Guidelines on how to build catalogues of public services at one-stop-shop portals and improve user experience

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1. Introduction

This work takes place in the context of Action 2016.29 – Accessing Member State information resources at European level – Catalogue of Services[1] of the ISA² programme[2]. The Catalogue of Services Action serves as the framework inside which work around the Core Public Service Vocabulary Application Profile (CPSV-AP) has been developed and updated. The CPSV-AP is a data model for the description of public services which aims to facilitate the set-up of catalogues of services aimed at businesses and citizens.

The CPSV-AP has been developed by a Working Group consisting of Member State representatives, experts, and academics focused on public service descriptions. The ultimate goal of this data model is to improve and harmonise the provision of information about public services on established eGovernment portals, taking into account the user-centric perspective.

1.1 Scope and objectives

This document aims to provide guidelines on how to build Catalogues of public services on one-stop-shop portals, improve user experience and establish easy-to-use searching facilities to display and present the public service information and catalogues of public services in a user-centric way.

1.2 Approach and methodology

The methodology for this report is to follow a milestones-based approach, in connection to the process a public administration might experience throughout the journey of determining the need to build a catalogue of public services, designing it, and building it. With the purpose of following the entire journey of building a catalogue of services, this document:

- Explains the rationale for such a platform;

- Illustrates how it might be used;

- Focuses on the needs of the catalogue's future users;

- Looks at the instruments that can help catalogue builders create a harmonised catalogue that is also user-friendly;

- Provides recommendations and best practices for the creation of service description catalogues.

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1 European Commission. Interoperability for European Public Administrations (ISA). Accessing Member State information resources at European level. https://ec.europa.eu/isa2/actions/CoS_en
2 European Commission. Interoperability for European Public Administrations (ISA). http://ec.europa.eu/isa/index_en.htm

1.3 Structure of this document

The remainder of this document is structured as follows:

- Section 2 presents a rationale for catalogues of public services, including examples of use cases;

- Section 3 provides recommendations and best practices for building catalogues of services;

- Section 4 presents the CPSV-AP and adjoining open source tools, which can be used to support the creation of catalogues of services;

- Section 5 summarises the main conclusions of the document.

2. Rationale for catalogues of public services

2.1 Context

The European Union is home to hundreds of millions of citizens, businesses and organizations each having their own projects. In order to support them in making their projects successful, public administrations of EU Member States offer a range of public services tailored to their specific needs, at different levels of administration, from the local, to the regional, national, federal, and European.

Information about available public services is often complicated to access, due to a lack of homogeneity in terms of location, format, language and level of detail. Each administration has a specific way of providing information and services that is familiar to their citizens, businesses and organizations. As a result, potential service users lack a clear overview of the actions and procedures they need to undertake. This hinders the development of their projects and significantly affects the efficiency of public services which end up being underused or misused.

2.2 Use cases

Citizens, businesses and organizations make use of public services in the context of a number of life and business events such as weddings, births, passport requests, business establishments and tax payments, to cite a few.

The following user stories illustrate the importance of making high-quality and interoperable public services data widely accessible at a local, national and European level.

Citizen relocation abroad

Laura, a Danish citizen living in Copenhagen gets the opportunity to work in the fashion industry in Milan. The job offer is a perfect fit for her and she decides to move to Italy a few weeks later. However, on top of organizing her move, Laura is wondering whether she needs a work permit, whether she needs to subscribe to specific insurances in Italy, and whether she will have to apply for Italian residency, among others.

When she starts searching for information, it turns out that these issues are regulated at the regional level in Italy and information is spread around different regional portals, in Italian only. When she seeks help from Danish authorities, they tell her that they do not have access to the information as the data formats are not compatible and do not allow for easy data transfer.

How can Laura get off to a great start with a new career and make plans for her stay Italy?

