Infectious Disease & Its Agent in Semantic Behavior

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Abstract: Disease are very common in everyone's life. The uncomfortable state of body which cause some symptoms to the disease. Symptoms are the key agent of disease. The knowledge about disease are very important for everyone's. Care at early stages is very helpful to stop the becoming disease dangerous. In this paper our aim is to store the information of infectious disease and its associated agents in sematic behavior. Semantics is the collection the meaning vocabulary for the specified domain.

IndexTerms **- Disease, Agent, Behavior, ontology, Information Retrieval etc.**

I. INTRODUCTION

By the volatile progress of data on World Wide Web, it has become an actual dare for Web consumers to discover and access appropriate data. Single probable method to speech this contest is monogramming the consumer's Web involvement [1]. Web involvement [2] is the procedure of modifying a Web spot to see the requirements of every precise user or group of consumers, by captivating benefit of the information developed over the examination of the user's directional behaviour. Semantic web is the way of knowledge representation in semantic form. Ontology are the one the pillar to achieve the goal of semantic concepts.
The structure of our work is plotted as follows:
1) Collecting the facts of Infectious disease and its agents.
2) Developing the Ontology of semantic facts using protégé.
3) Extraction of semantic facts with their properties and assertions.
4) Summary of the work done by the paper.
There are various tools to construct the ontology using semantic facts. Protégé is the famous tool which is used worldwide to construct the ontology. Semantic Web spreads the content of the existing web with added metadata which enables the work of machineries and mortal with facts [3]. On the supplementary arrow, the vast quantity of existing information on the web makes condition more complex to extract data from knowledge base systems [4]. For that aim, Semantic Web is measured the explanation for this problem through accumulating metadata to the web content, which we call it Semantic annotation.

Fig. 1 Sematic Annotations of Ontology

Ontology is measured as the spine of the semantic web. It describes a list of concepts, constrains, and their relations as an part of data [5] that enables exhibiting, calculation and account of areas through sets of terms [6]. Semantic explanation is the process of allocating dissimilar objects in the text to their semantic explanations as shown in fig 1.

Table 1 Annotation Tools & Description [4]

Annotation Tool	Type of Annotation	Format	Level	Prefixes	Storage
Amaya	Static	Html, XHTML, and XML	Manual	RDF(S)	Local or annotation server
GoNtogle	Dynamic / Static	Doc, pdf, txt. rtf, odt, and sxw	Automatic/ Manual	OWL, RDF(S)	Ontology server
MnM	Dynamic / Static	Html, Xml and Txt	Semi-Automatic	RDF (S), DAML + OIL, OCML	Embedded in web page
AutoMeta	Dynamic / Static	Text	Automatic/ Manual	RDF, OWL	Embedded in web page
KIM	Dynamic / Static	HTML	Automatic	RDF (S), OWL	RDF (S) data base
GATE	Dynamic / Static	Eml, Xsl, Xhm, Xlsx, pdf, xHTML, pptx, txt, and XML	Automatic	RDF (S), OWL	Local or annotation server

II. LITERATURE WORK

In the earliest few ages there is a lot of effort completed to resolve the medical finding problem. Several dissimilar methods were planned to make the diagnosis process cool and wild. The health ontology was shaped and recycle for the management of tropical diseases that act as an Information scheme to signify unchanging and establish way of information about tropical diseases. In chandramouli [7] proposed the cooperative approach for crawling the pages. The URL queue has been ordered based on popularity information retrieved from Web logs. They perform a predetermined order function along with learning algorithms for prioritizing the URLs based on a training set of URLs. In addition to the hyperlink information, ontology is used for determining the relevancy of the page. In jamali [8] used the link structure analysis and content similarity to fetch the web pages. The links in pages are a representation of the author's view about other pages, which is their idea behind the crawling process. In addition, the contents of pages are another source to relate these pages to a domain. The crawler described by the authors initially begins with a single seed page and attempts to retrieve the most related pages to specific domain (Sports) from the Web. The c-panko system (Cimiano) exploits surface patterns and the redundancy on the Web to categories automatically named entities with respect to a given ontology. In Onto syphon (mcdowell & cafarella) populates the ontology with instances through mining the web. The relevance of the candidate instances is identified through the ontology structure.

