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Semantic Web-Based Travel Guide.

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ABSTRACT

The traditional databases contain unrelated data over related tables. Our aim is to create a web application that would access a database made by the help of knowledge base. By this, the data would be highly structured and interactive with one another. Using SPARQL it would be easy to query this structured data. This is a better way to store and manipulate data than the existing technologies available. There will be a frontend that would interact with the user while the backend will provide information to the user so that he/she doesn't find any problem while traveling to anywhere. Moreover, due to the extensive relational capabilities of the knowledge base, the querying will be faster than before using a normal SQL database.

Keywords: SPARQL, NLP, Travel, Tourism, Protege, Query and Knowledgebase

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INTRODUCTION

We human beings love to visit new and interesting places and every year people spend millions on these trips and tours. We all have a different taste while selecting a place as a destination. And most of the time we are unaware of the possible options available which match our interests. Also, the places where we go are most of the time new to us[2]. We have no idea about people, culture, languages present there and best mode of transport available. This system can also attract foreign tourist to India. And this can help in promoting the Incredible India Campaign and ultimately will add up few bucks in India's economy [3].Moreover, we could also witness a huge uplift in the tourism sector which will be both indigenous as well as from foreign countries.

The main idea behind the paper is to develop a web application which helps tourists to find the better place at one instant. The long time which people waste on searching for the better places like Hotels, museums, etc. for their enjoyment in any new city which is totally unknown to them will get reduced if they use this application which built on a much better base. Hence this idea is very new and useful for all those who love to travel in a new city on a regular basis. This paper is about tourist guide system, how the tourist will get the best use of the application according to his/her point of interest.

RELATED WORK

After the development of tourism industry, enriched travel data provided on the Internet. But, a problem still exists that tourists usually don't get travel information on time and in an efficient way, when they are away from their personal computers. In this paper, we propose an architecture for a semantic web based travel guide system that can provide tourism information to the mobile and computer end-users conveniently. Some of the papers describe a location-aware travel guide prototype that was implemented by a phone with API support[4]. It contains related information that could assist users when they arrive at a particular destination. Today the conventional sites including travel sites are built on top of the relational database. In today's sites prediction of correct places according to affordable prices was not there. Now the query time and response is comparatively slow which doesn't help the user a lot. In this research, we propose to expand tourist coordination and integration towards complete support by employing all the technologies mentioned above. The main confront of our system is to provide a seamless flow of relevant information and service resources anytime, As well as the guarantee of personalized assistance and automation to the tourists, each having various preferences and support requirements that often changed during the trip. With the help of ontology, the system can help tourists better comprehend their wants and preferences collaboratively, so that the appropriate information and services resources you located from the Semantic Web[5]. Scalability and flexibility, tourists cannot be flexibly assisted in a centralized manner. The aid of increasingly acceptable mobile devices becomes the backbone in enabling such technologies.

METHODOLOGY

Why do we need such a system? There are several reasons behind this fact. Tourism is an information-dependent industry with a long value of chain. Features of tourism marketplace lead to many challenges. One of these is growing need for interoperability between information systems allowing information exchange between different tourism organizations. The traditional solution for existing problems was to develop interfaces between each pair of communication systems, but development and maintenance of such programs were too expensive. As a result there are some global standards used by large companies for the needs of small companies but used on a national level. Tourism is a very competitive business all over the world. Competitive advantage is driven by the advancement of information technology and innovation. Currently, the Internet is the primary source of tourist destination information for most of the travelers.

SYSTEM DESIGN

The system requirements classified into two broad types, and they are functional and nonfunctional requirements.

Functional requirements: The tourist guide system allows different types of users to interact with the system according to predefined privileges. There are two main users of the system: administrator and tourist.

