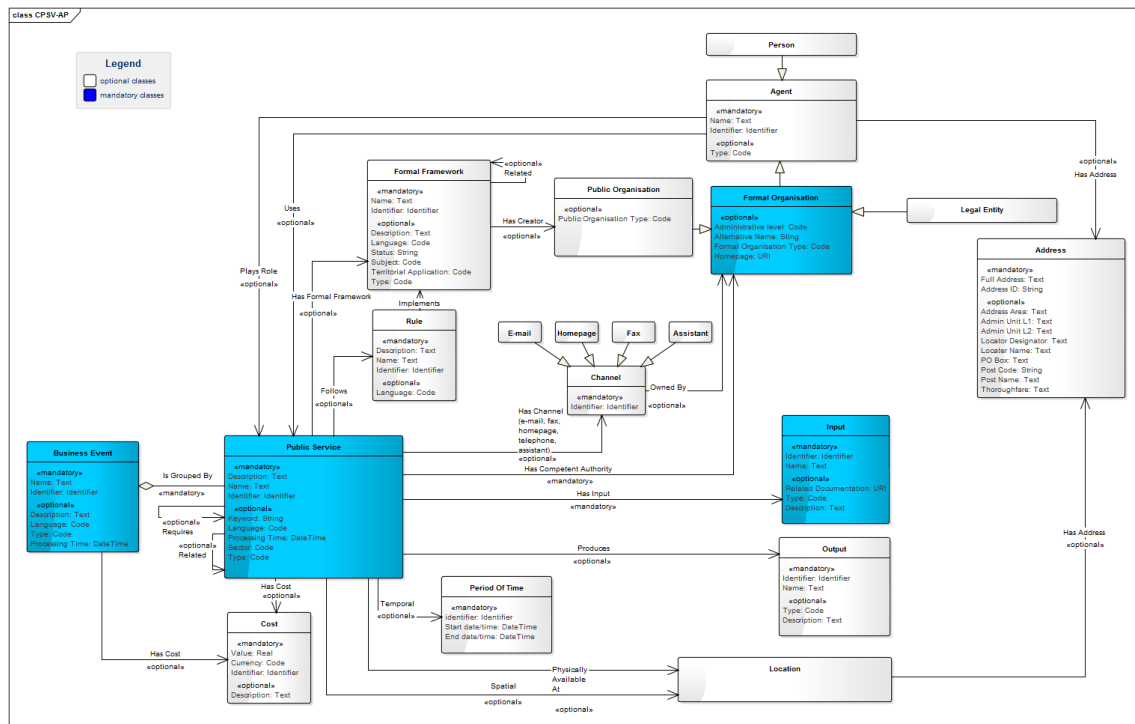
4.1. Mandatory and optional classes and properties of CPSV-AP

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 properties that are indicated as mandatory, if the particular class is used.

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.

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.

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.).

"Annex V: 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. The decision on which class or property is classified as being optional or mandatory has been taken based on the following priorities:

1. The minimum requirements indicated by the Service Directive;
2. Presence of the information on the PSCs of the Member States;

Additionally the proposal in "Annex V: Detailed list of mandatory and optional classes and properties" has been discussed with the Working Group.

4.2.   The Business Event class

This class represents a Business Event. A Business Event is 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.

In other words, a Business Event groups a number of public services that need to be delivered in for completing that particular event. In CPSV-AP this has been modelled by the "Is Grouped By" property (see section 4.3.4) of the "Public Service" class (see section 4.3).

4.2.1. Identifier

This property represents a formally-issued identifier for the Business Event.

4.2.2. Name

This property represents the name of the Business Event.

4.2.3. Description

This property represents a free text description of the Business Event. The description is likely to be the text that a business sees when it is looking for Public Services in the context of a particular Business Event on a PSC. Publishers are encouraged to include a reasonable level of detail in the description.

4.2.4. Type

This property represents the type of a Business Event as described in a controlled vocabulary. From the definition of "Key Business Event" (section 2) the following types of a Business Event are derived (see also section 5 on the recommended controlled vocabularies):

- 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"…

- Starting cross-border business:

All public services for foreign businesses (branches or temporary service provision). Some examples of events that would fall under this Key Business Event are "Registering a company abroad", "Starting a new branch"…

- Doing business:

All public services for business operation, growth, expansion, except staffing. Some examples of events that would fall under this Key Business Event are "Financing a business", "Staffing", "Reporting and notifying authorities", "Paying taxes"…

- 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"…

4.2.5. Processing time

This property represents an indication of time needed for executing all Public Services related to a Business Event. This can be a time range, average time, exact time for execution or any other indication of time.

4.2.6. Language

This property represents the language(s) in which the Business Event 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 5.

4.2.1. Has Cost

The Has Cost property links a Business Event to one or more instances of the Cost class (see section 4.3). It indicates the cumulative costs related to the execution of the Public Services included in a particular Business Event.

4.3. The Public Service Class

This class represents the public service itself. 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.

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

4.3.1. Identifier

This property represents a formally-issued identifier for the Public Service.

4.3.2. Name

This property represents the name of the Public Service.

4.3.3. 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 service see in any public service catalogue. Publishers are encouraged to include a reasonable level of detail in the description therefore, including basic eligibility requirements for the particular Public Service, and contact information.

4.3.4. Is Grouped By

This property links the Public Service to the Business Event class (section 4.2). Several Public Services are grouped (aggregated) into a Business Event. The same Public Service may be included in different Business Events.

4.3.5. Type

This property represents the type of a Public Service as described in a controlled vocabulary. The recommended controlled vocabularies are listed in section 5.

4.3.1. Has Competent Authority

The Has Competent Authority property links a Public Service to a Formal Organisation, which is the responsible agent for the delivery of the Public Service. Whether it provides the service directly or outsources it is not relevant, the Formal Organisation that is the Competent Authority of the service is the one that is ultimately responsible for managing and providing the 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".

4.3.2. 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 it has its legal basis.

4.3.3. 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 5.

4.3.4. Has Channel

This property links the Public Service to any Channel through which an Agent provides, uses or otherwise interacts with the Public Service.

It is a super property of Homepage (e-service), Physically Available At, E-mail, Fax, Assistant and Telephone. Further sub properties with more specific semantics may readily be defined such those that would link to proprietary platform applications, phone lines etc.

4.3.5. Processing time

This property represents an indication of time needed for executing a Public Service. This can be a time range, average time, exact time for execution or any other indication of time.

4.3.6. Sector

This property represents the industry or sector a Public Service relates to or is intended for. The possible values for this property are described in a controlled vocabulary. The recommended controlled vocabularies are listed in section 5.

4.3.7. Keyword

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

4.3.8. *Physically Available At*

This property links a Public Service to a physical location at which an Agent may interact with it. This property is defined as a sub property of Has Channel. The location itself is recommended to be described using the Core Location Vocabulary[19]. It may also include details such as office opening hours, accessibility information about the site etc.

4.3.9. *Requires*

One public service may require, or in some way make use 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.

4.3.10. Has Input

The Has Input property links a Public Service to one or more instances of the Input class (see section 4.4). A specific Public Service may require the presence of certain Inputs or combinations of Inputs in order to be delivered. These should be described in an instance of a given Public Service.

4.3.11. Produces

The Produces property links a Public Service to one or more instances of the Output class (see section 4.5), describing the actual result of executing a given Public Service. Outputs can be any resource - document, artefact – anything produced as result of executing the Public Service.

4.3.12. 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 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.

4.3.13. Spatial, Temporal

A Public Service is likely to be available only within a given area, typically the area covered by a particular public authority; and/or within certain time periods such as the winter months.

A common usage of spatial will be to define the country in which a Public Service is available.

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[19] https://joinup.ec.europa.eu/asset/core_vocabularies/description

The Publications Office of the European Union offers a URI set[20] that is suitable for this purpose, e.g. Malta is identified by
http://publications.europa.eu/resource/authority/country/MLT

N.B. These restrictions are not meant to be used to describe eligibility or the speed of operation of the service. These aspects will be covered by the Rule.