III. INFECTIOUS DISEASE ONTOLOGY

In first phase of ontology construction the classes for semantic data is identified which is shown in the figure below. In figure 2 human disease is superclass for the constructed ontology which is also a subclass of owl thing. Owl thing is the web ontology super class asserted by the tool as a default. All the asserted and inferred subclasses are arranged below the superclass hierarchy. The asserted classes, subclasses, individuals and instances are added by the programmer or consumer to build the semantic relations. In the figure classes, individuals, annotation and type annotation are shown for the class dengue disease. Annotations shows the description about that instance created for the individual in the concept. Annotations property allow to add the comments for a class, subclass, and individuals of that class in relation for asserted hierarchy. In second phase the object property, restriction are set to fix the boundary on semantic relation. At every stage of modification in semantic relation reasoned is set and initialize to check the consistency of the added information in the corpus.

If the data is inconsistent with created ontology it shows the error and explain the inconsistency using log file created by the reasoner. There are various reasoner available in protégé to check the consistency of ontology installed by default and some can be manually installed using plugin functionality of the protégé.

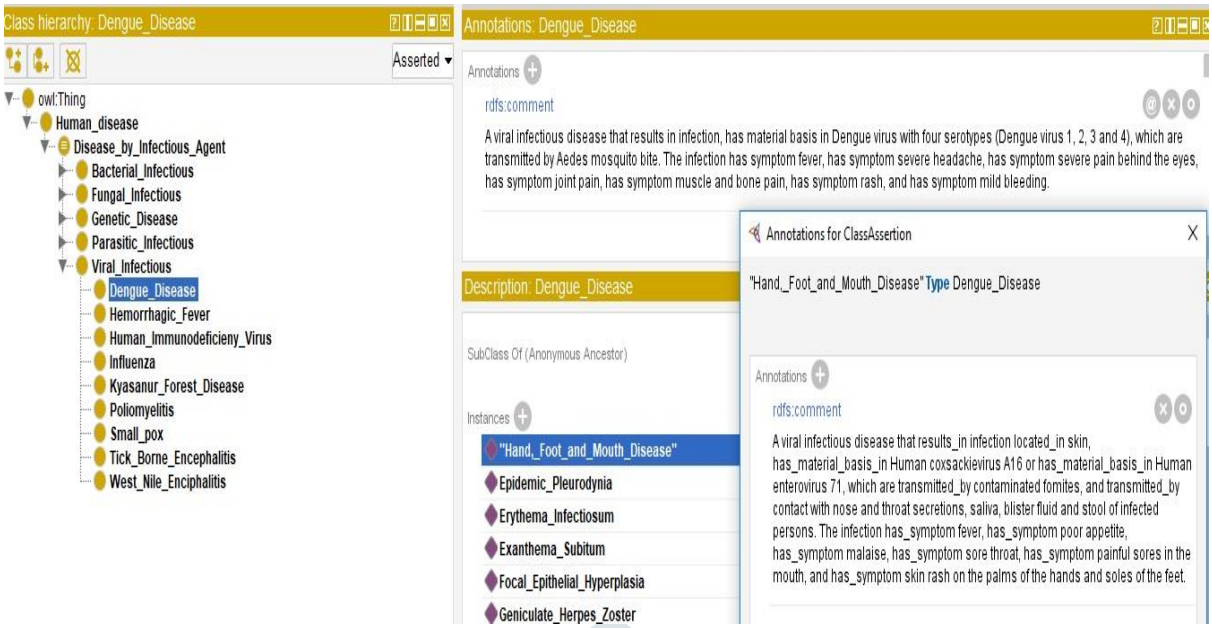

Fig. 2 Classes, Individuals, Annotations for Ontology

In protégé three are two type of semantic properties used for constructing data charts name as object property, data property. Object properties are named label given to connect the super classes, sub classes and classes in a given semantic relation. Data properties are static value given for the object to enhance the functionality of the relation in data charts.

