An Ontology for Modeling Life-Events

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Abstract

Contemporary public administrations all over the world are exploring new service provision models that adhere to citizens needs. Recently, the "life-event" concept was introduced as a guiding metaphor for presenting and providing integrated public services. A life-event includes all public services that are related to a specific situation that citizens face. Although the concept of life-events is increasingly important for public administrations, the relevant scientific literature is limited. In this paper we present the main classes of an ontology for modeling life-events. It is anticipated that the use of this ontology will facilitate domain experts in public authorities to model life-events in a straightforward manner.

1. Introduction

Integrated public service provision according to customers' needs lies at the heart of every eGovernment action plan. Life-events are often used as a guiding metaphor for customer-centric public service provision, e.g. [1]. A life-event is a set of actions, including at least one public service, which, when executed in its appropriate workflow, fulfils a need of a citizen arising from a new life situation [2].

An analysis of the relevant literature suggests there are two main approaches for modeling life-events. The first suggests modeling life-events as workflows of related public services and actions [2]. The second suggests modeling life-events using ontologies [3] thus capitalizes on the idea of semantic representation of knowledge. An ontology is a network of connections between concepts of a particular domain with the aim to provide a well structured model.

In this paper we propose a new model for life-events and describe the main classes and properties of an ontology used for representing this model.

2. Life-Event Ontology Model

The proposed model is based on a small number of core classes and properties. These were derived by studying previous work such as the GEA models [3] and public services ontologies (e.g. the Meta ontology proposed by the OntoGov project [4]). Theoretical work was combined with empirical data that we gathered from studying a number of life-events in four different countries (this work was conducted within the OneStopGov project [4]).

The proposed classes are: *life-event*, *public service*, *citizen*, *user profile*, *input*, *output*, *rules Public Administration (PA) document* and *non-Public Administration object* (see also Figure 1).
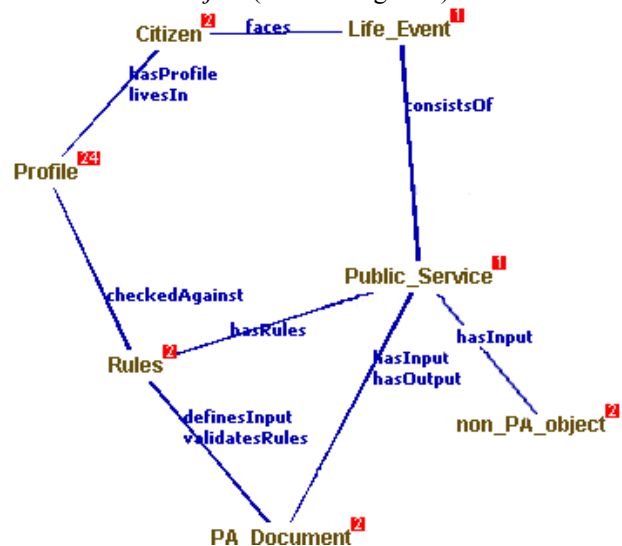

Figure 1. Life-event ontology classes and properties

A *citizen* faces *life-events* (e.g. a citizen wants to get married). Each life-event consists of one or more *public services*.

By assuming a system's approach, each public service receives input and produces output. The input can be either an official *document produced by the Public Administration* (e.g. birth certificate) or an *object not produced by the Public Administration* (e.g. a photograph). The output of a public service is always an official Public Administration (PA) document (e.g. marriage permit).

In addition, a public service has *rules* stated in the relevant laws and regulations. The rules define the input and output and the internal logic of the service. For example, the public service "Getting a divorce" has one important rule (which here acts as a pre-condition): the

person who invokes this service must currently be married.

Finally, a citizen has a *profile* that contains information e.g. age, marital status, etc. When a citizen invokes a service, this information may be checked against the service's rules for a number of reasons e.g. to determine the citizen's eligibility for the service, to provide input to the service, etc.

The proposed life-event model has been implemented using OWL DL. The prototype life-event ontology was developed using the Protégé tool with the OWL plug-in.

3. Discussion

The proposed life-event ontology can be used by domain experts within public administrations. Usually, domain experts have to fill in different templates and/or draw process diagrams in order to describe life-events and the public services involved. Instead of that, the proposed life-event ontology aims at assisting domain experts in describing and modeling life-events by simply creating instances of the classes of the proposed ontology.

The use of an ontology has a number of advantages, including:

• Ontologies may solve interoperability problems. Indeed, the standardization of ontologies provides a common frame of reference for cross-organizational applications.

• Ontologies have axioms and rules that completely define the values that a concept can have.

• The process of modeling a domain using ontologies helps identifying and understanding the relevant elements in a specific domain and the relationships between them [6].

• The use of formalized models (ontologies) helps managers easily communicate and share their understanding of the domain among other stakeholders.

• It enables creating a knowledge repository where all tacit and implicit knowledge is modeled in an explicit and reusable form.

In addition, the proposed method of modeling life-events has the following advantages:

• The life-event concept is clearly defined.

• The same public service can be invoked by different life-events. Using the proposed ontology, each public service is modeled only once.

• Maintenance of life-events is simplified. For example, if one rule changes in one public service it is easy to apply this change to all instances of the ontology classes.

• It is easy to visualize life-events. This is important in order to monitor the relationships between classes and to have a clear understanding of the life-event concept as a whole and of the public services invoked based on the citizen profile.

• The life-event ontology can be used for implementation purposes, e.g. in a one-stop government portal.

4. Conclusion

In this work we proposed a life-event ontology that may assist domain experts in public administrations in modeling life-events. More specifically, we identified a small number of core classes and their properties, which enabled producing the life-event model upon which the ontology is based. We further outlined some of the advantages of the proposed method for modeling life-events. Future work includes modeling a number of life-events to examine the generality of the model.

5. Acknowledgements

6. References

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