

A Review on Various Methods for the Development of Web Services

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Abstract - Software engineering is the branch of computer science that is related with the development of a software product which satisfy all the requirements that the customer have defined as per the software requirement specification document. In this paper, we will discuss about the Web Services that is a method of communication that allows the two software systems to exchange the information over the network and how the data is exchanged between the systems. It connects the system by using a special protocol SOAP (Simple Object Access Protocol).SOAP is a messaging protocol that allows programs that run on disparate operating systems (such as Windows and Linux) to communicate using Hypertext Transfer Protocol (HTTP) and its Extensible Markup Language (XML).

Keywords - WSDL, SOAP, Web Services, UDDI, QoS.

1. Introduction

1.1 Software Engineering

Software engineering is an engineering approach which deals with the design, development and maintenance of software. It gives us a proficient and solid programming in results. Software engineering process has less extensive degree as compared to the software project management.

1.2 Software Development Lifecycle (SDLC)

A Software Development Life Cycle (SDLC) is essentially a series of phases through which the software undergoes during its development. Various phases of Software Engineering are Feasibility Study, Requirement gathering and analysis, Design, Coding, Unit Testing and Integration Testing, Maintenance.

1.2.1 Feasibility study

It involves checking whether it is feasible to develop the software or not. There are many different types of

feasibility studies like technical feasibility, economic feasibility, Cultural Feasibility and Resource Feasibility etc.

1.2.2 Requirement Gathering and Analysis

In this phase, all the requirements of the customers are gathered to develop software. Requirements analysis in some cases obliges people/groups from customer and in addition administration supplier sites to get definite and exact necessities. Frequently there must be a ton of communication to and from to comprehend these requirements.

1.2.3 Design

In systems design, the configuration capacities and operations are portrayed in point of interest, including screen designs, business principles, procedure charts and other documentation.

1.2.4 Coding and Unit Testing

In this phase code is accomplished in modules. Then unit testing is done of every individual module.

1.2.5 Integration and Testing

All the modules are integrated in a planned manner. Once all the modules are integrated, then integration testing will be done.

1.2.6 Maintenance

The deployment of the system includes changes and enhancements. It is the most important phase of SDLC which takes more effort than other phases.

1.3 Web Services

Web administration is a method for correspondence that allows two product systems to exchange the data over the web. The product framework that requests data is known as an administration requester, while the item system that would handles the data and give the data is known as an administration supplier. Different programming may be built using differing programming vernaculars, and subsequently there is a necessity for a procedure for data exchange that doesn't depend on a particular programming vernacular. Most sorts of programming can, in any case, interpret XML names. As needs be, Web organizations can use XML archives for data exchange. Rules for correspondence between different structures need to be described.



Fig 1.1: Communication of Web Services

For example,

- How one system can request data from another system?
- Which specific parameters are needed in the data request?
- What would be the structure of the data produced?
- Normally, data is exchanged in XML files, and the structure of the XML file is validated against an .xsd file.
- What error messages to display when a certain rule for communication is not observed, to make troubleshooting easier.

These precepts for correspondence are portrayed in a record called WSDL (Web Services Description Language), which has the document augmentation .wsdl. An index called UDDI (Universal Description, Discovery and Integration) which describes which programming system ought to be arrived at for which kind of data. So when one item system needs one particular report/data, it would go to the UDDI and find which other structure it can contact for getting that data.

Once the item system finds which other structure it should get in touch with, it would then contact that system using SOAP (Simple Object Access Protocol). The organization supplier structure would most importantly else acknowledge the data request by suggesting the WSDL record and after that process the offer and send the data under the SOAP convention.

