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Non Functional Requirementt Based Semantic Web Service Composition

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ABSTRACT

The paper presents automated semantic web service composition based on non-functional requirements(web services like fastest or cheapest). An important advantage of this approach is that the composition process of web services are optimized. Automated web services composition is being critical with the increase in the number of available services day to day. The response for user queries need to be faster. Semantic information is used for discovery and composition process as well as for approximating the optimal composite services. The model devised in this paper focuses on the addition of the OWL-S descriptions of produced composite services to accelerate the composition process. It also deals with enhancing the approach with the ability to produce various composite services according to non-functional user requirements. This could be possible by extending existing web service description.

KEYWORDS : Automated service composition, service discovery, semantic service indexing

1.INTRODUCTION

An important vision of service headed computing is to modify dynamic service binding, i.e., it ought to become possible to mechanically opt for and invoke service suppliers at runtime. to realize this, applicable means that to explain and match services area unit required. In our previous work we've bestowed such means that, specifically a service description language associated an economical matching algorithmic rule for this language. However, once attempting to search out a match for a definite request it's going to usually happen, that the request cannot be maintained by one supply alone however might be handled by combining existing offers. Ancient service matching mechanisms fail in these cases however techniques of automatic service composition supply an answer. Though automatic composition could be a terribly active field of analysis it's in the main viewed as a coming up with drawback and typically treated on an individual basis from service discovery. Most composition approaches don't upset linguistics discovery in the slightest degree and plenty of use proprietary request (or higher goal) description languages appropriate for coming up with and composition, however not for discovery.

2.RELATED WORK

The most closely connected work with relevance discovery is that the recently bestowed WSMO-MX interprocessor by Kaufer and Klusch [3]. WSMO-MX could be a hybrid intercessor for WSML services that borrows the graph-matching approach from the DSD intercessor, however combines it with different concepts developed among different matchmakers that the DSD intercessor is lacking. What distinguishes the DSD Matchmaker most from WSMO-MX, as from all different discovery approaches is DSD's idea of precise fine-grained preferences and ranking. Most matchers projected for OWL-S believe subscription matching of inputs and outputs and don't take the results of the service under consideration. The matchmaker projected recently in additionally matches service product and classification. In distinction, DSD's matching is solely state-based.

The METEOR-S framework [5] provides dynamic binding of services, however works with composite service templates and doesn't arrange to dynamically synthesize service compositions as we tend to do. Though METEOR-S stresses the importance to pick out element services optimized with relevancy sure international improvement criteria like overall financial value, it's lacking fine-grained user preferences as realized by DSD's fuzzy sets.

Finally an outsized range of composition approaches deal principally with chaining of services. This generally addresses things wherever either further data gathering or some sort of knowledge transformation is required to service a user request with the accessible offers. associate exemplary example for such associate approach is [13]. Issues generally self-addressed by chaining approaches area unit complementary to the matter of multiple connected effects as restrained during this work.

3.PROPOSED ARCHITECTURE

In this paper we presented semantic ontology for the automated web service discovery and the composition of web services. The semantic based service discovery involves semantic categorization of services and semantic enhancement of service request. The services published in the service registry should be classified and this will do as offline. The service selection includes refinement of web service with input, output, description parameters and enhancement of service request with ontology. The OWL-S is an ontology built on top of Web Ontology Language (OWL) based framework of the Semantic Web, for detecting Semantic Web Services. The semantic ontology based web service discovery and the web service composition is done by using OWL-s. The architecture for Semantic Based Automated Service Discovery and composition is given in Figure 1.

The service client makes use of the service to implement the client side of the client server interface. It uses the service registry to discover a service and its description.