The administrator application: This application provides the administrator with tools to manage the information of the tourist guide. The following are some features available to the administrator :Access the system, Import and export the system's database,Send email immediately containing the new password whenever the user changes his/her password,Administer the basic data and information of the system: hotel, restaurant,monuments,hospitals,companies etc. This application provides the tourist with interactive tools (web-based)to use the system services. The following are some important features provided to the tourist ,Create (and change) account password,Search for information of hotel, restaurant, monuments, shops,hospitals and companies,Hotel, restaurant and cinema-ticket bookings,Displaying the shortest path between the source and destination the visitor specifies, Non-functional requirements: Here we have verified and proved the system's aspects and interfaces that are not directly related to the functional behavior, such as usability, reliability, supportability, performance and security: Usability: Is the system providing a flexible user interface that can be used easily by all the users? Does the system have one or more obvious components which allow the user to search easily? Are the system applications easy to use by the tourists? Is the system adaptive to user needs? Supportability: Can the system be easily modified or extended easily? Can administrators add materials easily? Contents and Design: Are the design and contents of the system satisfactory to tourists and system administrators on an equally satisfying basis? What are their feedbacks? Does the system cover all the topics well? Are they useful and meet their goals? The quality of texts, images? Performance: Are the performance requirements concerned with quantifiable attributes of the system, such as response time, throughput availability and accuracy? Flexibility: Is the system flexible, because it will be used regularly with a new set of initial data and can it accommodate changes in databases such as modifying the contents? Security: Is the system preventing unauthorized users from accessing the system?

Any effective web-based system should have an easy graphical user interface (GUI) that facilitates its use and flexibility. Thus the proposed system should possess a good GUI that is suitable for the potential users. The interface should be looked after by its users and updated whenever necessary. The tourist guide system interface is entirely web-based and doesn't necessitate any technical skills from the potential users. The system is appropriate for web-based search, with access to the Internet. Database design: Database is a very important component of our system. We have used Microsoft SQL Server database as a database management system (DBMS). Work in travel and tourism industry is more specifically concerned with providing services and help for people who are quite far away from home, on business trips or holiday. Travel types can be leisure travel involving package tour, pilgrim travels, adventure travels, etc. or for pure business. Work at every functional or non-functional level in the industry involves working and serving directly with people.

Travel company people and websites must be up to date on current rules and regulation and documents required, in areas like cargo stuff, tickets and passport, visas, etc. so as to correctly advise the clients, and to take care of paperwork whenever necessary. Besides this, all tourism staff in marketing, counter suited sales, or guide providing services, should be well informed about the places their clients might visit, regarding general backgrounds, how to comfortably get there, various connections by air, rail and road and the different facilities available. As a very large industry, it consists of Government tourism department, Immigration, custom services, travel agency, airlines, tour operators, etc. and many associated service industries such as catering or laundry services, guides, interpreter, tourism promotion and sales executives, etc.

DESCRIPTION

with all these points in mind, we decided to build a website to handle these common glitches while providing a base of web 3.0 so that it is long lasting and better in all terms. Given below is a sample depicting the front end of the project following which a flow chart given that describes the flow of the whole project. First of all the user enters a natural language query[6]. This natural language query could be anything related to traveling or the amenities present nearby. The first processing step here is that the patterns which are so common in day to day life enlarged into separate words for easier further processing. This is done by accessing the regex (regular expression) file already made to compare and replace pattern if needed.

