Improving Geographical Data Finder Using Tokenize Approach from GIS Map API

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Abstract-This Paper presents a novel approach to geographical data finder by combining the tokenize algorithm. Improper correctness of Geo location data lapse performance of GIS based applications. In this work, Geo location data is found using tokenize algorithm. This paper describes about tokenize method which provide correction of geographical location for map. We have experimented on tokenize algorithm using RPSC Examcentres information of Rajasthan in India. Geographical finder tools have been implemented based GIS map API. This work gives a dynamic approach for finding latitude and longitude for spatial database.

Keywords- Geographical spatial data, GIS based applications, Tokenize algorithm, GIS Map API.

I. INTRODUCTION

Our Earth has located on GIS map that divides it into various geographical locations where lives all people. People requirements have been increased from earlier days for GIS Information system. People want easiness for searching any geographical location on GIS Map. They should require GIS based applications for finding direction one place to another place. GIS based applications need to geographical information data which belong to latitude or longitude for show location in GIS map. GIS map has many applications which locate geographical information data such as Google map, Arc GIS map. Many organizations are developing GIS based application using Google map or Arc GIS map. The development of applications need of latitude and longitude for particular location. To purpose for locating location in GIS map, it is very crucial to find out rigorous location on map. For Example many organizations such as Rajasthan public service commission conduct the examination in different-2 cities or regions. The cities have more than 5000 Examcentres.

Organizations want to locate Examcentres on GIS Map, but it requires Latitude and longitude for locating location on its Examcentres on the map where we will be find it. This question is also one emanating research for Geographical information system. To solve this question, we proposed tokenize algorithm which will be used to find GIS data from maps and direction between two places also. Tokenize approach work on Geographical location name entities. The Geolocation is divided into token and find latitude, longitude of these locations based on it.

The Reminder of this paper is organized as follows: The Section 2 describes about the problem which had faced by existing methodology. Section 3 explain our tokenize methodology to solve problems which identified in the existing methods. It gives tokenize approach which implemented on Google Map API. Section 4 consists of evaluation and result of this experiment. Section 5 we conclude about paper.

II. PROBLEM ANALYSIS OF EXISTING METHODOLOGY

When, we were developing a GIS based application for Rajasthan Public service commission in India. Our problem is that we had not Geospatial location database of Rajasthan which had 33 districts and 3345 Examcentres location. To solve this problem used Google map API which could retrieve existing Geo location data. There are two methodologies which retrieve latitude, longitude from exiting the GIS map. But Many Problem occurred with these methodologies.

A. Using Google Map Web Service with XPATH method

```
XmlNodeList objXmlNodeList =
objXmlDocument.SelectNodes("/GeocodeResponse/result/geometry/location");
```

XmlNodeList class creates request for google map API web service.

A. Using Geocode class.

```
GeoCode geocode = GMap.geoCodeRequest();
```

Geocode class is used for get information data from the GIS map. It request to Google Map API for retrieving Geo information spatial data.

When we are putting address as input in both methods .These methods give only 10% Geo spatial data which contains latitude and longitude geographical information for location address on the GIS map. For Example: When we provide an input string into Google map preview such as Sophia (Hindi) sr. Sec. School, Ajmer, Rajasthan. It could not show results on the Google Map.