4.3.14. Has Cost

The Has Cost property links a Public Service to one or more instances of the Cost class (see section 4.3). It indicates the costs related to the execution of the Public Service by a citizen or a business.

4.4.   The Input Class

Input can be any resource - document, artefact - anything. In the context of Public Services, Inputs are usually administrative documents, applications… A specific Public Service may require the presence of certain Inputs or combinations of Inputs in order to be delivered.

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

4.4.1. Identifier

This property represents a formally-issued identifier for the Input.

4.4.1. Name

This property represents the name of the Input.

4.4.1. Description

This property represents a free text description of the Input.

4.4.2. Type

This property represents the type of the Input as described in a controlled vocabulary. The recommended controlled vocabularies are listed in section 5.

4.4.3. Related Documentation

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

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[20] http://open-data.europa.eu/open-data/data/dataset/2nM4aG8LdHG6RBMumfkNzQ

4.5. 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 documents an official documentation of the Competent Authority (Formal Organisation) that permits/authorises/entitles an Agent to (do) something.

In some cases, the Output of one Public Service will be an Input to another Public Service. Such relationships should be described in the associated Rule(s).

4.5.1. Identifier

This property represents a formally-issued identifier for the Output.

4.5.2. Name

This property represents the name of the Output.

4.5.3. Description

This property represents a free text description of the Output.

4.5.4. Type

This property represents the type of Output as defined in a controlled vocabulary. The recommended controlled vocabularies are listed in section 5.

4.6. The Cost Class

The Cost class represents any costs related to the execution of a Public Service or to all Public Services related to a Business Event which the Agent consuming it, needs to pay.

4.6.1. Identifier

This property represents a formally-issued identifier for the Cost.

4.6.2. Value

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

4.6.3. 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 5.

4.6.4. Description

This property represents a free text description of the Cost.

4.7. The Channel Class

The Channel class represents the medium through which an Agent provides, uses or otherwise interacts with a Public Service.

4.7.1. Identifier

This property represents a formally-issued identifier for the Channel.

4.7.2. Is Owned By

This property links the Channel class with one or more instances of the Formal Organisation class (section 4.12). This property indicates the owner of a specific Channel through which a Public Service is delivered.

4.8. The Period of Time Class

The Period of Time class represents an interval of time that is named or defined by its start and end dates. This interval indicates from when to when a Public Service is executable, for instance during particular months of the year or for Public Services that have a known life span.

4.8.1. Identifier

This property represents a formally-issued identifier for the Period of Time.

4.8.2. Start date/time

This property represents the start of the period.

4.8.3. End date/time

This property represents the end of the period.

4.9. 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. Rules are used for validating the input required by the service, deciding on the eligibility of the user, steering the service process and defining the dependencies/relationships between services. The CPSV-AP does not envisage instances of the Rule class as machine-processable business rules.

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

4.9.1. Identifier

This property represents a formally-issued identifier for the Rule.

4.9.2. Description

This property represents a free text description of the Rule.

4.9.3. 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.

4.9.4. Name

This property represents the name of the Rule.

4.9.5. Implements

The implements property links a Rule to relevant legislation or policy documents i.e. the formal framework under which the rules are defined (see section 4.10).

4.10. 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)"[21].

4.10.1. Name

This property represents the name of the Formal Framework.

4.10.1. 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.

4.10.2. Description

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

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[21] http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:52012XG1026%2801%29

4.10.3. Language

This property represents the language(s) in which the Formal Framework is available. Recommended best practice is to give URIs as values for this property, in particular, the European Publications Office's Named Authority List of languages. This provides URIs for all languages recognised in ISO-693-3, for example http://publications.europa.eu/resource/authority/language/POR (Portuguese) and provides labels in the 24 official languages of the EU.

4.10.4. 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 5.

4.10.1. Subject

This property represents the subject of this Formal Framework, coming from a controlled vocabulary. The recommended controlled vocabularies are listed in section 5.

4.10.2. Territorial Application

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

The values of this property come from a controlled vocabulary, for instance NUTS. The recommended controlled vocabularies are listed in section 5.

4.10.3. Type

This property represents the type of a Formal Framework as described in a controlled vocabulary (e.g. directive, règlement grand ducal, law, règlement ministeriel, draft proposition, Parliamentary act, etc.). The possible values for this property are described in a controlled vocabulary. The recommended controlled vocabularies are listed in section 5.

4.10.4. Related

This property represents a Formal framework related to this Formal Framework.

4.10.5. Has Creator

This property links the Formal Framework to one or more instances of the Public Organisation class (section 4.13), which are the creators of the specific Formal Framework.

4.11. The Agent Class

The Agent class is any resource that acts or has the power to act.

REMARK: In some countries' legislation the concept Person is a class for anyone that can be legally represented and can thus have both Natural Person and a Legal Person (organisation) as subclasses. In the context of this specification a Natural Person is described through the "Person" class (see section 4.14), defined in the Core Person Vocabulary[22], and the Legal Person through the "Legal Entity" class (see section 4.15), defined in the Core Business Vocabulary[23].

4.11.1. Name

This property represents the name of the Agent.

4.11.2. Identifier

This property represents a formally-issued identifier for the Agent.

4.11.3. Type

This property represents the type of an Agent as described in a controlled vocabulary. In the context of CPSV-AP an Agent can be a Formal Organisation or a Person. The recommended controlled vocabularies are listed in section section 5.

4.11.4. Plays Role

Plays Role is a generic property that links an Agent to a Public Service in which it plays some role. Uses is a sub property of playsRole with specific semantics.

4.11.5. Uses

The uses property links an Agent to a Public Service in which it plays the specific role of user, meaning that it provides the input and receives the output but does not play any direct role in providing the service. This will typically be an individual citizen or an outside organisation.

4.11.1. Has Address

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

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[22] https://joinup.ec.europa.eu/asset/core_person/description

[23] https://joinup.ec.europa.eu/asset/core_business/description

4.12. The Formal Organisation Class

The Formal Organisation[24] class has been defined in the Organization Ontology[25]. It represents an Organisation[26] which is recognized in the world at large, in particular in legal jurisdictions, with associated rights and responsibilities. Examples include a corporation, charity, government or church.

4.12.1. Administrative Level

This property represents the administrative level a particular Formal Organisation is operating on, for instance local, national, provincial…

4.12.2. Alternative Name

This property represents a name by which the Formal Organisation is known other than her official/legal name.

4.12.3. Homepage

This property represents a website through which information about the Formal Organisation can be retrieved, the particular Formal Organisation can be contacted….

4.12.4. Type

This property represents the type of a Formal Organisation as described in a controlled vocabulary. In the context of CPSV-AP, a Formal Organisation can be of type Formal Organisation, Public Organisation or Legal Entity. The recommended controlled vocabularies are listed in section 5.

4.13. The Public Organisation Class

The Public Organisation class represents a Formal Organisation that is owned by and managed by a state's government (local, regional, national…) and funded through taxes.

4.13.1. Public Organisation Type

This property represents the type of a Public Organisation as described in a controlled vocabulary, for instance an Agency, a Ministry, a Council… The recommended controlled vocabularies are listed in section 5.

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[24] http://www.w3.org/TR/vocab-org/#class-formalorganization

[25] http://www.w3.org/TR/vocab-org/

[26] http://www.w3.org/TR/vocab-org/#class-organization

4.14.   The Person Class[27]

The Person class represents a natural person. A natural Person can be the user of a particular Public Service. The Person class has been defined as part of the Core Person Vocabulary[28]. We refer to this vocabulary for more information and details on the properties for describing a Person.

4.15.   The Legal Entity Class

The Legal Entity class has been defined in the Core Business Vocabulary[29] and represents a business that is legally registered.

In many countries there is a single registry although in others, such as Spain and Germany, multiple registries exist. A Legal Entity is able to trade, is legally liable for its actions, accounts, tax affairs etc.

