▶ A LexO-Server Use Case: Languages and Cultures of Ancient Italy

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Purpose: This paper presents a set of REST services called a LexO-server (https://github.com/andreabellandi/LexO-) for the management of lexical resources modeled as the *OntoLex-Lemon* model. This comes as a software backend, providing data access and manipulation to frontend developers, and will be exemplified through the Languages and Cultures of Ancient Italy CLARIN-IT related project. This is a use case where the creation and edition of an integrated system of LRs for ancient fragmentary languages will be shown in compliance with current digital humanities and Linked Open Data principles. Other relevant use cases will be mentioned for demonstrating the versatility of these services and how they can be easily integrated within more complex systems and/or interact with other independent back-ends.

Design/methodology/approach: A LexO-server is a system based on Service-Oriented Architecture (SOA), an architectural style where services are provided to the other components by application components, through a communication protocol (REST in our case) over a network. Each service is a discrete unit of functionality that can be accessed remotely and acted upon and updated independently, such as by retrieving a lexical entry or adding a lexical sense to a lexical entry. According to the aim of the *OntoLex-Lemon* model, that is the enrichment of conceptual ontologies with linguistic information, a LexO-server provides services at both the lexical and conceptual levels. A LexO-server natively provides services for the management of SKOS ontologies only, but it makes possible lexical entries refer to external existent OWL ontologies.

Findings: A LexO-server is a free and open source backend that relies on the GraphDB semantic repository. It is implemented as a set of Representational State Transfer (REST) services based on the HTTP protocol, and exchanges data in JSON format. Services conform to OpenAPI, a specification for machine-readable interface files to describe, produce, consume, and display REST services.

Research limitations/implications: On the one hand, a LexO-server allows the target of *OntoLex-Lemon* users to be broadened, while on the other it opens up the possibility for the construction of applications oriented at different tasks, such as editing, linking, dictionary making, and linguistic annotation.

Practical implications: Service orientation architectures allow a strong frontend-backend separation of application concerns to be maintained in a way that makes

most services potentially reusable in different contexts. This allows developers to build different end-user applications on the same backend.

Originality/Value: Some similar initiatives have been developed. Among them, K Dictionaries by the University of Cambridge, and REST services provided by the University of Oxford for accessing their dictionaries. Another experience worthy of note is a REST interface developed in the context of the ELEXIS infrastructural project for accessing collections of monolingual and multilingual resources with a broad range of usages. Differently from these, the LexO-server also provides editing services, in order to serve a wider set of possible tasks for the development of dedicated applications by third parties.

Keywords: *LLOD, OntoLex-Lemon, digital historical linguistics, lexicon web services.*

Research type: Technical paper.