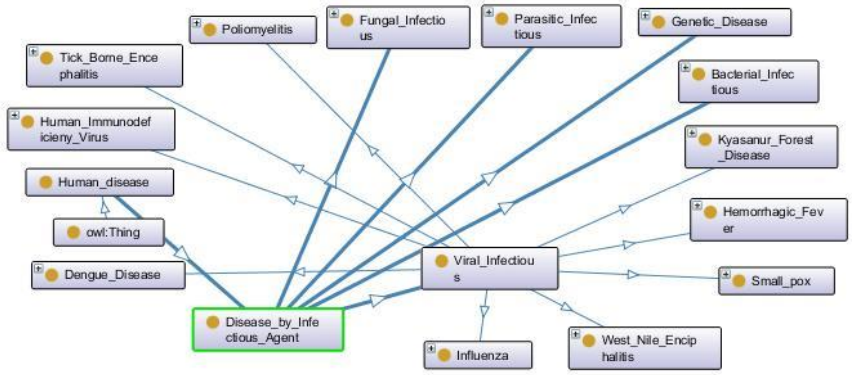

Fig. 3 Onto Graf Created in Protégé

OntoGraf visualization is defined as representation of information in form of graphs. It is used to represent the relation between classes i.e. sub classes, super classes, equivalence classes, individuals, etc. We can expand any class and individual. We can hide any relationship. We can zoom in or zoom out the graph. We can represent the graph in grid form, spring form, vertical directed, horizontal directed, tree form, etc

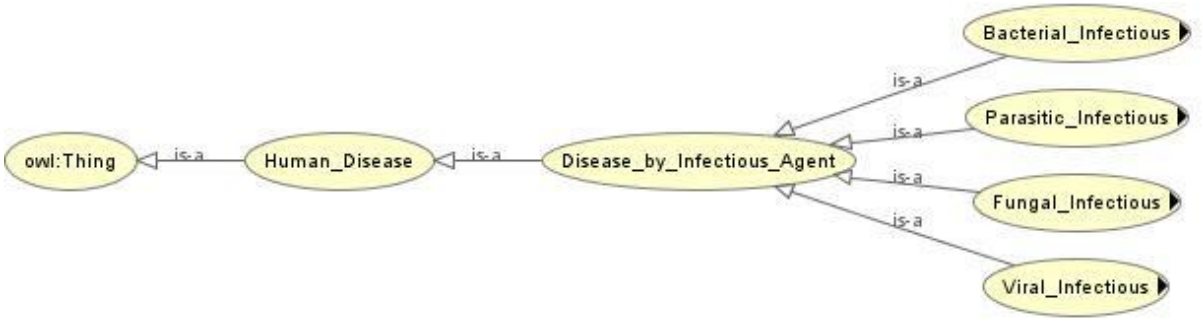

Fig 4 OWL Graph Visualization

Owl is a another way to visualize the semantic relation in the form of data charts in which objects are represented by the circles and relation among is presented by the directed edge labeled with the relation name like bacterial infectious is a disease by infectious agent in the figure 4.

IV. EVALUATION

In evaluation phase query on the ontology is performed to check the ontology completeness. Protege provide the functionality to query on semantic facts stored in different ontology format like rdfs, owl, xml etc. The query is done by DL- query, Sprql query method which is as follws.

In Dl-query the query is written in the the language in which the ontology is construted like in this ontology the query can be done with the name of classes, subclasses and superclasses to extract the information stored in the ontology the output of the query language is also in the form of stored relation.

