iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 4 **Issue:** V **Month of publication:** May 2016

DOI:

www.ijraset.com

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)

Facets of Semantic Web (3.0)

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Abstract— Ontology represents relationships among set of terms and concepts in hierarchical fashion. Ontology plays crucial role in formulization of information related to given domain. Understanding these ontologies without having sufficient knowledge of ontology editors is like working on project without knowing its requirements. Semantic Web (SW) uses Semantic Web documents (SWD's) that must be combined with Web based Indexing. Information Retrieval Technology is a major factor for handling annotations in semantic web. We view the future web as combination of text documents as well as Semantic Mark Up.

Keywords— Semantic Web, Ontology, Information Retrieval, Semantic Web Architecture, Protege Editor.

I. INTRODUCTION

Semantic Web (SW) uses Semantic Web documents (SWD's) that must be combined with Web based Indexing. It has been a serious problem to extract the information from web because of the large amount of data available in hyperlinks form. Semantic web come up with the solution of this problem. Traditional text Search Engines are not optimal for finding the relevant documents .This problem can be solved by various approaches of ontologies and semantic data. Traditional search engines are based on keyword based searching that is unable to transform raw data into knowledgeable representation data. It is a cumbersome task to extract relevant information from large collection of web documents.

We view the future web as combination of text documents as well as Semantic mark up .In recent years, there was a great demand of Knowledge Management(KM) solutions and are used in organization as tools for performing many tasks. These tasks includes:-

A. Document Management and Workflow Management
B. Web Conferencing
C. Data Warehouse and Decision Support Systems

II. LITERATURE REVIEW

Various Researchers have been laid by researchers in context of generating Fussy Logic. The FOGA framework has been proposed for generation of fuzzy ontology [62]. It deals with the fuzzy formal concept analysis (FCA) and clustering rather than textual formal concept analysis. FOGA method extends FCA approach that is being applied to extract ontologies with the help of fuzzy sets. The fuzzy sets are represented by membership functions. But the FOGA framework failed due to its small database size.

Cimano et.al [63] devised an automatic taxonomy learning algorithm that extracts hierarchical concepts from textual database. The learning algorithm used by them was formal concept analysis (FCA). It is method for deriving indirect relationships among set of objects holding set of attributes. FCA uses textual clustering techniques to generate lattice instead of fuzzy clustering techniques.

Chang Lee et.al [64] introduced the use of fuzzy ontology that includes some concepts related to domain. The attributes (classes, objects) used in designed ontology are predefined by experts. The taxonomy is generated on basis of these predefined concepts rather than discovering concepts automatically.

Mohd. Abu et al.[66] extracts relationship between designed ontology on biological system. The approach saves the basic knowledge related to domain but it needs to be updated from time to time. The text documents are analyzed and the association between two biological entities is represented by fuzzy conjunction operator. It leads to generation of fuzzy relations that are used to retrieve information from medical document called GENIA.

III. PHASES OF ONTOLOGY DEVELOPMENT

A. Specification Phase

This phase has its own activities:-

1) *Domain Vocabulary definition:* - It defines common name and attributes for domain concepts.
2) *Identifying Resources:* - A Resource is anything that has URI. So, if some concepts have number of instances, then they can be grouped into a class.

Volume 4 Issue V, May 2016
ISSN: 2321-9653
International Journal for Research in Applied Science & Engineering Technology (IJRASET)

3) *Identifying Axioms:* - They are structures that represent behavior of concepts.
4) *Identifying relationships:* - Relations are defined within resources.
5) *Identifying data characteristics:* - Defines features of types of resources and their relationship.
6) *Applying constraints:* - Constraints represent named relationships between domain and range class.
7) *Verification:* - After designing preliminary web ontology model, it is necessary that it should be tested for its correctness.

B. Design Phase

The phase is backbone of Semantic Web. It refines requirements and reduces coding efforts thus making Semantic Web more adaptable. The physical structure of designed ontology is based on RDF model which is associated with three triples- Subject, Predicate and Object.