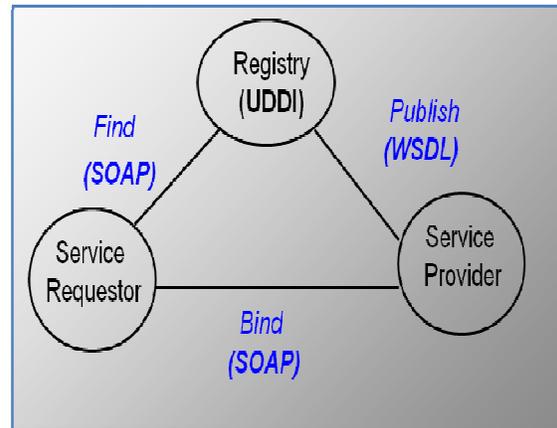


Fig 1.2: SOAP,UDDI,WSDL

1.3.1 Benefits & Limitations of Web Service

A Web Service can be available over the Internet or on a private network. It utilities standard XML messaging system. The programming language or operating system used to create the Web Service are not of a large concern, since no matter which programming language is used to create it is available to various different platforms. Web services provides a number of benefits as listed below:

- It increases competition among vendors which results in lower product costs.
- It helps in easy transition from one product to another, resulting in lower training costs.
- It increases the ability for parties to interoperate, resulting in lower maintenance costs.
- It ensures greater degree of adoption and longevity for a standard. A large degree of usage from the vendors and the users leads to a higher degree of acceptance.
- Web Services can be implemented in various different applications. It is easy to reuse an existing web service application for many other related applications.

There are some known issues about web services that everyone should also be aware off as listed here:

- Web Services are very simple and easy to use in all respects. However, the large size of web services is sometimes the issue.
- HTTP and HTTPS are simple and core web protocols which are used extensively. However they are not meant for long term sessions due to

security issues. In case of a browser which makes an HTTP connection, it will request a Web Page and the related images and then disconnect.

- It is always unclear that whether the money will be made in offering Web Services or not.

1.3.2 Types of Web Services

Web services are of various types. The two main types are:

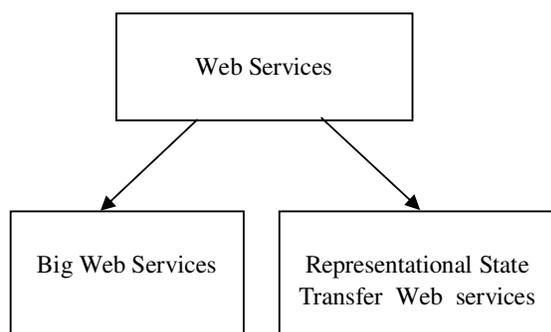


Fig 1.3: Types of Web Services

1.3.2.1 Big Web Services

Big web Service use XML messages that take after the Simple Object Access Protocol (SOAP) standard, a XML lingo describing a message building outline and message outlines. Such systems consistently contain a machine-lucid depiction of the operations offered by the organization, written in the Web Services Description Language(WSDL),XML lingo for describing interfaces phonetically. The SOAP message bunch and the WSDL interface definition lingo have expanded no matter how you look at it allocation. Various progression gadgets, for instance, Net beans IDE, can reduce the flightiness of making web organization applications.

1.3.2.2 Representational State Transfer (REST) Web Services

REST (Representational State Transfer) web services are in light of the way how our web functions. The internet system (www) – the biggest appropriated application is in view of a structural style called REST. REST is not a standard or a convention. It is simply a compositional style like say for instance customer server construction modeling (customer server is not a standard or a convention).

Web administrations taking after this design style are said to be RESTful Web administrations. It is essentially an outline style like say for the case of client server development displaying. Web organizations copying this structural style are said to be RESTful Web administrations. As demonstrated by Roy Fielding who generated this term, it is wanted to summon a picture of

how a nicely made Web application carries on: Presented with an arrangement of site pages (a virtual state-machine), the customer advances through an application by selecting associations (state moves), coming about the page being traded to the customer.

2. Literature Background

Diaz-Herrera [1] “Engineering design for software: on defining the software engineering profession” In this paper author want to proposed that the development of item known as formal field of study in the informed group. The direction to fabricate a modified specifically course to different expert undertakings. In this paper the makers look at all things considered recognized implications of building and show their correspondence or congruity to programming progression. They demonstrate through an unequivocal examination how recognizable eccentricities that cut over all building controls are found in programming outlining too. They close with a dialog of the enlightening implications.