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

A Legal Entity can play different roles related Public Services. The Legal Entity can be a user of a particular Public Service but can also be the Competent Authority of the Public Service. The Legal Entity class has been defined as part of the Core Business Vocabulary[30]. We refer to this vocabulary for more information and details on the properties for describing a Legal Entity.

4.16.   The Location Class

The Location class represents an identifiable geographic place.

The Address class has been defined in the context of the Core Location Vocabulary[31]. We refer to this vocabulary for more information and details on the properties for describing a Location.

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[27] In the context of this specification the Person Class refers to a natural person. In some countries, for instance in legislation, the concept Person is used to referring both to a natural person ("Person" in CSPV-AP) and a Legal Person ("Legal Entity" in CPSV-AP).

[28] https://joinup.ec.europa.eu/asset/core_person/description

[29] https://joinup.ec.europa.eu/asset/core_business/description

[30] https://joinup.ec.europa.eu/asset/core_business/description

[31] https://joinup.ec.europa.eu/asset/core_location/description

4.16.1. Has Address

This property represents an address representing the location.

4.17. The Address Class

The Address class represents an address for the representation of a Location.

The representation of addresses varies widely from one country's postal system to another. Even within countries, there are almost always examples of addresses that do not conform to the stated national standard.

The Address class has been defined in the context of the Core Location Vocabulary[32].

The representation of addresses varies widely from one country's postal system to another. Even within countries, there are almost always examples of addresses that do not conform to the stated national standard.

4.17.1. Address Area

This property represents the name of a geographic area or locality that groups a number of addressable objects for addressing purposes, without being an administrative unit.

This would typically be part of a city, a neighbourhood or village.

4.17.2. Address ID

This property represents a globally unique identifier for this instance of the Address.

The concept of adding a globally unique identifier for each instance of an address is a crucial part of the INSPIRE data specification[33]. A number of EU countries have already implemented an ID (a UUID) in their address register/gazetteer, among them Denmark.

It is the address identifier that allows an address to be represented in a format other than INSPIRE whilst remaining conformant to the core vocabulary. The identifier is a hook that can be used to link the address to an alternative representation, such as vCard.

4.17.3. Admin Unit L1

This property represents the uppermost administrative unit for the Address, almost always a country.

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[32] https://joinup.ec.europa.eu/asset/core_location/description

[33] http://inspire.ec.europa.eu/index.cfm/pageid/2

Best practice is to use the ISO 3166-1 code but if this is inappropriate for the context, country names should be provided in a consistent manner to reduce ambiguity. For example, either write 'United Kingdom' or 'UK' consistently throughout the data set and avoid mixing the two.

Examples: "UK", "United Kingdom"

4.17.4. Admin Unit L2

This property represents the region of the Address, usually a county, state or other such area that typically encompasses several localities.

4.17.5. Full Address

This property represents the complete Address with or without formatting.

Use of this property is recommended as it will not suffer any misunderstandings that might arise through the breaking up of an address into its component parts.

4.17.6. Locator Designator

This property represents a number or a sequence of characters that uniquely identifies the locator within the relevant scope.

The locator designator is a number or a sequence of characters that uniquely identifies the locator within the relevant scope(s). The full identification of the locator could include one or more locator designators. In simpler terms, this is the building number, apartment number, etc.

It is characteristic that these designators, according to tradition or to a specific set of rules, are assigned systematically. For example address numbers are most often assigned in ascending order with odd and even numbers on each side of the thoroughfare. Another example is the floor identifier that in a standardized way expresses on which level the address is located[34].

The key difference between a locator designator and a locator name is that the latter is a proper name and is unlikely to include digits.

Examples: "17", "Flat 3", "Floor 6"

4.17.7. Locator Name

This property represents a proper noun applied to the real world entity identified by the Address.

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[34] http://inspire.ec.europa.eu/documents/Data_Specifications/INSPIRE_DataSpecification_AD_v3.1.pdf

The locator name is a proper noun applied to the real world entity identified by the locator. The locator name could be the name of the property or complex, of the building or part of the building, or it could be the name of a room inside a building. [INSPIRE]

The key difference between a locator designator and a locator name is that the latter is a proper name and is unlikely to include digits.

Examples: "Rose Cottage", "Grand Suite", "The little house by the lake"

4.17.8. PO Box

This property represents the Post Office Box number.

INSPIRE's name for this is "postalDeliveryIdentifier" for which it uses the locator designator property with a type attribute of that name. This vocabulary separates out the Post Office Box[35].

4.17.9. Post Code

This property represents the post code, also known as postal code, ZIP code, etc.

Post codes are common elements in many countries' postal address systems.

4.17.10. Post Name

This property represents the key postal division of the address, usually the city.

The post name is a name created and maintained for postal purposes to identify a subdivision of addresses and postal delivery points[36].

Examples: "Brussels"

4.17.11. Thoroughfare

This property represents the name of a passage or way through from one location to another.

A thoroughfare is an address component that represents the name of a passage or way through from one location to another. A thoroughfare is not necessarily a road, it might be a waterway or some other feature.

Examples: "Main Street"

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[35] http://inspire.ec.europa.eu/documents/Data_Specifications/INSPIRE_DataSpecification_AD_v3.1.pdf

[36] http://inspire.ec.europa.eu/documents/Data_Specifications/INSPIRE_DataSpecification_AD_v3.1.pdf

5.   RECOMMENDED CONTROLLED VOCABULARIES

In order to facilitate the exchange of information on Business Events and Public Services, 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 4, 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 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 the controlled vocabulary by adding additional events or providing additional levels of granularity.

Where possible, Table 2 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. Finally existing controlled vocabularies in the Member States are also taken into account.

Table 2 - CPSV-AP controlled vocabularies

Class	Property	Section	Controlled vocabulary
Business Event	Language	4.2.6	European Publications Office's Languages Named Authority List (NAL) [37]
	Type	4.2.4	List of Key Business Events: • Starting business • Starting cross-border business • Doing business • Closing business
Public Service	Type	4.3.4	COFOG taxonomy[38]
	Language	4.3.1	European Publications Office's Languages Named Authority List

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[37] http://publications.europa.eu/mdr/authority/language/

[38] http://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=4

Class	Property	Section	Controlled vocabulary
			(NAL)
	Sector	4.3.6	List of NACE codes[39]
Input	Type	4.4.1	Due to the fact that for this property no Controlled Vocabulary has been defined on the European level, the MSs may use their own Controlled Vocabulary and the need for defining this Controlled Vocabulary has been identified.
Output	Type	4.5.1	Due to the fact that for this property no Controlled Vocabulary has been defined on the European level, the MSs may use their own Controlled Vocabulary and the need for defining this Controlled Vocabulary has been identified.
Cost	Currency	4.6.3	European Publications Office's Currencies Named Authority List (NAL)[40]
Rule	Language	4.9.3	European Publications Office's Languages Named Authority List (NAL)
Formal Framework	Language	4.10.3	European Publications Office's Languages Named Authority List (NAL)
	Status	4.10.4	European Legislation Identifier[41]: • in force • not in force • partially applicable • implicitly revoked • explicitly revoked • repealed • expired • suspended

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[39] http://ec.europa.eu/competition/mergers/cases/index/nace_all.html

[40] http://publications.europa.eu/mdr/authority/currency/index.html

[41] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52012XG1026(01)

Class	Property	Section	Controlled vocabulary
			• other
	Subject	4.10.1	Eurovoc domains[42]
	Territorial Application	4.10.2	NUTS taxonomy[43]
	Type	4.10.3	Resource Types Named Authority Lists (NAL)
Formal Organisation	Administrative Level	4.12.1	NUTS taxonomy
	Type	4.12.4	• Public Organisation • Legal Entity
Public Organisation	Public Organisation Type	4.13.1	Due to the fact that for this property no Controlled Vocabulary has been defined on the European level, the MSs may use their own Controlled Vocabulary and the need for defining this Controlled Vocabulary has been identified.

