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Modelling Citizen Letters for Public Services automation*

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Abstract. The publication and, when it is possible, automation of public services on Internet provides advantages for citizens and governance. The former because promotes the transparency and control over governance actions and avoids unneeded presencial inquiries and the latter because information systems help to decrease human resources costs. A number of efforts have been performed by public administrations to provide precise service information online. As this service information is incrementally published, manual interaction to navigate and query these services becomes a difficult task that automated mechanisms could support based on service catalogs. In this paper we introduce an ongoing work proposing the use of ontologies to enable the automated processing -i.e. search and validation- of these service catalogs.

1 Introduction

In the last years, the transparency of public administration has been promoted through the publication of provided services description and data. Doing so, on the one side, these services become more flexible as citizens can check them ubiquitously and without time restrictions as common "window time" (e.g.: 8.00-15.00) and, on the other side, costs of human resources are reduced as human to human interactions for service provision or service information are substituted by human to computer interactions. In this context, a number of countries make an effort to maximize the provision of online public services for citizens. In particular, Brazil published in 2009 the law about citizen attendance services [1] about the dissemination of public services. This law requires that all public agencies define a Citizen Letter where they have to describe all the information related to the services they provide, such as: service requirements, location, timetables, how to consume it, documentation or commitments by the public agency to provide these services. In the last 6 years a number of agencies have developed and published their Citizen Letters on Internet.

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Although this information is very useful to support service consumption, there is a great number of public organizations so it is very difficult to manually handle all existing public services and descriptions. Citizens could take advantage of information systems to support the management of Citizen Letters to classify services: *Which are education services offered in my region*? or automate the selection of the most suitable for some requirements them (regarding geographical criteria, requirements,...): *Which is the nearest clinic where I could get dental care before 2 weeks*? Furthermore, the accomplishment of committed times or the compliance of published procedures with real actions could be monitored and evaluated. This management would enable the classification of service regarding a standard Maturity Model, such as CMMI[3] or ITIL[4]. However, automating the management of Citizen Letters is difficult as each agency or public company provide this information with their own document and each Citizen Letter is described in different document format (word, pdf, html, ...) without any formal language (natural language description) or normalized structure (service properties are different in each document).

Therefore, in this paper, we tackle the task of providing a formal model to describe Citizen Letters as a first step to provide a service catalog and support service discovery by citizens. In order to provide such a model, we focus on the following questions:

- R1) Which is the key service information for citizens?
- R2) How this information can be formalized to support queries?

The description of service terms and guarantees are commonly defined through different aspects in Service level agreement documents (SLAs). There are a number of contributions to formalize SLAs. Among then, Linked USDL Agreement [2] is an extension to Linked USDL to cover service agreement. Linked USDL is a modular family of ontologies to support the trading of services in an automated way. Linked USDL Agreement include domain independent aspects related to service contracting, such as committed parties, quality metrics to measure, performance goals or compensation functions in case of over or under accomplishment of these goals. In this work, we propose defining an ontology (or family of ontologies) to describe public services in the context of the citizen attendance law so the Citizen Letters can be included in a service directory which enables automatic relevant queries for citizens.

2 Describing Public Services with Linked USDL

We goal defining a family of ontologies to describe services included in Citizen Letters from Brazil public agencies. In order to define these ontologies we follow the methodology described in [3]. This methodology proposes, first, an analysis of the domain to be described, then the definition of the relevant questions that should be addressed with the ontologies. A list of terms and relationships will be defined based on these questions to describe services. These terms will be classified according to the service domains to

[3] http://cmmiinstitute.com/cmmi-models

[4] https://www.axelos.com/best-practice-solutions/itil/itil-maturity-model

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define new ontologies or reuse previous related ontologies. We focus on existing Citizen Letters provided by the National Program for Public Management[5] together with other single Citizen Letters such as FIOCruz[6] or Cinema National Agency[7].

In these Citizen Letters we find services from heterogeneous domains such as: (i) Health, (ii) Education, (iii) Public Employment. There also information about specific services as cultural events, taxes, or touristic offers. Together with the service description, the law requires information regarding office times for service provision, maximum waiting time for service inquiries or documentation requirements. Therefore, around these services we propose basic questions that should be addressed with the ontology, regarding service provision itself, or regarding the legal obligations required for Citizen Letters:

- Which services of [service-area] are in the region [region]?
- Which service of [service-area] can be performed [now/before X days/from X days]?
- Include all the services the office times?
- Is all the document required for service provision described in the Citizen Letter?

where *[service-area]*, *[region]*, and *[now/before X days/from X days]* are general categories for the different domains.

As we introduced in previous section, we will describe these ontologies as an extension of Linked USDL Agreement ontologies. We also consider the adaptation of general existing classes or schemas for services and citizens such as Person[8] and Service[9] or Core Public Service Vocabulary[10]. The definition of these ontologies will enable us to describe formally the services used in the analysis as a first step to create an automated service catalog. However, as the domains are very heterogeneous and the number of services is very high, we initially focus on one of the most significant domains (regarding the number of related services), such as Health services.

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