

A Study of Web Service Composition Using Petrinet Model

¹Pallavi Tiwari & ²Dr. S. Srinivasan

¹Research Scholar Mewar University, Chittorgarh, Rajasthan

²Professor & HOD of Computer Science & Applications

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ABSTRACT

The expanding request of clients for high caliber and opportune data is putting organizations under the weight of working together with different friends for accomplishing cost-effectiveness and expertise- availability in their business. To fulfill these need applications dependent on Web service innovation have been utilized quickly in business associations. In this situation the job of Internet has turned out to be critical with a few noteworthy changes. Presently it has a vehicle of Web benefits as opposed to only a storehouse of data. Subsequently numerous associations are putting their center business abilities on the Internet as an accumulation of Web services, since it is difficult to coordinate client's needs with just a solitary Web service. Other than this it is additionally important to choose proper services according to prerequisite. Web service is a product work given at a system address over the web, it is an service that is recognized by a URI and "dependably on" as in the idea of utility processing. The World Wide Web Consortium (W3C) characterizes an "Internet service" as "a product framework intended to help interoperable machine-to-machine association over a web, whose interfaces and restricting are equipped for being characterized, depicted, and found by XML antiques and supports direct connections with other programming applications utilizing XML-based messages by means of Internet based applications. Web service organization is a component for making new Web services from existing Web services. Web service organization empowers fast service creation by reusing existing services.

1. Introduction

The Agent based methodology is considered for dynamic web service creation which implies arrangement at runtime. Dynamic viewpoints are considered and bolstered by a Composition Agent in this structure, which empowers a requester to work easily with a couple of burdens, on the grounds that Intelligent operators are critical thinking, independent, computational that are equipped for compelling proactive conduct in open and dynamic conditions In Agent Based Web Service Composition, the creation of web services which are made by the service specialist with different operators dependent on the necessity of the client. Utilization of Agent based web service arrangement diminishes the time multifaceted nature and giving ideal answer for the client.

Demonstrating and dissecting the procedures of complex work processes has produced a need of devices and situations which encouraging visual displaying and particular of complex work processes , for this, idea of petri-net has been proposed . Its job is legitimized by numerous reasons. For instance, petrinet is high-level exact language with for-mal semantics utilized for visual portrayals which permits communicating and thinking about ideas at their characteristic dimension of deliberation and it additionally gives incredible examination methods which can be utilized to confirm the accuracy of work process strategies. Petri nets (Petri 1962, Peterson 1981) are a well-founded procedure displaying strategy that have been utilized to demonstrate and break down a few kinds of procedures including conventions, fabricating frameworks, and business forms. A Petri net is a coordinated, associated, and bipartite chart in which every hub is either a spot or a progress. A Web service conduct is fundamentally an in part requested arrangement of activities. Along these lines, it is clear to outline into a Petri net. Tasks are displayed by advances and the condition of the service is demonstrated by spots. The bolts

among spots and changes are utilized to indicate causal relations.

The present powerful business condition included from members like business industry, generation unit, specialist organizations, providers, clients and so on., where each element is in charge of productivity of by and large business and each substance is dynamic in nature. To help this business condition, business application programming needs to adjust to huge changes for amplifying benefit. By characterizing all around characterized shared semantics and philosophy's for dynamic business, the business applications can satisfy the prerequisites for dynamism, which is critical in current business conditions, which is finished by deciphering the key parts of semantic web innovations into business phrasings. The proposal expects to build up a system, which can utilize Semantic Web advancements as an instrument for different unique business activities. For interpretation of dynamic business perspectives into semantic documentation, the movement hypothesis structure is used which gives a strong system and can deal with different powerful business situations. Semantic Web advancements are relocating to key innovation to determine the issues of interoperability and mix inside the heterogeneous universe of pervasively interconnected frameworks concerning the idea of parts, principles, information groups, conventions, between people expanding the heterogeneous condition. and so on. It gives fantastic correspondence connect highlights of Semantic Web advances for The world-class aggressiveness of endeavors emphatically depends, later on, on their capacity to quickly set-up, and keeps up, virtual, organized undertaking structures. Truth be told, dealing with the semantics of business-to-business association might be the most testing errand in coordinated e-business esteem chains, and there is increasingly more proof that Semantic Web innovation to

alleviate such issues. For the most part, the web services are alluded as application services which incorporates some mix of information and programming, just as it likewise contains HR. This procedure is made accessible for the web servers and web clients. It is additionally utilized for their business or other web related projects. The web specialist co-ops are ordinarily called as application specialist organization. Various types of web services are accessible and the real services are named as Customer Relationship Management (CRM), stockpiling the board and different services are the checking of the offers amid closeouts, outfitting of stock statements, etc. The significant web slants in web service empower the accessibility of these services and increasing speed creation. The web service client's entrance various types of web benefits over shared servers as opposed to utilizing a focal server. In any case, a few services speak with other web services. Various information or procedure trade is likewise typically empowered by the product class, which is named as middleware. Already, the web services were utilized just for Electronic Data Interchange (EDI). Be that as it may, as of now they find broad applications in a few zones. Other than wide accessibility and institutionalization to organizations and the web service clients of the web itself, web services are additionally reached out with the assistance of Extensible Markup Language (XML) as a method for trading information and institutionalizing information designs. XML is the crucial substance for the Web Services Description Language (WSDL) as appeared in Figure 1.