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[42] http://eurovoc.europa.eu/drupal/?q=node/555

[43] http://ec.europa.eu/eurostat/ramon/nomenclatures/index.cfm?TargetUrl=LST_NOM_DTL&StrNom=NUTS_22&StrLanguageCode=EN&IntPcKey=&StrLayoutCode=HIERARCHIC

6. CONFORMANCE STATEMENT

Any implementation of the Core Public Service Vocabulary Application Profile is conformant if:

- It includes at least all mandatory properties of all mandatory classes as indicated in "Annex V: Detailed list of mandatory and optional classes and properties";
- It includes at least all mandatory properties of any optional class used for describing the Public Service, as indicated in "Annex V: Detailed list of mandatory and optional classes and properties";
- It uses the terms (classes and properties) in a way consistent with their semantics as declared in this specification;
- It does not use terms from other controlled vocabularies instead of ones defined in this specification (section 5).

A conforming implementation of the Core Public Service Application Profile may include classes and properties from other vocabularies.

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.

7. 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[44].
- 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[45] has already provided multilingual labels and descriptions for classes and properties[46].

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[44] http://www.ietf.org/rfc/rfc3987.txt

[45] https://joinup.ec.europa.eu/node/52600/

[46]

https://docs.google.com/spreadsheet/ccc?key=0Arqf55JwcBx4dGpvVG5BcTVqaUNKTEFJX09xcX paRUE&usp=drive_web#gid=3

8. EXAMPLE MAPPING OF INFORMATION FROM MS'S POINTS OF SINGLE CONTACT TO CPSV-AP

In order to show a practical example this section contains two examples of how the information that is available on a MS's PSC can be mapped to the CPSV-AP. In the sections below an example is included for Spain (8.1) and Estonia (8.2). Besides these two countries a mapping will be created with CPSV-AP for all participating Member States (Austria, Estonia, Finland, Greece, The Netherlands, Latvia, Lithuania, Poland, Spain and Sweden). The (draft) mapping is available in the following spreadsheet:

https://docs.google.com/spreadsheets/d/1io9DBEcXZX0roqsVC0ESeZ5eAHffFZ8i93l
uQs2OhZ0/edit?usp=sharing

The mapping of the MS's data model to the CPSV-AP was based on the review and analysis on the way information is provided on the MS's PSC on the one hand, and the latest version of CPSV-AP on the other hand. The mapping should be read from right to left. A mapping can be of the following types[47], where A is the foreign class or property and where B is the class or property from CPSV-AP:

- A has an **exact match** with B if the set of subjects of A is equal to the set of subjects of B. The definitions of A and B are equivalent.
- A has a **close match** with B if the set of subjects of A is mostly equal to the set of subjects of B. The number of subjects of A not included in B, and vice-versa, is negligible.
- A has a **related match** with B if there is a meaningful intersection between the subjects of A and the subjects of B.
- A has a **narrow match** with B if the set of subjects of A is a superset of the set of subjects of B. The definition of A generalizes the definition of B.
- A has a **broad match** with B if B has a narrow match with A.

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[47] Source: https://joinup.ec.europa.eu/asset/core_vocabularies/asset_release/core-vocabularies-v11
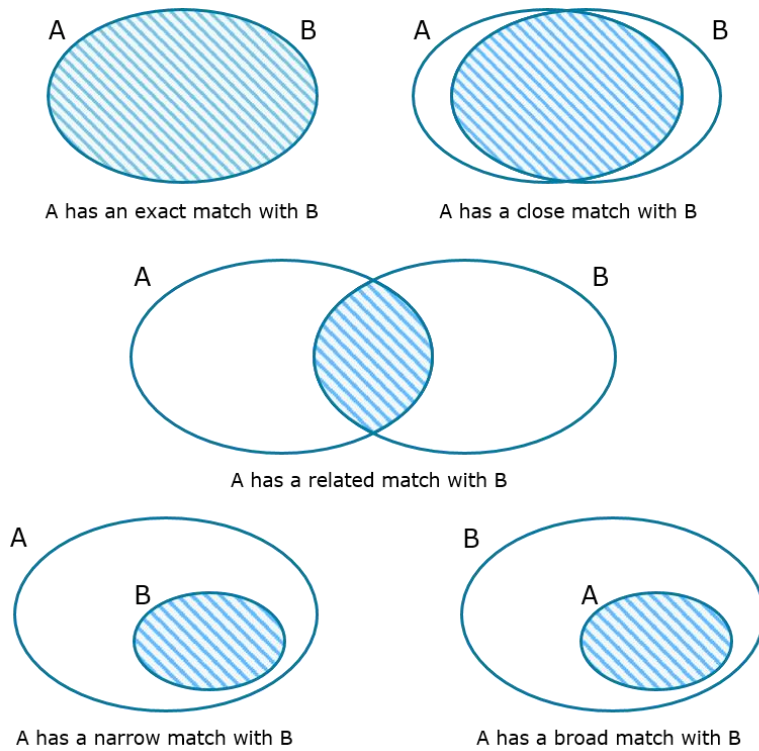
Figure 4 - Mapping types

8.1.   Example 1: Spain

Table 3: Mapping of information on the Spanish PSC to CPSV-AP

Class - CPSV-AP	Property – CPSV-AP	Mapping type	Property – Spanish PSC	Class – Spanish PSC
Business Event		Exact match		Business situation
Business Event	Identifier	Exact match	URL	Business situation
Business Event	Identifier	Exact match	URL subcategory	Business situation
Business Event	Name	Exact match	Name	Business situation
Business Event	Name	Exact match	Subcategory	Business situation
Business Event	Description	No match		
Business Event	Type	No match		
Business Event	Language	No match		
Business Event	Processing time	No match		
Business Event	Has Cost	No match		
Public Service		Close match		Procedure
Public Service	Identifier	Exact match	ID procedure	Procedure
Public Service	Description	Exact	Description	Procedure

Class - CPSV-AP	Property – CPSV-AP	Mapping type	Property – Spanish PSC	Class – Spanish PSC
		match		
Public Service	Description	Close match	Remarks	Procedure
Public Service	Name	Exact match	Name	Procedure
Public Service	Is Grouped By	Exact match	Business Activities which Apply	Procedure
Public Service	Is Grouped By	Exact match	Procedure	Business situation
Public Service	Type	No match	Type of provision	Procedure
Public Service	Type	No match	Country of origin	Procedure
Public Service	Type	No match	Type of establishment	Establishment
Public Service	Type	No match	Legal form	Procedure
Public Service	Type	No match	Procedure group	Procedure
Public Service	Type	No match	Category	Procedure
Public Service	Type	Related match	Type	Procedure
Public Service	Language	No match		
Public Service	hasChannel	Close match	Channel	Procedure
Public Service	hasChannel	Exact match	Telephone Number	Competent authority
Public Service	hasChannel	Exact match	Telephone Number	Professional association
Public Service	Processing Time	Exact match	Average time for resolution	Procedure
Public Service	Sector	Exact match	Name	Business sector
Public Service	Sector	Exact match	Name	Activities
Public Service	Keyword	No match		
Public Service	Physically Available At	No match		
Public Service	Requires	No match		
Public Service	Related	No match		
Public Service	Has Input	Narrow match	Documentation to be submitted	Procedure
Public Service	Has Input	Narrow match	Form	Procedure
Public Service	Produces	Exact match	Result	Procedure
Public Service	Follows	Exact match	Requirements	Procedure
Public Service	Follows	Exact match	Regulations	Procedure
Public Service	Spatial	Exact match	Province	Location
Public Service	Spatial	Exact match	Town	Location
Public Service	Spatial	Exact match	Autonomous community	Location
Public Service	Temporal	Exact match	Periods	Procedure

