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A Terse Overview of Semantic Web Services Framework

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Abstract: ***semantic web is an extends to the current world wide web. The contents on the world wide web is generally used by human beings but barely understandable by machines. The semantic web is a vision of information that is understandable by machines.***
Current information retrieval techniques on web are not intelligent to retrieve the precise answer to precise question. Semantic web defines the future web as pages text as well as semantic mark-up. The vision of semantic web is: an extension of the current web in which information is in precise way and have well define meaning which is understandable by machines.[2]
Semantic web services are the component of semantic web to make web contents readable by machine. For providing the meaning to web contents we need a framework.
This paper an attempt to present a concise overview of semantic web service framework.semantic web services framework (swsf) further involves-semantic web services language (swsl)and semantic web services ontology(swso).
Keywords- semantic web,web services, semantic web services framework, ontology, language.

I. INTRODUCTION

The Internet and the World Wide Web have brought a revolution to information technology. But the current World Wide Web is the huge global database which is understandable by human beings not by machines. Here the machines only serves as a delivery point between web and the people.[1]
The word Semantic Web is made up of two terms Semantic and web. The term semantic is related to meaning and the web specifies the well defined and well structured system.
The Semantic Web is an effort to develop a system in which the meaning of information and services on the web are well defined and make it possible to "understand" and satisfy the requests of people and machines to use the web content.
Semantic web is the future's web which contains the huge distributed knowledge based system instead of huge distributed hypertext system. In other words the main motive of semantic web is to share the data rather than documents.[4]

II. SEMANTIC WEB SERVICES

Semantic web services are the server end of a client-server system for machine to machine interaction where server acts as provider of the web services and client as the requester of the web services. The user wants to the service provider that the context and the meaning of the query presented should be understandable.[5] For this purpose we need smarter and intelligent web services that are Semantic Web Services.
Semantic web services should be platform independent to its clients i.e. if the services is implemented with J2EE technologies then it should be possible for .NET clients to use those services.[3]

III. SEMANTIC WEB SERVICES FRAMEWORK

Semantic Web Services need a platform to express the meaning that is Semantic Web Services Framework (SWSF).
The framework is defined as –
"A framework is the collection of classes and applications, libraries of SDKs and APIs to help the different components work together".
For any service, the framework acts as the building block. Due to growing demands there is need for richer semantic specification of web services as Web Services Description Language (WSDL) does not support the specification of workflow of composed services.
We need richer semantic web services which are based on a representational framework that must include the full range of service related concepts.[7]SWSF is the foundation for the broad range of activities across the web service life cycle. It supports the construction of more powerful tools and ontologies use in the web services.[6,7]

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Semantic Web Services Framework consists of two major components-
Semantic Web Services Languages (SWSL) - gives the physical description of web services.

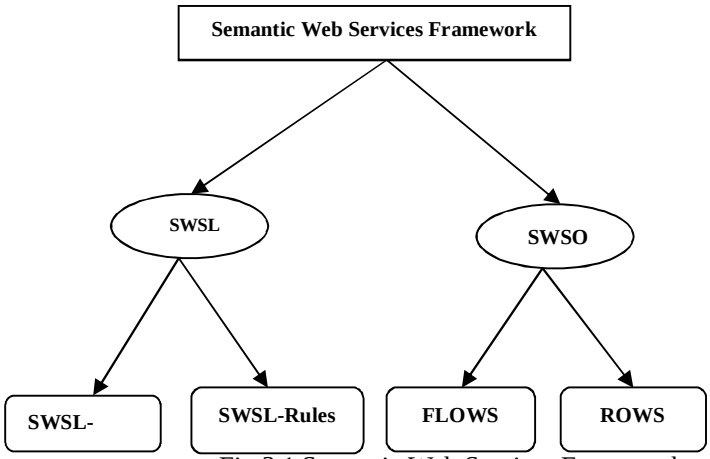


Fig 3.1 Semantic Web Services Framework

Semantic Web Services Ontology (SWSO) –gives the logical description of web services.

A. Semantic Web Services Languages

SWSL is used to specify the Web service concepts and descriptions of individual services. It consists of two layers-

1) *SWSL-FOL :* It is based on the first order logic, extended with features from HiLog and the frame syntax of F-logic . It is used to express the ontology the web services concept and dynamic properties of services.[7,8]

2) *SWSL-Rules* **:** It is based on logic programming. SWSL-Rules are used to support the execution of ontology and to provide service profile specification,service directory.[7,8]

3) The terms used in the SWSL-FOL and SWSL-Rules-

a) The Mon LT (monotonic Lloyd-Topor) allows disjunctions in the rule body and conjunction and implication in the rule head.

b) The NAF is abbreviated as negation-as-failure which is an extension that permits negation in the rule body using well-founded semantics.

c) The Nonmon LT (nonmonotonic Lloyd-Topor extension) allows quantifiers and implication in the rule body.

d) The Courteous rules introduce restricted classical negation and prioritized rules.

e) The HiLog enables high degree of meta-programming by allowing variables to range over predicate symbols, function symbols, and even formulas.

f) The Frames layer introduces the most common object-oriented features, such as the frame syntax, types, and inheritance.

g) The syntax and semantics of this extension is inspired by F-logic.

