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Analysis of Location-Aware Web Service Recommendation

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Abstract— **Web services are nothing but the software components used for machine-to-machine transaction over a network. Web services are used for building SOA application (Service Oriented Application) in both industries and academic areas. Most of web services are publicly available. To select a proper web services is really a difficult task or users. Selecting inaccurate web services are may cause number of problems, such as ill-suited performance. In this report we would like to suggest a distinctive collaborative filtering-based web service recommender program to steer applicants opt for products and services having the best possible Quality-of-Service efficiency. By using this approach users can select services with QOS (Quality-of-Services) performance. This approach (LoRec) used the location information and QOS values to cluster users and services. Web service Recommendation result based on clustering compare with existing system, our approach improve recommendation accuracy.**

***Index Terms*— Recommendation, Web service, Collaborative filtering, Quality of Service (QoS).**

I. INTRODUCTION

Web services are utilized pertaining to machine-to-machine interaction over a system. Web services utilized WSDL Web Program Outline Language intended for user interface outline as well as SOAP Simple Object Access Protocol for alternate structured data web services tend to be mostly utilized by both enterprise as well as particular developers intended for constructing web service applications. Whenever a developer develop any kind of services which is application oriented, the initial phase would be to design the business enterprise procedure featuring a specification. Nowadays many developers lookup internet services determined by some public websites for instance Google developers, Yahoo, Programmable webs and so forth. These are publicly available today but none of them are provide Location based QOS information for users. Some web services are available in EU that's why these services are not able to ship to different countries. Some developers interested to implement their own web services. By using publicly available web services may occurs extra overhead in both time and resources. Selecting inappropriate service might add some risk in business domain. In this paper QOS (Quality of Services) is nothing but response time, availability. All these parameters are measured at the client-side. Different users could have different QOS values of same services. In another words, Same QOS values of one user cannot be used for web service selection. Conducting world web services are time consuming and resource-consuming. To overcome this drawback, this paper used personalized QOS value prediction for users based on the users' rate or past usage experiences from different users. Based on QOS collected data from different users and different location, among them one user can select the best web service through service recommendation. For example Google Transparency Report has similar records on Google services. To get the prediction accuracy, we are going to propose an Aware-Location web service recommender system (LoRec). LoRec used web service values and user locations for making QOS prediction. In such system different users from different locations share their past experiences of service and system provides service recommendations to them. At the first stage, LoRec collects user QOS records of various services then make group (cluster) of users according to locations finally based on similar QOS values to get service recommendations. The main contributions of our work are:

- We develop an Aware-Location web service recommendation approach (LoRec), which can help to improve the recommendation accuracy and time quality by using service recommendation algorithms.
- We conduct comprehensive experiments in order to evaluate our approach by using a real-world web service QoS information set. Also the analysis and review on impact of algorithm parameters is provided.

II. BACKGROUND AND MOST IMPORTANT RELATED WORK

A. Collaborative Filtering

Collaborative Filtering is used in commercial recommendation systems like Amazon and etc. [2], [9], [18]. Collaborative Filtering is used to give suggestion or recommendation of items or web services for particular user based on collected data from different users at different location. Such data and users are called Training data and Training users respectively. Collaborative Filtering process is based on user-item matrix. Memory-based collaborative filtering consists of two techniques: first is user-based and second one is item-based techniques.

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Memory-based collaborative filtering easy to implement and sometimes required low cost otherwise it is free of cost. However, memory primarily based algorithms have high computation complexity so that it does not used in large scale operations. Model-based Collaborative Filtering algorithms, this model access the past data or rating data using statistical and machine learning algorithms and quickly generate recommendations for specific user based on similar QOS values and location. The main advantage is these models should be rebuilt once new users are added to the system.

B. Service Selection and Recommendation

Recently, Service selection and recommendation both are considered main key factors of our proposed systems. By using clustering techniques it is easy to process the further recommendation task. . El Hadadd et al proposed a selection technique, in which the attributes or items and QOS values are selected. Kang et al. [7] propose AWSR to recommend the web services based on the rating data which is collected from Training users from different locations through preferences. Shao et al. uses a user-based Collaborative Filtering algorithm to predict the QoS values of web services. Such information are used for experimental analysis. In our LoRec approach, we analyzed mixture tasks of various Collaborative Filtering algorithms as discussed earlier. This mixture is much more helpful in generating web service recommendation. The authors also integrate some Neighborhood approach with Matrix factorization in LoRec system. Yu [15] presents the technique which integrates matrix factorization with decision tree learning for service recommendation. Chen et al. [4] used the region-based Collaborative Filtering algorithm to make a web service recommendation. Many, authors also propose a visualization technique for displaying service recommendation results on a map. In our LoRec system, web service recommendation is totally based on both users and web services perspective. That is recommendation algorithm match similar QOS records based on users (cluster) and web services (QOS values/ response time). So that prediction and recommendation accuracy will automatically increase because in our LoRec system considered both user region i.e. Location and web service QOS values.

III. QUALITY OF SERVICE PARAMETERS

NO	QoS Parameter	Description
1	Response Time	Max or Average Time taken to send a request and receive a response.
2	Availability	Number of successful invocations / Total invocations.