Sparql is advance form of Dl-query it is somehow similar to the structure query langauge. The input provided in the form of subject and the realtion type the keywords are used like select. The output of the query language is same as the Dl-query in termes of stored relation. Efore querying in the protege the reasoner must be initialized to check the consistency if there is any inconsistency in the semantic relation the output will not be reflecte in the window.

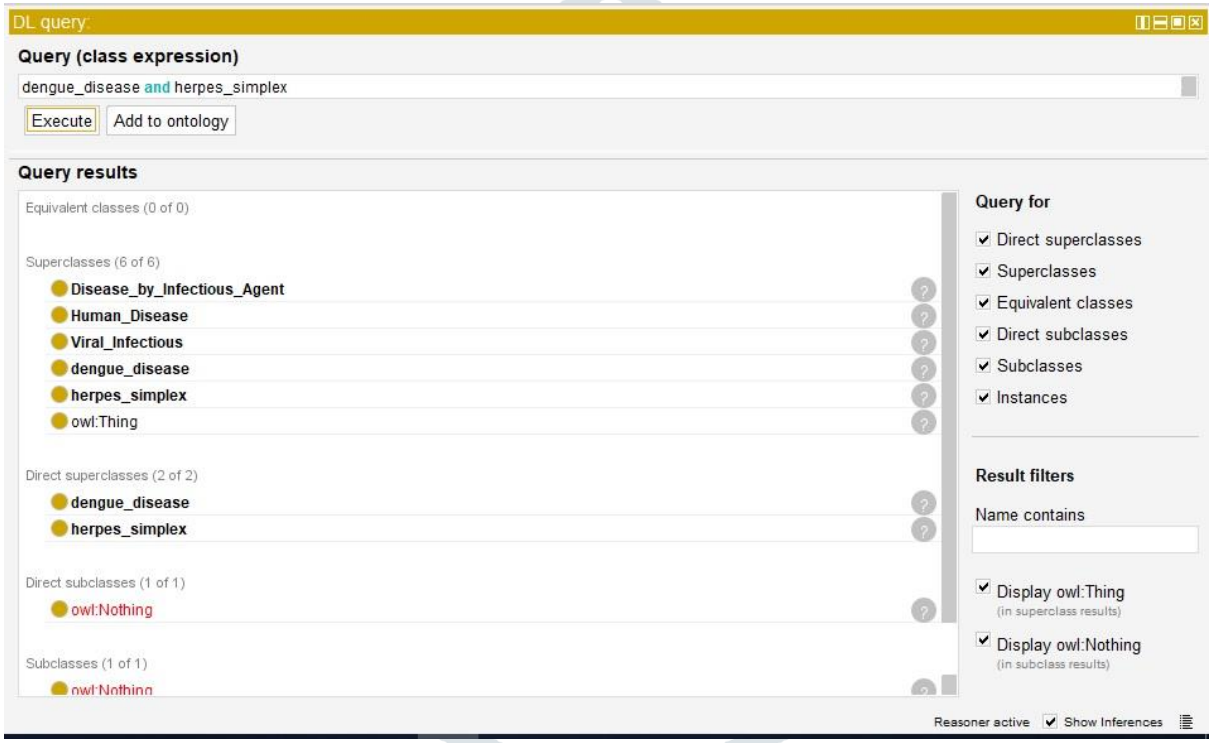

Fig 5 DL- Query Execution Scenario

In figure 5 Dl query is presented to retrieve the result for dengue disease and herpes simplex.

There are two instances in the input query connected by and operator. The output is the intersection of the instance executed by the query logic. Also we can query with the not operator, or operator etc. to extract more relevant information. Additionally the result is filter out by apply the check box like instances, super classes, and so on.

V. CONCLUSION

In this study, we present the ontology construction mechanism for infectious disease. Our paper presents the study of annotation applied on ontology domain and the tools available with their properties. In last the evaluation methods of ontology and their output for the infectious disease ontology.

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