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Determining QoS of Web Services- A Review

Amandeep Kaur
Chitkara University, Department of Computer Applications, Rajpura, Punjab, India

Rachna Soni
D.A.V College, Department of Computer Applications, Yamuna Nagar, Haryana, India

Abstract: ***With the quick evolution of alike web services on the web. Quality of Service (QoS) plays an important role in searching the most appropriate web services for the users. QoS factors of web services has got a lot of demand these days, but still it did not get much attention in multi-perspective Quality of Services (QoS) of web services. Web Services are in contrast with the traditional software paradigms as they are harnessed, polished and are further used by different types of users like consumer, provider and broker but similar web services vary according to QoS requirements. As the base from the idea of Quality of Service, number of authors gives their association rules to get regularities among the products in large scale transaction data and the need of exploratory research can be done to get rid of the problems by the survey. In nutshell of this research paper, we will discuss various issues presenting in literature review.***

Keywords: SOAP, QoS, UDDI, XML

I. INTRODUCTION

Web Services plays an important role in WWW.Guaranteed Services processing capacity is required by many web applications. For the purpose of real time information, Quality of Service based selection mechanism become essential for any E-Business application. There are many standards such as Simple Object Access Protocol (SOAP), Web Services Description Language (WSDL), Extended Mark-up Language (XML), and Universal Description Discovery Integration (UDDI) supporting web services. Nevertheless the future of web services seems very promising but still with strenuous obstacles. One of the severe problems is Web Service Selection. Current Web Services cannot support QoS or non-functional aspects of a service. Quality of Service (QoS) is a collection of non-functional parameters i.e.; response time, content, availability, throughput. Existing Web Services are more streamlined and focused on functional aspects of services. Selection of best web service among similar web services depends on Service Consumer. Without knowledge of Quality of Service (QoS) QoS factors, Service Consumer can select low quality or costly web service. There are many existing approaches which shown differences in results of similar web services. Base model of research is shown in Figure 1 in which a service provider can select service with the help of description of service functions published by Service Provider. But in an open environment, several problems have been faced by the service consumer while making a choice from a cluster of services offering the same function. Service Provider and Consumer communicate with one another via protocols like Extended Mark-up Language (XML) and Simple Object Access Protocol (SOAP). At this point,

Service Consumer not only needs to know what a web service is, but there should be knowledge of how web services can do. Current Universal Description Discovery Integration (UDDI) registries provide only syntactic information. But problem arises when consumers are keenly interested in knowing semantic information i.e.; response time, availability, content, throughput etc. and in order to provide solution of this problem another question arises that how service provider publishes Quality of Service (QoS) information of similar web services in Universal Description Discovery Integration (UDDI) . After publishing QoS information in Universal Description Discovery Integration (UDDI), how to update and save information in UDDI if need arises.

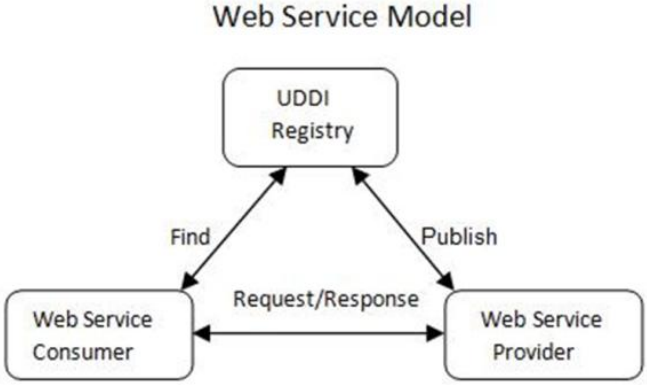

Figure 1: Web Services Model

For Example: A Stock Company is looking for a web service to obtain real time stock quotes for better stock management. Company demands service availability should not be more than 95% and the cost of each transaction should not exceed 1 lakh. Company searches manually Universal Description Discovery Integration (UDDI) registry and finds 20 web services that pro-vide real time stock quotes. But after contacting service providers it is found that there exist only 10 web services that satisfy customer's requirements. All of these 10 services found that their service availability should not be more than 95% and that cost of each web service is 1 lakh per transaction. The Problem is that which service should be chosen out of 10 web services? And advertised QoS information of a Web Service is not always authentic. A service provider possibly publishes misleading QoS information to attract more customers and the advertised information may be out of date.