Class - CPSV-AP	Property – CPSV-AP	Mapping type	Property – Spanish PSC	Class – Spanish PSC
Public Service	Has Cost	Exact match	Fees	Procedure
Public Service	Plays role	No match		
Public Service	Uses	No match		
Public Service	HasCompetentAuthority	Exact match	Competent authority	Procedure
Public Service	HasCompetentAuthority	Related match	Competent/processing body	
Public Service	HasCompetentAuthority	Close match	Link to competent authority	Procedure
Input		No match		Form
Input	Identifier	Exact match	URL	Form
Input	Name	Exact match	Name	Form
Input	Description	No match		
Input	Type	No match		
Input	Related Documentation	Close match	URL	Form
Output		No match		
Output	Identifier	No match		
Output	Name	Exact match	Result	Procedure
Output	Description	No match		
Output	Type	No match		
Cost		Exact match	Fees	Procedure
Cost		No match		
Cost	Identifier	No match		
Cost	Value	No match		
Cost	Currency	No match		
Cost	Description	No match		
Channel		No match		
Channel	Identifier	No match		
Channel	Owned By	No match		
Period of Time		No match	Periods	Procedure
Period of Time	Identifier	No match		
Period of Time	Start Date/time	No match		
Period of Time	End Date/time	No match		
Rule		No match		
Rule	Identifier	No match		
Rule	Description	No match		
Rule	Name	No match		
Rule	Language	No match		
Rule	Implements	No match		
Formal Framework		Exact match		Regulation
Formal Framework	Identifier	Exact match	Number	Regulation
Formal Framework	Name	Exact match	Name	Regulation
Formal Framework	Description	Exact match	Method of commencement	Procedure

Class - CPSV-AP	Property – CPSV-AP	Mapping type	Property – Spanish PSC	Class – Spanish PSC
Formal Framework	Language	No match		
Formal Framework	Status	No match		
Formal Framework	Subject	No match		
Formal Framework	Territorial Application	No match		
Formal Framework	Type	No match		
Formal Framework	Related	No match		
Formal Framework	Has Creator	No match		
Agent		No match		
Agent	Identifier	No match		
Agent	Name	No match		
Agent	Type	No match		
Agent	Plays Role	No match		
Agent	Uses	No match		
Agent	Has Address	No match		
Formal Organisation		Exact match		Professional association
Formal Organisation	Name	Exact match	Name	Professional association
Formal Organisation	Administrative Level	Exact match	Scope	Procedure
Formal Organisation	Alternative Name	No match		
Formal Organisation	Identifier	Exact match	Link	Professional association
Formal Organisation	Homepage	Exact match	Link	Professional association
Formal Organisation	Has Address	Exact match	Address	Professional association
Formal Organisation	Plays Role	Related match	Relevant department	Procedure
Formal Organisation	Type	No match		
Public Organisation		Exact match		Competent authority
Public Organisation	Identifier	Exact match	Link	Competent authority
Public Organisation	Public Organisation Type	No match		
Public Organisation	Name	Exact match	Description	Competent authority
Public Organisation	Homepage	Exact match	Link	Competent authority
Person		No match		
Legal Entity		No match		
Location		Exact match		Location
Location	Has Address	No match	Address	Professional association

Class - CPSV-AP	Property – CPSV-AP	Mapping type	Property – Spanish PSC	Class – Spanish PSC
Address		No match		
Address	Full Address	No match		
Address	Address ID	No match		
Address	Address Area	No match		
Address	Admin Unit L1	Exact match	Province	Location
Address	Admin Unit L1	Exact match	Autonomous community	Location
Address	Admin Unit L2	Exact match	Town	Location
Address	Locator Designator	No match		
Address	Locator Name	No match		
Address	PO Box	No match		
Address	Post Code	No match		
Address	Post Name	No match		
Address	Thoroughfare	No match		

8.2. Example 2: Estonia

Table 4: Mapping of information on the Estonian PSC to CPSV-AP

Class - CPSV-AP	Property – CPSV-AP	Mapping type	Property – Estonian PSC	Class – Estonian PSC
Business Event		Broad match		Topic
Business Event	Identifier	Exact match	Topic URL	Topic
Business Event	Name	Exact match	Name	Topic
Business Event	Name	Exact match	Category	Topic
Business Event	Description	Exact match	Description	Topic
Business Event	Type	No match		
Business Event	Type	No match		
Business Event	Language	No match		
Business Event	Processing time	No match		
Business Event	Has Cost	No match		
Public Service		Exact match		Service
Public Service	Identifier	No match		
Public Service	Description	Exact match	Description	Service
Public Service	Name	Exact match	Name	Service
Public Service	Is Grouped By	Broad match	Related topic	Service
Public Service	Is Grouped By	Broad match	Related service	Topic
Public Service	Is Grouped By	Broad	Related external	Topic

Class - CPSV-AP	Property – CPSV-AP	Mapping type	Property – Estonian PSC	Class – Estonian PSC
		match	services	
Public Service	Type	No match	Audience	Service
Public Service	Type	Exact match	Category	Service
Public Service	Language	No match		
Public Service	hasChannel	Exact match	E-mail	Contact
Public Service	hasChannel	Exact match	Fax	Contact
Public Service	hasChannel	Exact match	Homepage	Contact
Public Service	hasChannel	Exact match	Phone	Contact
Public Service	Processing Time	No match		
Public Service	Sector	Close match	Category	Economic Activities of Estonia (EMTAK)
Public Service	Keyword	Exact match	Name	Most popular related keywords
Public Service	Physically Available At	No match		
Public Service	Requires	No match		
Public Service	Related	Exact match	Related service	Service
Public Service	Has Input	Exact match	ID	Form
Public Service	Produces	No match		
Public Service	Follows	No match		
Public Service	Spatial	No match		
Public Service	Temporal	No match		
Public Service	Has Cost	No match		
Public Service	Plays role	Exact match	Related institution	Service
Public Service	Uses	No match		
Public Service	HasCompetentAuthority	Close match	Related institution	Service
Public Service	HasCompetentAuthority	Exact match	Related service	Contact
Input		Exact match		Form
Input	Identifier	Exact match	ID	Form
Input	Name	Exact match	Name	Form
Input	Description	No match		
Input	Type	Exact match	Type	Form
Input	Type	Exact match	Category	Form

Class - CPSV-AP	Property – CPSV-AP	Mapping type	Property – Estonian PSC	Class – Estonian PSC
Input	Related Documentation	No match		
Output		No match		
Output	Identifier	No match		
Output	Name	No match		
Output	Description	No match		
Output	Type	No match		
Cost		No match		
Cost	Identifier	No match		
Cost	Value	No match		
Cost	Currency	No match		
Cost	Description	No match		
Channel		No match		
Channel	Identifier	No match		
Channel	Owned By	No match		
Period of Time		No match		
Period of Time	Identifier	No match		
Period of Time	Start Date/time	No match		
Period of Time	End Date/time	No match		
Rule		No match		
Rule	Identifier	No match		
Rule	Description	No match		
Rule	Name	No match		
Rule	Language	No match		
Rule	Implements	No match		
Formal Framework		Exact match	Legislation	Topic
Formal Framework	Identifier	Exact match	URL	Legislation
Formal Framework	Name	Exact match	Name	Legislation
Formal Framework	Description	No match		
Formal Framework	Language	No match		
Formal Framework	Status	No match		
Formal Framework	Subject	No match		
Formal Framework	Territorial Application	No match		
Formal Framework	Type	No match		
Formal Framework	Related	No match		
Formal Framework	Has Creator	No match		
Agent		No match		
Agent	Identifier	No match		
Agent	Name	No match		
Agent	Type	No match		
Agent	Plays Role	No match		