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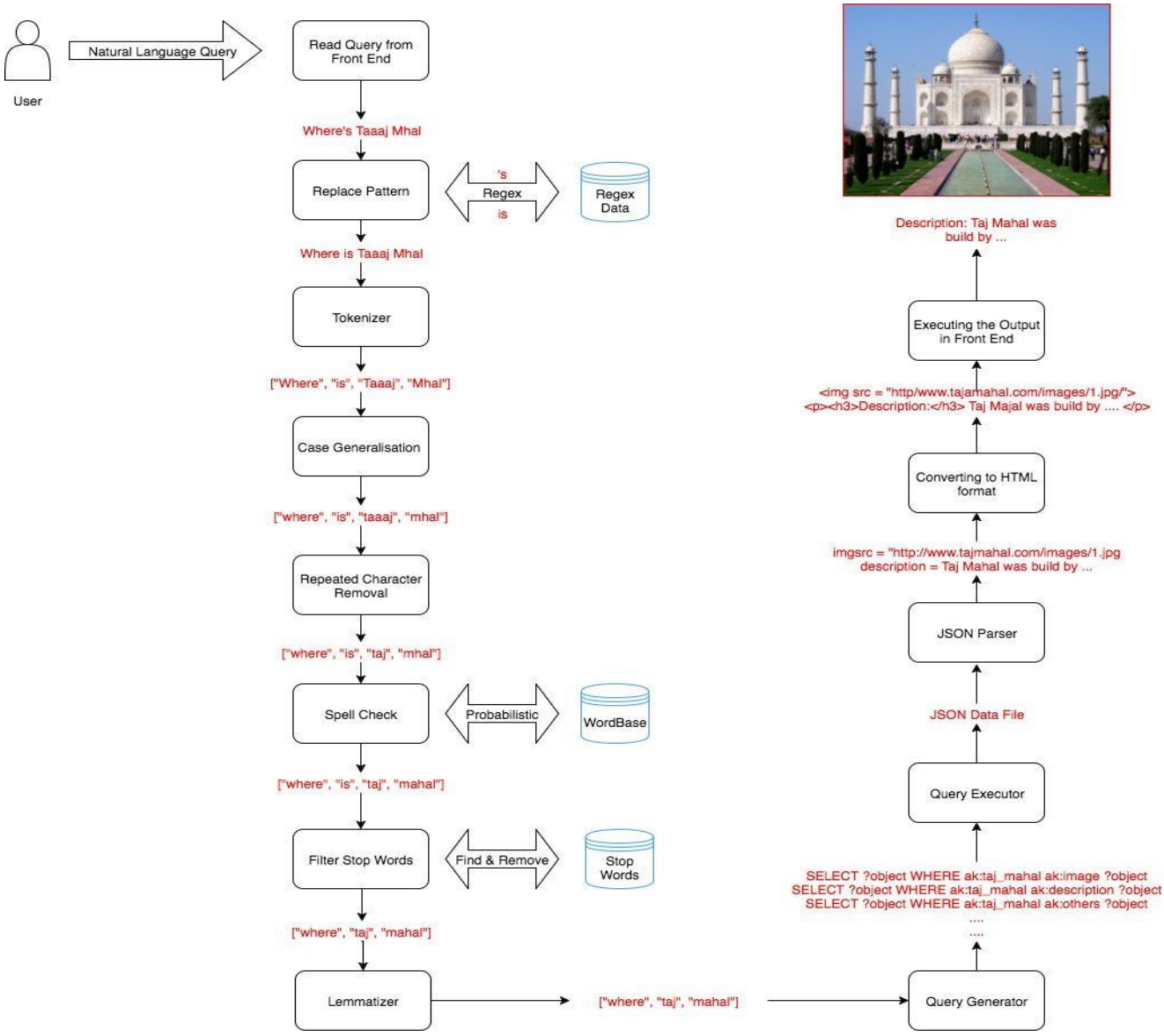

Fig 1.2. Flowchart

The next step is to divide the query into tokens. This process is done by the tokenizer which divides a string of words into separate tokens for further processing. The next task is that of case generalization where all the tokens converted into lowercase for ease of use using the usual string to lower function definition of python. The further step includes removal of the repeated characters by checking and comparing from the corpus. After that, the spellings checked from the word base. Based more on the probability of which is the most fitting word according to the usage. Further step is to remove the stop words such as a, an, is, etc. This is done by checking and comparing against a stopwords.txt fie which contains a list of all the stop words. The next job is of lemmatizer to take out the stem word in its original form. After that an SPARQL[7] query is generated that queries on an owl file to fetch the correct result. The owl file is made using protégé[1] and acts as a knowledge base. After this the output is converted into HTML (Hyper Text Markup Language) type using HTML wrapper and CGI (Common Gateway Interface).The final result is displayed on the website. The following are some screenshots regarding the project.

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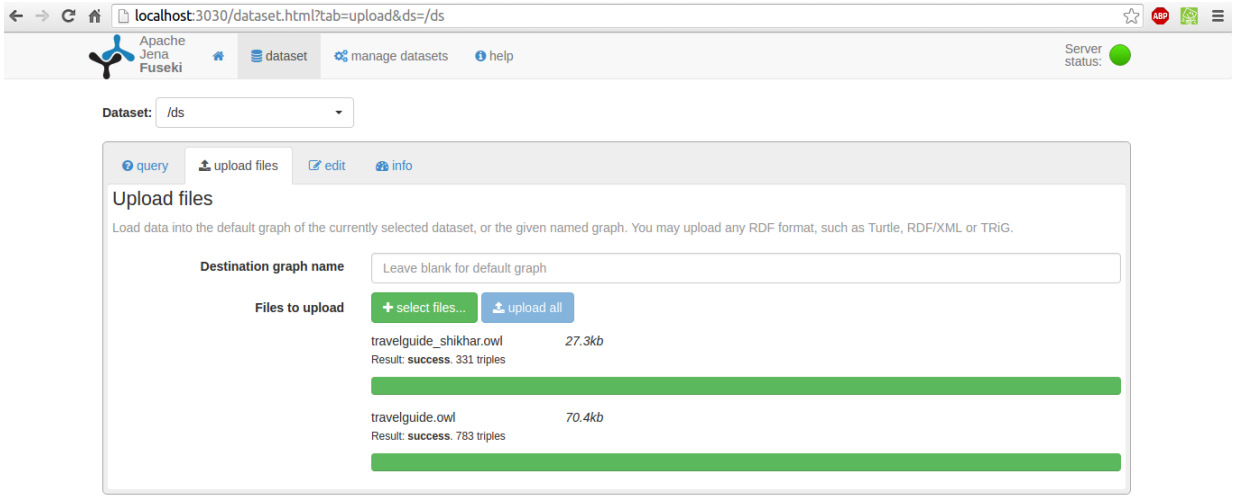

