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## *Ontology based personalized information from semantic Web*

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*Abstract: Now a day's many businesses publish their applications utilities on the web. The desideratum for supporting the classification and semantic annotation of services constitutes an important challenge for service-centric software engineering. Such a semantic annotation may require, in turn, to be made in acceptance to a specific ontology. Also, a service description needs to felicitously relate with other similar services. For a particular service request to relate an implicit service description, this paper overcomes the issues in web service discovery using semantics. The service request along with web service composition is performed using categorization of semantic based service and enhancement in semantics in an ontology frame work.*

*Keywords: Semantics, Ontology, Web Service, WSDL, UDDI.*

### I. INTRODUCTION

A web service can be termed as a self-contained, modular application that can be described, published, located, and invoked over the Web. Web Services can be combined with each other in different ways to create business processes that enable us to interact with customers, employees, and suppliers.

The web services are described using the Web Service Description Language (WSDL) and the described web services are stored in the applicable repository called Universal Description, Discovery and Integration (UDDI) [4]. Web Services use the Web to perform application-to application integration and they are business process interfaces. Each Web Service is a point of interaction to give input and receive output from a business process. Further it allows previously incompatible applications to interoperate on the Web regardless of language, platform, and operating systems. A web service is a standalone function that can be called by many different applications. Web services reduce the complexity by encapsulating business processes into reusable components and improve interoperability by acting as a wrapper around legacy or platform - specific applications. They can be self-describing (WSDL, UDDI) and can be used to develop applications much faster than before. A Web Service is a simple, reliable way to blend existing systems with new applications and services.

Ontology is an explicit formal specification of the terms (vocabulary) in the domain and relations among them. It is used for domain information sharing, categorizing Web sites (Yahoo!) & products for sale (Amazon.com). Further it defines classes, relations and axioms to support the modeling of time-dependent activities.

**Syntax** - based search will produce the documents or services by comparing in the existing repository where the output produced may not be relevant to the user's request.

**Semantic** - based search is a type of machine learning methodology in coordination with ontology where the user's request can be directed to the appropriate web service [1].

The performance of the semantic - based categorization can be improved by implementing the categorization techniques over the ontology. The augmented web service classification into functional categories using semantics is done at the UDDI for semantic-based categorization.

## II. RELATED WORK

The field of automatic annotation of syntactic Web services contains several works relevant to our research. It presents a combined approach toward automatic semantic annotation of Web services. The approach relies on several matchers (e.g., string matcher, structural matcher, and synonym finder), which are combined using a simple aggregation function. Machine learning is used in a tool called Assam, which uses existing annotation of semantic Web services to improve new annotations. A context-based semantic approach to the problem of matching and ranking web services for possible service composition. Unfortunately, all these approaches require clear and formal semantic annotations to ontologies. Ontology evolution has been researched on domain specific Web sites. Noy and Klein defined a set of ontology-change operations and their effects on instance data used during the ontology evolution process. Unlike prior work which was heavily based on existing ontology or domain specific, our work evolves an ontology for Web services “from scratch”. A survey on the state of the art Web service repositories suggests that analyzing the Web service textual description in addition to the WSDL description can be more useful than analyzing each descriptor separately. The survey mentions the limitation of existing ontology evolution techniques which yield low recall. Our solution overcomes the low recall using Web context recognition. The spectral subtraction is based on the principle that the enhanced speech can be obtained by subtracting the estimated spectral components of the noise from the spectrum of the input noisy signal. A novel speech detecting method has been developed in our laboratory by using millimeter wave radar technology. Because of the special attributes of the millimeter wave, this method may considerably extend the capabilities of traditional speech detecting methods. However, radar speech is substantially degraded by additive combined noises that include radar harmonic noise, electro circuit noise, and ambient noise.