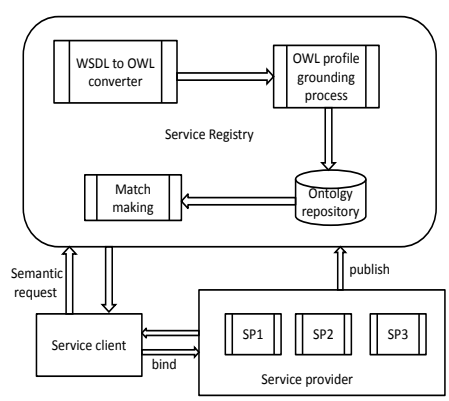

Fig 1: Service Discovery and Composition

The services are created with all user requirements and 'N' number of service providers publishes their 'N' number of services in the form of WSDL file to service registry. Service Providers distributes the services along with their Constraints to the service registry. A WSDL to OWL-S converter tool is used to convert from WSDL to OWL-S which in turn generates profiles, process, and grounding. Using these, a domain specific ontologies are created and that is stored in a repository called ontology repository.

On Service client's request, ontology which was present in ontology repository is parsed to get the information about the services. Services are then identified in the service registry and it is processed through match making algorithm. Using the match making algorithm the services are matched. After sorting out all unmatched services, a best matched service is discovered. A URL is discovered from the service registry and it is invoked by the service client and finally bind to the service provider.

Existing services are combined and it provides multiple services have to be discovered and they together match the service request. Ontology based semantic web service composition uses OWL-s will help the combination of web services. Similar services are combined based on the keywords with user request.

4.EVALUATION

As converse in Section 1 our integrated approach to service discovery and work tackles situations where simple discovery watching one matching service fails, however a composition of existing services is ready to meet a goal. This approach needs to suit a very important requirement: so as to not quit on the thought of dynamic discovery, the composition needs to be performed on the fly reacting to a call for participation. Thus, potency of the composition algorithmic rule may be a central issue. During this section, we have a tendency to appraise our composition approach with a special concentrate on this demand.

4.1 Scalability

When it involves quantify, 3 parameters got to be discussed: the dimensions of the request description (or number of requested effects), variety of accessible supply's and also the number of how to tack one offer by selecting totally different fillings for its input variables.

Regarding the primary parameter we tend to feel that it's impossible to possess requests coverings thousands of effects. a practical variety would be anyplace between one impact for an easy request.

Thus within the following we tend to treat the amount of effects and also the size of the request description as constant and address the difficulty of quantify within the alternative 2 parameters by a discussion of our architecture's complexness.

4.2 Experimental Analysis

In order to test our approach with regard to the requirement of efficient composition, we ran a series of tests with our implementation. A set of 11 service offers which were designed according to some real world web ser-vices in order to have a realistic complexity of the services. (Although this is not a huge number this is not critical in terms of the evaluation. Only service offers that suit pretty well are considered further after the prior matching and the prior matching scales extremely well. Thus, even if we had used a much bigger number of offers, the number of offers considered during most of the matching process would not have increased drastically.) The test services were chosen randomly by considering required service as query.

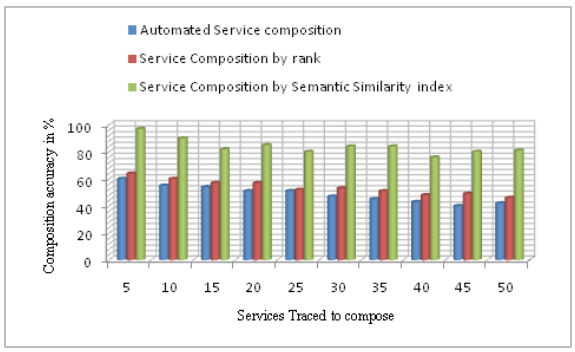

Figure 2: Performance analysis of automated service trace and composition strategies under composition accuracy metric

5.CONCLUSION

The efficient web service discovery needs, the user must be able to discover all relevant optimized web services(non functional requirement based) within the UDDI irrespective of the predefined classes, and all appropriate web services must be successfully discovered even if the user is not aware of all the relevant terms that include all appropriate web services. In this paper we have considered the semantic based ontology approach involves service categorization and selection of services with semantic service description and the composition of web service using OWL-S. In this regard, this work tends to actuate the requirement to integrate automated service composition. . We have tested the proposed approach by using a sample web service application. As future work, extension is possible to explore additional mapping tools to express service request to search for relevant concepts.

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