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Trust Decision Model and Trust Evaluation Model for Quality Web Service Identification in Web Service Lifecycle Using QSW Data Analysis

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ABSTRACT

In secure web application development, the role of web services will not continue if it is not trustworthy. Retaining customers with applications is one of the major challenges if the services are not reliable and trustworthy. This article proposes a trust evaluation and decision model where the authors have defined indirect attribute, trust, calculated based on available direct attributes in quality web service (QWS) data sets. After getting training of such evaluation and decision strategies, developers and customers, both will use the knowledge and improve the QoS. This research provides web-based learning about web service quality which will be utilized for prediction, recommendation and the selection of trusted web services in the pool of web services available globally. In this research, the authors include designs to make decisions about the trustworthy web services based on classification, correlation, and curve fitting to improve trust in web service prediction. In order to empower the web services life cycle, they have developed a quality assessment model to incorporate a security and performance policy.

KEYWORDS

Classification, Correlation, Curve Fitting, Decision Model, QoS, QWS Dataset, Trust Evaluation Model, Web Service Lifecycle, Web Services

INTRODUCTION

Web based learning is very helpful in all areas where ever need of training is required to be latest and updated. Our research is related to the field of information technology project management and training where developer need to work in user or customer friendly development environment. which should be vital, high quality and of a scholarly nature to advance the knowledge in the information technology project management field. Due to high economic impact of global markets and the agility of business processes, there is need to increase in the number of published web services. Web service clients having technical hitches in opting the suitable and economically effective provider with required set of web services with consumer's preference. Trust which is a degree of confidence, is required to come over this technical hitch.

In our research objective, we have presented a web-based self-learning technique for a customized provider list for selective types of web services. Web supporting WS simulator which can be design

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on the basis of our research work, can be very helpful for making consumer aware about web service and its proper and effective utilization. This list will be automatically updated, and customer need to understand the usability and working of the list which can be done through understanding of web service lifecycle, means of trust we have focused in improving the service quality and assuring the security which can be possible through safe and secure web service communication in between users and developers. We had defined our research objectives and efforts in the fields of improving the quality of web service selection and its lifecycle. We had done literature study of various web service lifecycle and development frameworks, composite web services and their area of implementation as complex web application. Through research survey we had found that number of works are doing in the field of service prediction but there are the scope of trust based web service selection. This can be done only if we calculate trust based on available attributes from datasets of web service quality. We had selected QWS dataset for these direct attributes and use the mathematical derivation as defined for trust calculation. For validating the Trust Evaluation Model (TEM), we had used the RapidMiner tool where first we had analyse the relation between the provided attributes and come to a conclusion with a mathematical equation for calculating trust as a derived attribute from direct attributes QWS data set. To validate this trust equation, we analysis correlation metrics to observe the correlations between direct parameters and use it in TEM for evaluating trust values. In extension of that we had used classification and clustering in our research where first we compare the different classification techniques and find the suitable technique for implementation in TEM. For Classification, we have analyzed k-nearest neighbor, Naive Bayes classification model, decision tree and rule induction model techniques which is demonstrated and discussed in implementation and result analysis part of the article.

The Major focus of this paper is to evaluate trust and to design quality assessment model for QoS aware web service prediction and updating Consumer specific Customized Provider List. The existing models reflect on numerous permutations/combinations of QoS metrics to calculate the trust of web service. However, very few of them did consider the correlation among the different metrics. As per above discussion, we had also focused in correlation but within the metrics to generate improved method for calculating trust score which reduce the chances of wrong estimation of confidence in computation.

THEORETICAL BACKGROUND AND LITERATURE REVIEW

The web service trust in lifecycle has number of existing literature where quality is measured as the metrics to evaluate the trust of web services based on possibility. Web Service Lifecycle (Raj, Singh, & Bansal, 2014) has been proposed in number of literatures include the phases as defined as development, deploy, maintenance, archive and destroy. Web services are micro processes relay on open standards for communication to find the inter-operability to prevent the incidence of a long time dependency over the provider (Xenos, Stavrinoudis, & Christodoulakis, 1999).

Web Services put efforts as guided by service-oriented architecture which is an idea of service operation and execution of any application. SOA gives assured description to WS and its trust from service design and implementation (Jaiswal, Arunima, Raj, & Singh, 2014).

Web Services can be composed, self-contained and modular design. Services can describe methods called by another web application or service via putting attribute and fetching information from existing methods. Combined services can be assumed as a composite service for a large and complex web application. Web Service user request for service which is executed at web server.

Trusted Web Services which is in demand needs to describe in a vast variety of service domain. Trusted Web Services are dominating in the area of e-commerce as well as m-commerce and lots of research are developing and under process (Yao, Sheng, & Maamar, 2012; Rotter et al., 2017; Alrifai, Skoutas, & Risse, 2010).

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