



## A Framework for Evaluation of Service Interface

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**Abstract**— *This paper proposes an evaluation model for Service Oriented Architecture. Many different models have been proposed in different views. This paper proposes a metrics model for measuring service interface. In service oriented architecture the service interface is glue between the service producer and service consumer. The best practice in the development of service is developing the contract first. This emphasizes the importance of design of service contract. During the design of service interface, the principle characteristics of SOA should be considered. This paper proposes a metric model for measuring service interface to evaluate Service Oriented Architecture.*

**Keywords**— *Service Evaluation, Service Interface, SOA, Service evaluation Model*

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### I. INTRODUCTION

A Service oriented Architecture (SOA) is becoming popular and dominant architectural style for building business applications. In SOA the building blocks are services. SOA service type includes different style services such as Web services, Representational State Transfer (ReST) style services, and fixed position (FP) API style services. A continuous debate is going on in the selection of services. Among these, Web services rely on rigorous standards. Hence in this paper we have taken the SOA services are Web services. Web Services are independent and self-contained. The Web services communicate each other via messages [1]. Messages are in standard format so that any other services can read, understand and communicate. The message contains a set of instructions and data which are required to facilitate interaction between the consumer and services. The service should also expose its functionality as operations. The messages and operations of a service are structured in the service interface. The service interface is the actual contract between service consumer and service producer [2]. The service contract provides glue between the service consumer and the service producer. Developing the contract first is the best practice in the development of services. The service contract should be carefully designed. The reason for emphasizing the careful design of service contract in SOA is, a poorly designed service interfaces produce negative impact on applications which uses them. A good service interface design should reflect the principle characteristics of service oriented architecture. This paper is organized as follows. In section II about the service interface is discussed. Section III discusses why service contract first. In section IV an evaluation model is given. Section V concludes the paper.

### II. SERVICE INTERFACE

A Web service contract is nothing but collection of meta data which describes the information about software program that provides the service. The information includes, what are the various functions that service can provide, the input and output messages to communicate with the service consumer, data structure of the messages and how and where the service can be accessed. Web services rely on a set of standards [3]. However for defining the service interface it follows the following four standards:

1. WSDL - Web Service Description Language
2. XSD - XML Schemas Definition Language
3. XML - Extensible Markup Language
4. SOAP - Simple Object Access Protocol

The WSDL defines name, location and operations of the service and inputs and outputs of the service. The XML schema defines the structure of input and output data type. SOAP is a communication protocol to communicate between the services. In the context of Web service, the communication is happened through the service interface (Figure - 1). The consumer service which want to access another service, first identifies the format of interface of producer's service [4]. As per the format of the request message given in the WSDL, the consumer creates and inserts data into the request message and sends it to the producer service. The producer service upon receiving this message, extract and process the

request data. After processing, the response data inserted into the response message and it is sent to the consumer as reply. The above request and reply processing are happened through the service interface regardless of underlying technology in both the services. This emphasizes the proper designing of service interface or contract [5].

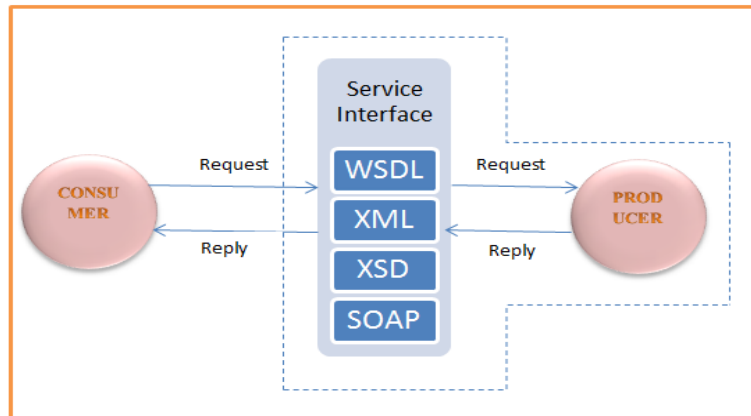


Figure – 1 Request – Reply between Consumer and Producer services

### III. SERVICE CONTRACT FIRST

During the development of Web Services the service contract can be developed at two points. Service contract may be created first before developing the service. And then service is developed. Or the service contract may be created at the very end after developing the service code. From the developed source code, service contract code is generated. Service Contract-last may be developed by tooling. The Service Contract-last pattern is having some potential disadvantages:

- ❖ Service is for specific application.
- ❖ If there is any change in the source code, it will be reflected in the service contract.
- ❖ Results in service may not be optimized one.
- ❖ Extension may be difficult
- ❖ Since lacking of extensibility and flexibility, the reusability will be less.

In case of Service contract-first pattern the service contract is first created and then the source code is developed. In this model the contracts both data and service contract are developed. Then it is reviewed to whether the service needs further refining. The contract should reflect the principles of Service Oriented Architecture. The flexibility and extensibility in the service contract should be measured. If it is needed it should be refined. In this approach even the next version comes, it will not affect the previous one. Since this approach has significant advantages Service contract – first should be followed.

### IV. EVALUATION MODEL

The purpose of selection of service contract-first is we can design the service contract in such a way that it adhere the principle characteristics of service oriented architecture. When a service contract is created first time we do not know the level of the characteristics such as extensibility, flexibility, coupling, reusability and so on. The refining may it needed. At this stage we need some measures to evaluate these characteristics. In this paper we propose an evaluation model to evaluate the service interface (Figure – 2). The first step is creation of service interface. After developing the service interface using a set of measures the service interface has to be measured to check whether it needs further refinement. Because the service interface is only contact point to the service consumer. The consumer will also measure the service interface performance before it is consumed. Therefore the service interface should review and refined properly at this stage. Our work is on the second stage to propose a software metric framework to measure the service interface for evaluating service oriented architecture.

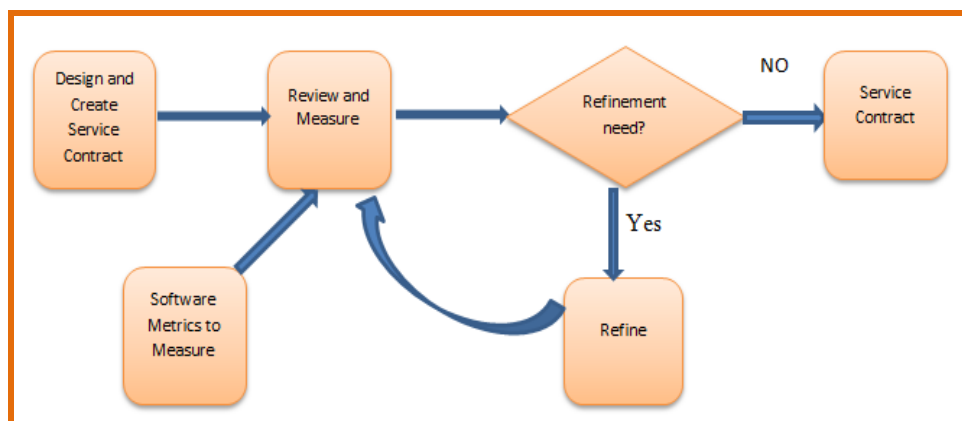


Figure - 2 Creation and Evaluation of Service Contract

#### V. CONCLUSIONS

In this paper we discuss about the service contract and the importance of designing of service contract first. In this paper we proposed a model to evaluate service interface. Our future work is proposing software metrics to evaluate service oriented architecture by measuring service interface.

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