Predicate: - All characteristics of resources and relationship are taken as Predicate.

E.g. each student is assigned unique RollNo called as 'HasRollNo'.

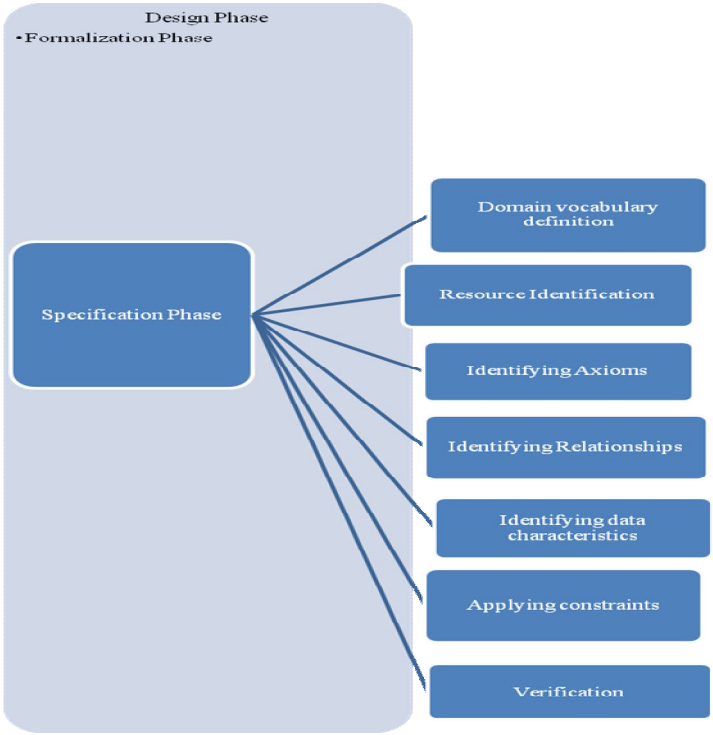
E.g. there are various average students each having unique URI, so they are grouped in 'AvgStudentsGroup'.

Objects: - Refers to Range class relationships.

E.g. HasRollNo contains range class 'NUMBER' which is literal.

C. Formalization Phase

This phase is the result of output of ontology obtained in design phase with the help of some tools.



IV. CONCLUSION

Since, there is large number of documents present on web and to retrieve information from them is very difficult task. It generates the concept of Information Retrieval and Semantic Web. Semantic Web is termed as next generation of current World Wide Web. It used Semantic markup documents for extracting information from web documents. It generates annotations and metadata from original data by translating them into knowledgeable representation documents. The traditional Search engines failed to understand the structure and semantics of semantic web documents. This study concludes that current Search engines like Google, Yahoo do not work well with Semantic Web Documents (SWD's) since they are designed to work with natural languages only. These engines expect documents to be unstructured text but there are various documents involved in Information Retrieval (IR) process. The documents may be Unstructured, Structured, and Semi- Structured. So, for extracting SWD's from Semantic Web, we have used

Semantic Search Engines that works on Semantic based approach for producing accurate results. We have developed ontology on Family using one of ontology editors named Protégé. Our framework in protégé provides a layer in which developers can construct ontologies with high quality description of role concepts. The research issues in Semantic analysis have been described that are useful in discovering complex relations between entities in data sets. Use of semantic analysis plays vital role in Semantic web.

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Volume 4 Issue V, May 2016
ISSN: 2321-9653
International Journal for Research in Applied Science & Engineering Technology (IJRASET)

SKOWRON, RAKESH AGRAWAL, MICHAEL LUCK AND EDITORS, PROCEEDINGS OF THE 2005 IEEE/WIC/ACM INTERNATIONAL CONFERENCE IN WEB INTELLIGENCE, PAGES 379-385, IEEE COMPUTER SOCIETY.

