Huerta, Schade, Granell (Eds): Connecting a Digital Europe through Location and Place. Proceedings of the AGILE'2014 International Conference on Geographic Information Science, Castellón, June, 3-6, 2014. ISBN: 978-90-816960-4-3

ELF GeoLocator Service

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Abstract

This paper describes the implementation of a gazetteer service, GeoLocator, developed in the project 'European Location Framework' (ELF). The GeoLocator service contains data from the INSPIRE/ELF themes Geographical Names, Administrative Units and Addresses. The functionalities of the service include geocoding, administrative unit-limited geocoding, fuzzy geocoding, reverse geocoding and administrative unit-limited reverse geocoding.

Keywords: Gazetteer Service, geocoding, reverse geocoding, WFS-G.

1 Introduction

The ongoing implementation of the INSPIRE directive is resulting in the creation of harmonized European-wide spatial data that covers multiple data themes and enables the creation of spatial Web services that provide functionalities for the whole area of Europe.

This work describes the process of implementing the ELF GeoLocator service that is a gazetteer service that contains multilingual and authoritative European spatial data.

The implementation of gazetteer services have been standardized by the Open Geospatial Consortium (OGC) in the gazetteer service application profile of the Web Feature Service interface (WFS-G AP) best practice paper in 2012 [1].

The ELF GeoLocator service is based on earlier EuroGeoNames (EGN) service, originally created in 2006-2009 [2] and renewed in 2012 [3]. The main objectives in the project are (1) to add more geographical names (GN) data into the service and to import new data from the themes 'Addresses' (AD) and 'Administrative Units' (AU) and (2) to create new service functionalities by enhancing the service's geocoding capabilities and by adding new reverse geocoding functionalities.

2 Related Work

Digital gazetteers are an important research topic in geoinformatics. The core elements of digital gazetteers have been studied by Hill [4]. Some examples of gazetteer services are a meta-gazetteer service [5] that integrates data from multiple gazetteer services and supports geocoding and reverse geocoding and a geoXwalk [6] gazetteer that parses place names from various documents.

There are currently many gazetteer services available on the Internet. Manguinhas et al. [7] have collected a list of many of these services.

3 ELF GeoLocator Service

3.1 Service Architecture

The ELF GeoLocator Service is based on a centralized architecture that contains a PostgreSQL/PostGIS service database that stores all the collected data (Figure 1). The database contains the contents of the EGN database and AD, AU and GN data that have been collected from the national INSPIRE/ELF download services.

The main service output is the WFS-G AP encoded output that is created with the deegree WFS application. On top of it there is a custom front-end WFS module, developed in the EGN and ELF projects. It is a Java Servlet module that handles the execution of the WFS query process. The front-end WFS adds the support for custom service operations and the support for custom LANGUAGE parameter that can be used with the WFS-G output for requesting the location type information in a specified language.

3.2 Service operations

The service supports the WFS operations *GetCapabilities*, *DescribeFeatureType* and *GetFeature*. The main geocoding functionality is available through the *GetFeature* operation by using filters with the queries according to the OGC's filter encoding language.

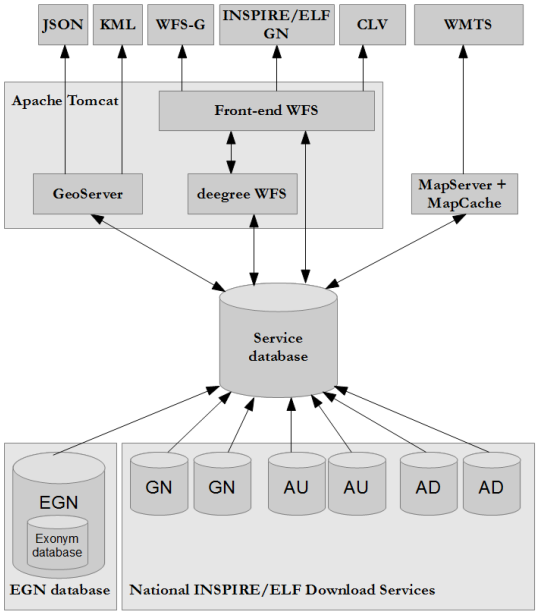
The service supports also three custom operations *GetFeatureInAu, FuzzyNameSearch* and *ReverseGeocode.*

The *GetFeatureInAu* operation limits the geocoding inside a specific administrative unit. It is useful for finding results when there are multiple features that have the same name.

The *FuzzyNameSearch* operation executes name searches that can find features from a slightly misspelled input. It is useful when the user makes a typing error or when the queried name contains diacritics or special characters.

The *ReverseGeocode* operation contains two modes: (1) normal mode where the operation returns the feature nearest to the given coordinate point. (2) AU–limited mode where the operation returns the AU-based feature from the most detailed AU level that contains the given coordinate point.

Figure 1: The architecture of the ELF GeoLocator service



4 Discussion

Currently the ELF project is ongoing and the total amount of countries that are able to provide the data for the ELF GeoLocator service is unknown. The eventual aim is the full coverage of the EuroGeographics member countries.

In future the ELF GeoLocator service could be expanded with new operations and new data from new themes. One potential data theme is the INSPIRE theme Cadastral Parcels (CP).

5 Conclusions

The ELF GeoLocator service provides functionalities that are fundamental in the spatial data infrastructure. It enlarges the data contents of the EGN service by increasing the amount of its GN data and by importing data from new themes: AD and AU. The service functionalities are expanded with administrative unit-limited geocoding, fuzzy geocoding, reverse geocoding and administrative unit-limited reverse geocoding. In future the service will be further developed by uploading content from new countries via the INSPIRE/ELF-compliant Download Services provided by the participating NMCAs.

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