Class - CPSV-AP	Property – CPSV-AP	Mapping type	Property – Estonian PSC	Class – Estonian PSC
Agent	Uses	No match		
Agent	Has Address	No match		
Formal Organisation		Exact match		Contact
Formal Organisation	Identifier	Exact match	Homepage	Contact
Formal Organisation	Name	Exact match	Name	Contact
Formal Organisation	Type	Exact match	Category	Contact
Formal Organisation	Has Address	Exact match	Address	Contact
Formal Organisation	Administrative Level	No match		
Formal Organisation	Alternative Name	No match		
Formal Organisation	Homepage	Exact match	Homepage	Contact
Formal Organisation	Type	No match		
Public Organisation		No match		
Public Organisation	Identifier	No match		
Public Organisation	Public Organisation Type	No match		
Public Organisation	Administrative Level	No match		
Public Organisation	Alternative Name	No match		
Public Organisation	Homepage	No match		
Public Organisation	Has Address	No match		
Person		No match		
Legal Entity		No match		
Location		No match		
Location	Has Address	No match		
Address		No match		
Address	Full Address	No match		
Address	Address ID	No match		
Address	Address Area	No match		
Address	Admin Unit L1	No match		
Address	Admin Unit L2	No match		
Address	Locator Designator	No match		
Address	Locator Name	No match		
Address	PO Box	No match		
Address	Post Code	No match		
Address	Post Name	No match		
Address	Thoroughfare	No match		

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ANNEX I: SOURCES FOR DEFINING THE WORKING TERMINOLOGY FOR KEY CONCEPTS

In this annex we describe the sources that were used as an input for defining a common working terminology for key concepts (Table 5). From the work that has been analysed, we have identified several definitions. These definitions are listed in Table 6, and were compared to come to a single definition for some key concepts (section 2) in the context of this work.

Table 5 - Related work for defining key concepts

Owner	Title	Description
ISA Programme of the European Commission	e-Government Core Vocabularies v1.1	This document contains consolidated and updated versions of the different core vocabularies helping to define the public service concept: the Core Business Vocabulary; the Core Location Vocabulary; the Core Person Vocabulary; and the Core Public Service Vocabulary.
European Commission	D5.13 Population of the Services Directory with Information Related to the New Professions v1.0	In a nutshell, this deliverable maps and captures all the data necessary to use the eServices and Services Directories involved in the SPOCS pilots. This document gives the definitions for Business Event and Administrative Formality.
ISA Programme of the European Commission	DIGIT – Federated catalogue of public services D2.2 Phase II Final report – WP 2: Requirements and Scenarios	The scope of this study is about a catalogue of public services offered by all public administrations at all government levels in all EU Member States and the three other EEA countries ("Member States"), which are the members of the ISA Programme. This document defines the key concepts related to Public Services Catalogue and Point of Single Contact.
Court of Justice of the European Union	Different reports & cases	These resources were used in purpose of defining the term of administrative formality.
Department of Enterprise, Trade and Employment, Irish Government	Public Services Broker Study	This study's objective is to provide browser-based access via a single entry point that will make it easier for businesses to deal with Government. The study provides a good model for defining the set of Key Business Events, which are a combination of business lifecycle, business functions and services.
Ljupco Todorovski, University of Ljubljana, Slovenia	The life event approach, 2006	The life event approach by Todorovski is a widely accepted way of modelling, integrating, and presenting government services from the perspective of users. The Business Event is a life event for the organizations.
European Commission,	Linking up Europe: the Importance of	The objective of this Commission services working document is to emphasise

Enterprise Directorate-General	Interoperability for eGovernment Services	the importance of interoperability in delivering eGovernment services in Europe. It also defines the term of Business Episode.
AXELOS	ITIL® 2011 glossary and abbreviations	An IT Service Management glossary. Contains good concepts for the definitions of Service Portfolio and Service Catalogue.
Oxford University	Oxford Dictionaries	An explanatory dictionary for defining the terms of Administrative and Formality.
John Wiley & Sons, Inc.	Environmental Impact Assessment: Practical Solutions to Recurrent Problems by David P. Lawrence	In this book different degrees of administrative formalities are defined. Low level of administrative formalities is applicable for the public services that do not need formal assistance, i.e. counselling services. High degree, vice versa, is applicable for the public services with very formal and complex procedures, i.e. litigation.
R. L. Daft, H. Willmott Murphy	Organization theory and design	In this work, a definition of an organizational lifecycle was given: "The organizational life cycle is the life cycle of an organization from its creation to its termination."
A. A. Zoltners, P. Sinha, S. E. Lorimer	Match Your Sales Force Structure to Your Business Life Cycle	The objective of this Harvard Business Review article is to analyse different aspects of company´s sales force structure over the life cycle of the business. The article supports four business life cycle stages - Start-up, Growth, Maturity and Decline.
G. A. Lichtenstein, T. S Lyons	Revisiting the business life-cycle: Proposing an actionable model for assessing and fostering entrepreneurship	Authors of this article are evaluating different business life cycle models and suggesting their own view of the best model.
L. E. Greiner	Evolution and revolution as organizations grow	Well-cited Harvard Business Review article that emphasizes manager's tasks in a different business life cycle phases. Introduces 5 important business life cycle phases – Creativity, Direction, Delegation, Coordination, Collaboration
K. C. Wang	The five elements theory in business research	This article provides Chinese point of view about business life cycle events – Planning, Innovation and Change, Leading and Market Control, Performance Management and Bureaucratic Control, Organizing and Clan Control.

Table 6 - Definitions from related work used as input for defining key concepts

Term	Definition	Sources

Administrative formality	The legislation of European Union does not define administrative formalities. However, based on court practice, similar concepts and contexts, it is concluded that the administrative formality means the rules of procedure for realizing citizens' or businesses rights or obligations.	PwC Legal Estonia, October 2014
Administrative formality	The term "administrative formalities" must be understood as covering all operations which involve the checking of documents and certificates accompanying the goods and are intended to ensure by simple visual inspection that the goods correspond to the documents and certificates, where such operations may be carried out by officials having general authority to inspect goods at the frontier.	European Court reports 1988 Page 04689. Case 190/87.
Formalities (count noun)	A thing that is done simply to comply with convention, regulations, or custom. Synonym to "Official Procedure".	Oxford Dictionary
Administrative formality	Administrative formality has different degrees: from low degree (unassisted procedures) to high degree (litigation).	"Environmental Impact Assessment: Practical Solutions to Recurrent Problems" By David P. Lawrence, John Wiley & Sons, Inc.
Procedure Description	The term procedure description is describing the formal activities that are part of the procedure of a public service, i.e. how the procedure for this service will be enforced including the process steps of the customer and the responsible public service provider.	Population of the Services Directory with Information Related to the New Professions, V1.0; 30-06-2011; SPOCS
Public Service	A set of deeds and acts performed by or on behalf of a public administration for the benefit of a citizen, a business or another public administration.	e-Government Core Vocabularies (v1.1)
Public Service	A public service is a service rendered by a public administration to either business (A2B), citizens (A2C) or other public administrations (A2A).	European Commission – ISA Work Programme; DIGIT – Federated catalogue of public services; D2.2 Phase II Final report – WP 2: Requirements and Scenarios; Version 0.1 June 2013
Service	A service is a resource that represents the capability to bring a certain outcome and value to the service requester and is enabled by the service provider.	European Commission – ISA Work Programme; DIGIT – Federated catalogue of public services; D2.2 Phase II Final report – WP 2: Requirements and Scenarios; Version 0.1 June 2013