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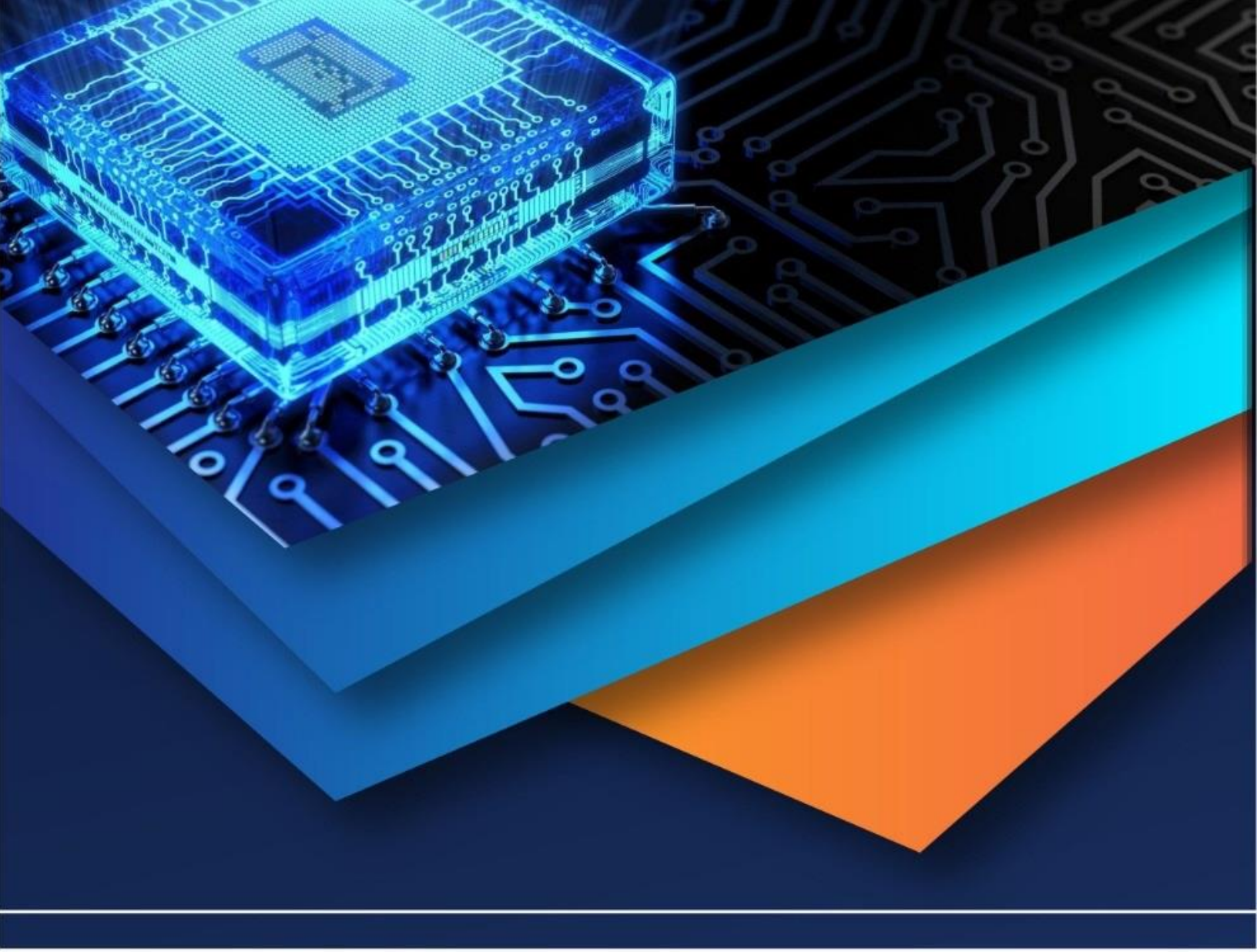

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