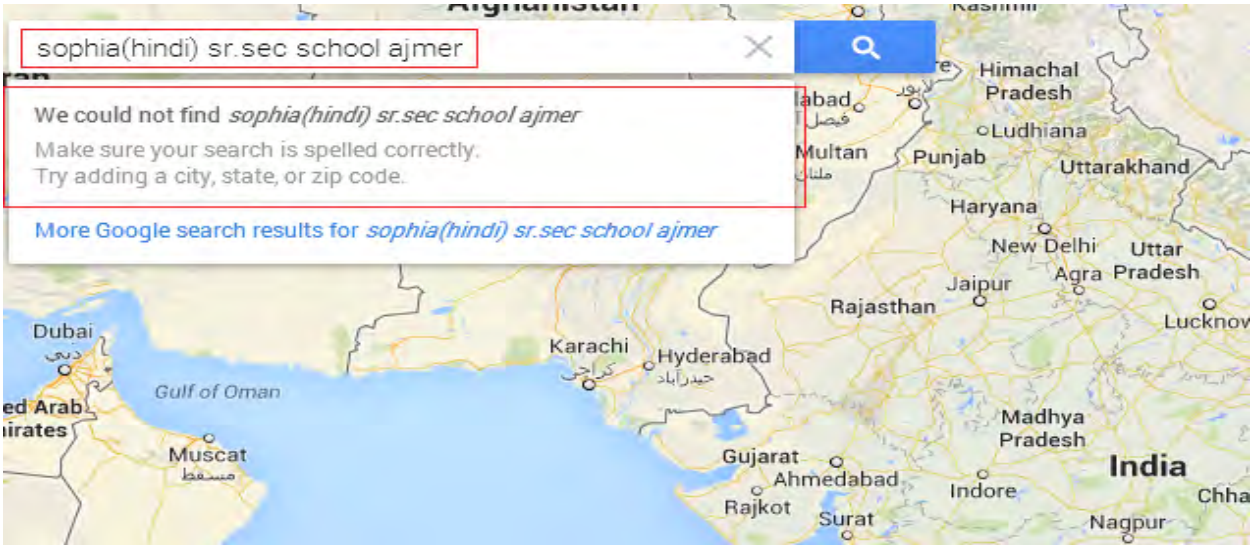


Figure 1. Problem Analysis of GIS Map for Geo location data

When, we give input Sophia school, Ajmer, Rajasthan in the search box of Google map it provides results. It provides result on a GIS map for location address which is inputted in the search text box. The problem is analyzed about improperness of the phonological structure of Examcentres name and its address with existing phonological entities on a GIS map.

III. TOKENIZE ALGORITHM AND IMPLEMENTATION

The objective of our work is to retrieve accurate Geo spatial information such as latitude and longitude from location address. We have implemented tokenize based approach to solve the problem of existing methodologies. Tokenize approach divides input string into tokens and combine it. Combination of tokens used to retrieve Geo location data from the GIS map using existing methodology. The process of tokenize algorithm described in fig.3. In this approach, we cannot get Geo spatial data from Location address. We retrieve Geo spatial data based on the street and city address.

