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(for example, gazetteers and web services).

**Publication of geographical name information by vector tile
format**

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Publication of geographical name information by vector tile format

In Japan, based on the government's open data strategies, various data are released by government agencies. As a part of it, Geospatial Information Authority (GSI) is experimentally providing web map data in machine-readable vector form since August 2014. Since July 2017, it began providing geographical name information in the vector form on the web. Here we introduce the outline of web provision in the vector form of geographical name information.

1. Introduction

In Japan, based on the government's open data strategies, various data are released by government agencies. As a survey and mapping organization in Japan, GSI is advancing efforts to provide data on Japan's land area in a manner that is easy to use. Regarding the geographical name, it has developed the geographical name database that is based on the feature names listed in the topographic maps of the scale of 1:25,000. The database can show this information on a map, and also can display the maps by location name search. From August 2014, we are experimentally providing web map data in machine-readable vector form.

From July 2017, we began providing the geographical name information newly in the form of machine-readable vector data format.

2. Provision of place name information by conventional web map service

"GSI Maps" is basically raster tile map services. In this web map service, it shows the geographical names as annotations on the map and uses those names as a key to search for positions in the map services. In the former services, they only deliver image information to users so the users can only read the notation of the Japanese Kanji characters (the Chinese characters) on the map.

3. Challenges related to the reading of place names in Japanese

For Japanese people, Japanese kanji has multiple readings in the same letter, and the geographical names combining them can have various reading patterns. For example, there are place names that read "Shinjuku" and "Nijuku" for the same Japanese kanji "新宿." There are place names that read "Oyama" and "Daisen" for the same kanji "大山." Therefore, it is difficult to pronounce the name reading only from the notation of Japanese kanji.

On the other hand, for foreigners unfamiliar with Japanese, reading can be known from Romanization notations but, there are cases in which readers cannot tell the accurate pronunciation from them. For example, "東京" is described as "Tokyo," but readers

cannot learn the actual pronunciation "tókio" from the notation.

These were issues for domestic and foreign users when communicating through geographical names.

4. Web provision of geographical name information in vector data format

The GSI has experimentally provided a web map service in a machine-readable vector format, as a vector tile map service in GeoJSON format, from 2014 and has subsequently added geographic features to be released. From July 2017 GSI began providing geographical name information on the website. In addition to the geographical name in Japanese Kanji, the information in the vector form also provides the reading and Roman alphabet descriptions of the Japanese kanji. With this, users can quickly confirm the readings of the geographical names by reading the written information.

Furthermore, by using the voice reading function (*) of a web browser, users can learn the unique pronunciations of the geographical names by sound. This feature makes it possible for a traveler who is unfamiliar with the geographical names in Japanese to grasp accurate pronunciation of the name; it enables them to communicate smoothly when understanding their current locations and destinations.

Besides, it can also be helpful for domestic users by facilitating communications through geographical names and in contributing to standardization of readings of geographical names.

5. Conclusion

Provision of geographical name information in vector form and geographical name speechreading service are effective for communication regarding place names, and it is expected to widen the range of their use.

After experimental vector format provision, GSI aims to provide it as one of official web map services from the year 2019. Also, toward the Tokyo Olympics and Paralympic Games in 2020, GSI plans to release geographical name information in international official languages.

*1 Experimental provision of vector tile

http://maps.gsi.go.jp/?ll=35.682503,139.789245&z=16&base=ort&ls=experimental_anno&cd=f4&vs=c1j0l0u0&d=1



Figure. Sample web map in vector tile format

(*) On browsers with voice reading functions (Chrome、Safari), users can play voice readings by clicking the natural feature names and residential geographical names with registered Japanese readings.