## III. DESCRIPTION OF THE SYSTEM

Semantic based search on web services gives the related services from the repository as the service consumer’s expectation. That is achieved by creating and maintaining the ontology which is more domain dependent. When ontology is created for a specific domain, which consists more terms which refers to a single web service. When the service consumer requested for a web service that appropriate service is discovered from the UDDI (Universal Descriptive Discovery and Integration) with the help of domain dependent ontology. The domain dependent ontology is developed by using associate ontology clustering algorithm [1]. The established clustering methodology is combined with ontology for semantic based categorization of UDDI. In the relevant ontology a concept is formed for every term in service description. A concept is added to the service description if a match is found. Based on semantic relationships among the concepts, the irrelevant terms are removed and the additional concepts are added.

The clustering is performed by finding the relationship among the service description and concepts in ontology leading to a set of service description. The efficient service categorization is obtained by adding the relevant semantic information to the UDDI. After the refinement of services from the registry when more number of services is required by the service consumer, the composition of web services is performed. The web service composition is achieved through web service choreography and web service orchestration. Web service orchestration is a method when more number of services are required to finish or meet the customer's requirement where the web services should be executed in a particular order.

For example a customer would like to have a round trip through airway and also he/she may be in need to book a hotel and a local call taxi. Here the service to book the air ticket must be executed first followed by booking the remaining services depending on the customer's requirement. The functional behavior of each web service is called the web service choreography, i.e., the execution process must be carried out sequentially which means that without booking of air tickets, the services used for

booking a hotel or taxi should not be performed by the service provider. By maintaining this approach for web service composition using semantic based web service discovery is achieved, which provides a better service to the service consumer.

Web services published by the service provider will be stored in the UDDI registry where all the services are described using WSDL. In the ontology framework, we have more number of domain dependent ontologies created and connected within the UDDI to discover the relevant web services to satisfy the request given by the service consumer.

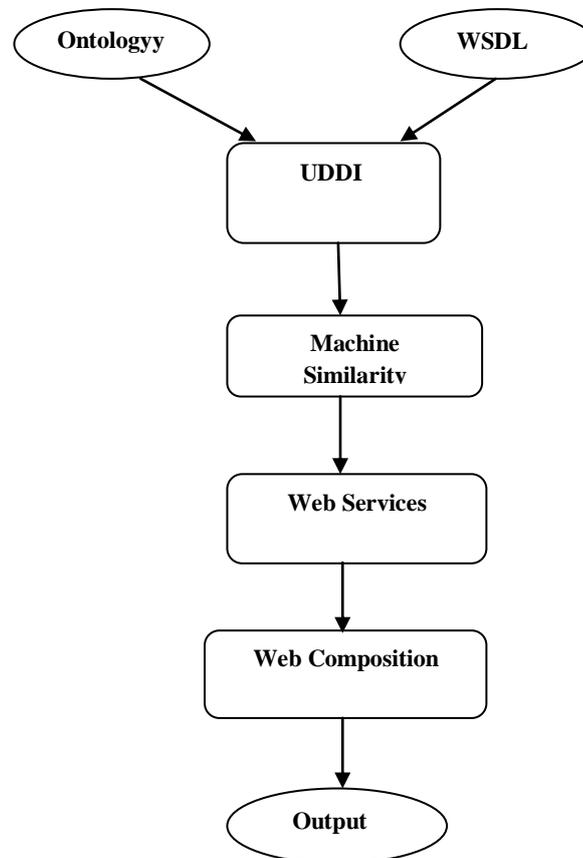


Figure 1: System Architecture of Semantic web services.

The ontological framework is used to identify the basic categories in the specific domain and gives the relationship within the categories in coordination with the relationship constraints [2]. The domain based ontologies are created using semantics which are helpful to identify the appropriate web services available in the UDDI. If more number of services is needed to complete the user's request, then they have to be executed in a specific manner, i.e., by implementing the web service composition which includes an order of performance and the control of functional behavior in the web services. A set of predefined ontologies provide the web service elements to represent the semantic based web service categorization. By applying the categorization method, a well refined automated web service discovery is attained. The composition of the similarity and the functionality of the ontologies activate the semantics of the metadata.