Thomas, J.P et al [2] “Modeling of Web services flow” Author proposed that the Organizations, modified purchasing, customized updating of expenses, or getting latest information can be given on the Internet using Web organizations development. Client can get this organization by utilizing web. Web organizations system consolidates a couple of standards like direct article access tradition (SOAP), Web organizations depiction tongue (WSDL) and complete delineation, disclosure and consolidation (UDDI). In this paper creator identify with appropriated Web advantages by exhibiting the surge of messages and methods in a Web organization trade. Such a model helps the Web organizations maker to ensure the precision of Web streams the extent that gridlock and right end of the Web organizations trade.

Benharref, A et al [3] “A New Approach for Quality Enforcement in Communities of Web Services” Author want to say that the Web administrations is similar to a work inside to enhance their detectable quality. Web benefits ordinarily offer battling and/or supplementing organizations. In this paper creator extend the gathering approach by describing a specific reason. Web Services working in any Web Services bunch. This watching gathering involves a set of Web Services prepared for viewing other Web Services. Clients, suppliers, and also chiefs of gatherings can make usage of the watching gathering to check if a Web Service is working clearly. This paper describes the general structural arranging of the checking gathering, the arrangement of activity behind, different principles and terms to be respected by its parts, organizations it offers to its distinctive classes of customers. The paper lets us know about the ensuring test outcomes using the checking gathering.

Chao Ma et al [4] “An Approach for Visualization and Formalization of Web Service Composition” Author

proposes a quick Web administration piece approach (FWSCA) which grasps the increased OWL-S Web organization semantic depiction dialect (OWL-ES). OWL-ES has the ability to delineate element changes among parts of Web administrations courses of action by increasing the current technique model of OWL-S. They clarify the layout of FWSCA and look at its usability by using a delineation of Web administration organization. For the tooling bit of FWSCA, They develop a customized Web organization synthesis visualization and formalization device (VFT) which has the limit encourages the strategy of Web organization plan for end-customers.

Yukyong Kim et al [5] “Adaptable Web Services Modeling Using Variability Analysis” Author told us about the web organizations have starting late come into concentrate as we end up ready to make programming systems versatile, reusable, and fiscally sagacious. In scattered Web organizations circumstances, Web organizations should be greatly flexible because the potential number of organizations can be amazingly limitless and target customers and organization suppliers need to face distinctive circumstances. To propel the adaptability of organizations, the variability on Web organizations should prudently be considered and showed. In this paper, They show a methodology for showing extraordinarily adaptable Web advantages by separating the variability with respect to building and behavioral characteristics. They describe showing parts of Web organizations to think the variability and mixed bag centers. They focus on the showing of variability of Web organizations from mixture purposes of structural eccentricities and behavioral contrivances. In this work, They endeavor to depict how flexible Web organizations are created with a suitable depiction of the variability as a framework for modifying structures concentrated around Web organizations.

Al-Masri, E et al [6] “Discovering the best web service: A neural network-based solution” In this paper author propose a framework for enabling the profitable exposure of Web organizations using counterfeit neural frameworks (ANN) best known for their hypothesis limits. The core of this framework is applying a novel neural framework model to Web organizations to center suitable Web organizations concentrated around the prospect of the nature of Web administration (QWS). The guideline thought of QWS is to assess a Web organization's behavior and ability to pass on the requested handiness. Through the aggregate of QWS for Web advantages, the neural framework is prepared for recognizing those organizations that fit in with a blended sack of class things. The general execution of the proposed system exhibits a 95% accomplishment rate for discovering Web organizations of speculation. To test the force and suitability of the neural framework computation, a rate of the QWS peculiarities were rejected from the readiness set and results exhibited a critical impact in the general execution of the system.