II. LITERATURE REVIEW

The progressive development topics are Web Service and Web Service discovery. Many methodologies have been proposed by various researchers for dynamic web service discovery. Since there are number of web services providing almost similar functionality in terms of QoS factors which in turns become important for both service providers and consumers' .The research on QoS Web Services is bound to an extent.

Cardoso[2002][1] proposed a model which focused on Semantic Web Services to discover web services and provide the interoperability among them in spite of the heterogeneity characteristic of web service. It does not address the problem that a web service can provide different QoS levels and how can user decides which level should be used as well as how to achieve the best end to end QoS in web service workflows.

E.Michael Maximilien et. al [2002][2] brought a reference model named Web Service Agent Proxy (WSAP) in order to select web services which meets the QoS requirements in literature, they described the reputation concept model of web service in detail so that the reputation information can be organized and be shared by relevant actors. However, how to get reputation score is not specified in these literatures.

P. Farkas et. al [2003][3] proposed a QoS broker for measuring QoS values of similar web services in UDDI in which broker acts as an intermediate between client and service provider. Software architecture was provided without fully information. Only partial information was provided. After Farkas, A.ShaikAli [2003][4] proposed an extension of UDDI business service structure without considering QoS changes.

Hongan Chen et al. [2003][5] introduced an application of broker based architecture in which broker performed as a third party. When the user is not acknowledged with the response to his/her request within acceptable response time then he/she will switch to another provider. To find the best service that fits the consumer's requirements, there is a hike in number of web services providing similar functionalities focusing on how to find the service and functional requirements (what the service can do),and non-functional requirements, such as the price,throughput,availability and quality of service in Gouscos [2003] [6]. UDDI registries are centric for WS discovery. They assist web services life cycle management, but UDDI registries are small, private and has no control over web services published information. They only support syntactic retrieval and provide no support for quality aware services. A new framework for smarter WS discovery was discovered providing clients with QoS information which enhances the selection process and reduces the failure chances. In this paper, Gouscos proposed a new approach to dynamic Web services discovery that models major attributes such as QoS and price. The model can be implemented using basic standards such as WSDL. The advantage of this model is its simplicity and easy implementation over existing standards, but still the QoS measuring is subjective and user centric.

E.M Maximilien et.al [2004][7] provided an approach for publishing and discovering web services using WSDL and UDDI which considered only customer's functional requirements. The problem in this approach is that current UDDI only supports functional requirements.

Ran [2004][8] proposed the same model but with an extension of a new compo-nent called Certifier which verifies the QoS factors of web services prior to its registration. Consumer feedback and dynamic environment of web services were not provided.

J. Hu, C. Guo[2005][9] presented an approach to select the matching client re-quested QoS property values against potential QoS property values of web services.However,this approach never guarantees the accuracy of the QoS values.

In Kumar [2005] [10], an approach of certifier was proposed for QoS information. On the time of registration, Web Service provider needs to provide QoS Information. It provides an enhancement to UDDI registry but it lacks supports of providing any guarantee and up-to-date information. So, this methodology does not give reliable mechanism and adequate solution and hence the server provider has to go through some additional steps for publishing process.

In OWL-S specification version 1.2, [2006][11], formal ontologies comes with Semantic Web Services having new ideas in service automation discovery, execution monitoring and composition. But problem in this approach is that it depends on prede-fined ontologies which are not easy to modify and difficult to deploy.

D' Mello et.al [2008] [12] presented a new methodology and many other service providers also provided similar web services. He proposed an agent based framework to provide QoS aware discovery of web services and provides the matching algorithm which consists with semantic and syntactic information from WSDL specifications. Some amount of services was required to test the performance of the system.

Hunaity and Rashid [2008] [13] enhances the web service discovery process with the support of a new framework which consists of retrieval algorithms for syntactic and semantic matching of services. QoS information is stored using tModel data structure .tModel itself can't deal with semantic information. In order to handle both semantic and syntactic information, tModel data structure is used within UDDI regis-try. But the problem in this approach is that verification or

certification process is not provided by this framework.

Xu et al [2009] [14] provided an enhanced UDDI to achieve measurement of QoS values of similar web services. Reputation Management System was developed with-out considering QoS verification process.