As there is an expansion in web benefits its principle concerns is comprise of in general requests on the particular impact on web service execution and furthermore on the system data transfer capacity with any sort of web service application, as its service raises the web service exercises. An endless number of new web service items have expanded and it is additionally assessed the web specialist organization. This empowers the product engineer to alter or create the web service application distributed as the web services with capacity for potential access.

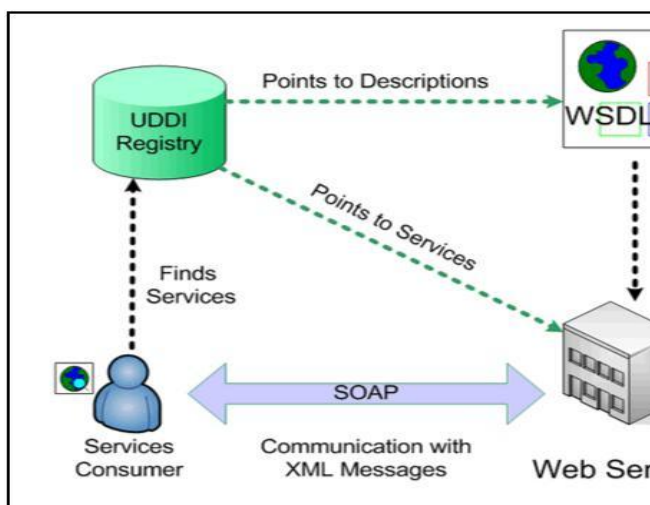


Figure 1 Typical Web Services Framework

A web service is a product framework recognized by a URL, whose open interfaces and ties are characterized and portrayed utilizing XML. Its definition can be found by other programming frameworks. These frameworks may then collaborate with the web service in a way recommended

according to its, utilizing XML-based messages passed on by web conventions. This definition has been distributed by the World Wide Web consortium W3C, in the Web Services Architecture report the web service model comprises of three substances, the specialist organization, the service library and the service customer.

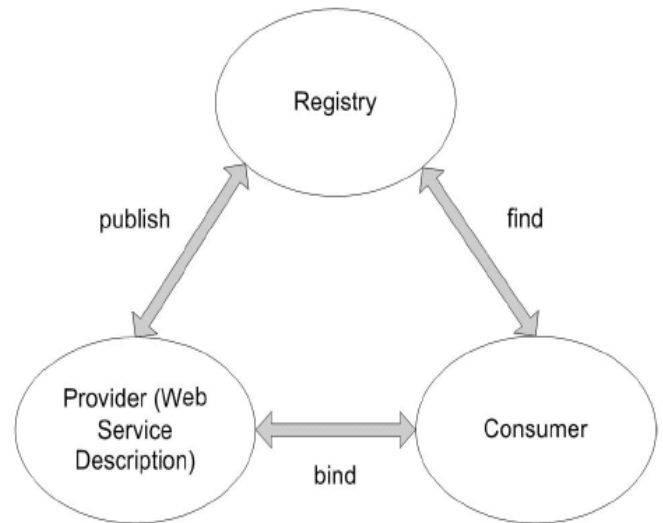


Figure 2 a graphical representation of the traditional web service model

The specialist organization makes or just offers the web service. The specialist organization needs to depict the web service in a standard arrangement, which thusly is XML and distribute it in a focal Service Registry. The service library contains extra data about the specialist organization, for example, address and contact of the giving organization, and specialized insights regarding the service. The Service Consumer recovers the data from the vault and uses the service depiction acquired to tie to and conjure the web service.

2. Literature Review

(Neubauer and Stummer 2010) In continuous years, nearby the thought on Service Arranged Engineering (SOA), the insightful network and the business are moving ever closer and the investigation on SOA is growing. One of the examination domains in SOA is service revelation and organization. Exactly when an unpredictable necessity of a customer can't be met with a single Web service it must be rehearsed by shaping a couple of huge services together regardless, the structure of Web services joins two edges they are (i) Web service disclosure and (ii) Web service organization. Given a file of service portrayals and an service request the Web service structure incorporates finding different Web benefits that can be collected in the correct solicitation of execution to secure the perfect service. Finding a Web service that can fulfill the interest alone is insinuated as Web service revelation.