Business expansion

Ana, a successful Spanish businesswoman wants to expand her business and open offices all over Europe. Ana, however, has a lot of questions. How do the tax systems work? What are the local labour laws? Where does she need to register and get permits in these countries?

Ana starts looking for information on the internet but the information is spread over different government and private portals, often in the language of the original country and following their own structure and logic. She has a hard time finding relevant information, understanding it, and identifying the right public service.

How can Ana expand her business and realise its full potential following systematic and efficient processes?

Application for subsidies

Jonas, a German citizen, has launched a non-profit organization called "Go4Success" that helps students find the right support to kick-start their businesses. For the past year, he has been receiving subsidies from the German government to finance his activities. Now that the organization is growing bigger and international students have shown their interest, Jonas is planning to expand his organization to two other European countries.

In order to secure the successful launch of his organization abroad, Jonas seeks financial support from public institutions in the targeted countries in the form of subsidies. Similarly to Laura and Ana, Jonas struggles with his researches as most information on subsidies is incomplete or extremely complicate to find. He loses a lot of time in the process and soon wonders whether it will ever be possible to apply for subsidies and achieve his objective.

How can Jonas easily expand his organisation across the borders and support ambitious students across Europe?

2.3 Public service user needs

To leverage existing public services and achieve their objectives, **potential public service users** need to:

- **Find information easily:** actionable, standardized information on relevant public services should be easily reachable through multichannel searches, including on governmental portals, and other public and private websites across Europe;

- **Understand:** The information found on the aforementioned portals should be autonomously understandable to the citizens, as well as the actions to be undertaken to move forward with their project;

- **Access:** Citizens should enjoy simplified and standardized procedures allowing them to benefit from public services at all levels;

- **Benefit**: Citizens should receive support and assistance from competent authorities when necessary.

2.4 Public service provider needs

To optimize the quality and efficiency of their services, **public service providers** need to be able to:

- **Describe their services only once** in a machine-readable format to allow for the widespread dissemination of the information across all channels;

  - Regardless of whether a public service catalogue is being designed from scratch or re-designed from an existing one, another one of the main goals of this work should be to **avoid redundancies** in the form of obsolete services, obsolete descriptions, and duplications. This is justified by the general tendency of public services to be more and more necessary in a cross-border context. With more public services being delivered across borders, the harmonisation and quality levels of existing service descriptions gain importance. Especially considering federative initiatives, like the Single Digital Gateway (SDG)[3], and ongoing efforts to implement The Once Only Principle, public service providers need to focus on eliminating redundancies across the EU. The Single Digital Gateway will provide citizens and businesses information, guide them to relevant procedures, and provide them assistance regarding public services available to them. To this end, public service descriptions need to be accurate, of high quality, and only published once. This will avoid confusion, enabling the SDG to point end-users towards a single version of the truth.

- **Exchange information** with other public administrations, at all levels;

- Get **access** to all public service descriptions in Europe;

- **Leverage** other service providers' best practices to improve their service offering, quality and efficiency.

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3   Single Digital Gateway: https://ec.europa.eu/info/law/better-regulation/initiatives/com-2017-256-0_en

Public administrations, as service providers, might already have a public service catalogue, in which case the focus would be directed more towards the maintenance and improvement of the current situation, or the full re-design of an existing catalogue. For instance, a step of improvement for existing public service catalogues would be to review existing public service descriptions, to ensure that no redundant descriptions, or indeed, redundant services, are still available.

Public service providers also need to make a concerted effort to **centralise and harmonise information** about services that might currently be scattered in different corners of existing one-stop-shop platforms. In the current situation, public service descriptions might be organised according to differing logical structures. For this particular need, using a common data model helping structure existing descriptions would be a good approach to move towards the harmonisation of public service descriptions on one-stop-shop portals across the EU.

Another important step for public service providers looking to improve the accessibility of information about available services has to do with how end-users interact with platforms. As mentioned in section 2.3, information needs to be easy to find. Therefore, one-stop-shops need to be user-friendly, with information structured in a user-centric way. This means structuring public service descriptions according to business and life events, enabling end-users to find what they need by simply identifying the event that triggered the search for a public service.