III. ISSUES IN LITERATURE REVIEW

Following Issues has been raised from literature review:

Issues	Literature Review
Protocol Comparison	SOAP
Registry Issues	UDDI,WSDL
Security Issue	XML
Model Issue	-Non Adaptable -Project Dedicated Model
Feedback Issue	Not satisfied
Optimization Issue	Less Optimized

The research problem is to find appropriate Web Services that match a set of user requirements in terms of QoS factors. For this purpose, a tModel of literature review needs to be concentrated which provide syntactic as well as semantic handling of information. The tModel, a current feature of the UDDI registry is used to store advertised QoS information of web services, a tModel came into existence when a provider publishes services in UDDI to simply represent QoS information of service. Technical Model (tModel) of literature review is not secure due to Category Bag, various technical improvement are required. HTML is stateless data forwarding mechanism .There is no guarantee of packet delivery. Extracting SOAP envelope from SOAP packet is time expensive. Parsing the contained XML information in SOAP envelope using a XML parser is also time expensive. With XML data, there is no possibility of optimization. Anyone can impose SQLInjection () to break the security.

IV. OTHER ISSUES IN LITERATURE REVIEW

In this section, positive and negative aspects have been presented in accordance with issues discussed in Section 2.

Year	Author Name	Conference/ Proceedings	Positive Aspects	Negative Aspects
1997 [15]	Valentine Janev et. Al	"Semantic Web Technologies: Ready for Adoption?" in IASTED Journal of Robotics and Automation,Vol.12,No.4,pp.135-145,1997	Development tools like XML and Semantic Modelling are being followed.	• It was not secure • Development of RDF technologies were required to be supported.
2004 [16]	Kalepu & S.Krihnaswamy	Reputation =f(User Ranking, Compliance, Verity) in Proceedings of ICWS'04	Determined the ranking of a service as a function of 3 factors: grading made by users, service quality compliance and its accuracy.	Trustworthiness of QoS reports were not kept in mind while providing solutions.
2004[17]	E.M Maximilien and M.P Singh	"Towards Autonomic Web Services Trust and Selection" In Proceedings of Second International Conference on Service Oriented Computing, ACM Press,2004 pp.212-221	Service providers displayed better QoS information in WSDL and XML Format in UDDI Registry	Interrelated issues raised because of the registry
2005[18]	Le Hung	Establishing Association between QoS properties in Service Oriented Architecture Proceedings of the International Conference on Next Generation Web Services Practices (IEEE)	Using SOAP Protocol, Web Services Selection Criteria was considered.	Grading criteria was not considered.
2005[19]	M.A. Serhani, R Dssouli, H. Sahraoui, A Benharef,E. Badidi	" QoS Integration in Value Added Web Services", Second International Conference on Innovations in Information Technology, Dubai, U.A.E, September 2005, pp.26-28.	Produced third party between client and provider	No Information is specified about the QoS Specification

2006[20]	Adam Blum	A.Blum,"Extending UDDI with Robust Web Services Information". Retrieved from http://searchsoa.techtarget.com/news/article/0,289142,sid26_gci952129,00.html, 2004.	Used methodology was supported with the help of Category Bag	• Not Secure • Complicated queries need more time period to handle
2007[21]	Ziqiang Xu, Patrick Martin, Wendy Powley and Farhana Zulkernine	"Reputation Enhanced QoS-based Web services Discovery", IEEE International Conference on Web Services (ICWS 2007), IEEE 2007.	Web Service Discovery Model that contains an extended an extended UDDI to accommodate the QoS information	They did not provide any verification process for QoS in what model
2008[22]	H.Alani et al	IEEE Intelligent Systems,May|June;2008, pp.6168	Proposed Model for comparison and ranking	Storage Format Issues
2009[23]	Ziqiang Xu, Patrick Martin, Wendy Powley and Farhana Zulkernine	"Reputation Enhanced QoS-based Web services Discovery", IEEE International Conference on Web Services	Proposed Web Service Discovery Model Provides Ranking Mechanism Use SOAP and XML	Feedback Issues
2011[24]	N. Patil, A.Gopal	"Comparative study of mechanisms for web service discovery based on centralized approach focusing on UDDI," international journal of computer applications, vol. 14, no. 1, pp. 28-31	Proposed an architecture to standardize the process of identification of web services	Ranking Mechanism is not used to work on quality parameters. Less Optimized

V. CONCLUSION AND FUTURE PLAN

Web services ensure Web Service providers and clients that are related with the QoS. From the client's prospective, web service based QoS discovery is a multi-criteria decision process that requires information about the service and its QoS description. These clients are less familiar to acquire the best selection of web service and trust the QoS information published by the provider. To solve the problems found in literature review, many attempts have been made in the past years but still the issues are uncovered and they are yet to be found in QoS based service selection, The new discovery approach will be recommended to be the solution for the current web service discovery issues in our future research papers.

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