The interaction of the predefined patterns with one another at execution level and message level, collaboratively forms the web service orchestration. Web service choreography is defined in XML-based business processing language which describes the web service participants collaboratively for the services to behave as peers and the interaction will last for longer time. In the architecture of shown in fig.1, web service composition, there is a component termed as web service composer, whose responsibility is to make the order of execution of the services and to control the service orchestration along with the service choreography, which finally leads to a composed set of web services.

## IV. EXPERIMENTS AND RESULTS

For an efficient web service discovery and web service composition, the three services namely airline booking, hotel booking and taxi booking are defined in three separate ontologies there by forming an ontology framework. When the request from the service consumer is given, the air ticket booking process will be executed first using semantic based service categorization [1] and the appropriate service is identified. Further the other two services i.e., hotel and car booking will be executed depending on service consumer's necessity where the service composer delivers the adequate output to the service requestor.

The following are the steps involved in the web service composition:

- A. First the service consumer opts for the required airline service by selecting one among the list of airlines given from the ontology which also gives the time of the flight's departure and the cost per person. The mode of display will be by producing the cheapest airline as the first one in the list. The user can go with the cost constraint given by the service discovery, or manually select the airline to meet the time phenomenon
- B. For example if a customer wants to travel from Chennai to Trichy, the following information will be retrieved from the relevant ontology:

Table 1 : Airline Services from relevant ontology.

| Flight Name         | Flight Number | Departure Time | Ticket Cost |
|---------------------|---------------|----------------|-------------|
| Jet Airways         | J40234        | 15.00 pm       | 2500        |
| Indian Airlines     | I20257        | 12.00 am       | 2800        |
| Kingfisher Airlines | KA432         | 2.00 pm        | 3000        |

- C. If the customer is willing to book the hotel available at Mayiladuthurai, the following information will be displayed by fetching from the hotel ontology.

Table 2 : Hotels Services retrieved from relevant ontology.

| Hotel Name    | Star | Facility                | Price per day |
|---------------|------|-------------------------|---------------|
| Hotel Cilambu | 3    | Near To Bus stand       | 500           |
| Hotel Abirami | 2    | Near to Shopping bazaar | 300           |
| Hotel Pams    | 4    | Near to Bus Stand       | 700           |

- D. Further, if the customer essentially needs a car, e/she can choose the feasible car service available, which are produced from the car ontology and few are given below:

Table 3 :Car Services from relevant ontology.

| Car Name       | Price per km |
|----------------|--------------|
| Tata Indica    | 25           |
| Swift Desire   | 30           |
| Renault Duster | 35           |

E. After selection of the services, the booking for all the services will be made by the service consumer.

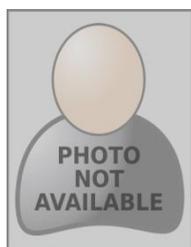
## V. CONCLUSION

In this paper we have concentrated on creating domain dependent ontologies, semantic based service discovery and web service composition along with service orchestration and choreography, effectively. The approach analyzes Web services from multiple perspectives and integrates the results. Web services usually consist of both WSDL and free text descriptors. This allows bootstrapping the ontology based on WSDL and verifying the process based on the Web service free text descriptor. The approach enables the automatic construction of ontology without the prior training required by previously developed methods. As a result, ontology construction and maintenance efforts can be substantially reduced. As a future enhancement of this work, regarding payment to different services can be made as a single payment which can be managed through SLA (Service Level Agreement) among the service providers. So that the service consumer need not to pay for individual service which in the service composition.

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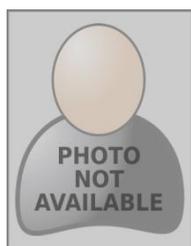
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