IV. CONCLUSION

This specific report presents a QoS-aware web service professional recommendation approach. The fundamental concept would be to predict web services QoS ideals as well as recommend the most beneficial one pertaining to productive users depending on historical web service QoS data. Existing system consider only response time of web services. But our LoRec system considers both response time and user location. Collaborative filtering algorithm is used to create cluster (group) based on Location. The previous recommendation system requires different platforms and resources at each stage during implementation. Recommendation algorithm gives all recommended web services for active user. A nearest-neighbor algorithm is used to generate nearest web services i.e. Nearest-neighbor algorithm returns the Top-n web service results, based on this algorithm user can select perfect web service at particular location.

REFERENCES

[1] M. Alrifai and T. Risse, ‘‘Combining Global Optimization with Local Selection for Efficient QoS-Aware Service Composition,’’ in Proc. 18th Int’l Conf. WWW, 2009, pp. 881-890.
[2] R. Burke, ‘‘Hybrid Recommender Systems: Survey and Experiments,’’ User Model. User-Adapt. Interact., vol. 12, no. 4, pp. 331- 370, Nov. 2002.
[3] X. Chen, X. Liu, Z. Huang, and H. Sun, ‘‘RegionKNN: A Scalable Hybrid Collaborative Filtering Algorithm for Personalized Web Service Recommendation,’’ in Proc. IEEE 8th ICWS, 2010, pp. 9-16.
[4] X. Chen, Z. Zheng, X. Liu, Z. Huang, and H. Sun, ‘‘Personalized QoS-Aware Web Service Recommendation and Visualization,’’ IEEE Trans. Serv. Comput., vol. 6, no. 1, pp. 35-47R1st Quart., 2013.
[5] J.E. Haddad, M. Manouvrier, and M. Rukoz, ‘‘TQoS: Transactional and QoS-Aware Selection Algorithm for Automatic Web Service Composition,’’ IEEE Trans. Serv. Comput., vol. 3, no. 1, pp. 73-85, Jan./Mar. 2010.
[6] S.-Y. Hwang, E.-P. Lim, C.-H. Lee, and C.-H. Chen, ‘‘Dynamic Web Service Selection for Reliable Web Service Composition,’’ IEEE Trans. Serv. Comput., vol. 1, no. 2, pp. 104-116, Apr./June 2008.
[7] G. Kang, J. Liu, M. Tang, X. Liu, B. Cao, and Y. Xu, ‘‘AWSR: Active Web Service Recommendation Based on Usage History,’’ in Proc. IEEE 19th ICWS, 2012, pp. 186-193.
[8] K. Karta, ‘‘An Investigation on Personalized Collaborative Filtering for Web Service Selection,’’ Honours Programme Thesis, Univ. Western Australia, Brisbane, Qld., Australia, 2005.
[9] H.Ma, I. King, andM.R. Lyu, ‘‘Effective Missing Data Prediction for Collaborative Filtering,’’ in Proc. 30th Int’l ACM SIGIR Conf. Res. Dev. Inf. Retrieval, 2007, pp. 39-46.
[10] L. Shao, J. Zhang, Y. Wei, J. Zhao, B. Xie, and H. Mei, ‘‘Personalized QoS Prediction for Web Services via Collaborative Filtering,’’ in Proc. 5th ICWS, 2007, pp. 439-446.
[11] R.M. Sreenath and M.P. Singh, ‘‘Agent-Based Service Selection,’’ J. Web Semantics, vol. 1, no. 3, pp. 261-279, Apr. 2003.
[12] N. Thio and S. Karunasekera, ‘‘Automatic Measurement of a QoS Metric for Web Service Recommendation,’’ in Proc. Australian Softw. Eng. Conf., 2005, pp. 202-211.
[13] S. Wang, Q. Sun, and F. Yang, ‘‘Towards Web Service Selection Based on QoS Estimation,’’ Int’l J. Web Grid Serv., vol. 6, no. 4, pp. 424-443, Nov. 2012.
[14] J. Yin, S.Deng, Y. Li, and Z. Wu, ‘‘Collaborative Web Service QoS Prediction with Location-Based Regularization,’’ in Proceedings of the 19th International Conference Web Services (ICWS’12), 2012, pp. 464-471.
[15] Q. Yu, ‘‘Decision Tree Learning from Incomplete QoS to Bootstrap Service Recommendation,’’ in Proc. IEEE 19th ICWS, 2012, pp. 194-201.
[16] Z. Zheng, H. Ma, M.R. Lyu, and I. King, ‘‘Collaborative Web Service QoS Prediction via Neighborhood Integrated Matrix Factorization,’’ IEEE Trans. Serv. Comput., vol. 6, no. 3, pp. 289- 299, July/Sept. 2013.

[17] Z. Zheng, H. Ma, M.R. Lyu, and I. King, ''QoS-Aware Web Service Recommendation by Collaborative Filtering,'' IEEE Trans. Serv. Comput., vol. 4, no. 2, pp. 140-152, Apr./June 2011.

[18] J. Zhu, Y. Kang, Z. Zheng, and M.R. Lyu, ''A Clustering-Based QoS Prediction Approach for Web Service Recommendation,'' in Proc. 15th IEEE Int'l Symp. Obj./Compon./Serv.-Oriented Real-Time Distrib. Comput. Workshops, Apr. 2012, pp. 93-98.

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