Services of general interest	The concept Services of general (economic) interest (SG(E)I) is an official term used by the European Union for all services that are of specific interest to society. This includes all public services. The scope of the SGIs is broader than the scope of the public services in this document and can also include services which are often, but not always, in hands of private companies (e.g. water, electricity, mail).	European Commission – ISA Work Programme; DIGIT – Federated catalogue of public services; D2.2 Phase II Final report – WP 2: Requirements and Scenarios; Version 0.1 June 2013
Business Event	A certain stage in the business lifecycle with which a bundle of public services is associated.	Population of the Services Directory with Information Related to the New Professions, V1.0; 30-06-2011; SPOCS
Business Event	An Event comprises the major categories through which any business carries out its business activities and interaction with Government. There are 12 Events in the proposed Business Access Model which are a combination of lifecycle, business functions and services.	Public Services Broker Study, BASIS 2001
Life Event	Metaphor used to denote 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.	Todorovski et al., 2006.
Business Episode	Components of the business life cycle. They are, in effect, life events for enterprises. Typical examples of business episodes include starting a business, employing staff, acquiring a licence, statutory returns, taxation, closing/selling a business.	Linking up Europe: the Importance of Interoperability for eGovernment Services. European Communities, 2003
Business Episode	An Episode is a sub-categorisation of Events and is essentially a more defined classification of key business activities and Government interactions. 105 unique Episodes were defined as sub-categories of the 12 Events.	Public Services Broker Study, BASIS 2001
Service Portfolio	The complete set of services that is managed by a service provider. The service portfolio is used to manage the entire lifecycle of all services, and includes three categories: service pipeline (proposed or in development), service catalogue (live or available for deployment), and retired services.	ITIL® 2011 glossary and abbreviations

Service Catalogue	A database or structured document with information about all live services, including those available for deployment. The service catalogue is part of the service portfolio and contains information about two types of service: customer-facing services; and supporting services required by the service provider to deliver customer-facing services.	ITIL® 2011 glossary and abbreviations
Catalogue of Public Services	A catalogue of public services is a collection of descriptions of public services that are provided by a public administration at any administrative level (i.e. local, regional, national or pan-European). These descriptions are created following a common data model for representing public services.	European Commission – ISA Work Programme; DIGIT – Federated catalogue of public services; D2.2 Phase II Final report – WP 2: Requirements and Scenarios; Version 0.1 June 2013
eService	An eService (or a digital public service), in the EU context, is (part of) a public service that is made available electronically via an e-Government portal. The administrative procedures can be completed via a user interface which is available on the Web.	European Commission – ISA Work Programme; DIGIT – Federated catalogue of public services; D2.2 Phase II Final report – WP 2: Requirements and Scenarios; Version 0.1 June 2013
Federated catalogue of public services	A federated catalogue of public services is a collection of catalogues of public services which are joined together following a common data model for representing public services.	European Commission – ISA Work Programme; DIGIT – Federated catalogue of public services; D2.2 Phase II Final report – WP 2: Requirements and Scenarios; Version 0.1 June 2013
Point of single contact	The Services Directive requires the Member States to set up a Point of Single Contact. This is a public administration portal (and a one-stop-shop) for service providers with two main goals: providing information and completing administrative procedures. It is necessary for the portal to describe the requirements, procedures and formalities which are necessary to perform or access the services within a Member State. It also needs to provide contact details of competent authorities, access to public registers, and online forms, and process the applications filed. A PSC can be seen as a catalogue of public services.	European Commission – ISA Work Programme; DIGIT – Federated catalogue of public services; D2.2 Phase II Final report – WP 2: Requirements and Scenarios; Version 0.1 June 2013

Organizational Lifecycle	The organizational life cycle is the life cycle of an organization from its creation to its termination.	R. L. Daft, H. Willmott Murphy (2010), Organization theory and design, p. 356

ANNEX II: TEMPLATE FOR THE ANALYSIS OF THE MODELS FOR DESCRIBING BUSINESS EVENTS AND PUBLIC SERVICES ON THE EU MS PSCS

In this Annex we describe the public service models used to review and analyse the state-of-the art in the Member States. For each model we will describe the title, description, the owner of the model, the administrative levels (national, regional and/or local) it applicable on and any other relevant documentation. This general information about the model is followed by a description of all classes and attributes and any controlled vocabularies used.

Table 7 - Template Public Service Model - General information

Title	Title of the public service model or the PSC.
Description	Description of the public service model or PSC website and the information provided. In cases problems were detected, they are also mention in this sub-part.
Owner	The owner of the public service model or the PSC (e.g. ministry)
Administrative level	• [National] • [Regional] • [Local]
Other documentation	Any other relevant documentation.

Table 8 - Template Public Service - Description of classes and properties

Class	Property	Controlled vocabulary / values	Comments
The class of the CPSV-AP that the property or value belongs to.	The property we are mapping from CPSV-AP.	The value belonging to the CPSV-AP.	Any additional information or remarks to be made related to mapping.

ANNEX III: REVIEW AND ANALYSIS OF THE STATE-OF-THE-ART IN THE MS CONCERNING DATA MODELS FOR DESCRIBING BUSINESS EVENTS AND PUBLIC SERVICES ON THE POINTS OF SINGLE CONTACT

In this section the models for describing business events and related public services, used in the national PSCs of Member States are identified and analysed. For each business event and public service model we have described the title, the description, the owner of the model, the administrative levels (national, regional and/or local) it is applicable on and any other relevant documentation. The general information about each model is followed by a description of all classes and attributes, and any controlled vocabularies used. Explanation on the template used for describing these data models can be found in "Annex II: Template for the analysis of the models for describing business events and public services on the EU MS PSCs". The detailed analysis of each data model used on the PSC per country is part of a document that will be published separately. Gives an overview of the PSCs that have been analysed:

Table 9 - Overview of analysed PSCs

Country	PSC	Link
Austria	National	http://www.eap.gv.at/index_en.html
	Burgenland	http://eap.bgld.gv.at/Start.aspx?lang=en
	Carinthia	http://eap.ktn.gv.at/Start.aspx?lang=en
	Lower Austria	http://eap.noe.gv.at/Start.aspx?lang=en
	Upper Austria	http://eap.ooe.gv.at/Start.aspx?lang=en
	Salzburg	http://eap.salzburg.gv.at/Start.aspx?lang=en
	Styra	http://www.eap.steiermark.gv.at/?lang=en
	Tiral	https://www.tirol.gv.at/arbeit-wirtschaft/eap-en/
	Voralberg	http://eap.vorarlberg.gv.at/Start.aspx?lang=en
	Vienna	http://www.wien.gv.at/english/psc/index.html?lang=en
Belgium	National	http://business.belgium.be/
Bulgaria	National	http://psc.egov.bg/
Croatia	National	www.psc.hr
Cyprus	National	http://www.businessincyprus.gov.cy
Czech Republic	National	http://www.businessinfo.cz
Denmark	Business in Denmark	www.businessindenmark.dk
	Virk	https://indberet.virk.dk/
Estonia	National	https://www.eesti.ee/
Finland	National	http://www.yrityssuomi.fi
France	National	https://www.guichet-entreprises.fr/
Germany	National	http://www.dienstleisten-leicht-gemacht.de/
	Baden-Wurttemberg	www.ea.service-bw.de

	Bavaria	http://www.eap.bayern.de/
	Berlin	http://www.ea.berlin.de/
	Brandenburg	www.eap.brandenburg.de
	Bremen	http://www.wfb-bremen.de/de/wfb-einheitlicher-ansprechpartner
	Hamburg	http://www.hamburg.de/einheitlicher-ansprechpartner
	Hesse	www.eah.hessen.de
	Mecklenburg-Vorpommern	www.ea-mv.de
	Lower Saxony	www.dienstleisterportal.niedersachsen.de
	North Rhine-Westphalia	www.ea-finder.nrw.de
	Rhineland-Palatinate	www.eap.rlp.de
	Saarland	www.saarland.de/einheitlicher_ansprechpartner.htm
	Saxony	www.sachsen.de
	Saxony-Anhalt	www.ea.sachsen-anhalt.de
	Schleswig-Holstein	www.ea-sh.de
	Thuringia	www.thueringen.de
Greece	EUGO PSC	http://www.eu-go.gr/
	StartUp Greece	http://www.startupgreece.gov.gr/
Hungary	National	http://eugo.gov.hu
Ireland	National	www.pointofsinglecontact.ie
Italy	National	http://www.impresainungiorno.gov.it/
Latvia	National	https://www.latvija.lv/en
Lithuania	National	http://www.verslovartai.lt/
Luxembourg	National	http://www.guichet.public.lu/
Malta	National	http://www.businessfirst.com.mt/
Netherlands	National	http://www.answersforbusiness.nl/
Poland	National	https://www.biznes.gov.pl/
Portugal	National	www.portaldaempresa.pt
Romania	National	http://www.edirect.e-guvernare.ro/
Slovakia	National	http://www.eu-go.sk/
Slovenia	National	http://www.eugo.gov.si/
Spain	National	http://www.eugo.es/
Sweden	National	https://www.verksamt.se/
United Kingdom	National	https://www.gov.uk/