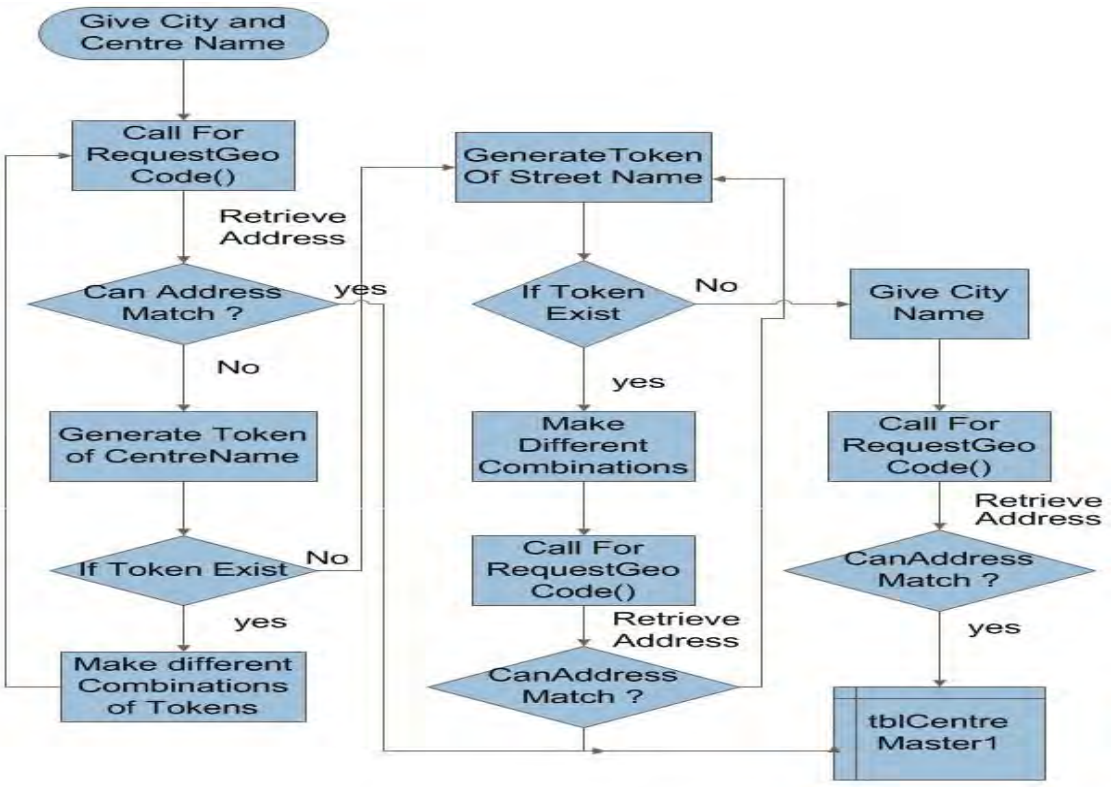


Figure 2. Approach of tokenize Algorithm for finding Geo location spatial data

Implementation of Tokenize algorithm interface is shown in figure 4.

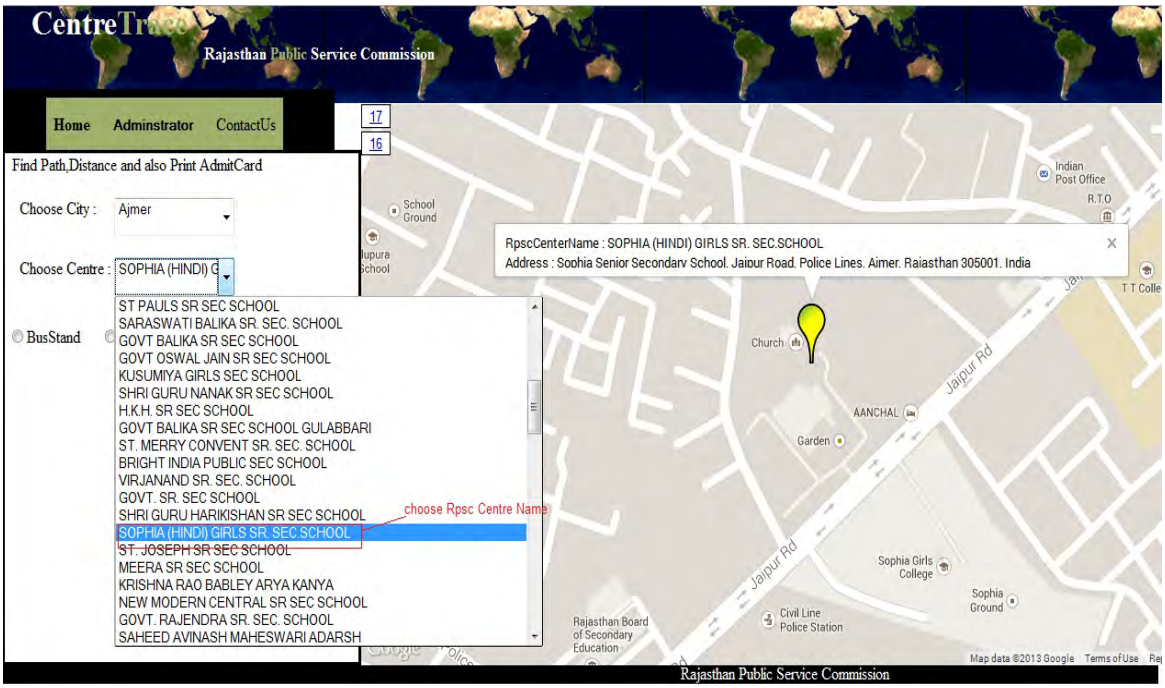


Figure 3. Interface for Tokenize Algorithm implementation

IV. EVALUATION AND EXPERIMENT RESULT

A. *Evaluation Metrics*

Accuracy- The main objective of our system has to find a more accurate Geo location on map. Thus, we conducted accuracy tests on evaluating data. We separately calculated accuracy for correct information Place name, street name of place and city name also. To measure the quality of accuracy, we have used following formulas.