3. BEST PRACTICES TO CREATE A CATALOGUE OF PUBLIC SERVICES

Member States and public administrations at all levels of government seeking to create a catalogue of services can benefit from following certain best practices in this context. These best practices seek to support the creation of catalogues of services that are user-centric, user-friendly, and harmonised, avoiding duplication of work and redundancies.

When designing catalogues of public services, creators need to consider a number of perspectives, further than just the stakeholder needs, but also how these needs can be fulfilled, practically. A public administration going through the process of building a catalogue should consider the answers to questions related to:

- Publishing information about public services on a portal;

- Creating and maintaining public service descriptions catalogues;

- Providing a search functionality for catalogues;

- Exchanging and validating information;

- Having a data model for public service description;

- Having a coherent governance and management approach.

The European Commission aims to help with all of the above by providing different instruments that provide specific guidance, but also practical support to catalogue creators. To structure the thinking around a catalogue and avoid overlooking any vital elements, creators can rely on the European Interoperability Reference Architecture (EIRA[4]) Solution Architecture Template (SAT[5]) for catalogues of public services. The SAT provides an architectural template of what components catalogue owners should think of, on the legal, organisational, semantic, and technical levels.

As to the question of how to build a good catalogue public services, creators can also rely on existing guidance on the subject published by other organisations. For instance, the Digital Service Standard[6] is a set of recommendations on providing good digital public services. The main principles to keep in mind in this matter are related to:

- Understanding user needs;

- Performing user research;

- Continuously improving the service;

- Understanding security issues, using open standards, etc.

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4 EIRA: https://joinup.ec.europa.eu/collection/european-interoperability-reference-architecture-eira
5 EIRA SATs: https://joinup.ec.europa.eu/search?keys=eira+sat
6 Digital Service Standard: https://www.gov.uk/service-manual/service-standard

The sub-sections below provide additional detailed information regarding the practical implementation of certain best practices for the design of public service catalogues.

3.1 Harmonizing public services information using common and open standards

Harmonising all existing public services data and mapping them against common standards is necessary to secure the widespread dissemination of qualitative public services information across Europe and optimise public services efficiency.

In the context of the Catalogue of Services Action, the European Commission developed the Core Public Service Vocabulary Application Profile (CPSV-AP), a standard data model to describe public services across Europe. The data model and associated tools allow for:

- The improvement of public services information quality, accessibility and searchability through standardization in terms of data location, format, language and level of details;

- The one-time creation of machine readable and interoperable public services information;

- The easy exchange and reuse of public services information at all levels;

- A certain degree of user centricity leading to qualitative user experience;

- The improvement of public services efficiency and use rate;

- A better management of public services portfolio.

Standard data models, such as the CPSV-AP, can be used in the following ways:

- **Unilaterally**, as the data model for describing public services. For example, the Region of Epirus in Greece uses the CPSV-AP to describe their public services.

- **As a base data model**, and extended for more country- or region-specific information. A public administration can use the CPSV-AP as a base to create its own structure, adding and/or removing elements tailored to their own needs. The CPSV-AP_IT, i.e. the Italian national data model constitutes a great example of it. It extends the CPSV-AP to include country-specific characteristics.

- **As inspiration**, to create an individual data model, where certain classes can be re-used. A number of countries, including Ireland and Finland looked at the CPSV-AP when creating their own national data models. They re-used classes and properties and ensured that the data model perfectly fits their needs.

- **As a standard**, to map different data models used within and across Member States to describe public services according to a common structure. This allows for the harmonization and seamless exchange of public service descriptions coming from different sources. For example, mapping is recommended when a country or region already has several catalogues of services in place, and seeks to build a one-stop-shop portal centralizing all the information.