An analysis of the commonalities and differences in terms of classes and properties of the data models used for describing key business events and public services on the PSCs has been performed. This has served as input for suggesting new classes

and properties to be added to the CPSV-AP to the Working Group and was an initial mapping of the data models used in the Member States with the CPSV-AP.
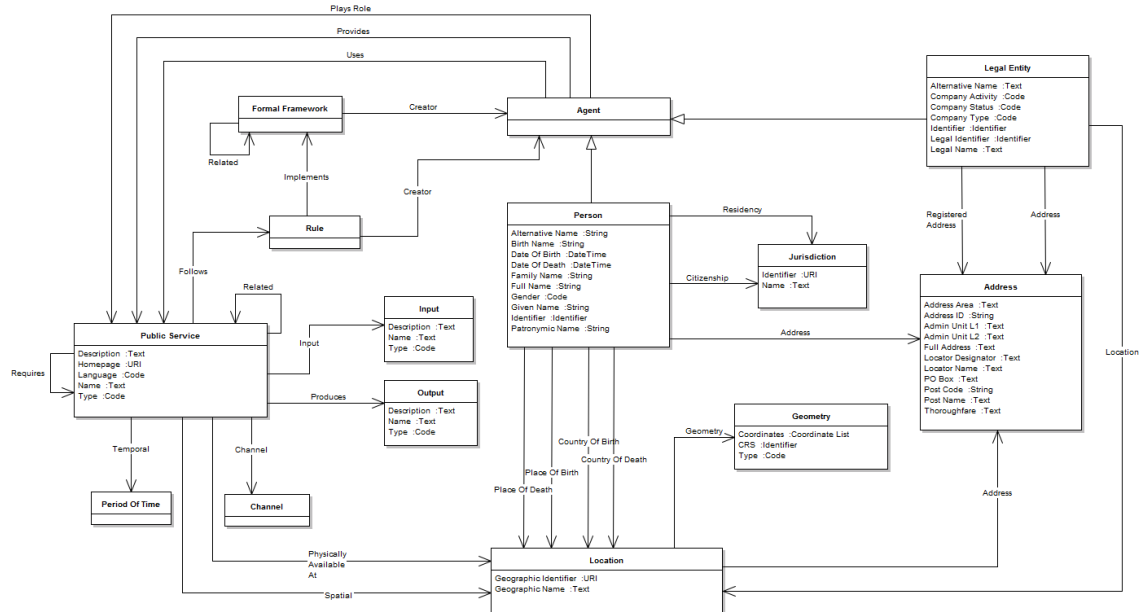
ANNEX IV: THE CORE PUBLIC SERVICE VOCABULARY

The Core Public Service Vocabulary[48] 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 5.

Figure 5 - CPSV diagram representation of current data model

Following the ISA Process and Methodology for Developing Core Vocabularies[49], 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:

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[48] https://joinup.ec.europa.eu/asset/core_public_service/description

[49] https://joinup.ec.europa.eu/community/semic/document/isa-deliverable-process-and-methodology-developing-core-vocabularies

- Owners/managers of e-Government portals operating at different government levels.
- Representatives of e-Government interoperability frameworks and strategies from the Member States and the Commission.
- Experts from EU-funded Large Scale Pilot projects, e.g. SPOCS.
- Representatives of standardisation bodies already active in service modelling, e.g. W3C, OASIS, The Open Group and OMG.
- Representatives of software vendors and IT companies already active in service modelling, e.g. SAP and IBM.
- 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[50]) to publish its intergovernmental product and service catalogue[51] as Linked Data.
- **EE – Integrated portfolio management of public services.** The Estonian Ministry of Economic Affairs created an extension[52] 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[53]. 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"[54] 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

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[50]https://joinup.ec.europa.eu/catalogue/asset_release/oslo-open-standards-linked-administrations-flanders-version-11
[51] http://www.corve.be/projecten/lokaal/IPDC/
[52]https://www.mkm.ee/sites/default/files/study_-_integrated_portfolio_management_of_public_services_-_brief_summary.pdf
[53] http://www.hel.fi/palvelukartta/Default.aspx?language=en&city=91

[54] https://joinup.ec.europa.eu/node/63148

enriched public service data. The pilot[55] and report[56] 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.

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[55] http://cpsv.testproject.eu/CPSV/

[56] https://joinup.ec.europa.eu/node/63148

ANNEX V: DETAILED LIST OF MANDATORY AND OPTIONAL CLASSES AND PROPERTIES

Table 10 - Mandatory and optional classes and properties

Class	Property	Mandatory/optional
Business Event		mandatory
Business Event	Identifier	mandatory
Business Event	Name	mandatory
Business Event	Description	optional
Business Event	Type	optional
Business Event	Language	optional
Business Event	Has Cost	optional
Business Event	Processing Time	optional
Public Service		mandatory
Public Service	Identifier	mandatory
Public Service	Description	mandatory
Public Service	Name	mandatory
Public Service	Is Grouped By	mandatory
Public Service	Type	optional
Public Service	Has Competent Authority	mandatory
Public Service	Has Formal Framework	optional
Public Service	Language	optional
Public Service	Has Channel	optional
Public Service	Processing Time	optional
Public Service	Sector	optional
Public Service	Keyword	optional
Public Service	Physically Available At	optional
Public Service	Requires	optional

Class	Property	Mandatory/optional
Public Service	Has Input	mandatory
Public Service	Produces	optional
Public Service	Follows	optional
Public Service	Spatial, Temporal	optional
Public Service	Has Cost	optional
Input		mandatory
Input	Identifier	mandatory
Input	Name	mandatory
Input	Description	optional
Input	Type	optional
Input	Related Documentation	optional
Output		optional
Output	Identifier	mandatory
Output	Name	mandatory
Output	Description	optional
Output	Type	optional
Cost		optional
Cost	Identifier	mandatory
Cost	Value	mandatory
Cost	Currency	mandatory
Cost	Description	optional
Channel		optional
Channel	Identifier	mandatory
Channel	Is Owned By	optional
Period of Time		optional
Period of Time	Identifier	mandatory

Class	Property	Mandatory/optional
Period of Time	Start date/time	mandatory
Period of Time	End date/time	mandatory
Rule		optional
Rule	Identifier	mandatory
Rule	Description	mandatory
Rule	Name	mandatory
Rule	Language	optional
Rule	Implements	optional
Formal Framework		optional
Formal Framework	Identifier	mandatory
Formal Framework	Name	mandatory
Formal Framework	Description	optional
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
Formal Framework	Has Creator	optional
Agent		optional
Agent	Identifier	mandatory
Agent	Name	mandatory
Agent	Type	optional
Agent	Plays Role	optional
Agent	Uses	optional
Agent	Has Address	optional

Class	Property	Mandatory/optional
Formal Organisation		mandatory
Formal Organisation	Administrative Level	optional
Formal Organisation	Alternative Name	optional
Formal Organisation	Homepage	optional
Formal Organisation	Type	optional
Public Organisation		optional
Public Organisation	Public Organisation Type	optional
Person		optional
Legal Entity		optional
Location		optional
Location	Has Address	optional
Address		optional
Address	Full Address	mandatory
Address	Address ID	mandatory
Address	Address Area	optional
Address	Admin Unit L1	optional
Address	Admin Unit L2	optional
Address	Locator Designator	optional
Address	Locator Name	optional
Address	PO Box	optional
Address	Post Code	optional
Address	Post Name	optional
Address	Thoroughfare	optional