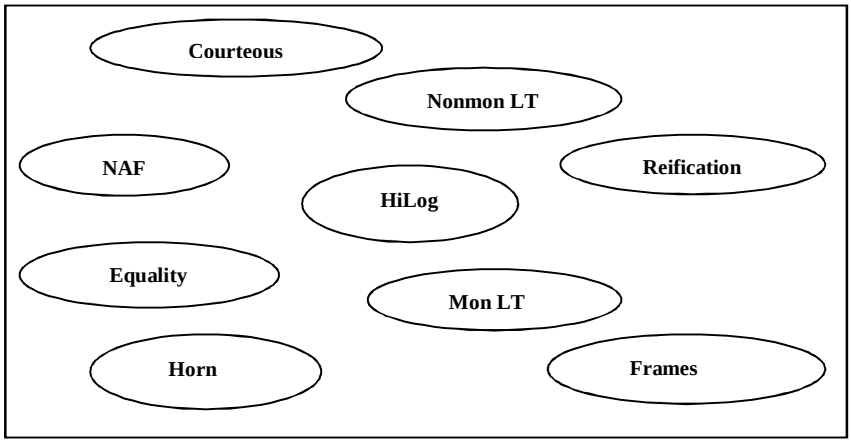


Fig 3.2 Structure of SWSL Rules

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B. Semantic Web Services Ontology

SWSO represents the conceptual model of semantic web services. It has two parts-

1) *FLOWS*- It stands for First-Order Logic Ontology for Web Services which provides the conceptual framework for describing and reasoning about services. The main contribution of the FLOWS ontology is the development of a rich behavioral process model andm to enable reasoning about the semantics underlying Web services and how they interact with each other and with the real world. It also gives the infrastructure for representing messages between services. This is the ontology used for SWSL-FOL.[7,9]
2) *ROWS*– It stands for Rules Ontology for Web Services which enable implementations execution environments based on logic-programming semantics. ROWS is a translation of FLOWS into SWSL-Rules.[7,9]

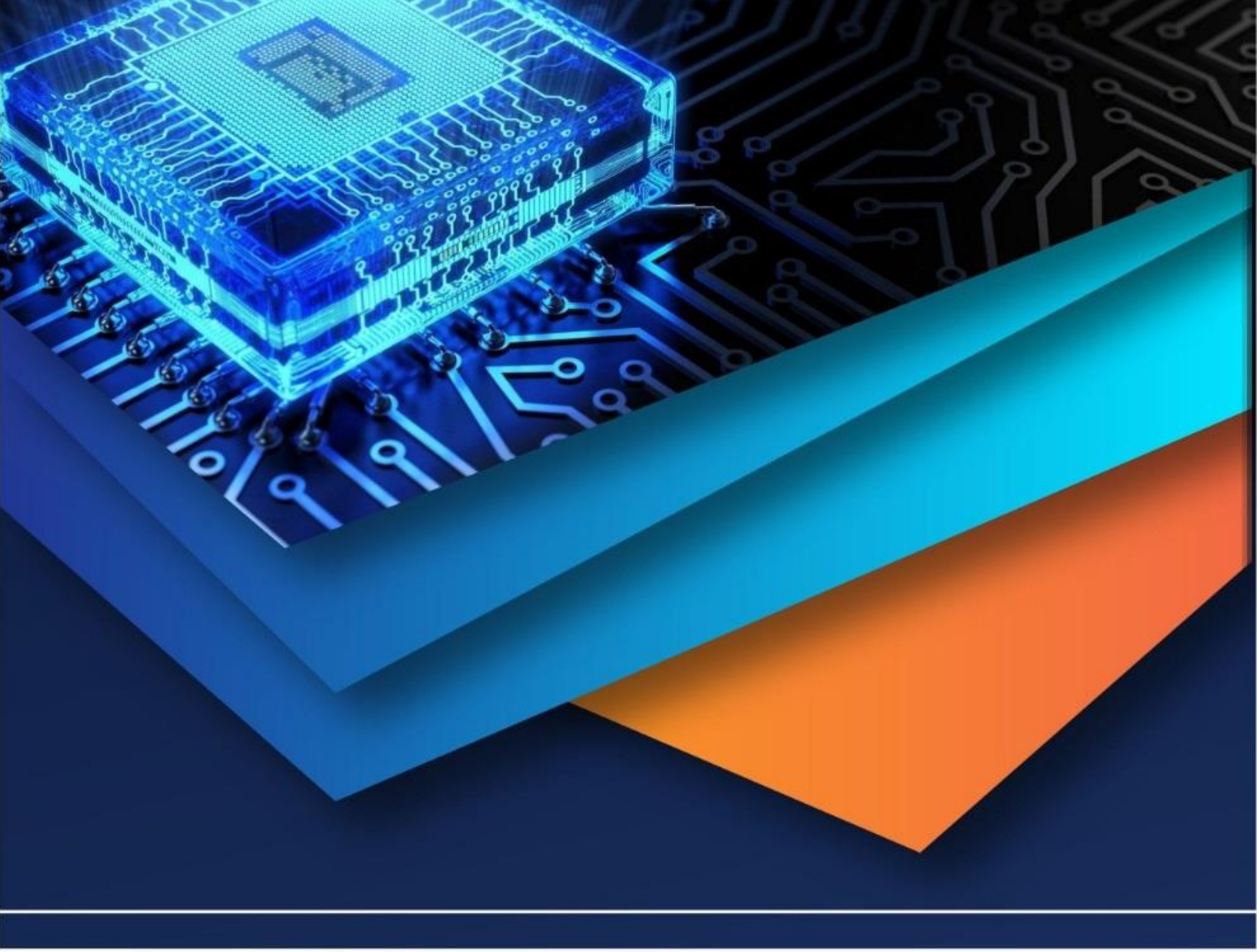
IV. CONCLUSION

These days IT Industry is moving towards semantic web services as it makes earier for machine to automatically process the information available on the web. This paper presents the semantic Web Services Framework which is the foundation for Semantic Web Services. Here we have shown the structure of Semantic Web Services Framework and how Semantic Web Ontology and Semantic Web Service Language are used.

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