Fig 1.3. Uploading OWL files

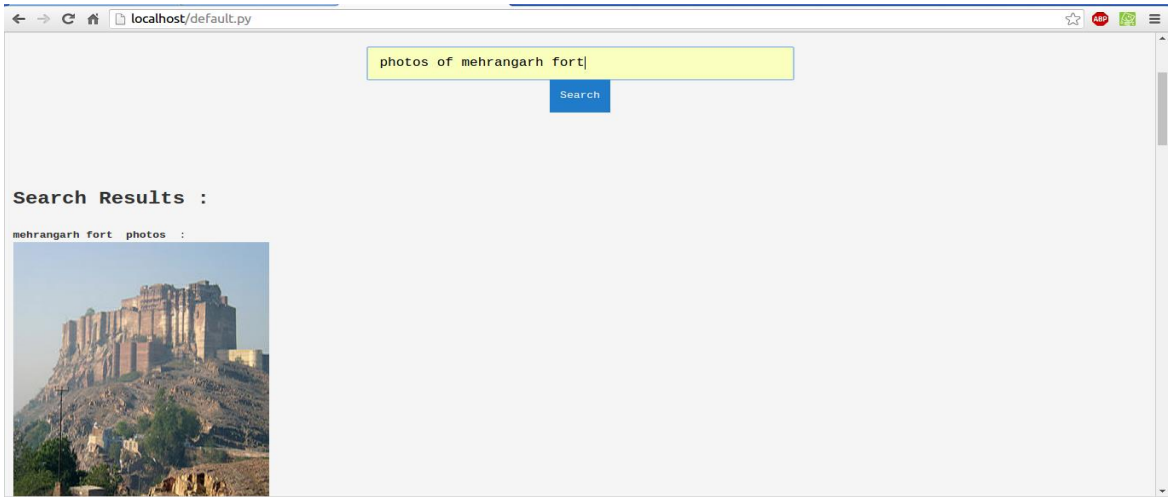

Fig 1.4. Sample search result

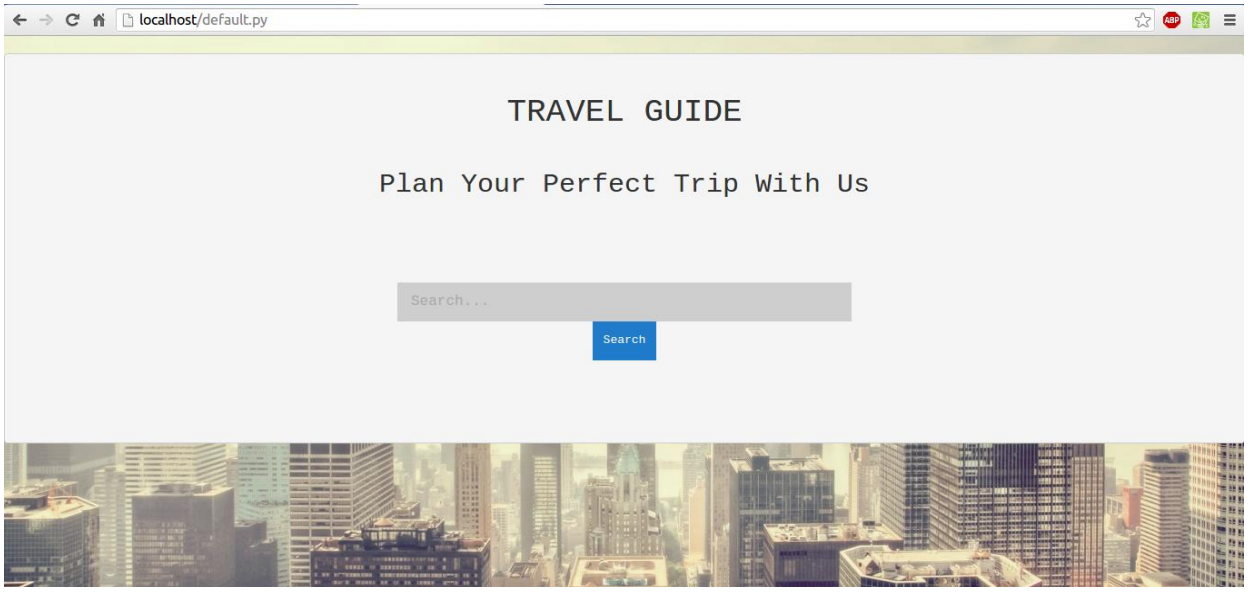

Fig 1.5. Front end

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The screenshots show the basic working of the project as to where the actual data is added i.e. OWL files. The data is stored as triples in the form of the subject,object, and predicate,which makes it so easy to query on it using SPARQL.

EXPERIMENTAL RESULTS

When we entered “famous food in mehrangarh fort” we got the following result,

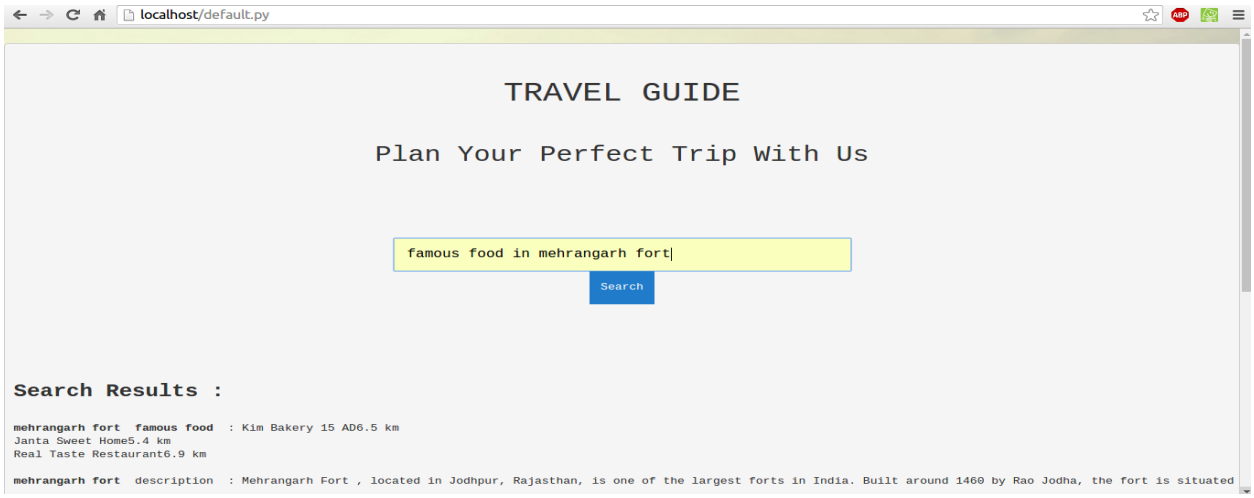

Fig 1.6. Example 1 showing a set of results

When we entered “where is mehrangarh fort” I obtained the following result,

Fig 1.7. Example 2 showing another set of results

CONCLUSION

We have provided a base of the semantic web for the searching and retrieving purposes. Also, the given knowledge base that is made with protégé is highly efficient and is the future too as it stores data as triples. Travel and Tourism always an ever increasing option for people around the world and hence this a good choice of the web site to deploy semantic web on. Work in the travel and tourism industry is essentially anxious with providing services for people who are gone away from home, on business or holiday. Work at every functional level in the industry involves dealing directly with people.

Travel companies must be up-to-date on current rules and regulations and the documentation required. Besides this, all tourism staff in marketing, counter sales, should be knowledgeable about the different places that their clients do visit, in terms of general background, how to get there, connections by air, rail and road and the facilities available.

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