3.2 Centralizing information through common platforms

Once public service descriptions have been harmonised using common data standards such as the CPSV-AP, the next challenge is to make the information easily accessible and searchable for the end-user. Ideally, in each Member State, all public services information should be available at a one-stop-shop portal, i.e. a Point of Single Contact (PSC), where citizens, businesses and organizations can find the information they need.

As stated in the PSC Charter[7], PSCs bring the benefits of e-Government to citizens, businesses and organizations. They provide them with comprehensive information on applicable requirements and allow them to complete administrative procedures online, be it in their own country or in any other EU Member State. It notably facilitates the free movement of citizens, simplifies the set-up and expansion of businesses in the Single Market and allows for the development of efficient organizations across Europe.

PSCs have already been set-up in most Member States, either at a local or national level. However, in most countries, the information available is not exhaustive yet and the user experience needs to be upgraded. Improvements in terms of data presentation, language and ease of use would further support the widespread and smooth adoption of the portals by potential services users.

Looking back at the use cases described above and analysing the searching patterns of public services users, the creation of governmental portals centralizing public services information is only part of the solution to improve data accessibility and usability. Indeed, potential users conduct searches through different channels, including search engines and offline channels which direct them to other private or public organisations' portals. This means that, until the existence and usefulness of PSCs has been widely acknowledged by potential users, the standardized data contained in the Catalogue of Services and available at PSCs should also be available on other information sources. A progressive integration and rationalisation of information leading to the full centralization of data at PSCs can then be operated based on each country's ecosystem.

3.3 Securing a consistent user experience

The key features of a successful PSC cover aspects such as the quality and availability of up-to-date information, the availability of online services, cross-border accessibility and the ease of use of the portal. The next section covers the last element focusing on the importance to provide a qualitative user experience to users.

The following elements are core principles to secure a high-quality user experience on information sharing portals such as PSCs and support the extensive use of public services:

- First of all, Member States should implement standard user journeys to make sure that, regardless of the national or local portal they are visiting, potential service users follow similar steps and procedures to achieve their objective.

- Then, the harmonization of information format, structure and design significantly contributes to the quality of the user experience. Coming across an interface that looks familiar, is intuitive and easy to use improves users' autonomy and constitutes an incentive for the reuse of the portals.

- Finally, governmental portals should be interconnected and allow for the exchange of information. The transfer of user data between different service providers would streamline the service provision process at the local, national and European level.

A high-quality user experience encourages potential service users to systematically conduct their searches on governmental portals, reduces the need for support and reinforces the added value of catalogues of public services.

3.4 Establishing easy-to-use searching facilities

A vital component of what makes a public service catalogue useful and easy-to-use to citizens and businesses is the way it enables searching for information. One-stop-shops and other eGovernment portals often face the challenge of having to provide an easily understandable structure for complex, multi-layered information. For end-users unfamiliar with organisational structures or local customs, a free-text search box might be almost entirely unhelpful. Some guidance pointing users to the right area according to business or life events will help them narrow down the category of services they need, and contribute to time savings.

Figure 1: Search facility on Irish platform

Figure 1 is an example of how to structure the search functionality on a platform. This search functionality, applied in Ireland, simply lists a number of the most common life and business events, then directing users to relevant services.

The user-centric structure of information about public services, focusing on life and business events, is the basis of a useful search facility that efficiently guides users to the services they need. This structure implies the use of a data model that facilitates the user-centric design of the platform by focusing on business and life events. One such data model is the CPSV-AP. The CPSV-AP includes ample definitions of both business and life events, and numerous examples of the most common events that platform owners should keep in mind when creating service catalogues.

4. THE CPSV-AP AND ASSOCIATED TOOLS

The European Commission has been working on providing practical support to complement the more theoretical guidance. Through the creation of a standard data model, the Core Public Service Vocabulary Application Profile (CPSV-AP[8]), and associated tools, the Commission supports public administrations building catalogues of services that meet the stakeholder needs described in section 2.3, while also providing answers to many of the questions public administrations should ask themselves.

