Analysis of the usage of the Core Public Service Vocabulary Application Profile

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ABSTRACT

Given its generic nature, the Core Public Service Vocabulary Application Profile (CPSV-AP) is a data specification used to capture and describe fundamental characteristics of public services (such as the name of a service, its description, where it can be provided) in order to facilitate the exchange of information between administrations. This specification has been developed in such a way that it can be easily tailored and extended to meet country-specific requirements. As such there are many different ways of using CPSV-AP. Although essential to its adoption and reusability, this implementation leeway can lead to different interpretations of the terms used once CPSV-AP is implemented and therefore impacts the data interoperability across local, regional and national borders. By comparing the several implementation cases of CPSV-AP, a thorough analysis of the use of the terms proposed by CPSV-AP was carried out, allowing the translation of these insights into recommendations for the future versions of the specification.

CCS CONCEPTS

• **Applied computing** → Computers in other domains; Computing in government; E-government.

KEYWORDS

CPSV-AP, Interoperability, Public services catalogues

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1 INTRODUCTION

Nowadays, interactions between citizens and public administrations, in the light of public service delivery, are increasingly digitised, especially with the current pandemic situation. With this regard, it has become crucial for online administrations to provide accessible and understandable information about public services to citizens and businesses. As new opportunities arise from this situation, administrations consequently must overcome new challenges. Due to the multitude of competent authorities and their own processes, ways of describing information and languages, it has become difficult to compare and exchange information about similar services at national or cross-border levels. With the Core Public Service Vocabulary Application Profile (CPSV-AP) [1], a common solution is provided to all European public administrations to share information by describing fundamental characteristics of public services. To obtain a view on the implementation of CPSV-AP, its added-value and challenges, a detailed analysis of its usage by different administrations in Europe is needed.

In the first part of this paper, we shed light on the different types of usages of CPSV-AP. Once done, we introduce the methodology followed to carry out the mapping exercise between the selected data models and CSPV-AP. Finally, we discuss the main findings from the mapping and propose some recommendations with a view to facilitating its adoption.

2 WHY AND HOW IS CPSV-AP BEING USED?

As any semantic data model, CPSV-AP is composed of a set of classes and properties. While classes represent concepts of a public service (such as Rule or an Evidence), properties are additional information that compose a class (such as a description or the language used in an Evidence for instance). Given that the objective of CPSV-AP is to act as an overarching model for describing public services, a certain level of flexibility is therefore required to address the needs of each administration. In practice, we see that two main implementation use cases of CPSV-AP exist.

On the one hand, CPSV-AP can be used as a starting point for administrations to catalogue their public services. CPSV-AP provides a simplified structure of public services in order to be reused by as many administrations as possible. Subsequently, the data model also allows a certain degree of extension to model specific situations and thus customise CPSV-AP according to the needs of an administration. The model developed by Italy is a concrete example of how CPSV-AP can be reused and extended, resulting in a new data model (CPSV-AP_IT) [2].

On the other hand, CPSV-AP can also be used to assess and validate the level of compliance of a data model for exchanging information between administrations. To this end, the German data model xZuFi [3] was mapped a posteriori with CPSV-AP to verify its compatibility with other European data models. This use of the specification ensures the compliance of different data models with CPSV-AP and therefore their ability to exchange information.

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3 METHODOLOGY

A mapping exercise including data models provided by Germany, Italy, Belgium (Flemish Region), Greece and Montenegro has been carried out in order to compare and outline the different implementation cases of CPSV-AP. It is worth mentioning that the mapping performed echoes the one conducted by Alexandros Gerontas and his colleagues[4] which similarly analysed different implementation cases of CPSV-AP among several Member States. The outcome of this previous exercise suggested a list of new additional terms to embed in the next versions of CPSV-AP. Therefore, the recommended terms from the previous exercise were integrated in our mapping to check whether the different models analysed followed the recommendations previously suggested.

The criteria set out in the SKOS mapping vocabulary specification [5] (exact match, close match, related match, broad match and narrow match) were used to interpret the results obtained from the mapping. As Greece and Montenegro recently started to reuse CPSV-AP, the access to the semantic information related to the terms used in these models was consequently limited. The mapping was hence carried out only with existing information. Lastly, a survey and several written exchanges were conducted with Italy, Estonia, Bulgaria, Czech Republic, Greece, Hungary, and Slovenia to consolidate our analysis.

