

Use of Sentiment Analysis and Semantic Web to create Smart Map**Sunita Dambhare¹, Prof S. J. Karale²**¹Yashwantrao Chavan College of Engineering, NagpurSunitadambhare28@gmail.com²Yashwantrao Chavan College of Engineering, Nagpursjkarale@gmail.com

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ABSTRACT

There are various limitations of the current web like high recall, low precision or search result are highly sensitive to vocabulary because of this next generation web i.e., Semantic web is used. In Semantic Web information is given in well defined and meaningful manner. Proposed system takes the advantages of Semantic web. In proposed approach we used Google Map API to create Map. And used as front end to select particular place called entity. Main aim of the system is to change the way we Map the entity. Once a Map entity is identified Semantic Web i.e., DBpedia is used to retrieve the information about select entity. After that comments, review also called tweets related to that select entity is displayed on Map form Twitter. Sentiment analysis could be applied on this tweet's to show the opinions, sentiments, evaluations, appraisals, attitudes, and emotions of other user towards entities.

Introduction

Think about the steps you would have to take to gather the information about particular place, restaurant or hotels when you are going to plan a trip. The amount of search methods and data sources people need to consult keep growing and which creates the overhead on people. For example if people want to find the good place to eat definitely they will search on Google to get information about place and search on Yelp, Tweeter or foursquare tips to know the user opinion about the same things. If we consider the current web there are various limitations of the current web like high recall, low precision and search result are highly sensitive to vocabulary. Like if we search on Google for Apple it will get the result as APPLE fruit as well as APPLE phone and its accessories in the form of web pages and images and it's our overhead to identify what we are looking for apple fruit or apple phone. Also it's very difficult to user to get desired result of search entity because number of result is high. Due to this next generation web called semantic web is used to get the information about search place. In proposed approach we are going to use DBpedia as semantic web to get the information about select entity.

The proposed approach is aimed at changing the way we Map the world by using the semantic web, social media integration and sentiment analysis. The rest of the paper organized as follows. Section two gives the details about the overview of DBpedia Semantic Web. Section three gives the brief overview of Sentiment Analysis. Section four provides an overview of related work. Section five focused on proposed approach toward the building Smart Map application. Section six concludes the paper with future work.

DBpedia: As a Semantic Web

Basically function of the current web is to build a source of reference for information on several subjects. Semantic Web is actually an extension of the current which is designed to build a web of meaning. Meaning that it allows our computer to combine and reason with information from multiple sources just as we do ourselves when we search and browse the web. In short Semantic Web is place where computer do presentation easy and people do the linking and interpreting hard.

DBpedia is the semantic web, it extract structured information from Wikipedia and make this information available on the Web. It uses Wikipedia as knowledge source to extract

information. DBpedia site contain information from 3.5 million of pages in Wikipedia. Wikipedia actually has two big roles in Semantic Web such as:

- A huge source of data.
- A set of canonical URL to defines many real world entities.

For each entity DBpedia defines a globally unique identifier. Over the past five years the DBpedia knowledge base turned into a crystallization point for emerging web of data. The core of DBpedia consists of an infobox extraction process. Infobox are template contained in many Wikipedia articles. They are usually displayed in the top right corner of articles and contained factual information.

DBpedia resources

A DBpedia resource consists of a number of properties that contain factual information and relationships with other data. Following are the three properties of DBpedia.

- **Classes:** It contains the type of the resource, e.g., populated place, company, music group or architectural structure. All of these are part of an extensive class vocabulary created by DBpedia.
- **Categories:** It holds a number of list that resource is a part of e.g., Mexican restaurants, companies based in Sacramento, American female guitarists and more. Each of these categories helps to identify and filter the resource.
- **Abstract:** Provide a brief description of the resource.

SENTIMENT ANALYSIS

Sentiment analysis is the process of analyzing people's perspective and emotional conditions. Root of the sentiment analysis is disciplines of psychology, sociology and anthropology. Feelings that are generated from both conscious and unconscious processing are called emotions. The feelings of the people can be expressed in positive or negative ways. Mostly, parts of speech are used as feature to extract the sentiment of the text. Sentiment analysis (opinion mining) includes categorizing beliefs in words into classes same as "positive" or "negative" frequently accompanied by an implied class of "neutral". There are Three main classification levels in Sentiment Analysis which are document-level, sentence-level, and aspect-level Opinion mining (Sentiment Analysis).

- **Document Level Sentiment Analysis**

The task at this level is to classify whether a whole opinion document expresses a positive or negative sentiment. For example, given a product review, the system determines whether the review expresses an overall positive or negative opinion about the product. This task is commonly known as *document-level sentiment classification*. This level of analysis assumes that each document expresses opinions on a single entity (e.g., a single product). Thus, it is not applicable to documents which evaluate or compare multiple entities.