The CPSV-AP[9] is a data model that describes public services in a structured and machine-readable way by standardising the semantics in public service catalogues data models. Public administrations and service providers can use this approach to describe their services and **guarantee a level of cross-domain and cross-border interoperability** at local, national and European level.

The CPSV-AP has been created and is maintained by a Working Group[10] composed of Member State and EU institutions representatives, and experts and academics in the field of semantic interoperability and Open Data. Over time, a total of 17 EU countries jointly defined the specifications of the CPSV-AP: Austria, Belgium, Estonia, Finland, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Poland, Slovakia, Spain, Sweden, the Netherlands and the UK.

To facilitate the creation, validation, harvesting and exchange of public service descriptions that comply with the CPSV-AP, the following Open Source tools[11] have been developed:

- **The Public Service Description Creator,** offering public service providers a template for describing their services;

- **The CPSV-AP Mapping Editor,** allowing users to create online mappings between the CPSV-AP and any other data model;

- **The Public Service Description Editor,** enabling public administrations to create and manage CPSV-AP compliant descriptions of public services;

- **The Public Service Description Harvester,** offering the possibility to users to automatically collect public service descriptions from various portals;

- **The CPSV-AP Data Validator,** providing public service providers with the ability to check whether public service descriptions meet the requirements of the CPSV-AP.
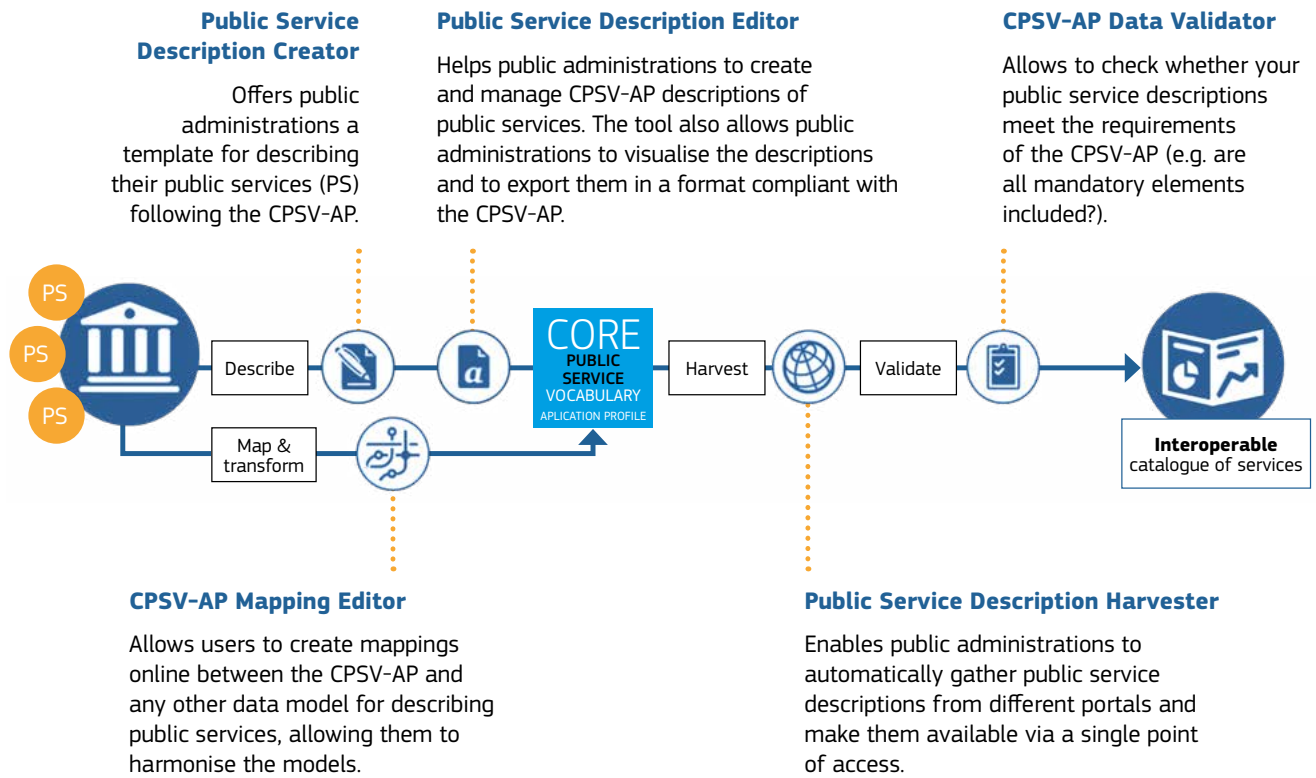
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8   CPSV-AP: https://joinup.ec.europa.eu/solution/core-public-service-vocabulary-application-profile/about
9   Explanatory video for CPSV-AP: https://youtu.be/IE2UJCV2ggl
10 CPSV-AP WG: https://joinup.ec.europa.eu/solution/core-public-service-vocabulary-application-profile/members
11 Open Source tools: https://joinup.ec.europa.eu/page/cpsv-ap-tools

