**DEBRE MARKOS UNIVERISTY**

**DEPARETEMENT OF INFORMATION TECHNOLOGY**

**Integrative Programming and Technologies (XML)**

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**What is the role of xml and RDF in the semantic web technologies?**

**1.1 Basic concept about Semantic Web**

* The idea of the semantic Web was conceived by Tim Berners-Lee, the founder of the WWW. He envisions that in future, the vast amount of information on the Web will bear machine readable metadata, resulting in computers being able to manipulate the contents automatically, without human intervention. Therefore, the semantic Web is imagined as an extension of the Web, in which information is given a well-defined meaning. It is the application of advanced knowledge technologies to the Web and distributed systems in general. It describes methods and technologies to allow machines to understand the meaning or “semantics” of information on the WWW. To accomplish this, the provided information should be structured, accompanied by sets of inference rules that can be used by computers to conduct automated reasoning.
* Generally semantic Web,
* Is a proposed development of the World Wide Web in which data in web pages is structured and tagged in such a way that it can be read directly by computers.
* Aims at machine process able information.
* Machine's ability to solve a well-defined problem by performing well-defined operations on existing well defined data.
* Data interchange growing Needs a common semantics.
* It is a relatively new and dynamic field of investigation.

**1.2**  **Semantic Web Technologies**

* The semantic Web contains resources corresponding not just to media objects (such as Webpages, images, audio clips, etc.) as the current Web does, but also objects such as people, places, organization and events. Further, the semantic Web will contain not just a single kind of relation (the hyperlink) between resources, but many different kinds of relations amongst the different kinds of resources.
* The common technologies for the semantic Web are

Semantic Web

XML, RDF, Metadata, Ontology

Information/Knowledge Management

Metadata Storage, Database Storage Technologies

**1.2.1 Semantic web technologies XMl**

* A XML (extensible Markup Language) is one of the fundamental contributions towards middleware technologies. It is a markup Meta language which allows sharing of information between different applications through markup, structure and transformation. As the major contribution towards semantic web XML provides syntax serialization and abbreviation for data modeling using Data Type Definitions but XML schema is restricted and can only be used for the structured documents because it does not provide semantic, arbitrary naming and structuring of element.1
* Generally XML is:
* Web services provide a way to describe their interfaces in enough detail to allow user to build a client application.
* It is plays a significant role in the present world of web development.
* It is more usable and beneficial in the present web development field.

**1.2.2 Semantic web technologies RDF**

* RDF (Resource Description Framework) is a URL based syntax data representation which provides a secure and reliable mechanism for metadata exchange between web applications. RDF processes Meta data by making abstract data models based on three object types .i.e., Resource, Property and Statement. Resource is an expression, Property is an attribute describing resource and Statement is a resource having some properties and values. RDF uses three containers .i.e., Object Bag, Sequence and Alternative to arrange available and alternative values in an order.
* RDF is more useful than XML because it provides independent syntax serialization and abbreviation for data modeling, syntax reification and semantic based features like domain independency, vocabulary and privileges in defining terminologies used in schema language but still RDF modeling mechanism is insufficient in expressing various logical statements.
* Generally RDF :
* it is a framework for describing resources on the web
* it provides a model for data, and a syntax so that independent parties can exchange and use it 
* it is designed to be read and understood by computers 
* it is not designed for being displayed to people 
* it is written in XML 
* it is a part of the W3C's Semantic Web Activity 
* It is a W3C Recommendation.

**Use of RDF**

* Describing information about web pages, such as content, author, created and modified data
* Describing properties for shopping items, such as price and availability 
* Describing content and rating for web pictures
* Describing content for search engines .
* Describing electronic libraries Describing time schedules for web events 

**CONCLUSION**

* The semantic Web is not a separate Web but an extension of the current one, in which information and services are given a well-defined meaning. The semantic Web is a Web for machines, but the process of creating and maintaining it is a social one. To make possible the creation of the semantic Web the W3C has been actively working on the definition of open standards, such as the RDF and OWL. Although machines are helpful in manipulating symbols according to pre-defined rules, only the users of the semantic Web have the necessary interpretative and associative capability for creating and maintaining ontologies. The principal benefit of semantics is that it provides a formal foundation for reasoning about the properties of systems that do automated knowledge translation based on sharing of ontology. Developers are vigorously building semantic Web services. In spite of this, as the standards are prepared and the demand for intelligent agents grows, expertise will be required in the field of semantic Web services.