- **Sentence level sentiment analysis**

The task at this level goes to the sentences and determines whether each sentence expressed a positive, negative, or neutral opinion. Neutral usually means no opinion. This level of analysis is closely related to *subjectivity classification* which distinguishes sentences (called *objective sentences*) that express factual information from sentences (called *subjective sentences*) that express subjective views and opinions. Group conclusion to be communicated in every sentence is intended by Sentiment Analysis. Distinguishing whether the sentence is subjective or objective is the principle step. When the sentence is subjective, if the sentence communicates positive or negative assessments is figured out by Sentence-level SA.

- **Aspect or Entity level sentiment analysis**

Both the document level and the sentence level analyses do not discover what exactly people liked and did not like. Aspect level performs finer-grained analysis. Instead of looking at language constructs (documents, paragraphs, sentences, clauses or phrases), aspect level directly looks at the opinion itself. It is based on the idea that an opinion consists of a *sentiment* (positive or negative) and a *target* (of opinion).

An opinion without its target being identified is of limited use. Realizing the importance of opinion targets also helps us understand the sentiment analysis problem better. For example, although the sentence "*although the service is not that great, I still love this restaurant*" clearly has a positive tone, we cannot say that this sentence is entirely positive. In fact, the sentence is positive about the *restaurant* (emphasized), but negative about its *service* (not emphasized).

1. RELATED WORK

Designing a Map and adding location to Map is not a difficult task. There are various ways to

discover a location on Map like Google Map, mobile application with built in section where we can see places. Following are the tool by using which we can create our own Map such as:

- **Smart Map**
- **Google Maps Engine**
- **Mapbox**

In all these tools datafiles are used for creation and designing of Maps. These tools support very specific design of Map feature like provide the control to change road colors and labels. But does not use the concept of social media integration and simplicity provided by the semantic search. Each tools covers a specific area – either Map design or addition of location to the Map but none of the existing tools takes the advantages to semantic web. There are various other site which provide their own Maps but they are limited to their own information.

If we consider the sentiment analysis there are various application which apply the sentiment analysis to know the user perspective. For example Sentiment analysis is apply on Amazon product reviews [2].Also apply the sentiment analysis on tweets to know the overall views about the company or political figure[5].

But no existing application or tools use sentiment analysis for Mapping purposes, *e.g.*, retrieving tweets regarding to particular venues.

NewsStand is tool has been invented by researchers from University of Maryland in which articles are retrieved from hundreds of RSS news sources and displays them on Map. This tools allows user to navigate to the specific areas of the Map where they want to get news from [6]. This application is similar to proposed approach in the sense that it retrieves information from different sources.

THE PROPOSED APPROACH

Smart search through Semantic Web

The proposed system takes the advantages of semantic Web. The main objective of proposed system is to change the way we Map the world. The first step of system is to select an entity you would like to get information about or select place in the Map. The proposed system is based on the use of the DBpedia Lookup service to perform entity extraction task.

What is the DBpedia Lookup Service?

DBpedia Lookup Service is a web service that allows the retrieval of DBpedia URIs(resources) by comparing given text with related keywords.

This means that either the label of the resource matches, or an anchor text that was frequently used in Wikipedia to refer to a specific resource matches.

The proposed system used Google Map API to create Smart Map. Once the Map is created user need to select the search entity whichever they want to search on Map. After selecting place on Map, information about select place is retrieve from DBpedia and display it on Map. Abstract extraction method of DBpedia is used to retrieve the information. There are two types of abstract available in Wikipedia articles such as:

Short abstract: is the first paragraph from a Wikipedia articles and is represented in DBpedia by `rdfs:comment`.

Long abstract: is the whole text before the table of contents in an articles which is represented by `dbo:abstract`.

In proposed system we `rdfs:comment` to retrieve short information about select place *i.e.*, short abstract.

Sentiment Analysis

After that to know what people says about the select place *i.e.*, views and opinion of people is display on Map in the form of Twitters review or comments also called tweets. Here Sentiment analysis plays an important role. By applying sentiment analysis on tweets proposed system can show the positive or negative response of people about the select place.

Instagram

To give some visual effect proposed system used Instagram images. By using API of instagram it will show the images about the select place from Instagram on Map.

2. CONCLUSION

The main objective of proposed system is to change the way we Map the world. This can be achieved through the use of semantic web, Sentiment analysis on review. Wikipedia is one of the largest knowledge source of mankind and the largest encyclopedia on the web with being the seventh most visited website according to dexa.com. Wikipedia is available more than 280 languages. However despite its success there are some issues such as: Search capabilities are

limited to keyword matching. Inconsistencies may arise due to the duplication of information on different pages. Because of this to improve search result proposed system used DBpedia to retrieve the information about select place. Which take the advantages of semantic search.

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