Figure 2: Overview of CPSV-AP tools

Public Service Description Creator

Offers public administrations a template for describing their public services (PS) following the CPSV-AP.

Public Service Description Editor

Helps public administrations to create and manage CPSV-AP descriptions of public services. The tool also allows public administrations to visualise the descriptions and to export them in a format compliant with the CPSV-AP.

CPSV-AP Data Validator

Allows to check whether your public service descriptions meet the requirements of the CPSV-AP (e.g. are all mandatory elements included?).

CPSV-AP Mapping Editor

Allows users to create mappings online between the CPSV-AP and any other data model for describing public services, allowing them to harmonise the models.

Public Service Description Harvester

Enables public administrations to automatically gather public service descriptions from different portals and make them available via a single point of access.

PS *Public Service*

As demonstrated by the pilots[12] with Member States, the tools are fully reusable and easily adaptable to other data models, business contexts, etc.

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12 Pilots: https://joinup.ec.europa.eu/solution/catalogue-services-pilots/about

5. Conclusion

Public service providers in Member States of the EU no longer need to be convinced of the need to have easily accessible public service descriptions. These descriptions are useful not just to the citizens and businesses benefitting from these services, but to other public service providers. Public service providers might however see an increase in their workloads not just as a result of building new catalogues of services, but also due to a demand for more accurate information about public services being available as a direct consequence of a move towards more efficient federation. Such tendencies will provide a decrease in workload in the future, but might require some additional work at the moment.

The federation of regional or national catalogues of services to the European level, for instance through initiatives like the Single Digital Gateway, imposes the need for accurate, unique public service descriptions, along with accurate translations. Public service descriptions are often scattered heterogeneously across eGovernment websites and one-stop-shop platforms, with sometimes redundant information still available, making it a daunting task for service providers to maintain. Following a central data model that provides a harmonized way to structure public service descriptions helps with the aforementioned tasks. But it is still an imposing task, for which any support is welcome.

This report illustrates the added value provided by the CPSV-AP along with its accompanying tools. Aside from the CPSV-AP acting as a common data model that can help the Member States of the EU make significant progress on the path towards a pan-European catalogue of public services, the open source tools represent material help that can directly support public service providers. Even in cases where providers are dealing with special situations, where the CPSV-AP or the tools need to be customized or adapted to the local situation, these assets still make a significant difference. Simply by avoiding a scenario where Member States are starting from scratch in their efforts related to public service descriptions, the data model and the tools provide an added value. Additionally, the open source tools accompanying CPSV-AP can provide significant reductions in the workload of public administrations, by automatizing certain steps and foregoing the need for entirely new developments.