$$Accuracy\ of\ place\ name\ (\%) = \frac{\text{Total No. of correct place latitude and longitude Geo spatial database row}}{\text{Total No. of row in Geo spatial database}} * 100 \quad (1)$$

$$Accuracy\ of\ street\ name\ (\%) = \frac{\text{Total No. of correct street latitude and longitude Geo spatial database row}}{\text{Total No. of row in Geo spatial database}} * 100 \quad (2)$$

$$Accuracy\ of\ City\ name\ (\%) = \frac{\text{Total No. of correct city, latitude and longitude Geo spatial database row}}{\text{Total No. of row in Geo spatial database}} * 100 \quad (3)$$

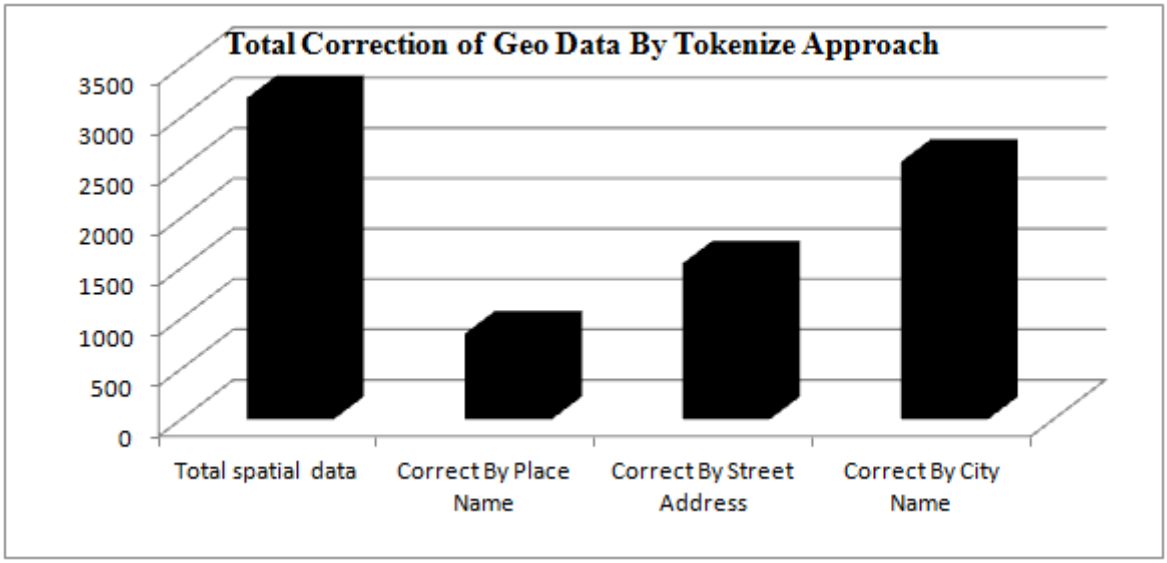
Table I show the test set which has performed on the Geo spatial database

TABLE I TESTING TABLE

TEST SET 1	CORRECT PLACE NAME GEO SPATIAL DATABASE ROW	849
	CORRECT STREET NAME GEO SPATIAL DATABASE ROW	1583
	CORRECT CITY NAME GEO SPATIAL DATABASE ROW	2556

TABLE II ACCURACY FOR TEST SET 1

TEST SET 1	ACCURACY (%)
BY PLACE NAME	33.45%
BY STREET NAME	66.56%
BY CITY NAME	96%



The average accuracy of the Geo spatial database is 65%.

Figure 4. Evaluation Result for Test Set

V. CONCLUSION

In this paper, we constructed Geo location data finder using tokenize approach. If tokenize approach could not find the accurate Geo spatial data for particular locations. Then developers have to statically enter data in spatial database which is a difficult task. Our experiment shows that Geo data can be easily found based on tokenize approach. Our system achieved accuracy 65% of correction of latitude and longitude of giving location names. In future we will extend our work with more accuracy of system to improving tokenize approach.

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