4 MAIN FINDINGS DERIVED FROM THE MAPPING EXERCISE

A first observation to stress is the significant reuse rate of the terms proposed in CPSV-AP by the models analysed: among the classes reused from CPSV-AP, 70% of them are considered as an "exact match" (being used in a similar fashion to the usage recommended d by CPSV-AP) while this number rises to 83% for the properties proposed in CPSV-AP. It is also worth reporting that the models using CPSV-AP as the starting point (Montenegro, Italy, Flanders) are more likely to reuse the classes proposed in CPSV-AP, than the models using it as a means of validation.

Among the five models analysed, some of the classes initially proposed by CPSV-AP seem to be relatively underused (0-20%): The **Public Service Dataset** class is, for instance, not used by any of the models analysed. This relates to previous discussions among the Working Group questioning the interest of having this class within CPSV-AP. At the moment, cv:PublicServiceDataset refers to dataset of public services which is a subclass of DCAT-AP dataset [6] (DCAT-AP is a specification dedicated to data portals in Europe, similarly to what CPSV-AP is for public services). The issue lies in the fact that this class cannot be found in other core vocabularies. The **Opening Hours Specification** class is only used by 20% of the data models analysed. While the Contact Point class is used in several ways in the models analysed (via vCard or as a property between a person and a function taken), the Opening Hours Specification class seems to be disregarded, questioning thus its interest within CPSV-AP. Finally, it is worth noting that only 20% of the models analysed reuse the **Collection** class, despite its recent inclusion in the latest versions of CPSV-AP. According to SKOS, the Collection class enables reusers to define collections of concepts (typically controlled vocabularies). In practice, the models analysed only use skos:Concept as a placeholder, thereby challenging the added value of having a Collection class in addition to the Concept one.

Beyond these findings, we also examined whether the terms recommended by Gerontas were used.

A first observation is that different terms specifying further the Channel class (email, phone, service URL) are used in most of the models while this choice was left to the discretion of its reusers in the most recent versions of CPSV-AP. The need for this type of information could result in new properties within CPSV-AP.

Additional information about the Evidence, such as the URI of the Base Registries could be of interest, especially in a context where data is controlled, exchanged and processed automatically (for instance for applying the Once-Only Principle). Indeed, several terms address regulatory aspects for digital public administrations: how to provide feedback and rate the public service, or to appeal against a decision are terms for which it would be worth asking the community whether it should be covered by CPSV-AP or not. Time considerations (availability, last updated), target service consumers or specific roles of Agents in a public service (e.g. creator) could also be included in CPSV-AP. Finally, including the steps of a Process followed during the provision of a Public Service represents an interesting proposition. If CPSV-AP does not cover this information, it is worth mentioning that in Flanders, the extended version of CPSV-AP includes a class Status [7] where administrative steps for the provision of a service are listed.

Beyond the analysis of the use of these different terms, one of the most recurring obstacles emerging through the mapping is related to the lack of guidance about the CPSV-AP implementation. This lack of information refers to practical information leading an administration step-by-step to the implementation of CPSV-AP. Slovenia, which is currently developing its data model based on CPSV-AP, is for instance looking for detailed guidelines to implement and publish administrative procedures via CPSV-AP as well as how to extend it.

5 CONCLUSIONS AND FUTURE IMPROVEMENTS

Echoing the challenge of providing concrete guidance to implement and extend CPSV-AP, it is essential to produce a thorough and comprehensive implementation guide describing the various steps to perform, implement and/or extend the specification. In a similar fashion, Gerontas also advocated to document more exhaustively CPSV-AP implementation processes with information about the tools needed, URI design policy and detailed examples. Implementers could also benefit from a complete pilot illustrating in detail how to produce a catalogue of services with CPSV-AP. Such documentation and pilot could then be reused by implementers to take informed decisions supporting interoperability as from the start.

More generally, public administrations are also eager to use CPSV-AP in a more pragmatic way. Indeed, terms from CPSV-AP could also be used to describe requirements of the Single Digital Gateway (SDG) or to automatically tag public services descriptions in HTML pages to improve the searchability level of the information.

Regarding the interoperability of nationally developed models (extension of CPSV-AP), we recommend the provision of validating

Table 1: Additional terms mapped

Additional terms used in the data models	Number of appearances
Additional content (Public Service), Phone (Channel), Address (Channel), E-mail (Channel)	3
Name (Channel), Service URL (Channel), Base Registries (Evidence), Availability (Public Service), Creator (Public Service), Deadline (Public Service), Process (Public Service)	2
Last Updated (Public Service), Appeal-complaints (Public Service)	1
Feedback (Public Service), Rating (Feedback)	0

tools allowing administrations to easily assess their level of compliance with CPSV-AP via tools such as the CPSV-AP validator [8] and the Interoperability Test Bed [9].

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