Discovering Web advantages through a wide decision of worth qualities can altogether be affected with the determination of QWS idiosyncrasies used to give a general assessment of Web organizations.

3. Approaches Used

3.1 Petri Net

A Petri NET is one of a few scientific demonstrating languages for the depiction of appropriated frameworks. A Petri net is a steered bipartite diagram, in which the hubs represent transitions (i.e. occasions that may happen, meant by bars) and places (i.e. conditions, denoted by circles). The coordinated bends depict which places are pre- and/or post conditions for which transitions (denoted by arrows).

3.2 Web Services Description Language (WSDL)

WSDL is an XML-based format for describing web services. Clients wishing to access a Web service can read and interpret its WSDL file to learn about the location of the service and its available operations. It is used to depict the administrations a business offers and to give an approach to people & different organizations to get to those administrations electronically. The acronym is likewise utilized for any particular WSDL depiction of a web administration (additionally referred to as a WSDL document), which gives a machine-lucid portrayal of how the administration can be called, what parameters it expects, and what information structures it returns. It subsequently fills a need that compares generally to that of a system signature in programming language.

3.3 Fast Web Service Composition Approach (FWSCA)

Fast Web Service Composition approach adopts the amplified OWL-S Web service semantic depiction language (OWL-ES). OWL-ES has the capacity portray dynamic changes among parts of Web administration structures by broadening the current procedure model of OWL-S. They expound on the outline of FWSCA and examine its convenience by utilizing a case of Web administration synthesis. For the tooling piece of FWSCA, they add to a programmed Web administration synthesis visualization and formalization device (VFT) which has the capacity facilitates the procedure of Web administration creation for end-clients.

3.4 Quality of Service

With the boundless multiplication of Web services, Quality of Service (QoS) will turn into a critical component in recognizing the achievement of administration suppliers. QoS decides the administration convenience and utility, both of which impact the

prevalence of the administration. In this article, we look at the various Web services Quality of Service requirement, bottlenecks influencing execution of Web administrations, methodologies of giving administration quality, value-based administrations and strategy for measuring response time of Web services utilizing the administration intermediary.

Table 1: Comparison Table

Sr. No	Approach Used	Advantages	Disadvantages
1.	Petri net	<ul style="list-style-type: none"> It is used to represent transition between nodes & places. It is used for the execution of semantics. 	<ul style="list-style-type: none"> It does not tell about the exact location.
2.	Web Services Description Language (WSDL)	<ul style="list-style-type: none"> It is used for describing the functionality offered by a web service. 	<ul style="list-style-type: none"> It has very heavy weight.
3.	Fast Web Service Composition Approach (FWSCA)	<ul style="list-style-type: none"> It provides better and accurate results. 	<ul style="list-style-type: none"> It is time consuming.
4.	REST	<ul style="list-style-type: none"> Only HTTP support is required Built-in error handling (faults) 	<ul style="list-style-type: none"> Not reliable Http delete can return OK status even if a resource is not deleted It is not usable for distributed computing environment where message may go through one or more intermediates.
5.	Quality of Service (QoS)	<ul style="list-style-type: none"> It is used to improve transmission rates. It tells us about error rates and other characteristics that can be improved. 	<ul style="list-style-type: none"> It requires Internet connectivity to collaborate, Any Person can edit, Open to SPAM and Vandalism if not managed properly.

The above table shows the advantages & disadvantages of various approaches and techniques used for the development of web services.

4. Conclusion

Web service is a strategy for correspondence that permits two software frameworks to trade the information over the web. This paper analyses techniques for web services-based development, and it identifies a problem in the conception of these techniques for the building of complex systems from multiple web services. Web service environment is highly complex. Software Development Life Cycle is essentially a series of phases through which the software undergoes during its development. They use SOAP (Simple Object Access Protocol) to connect the system which is based on Extensible Markup Language (XML). It provides the facility to communicate between the Application and Operating System. Success of published web services depends on how it is getting discovered. Efficiency, accuracy and security factors must be considered while providing the services.

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