(Weise et al. 2008) A wide scope of techniques has been proposed in the composition for service revelation and sythesis. A part of the formal methodologies for Web service structure are Petri Nets, Bound together Demonstrating Language (UML), State charts, Coherent Thinking, Movement plots, Procedure Variable based math and Fluffy Rationale The field of Web service disclosure and arrangement is dynamic in

this service revelation expect a fundamental occupation. Web service arrangement incorporates two sorts of services, to be explicit, fundamental services and composite services. Direct services are Web put together applications that don't depend with respect to other Web services to fulfill clients' sales. An instance of an essential Web service is a mediator that recognizes words in a given language and returns its understanding in another lingo. A composite service is described as an amassing of re-appropriated Web services, called individuals working pair to offer a regard included service.

(Cheng et al. 2007) SOA is a systematized depiction of the service orchestrated preparing perspective which describes a connected system for organizing and making service building subject to a great deal of open benchmarks. The SOA proposes a layered structure for dealing with services which can be appropriated, found, invoked and joined to make dynamically complex services. Generally, Web services are portrayed using the WSDL and are syntactic in nature and don't have the perspective of the service's semantics. Appropriately, looking for, gathering and organizing services are correspondingly troublesome and confined by the nonattendance of exactness. For example, UDDI service vaults feature catchphrase based service planning frameworks for WSDL services. Initial work has been done in discovering Web benefits explicitly by addressing syntactic Web benefits through their WSDL documentation using web files. One of the typical limitations of the syntactic web record is the by and large short substance of the WSDL file which finally decreases the precision and audit of the web searcher.

Fujii and Suda (2006) have shown the semantic based amazing service organization designing. This plan includes a section show called Segment Service Show with Semantics (Universe), a middleware called Segment Runtime Environment (Center), and an service piece framework called Semantic Chart based Service Composition (SeGSeC). The Web services which are exhibited by the Universe have been found by Center using a disclosure engine. The Discovery Motor at first recuperates every one of the models showing the coupling WSDL records from the UDDI and parses them into Universe semantic diagrams by using the WSDL and RDF parsers.

Toch and Gal (2007) the model system to be explicit, the Service Mediation Toolkit (SMT) has been executed to support the reachability and amplexness of this philosophy. The strategy nearby the model system empowers the present daily schedule with respect to show intercession for Web services organization. Have developed a Web based web crawler assembled Article Methodology Semantics Bound Coordinating (OPOSSUM) This web searcher uses semantic methodologies for the precise and profitable recuperation of Web services subject to their WSDL delineations. The OPOSSUM crawls the Web for WSDL depictions transforming them into ontological-based models of the Web services. It does that by means of subsequently extending the service properties with the present thoughts. The count they have used relies upon probabilistic methodologies for the assistant examination of the related cosmology's in order to improve the survey and exactness of the interest strategy. The web crawler recoups capably made services which are made out of a few atomic services. Thusly, paying little heed to whether a request isn't answered by a

singular service it might be answered by consolidating a few services.

(Ngu et al. 2010). The semantic web has ascended as an answer growing the present web advancements with all around portrayed ramifications to the present services and resources. This is supported by remarks with ontological semantics through vernaculars that can be interpreted and taken care of by PCs. Cosmology's are used to give a formal and unequivocal assurance to the area thoughts, reliable relations, imprisonments and properties of a semantic Web service. Semantic use this information to perform modified examination and explanations of Web services and resources. Hence, semantic web developments give additional degree to robotized service examination, decision and organizing, giving automated dealing with and fundamental authority reliant on semantic delineations. These systems can be manhandled with respect to support organization and alteration. The semantic Web services which utilize the power of cosmology's would give a capable technique for planning services.

Elgedawy et al. (2008) as different customers have particular semantics it is indispensable that the coordinating result finds only the services that meet the customer's request. Have proposed a technique that discards the nearness of false positives by returning only the correct service to meet the customer's target unmistakably the coordinating strategy should be established basically on the unusual state practical particulars, for instance, destinations, achievement settings and external lead.

Brogi (2010) has complemented the noteworthiness of lead information in service gets that curbs the probability of guaranteeing the service participation's and highlights the confinements of starting at now available service vaults which don't think about the social information. A structure Web Thinking Framework - III (IRS-has been used for the creation and running of semantic Web services which receives a semantic shipper based technique for the intervention between service requesters and service providers have added a Procedure Show class to the ebXML Library Data Demonstrate (ebRIM) for the geospatial information dealing with. It is a key extension used with the ultimate objective of data disclosure instead of the ebRIM profile.

Bener et al. (2009) proposed a go between designing that performs semantic coordinating of Web services dependent on utilitarian and non-practical parameters of the service profile of an OWL-S. Bipartite outline coordinating has been used to find the best pairings among disputes, predicates and conditions having a spot with promotions and request. Hybrid semantic service decision performed by OWLS-MX social arranger mishandles both basis based reasoning and non-justification based Data Recovery (IR) techniques for OWL-S service profile signature coordinating. Their work has focused just on the service data and yield (IO) parameters and dismisses precondition and effect (PE).

Segev and Toch (2009) have proposed a setting based semantic approach to manage the issue of coordinating and situating of Web services for possible service sythesis and gave a numeric estimation about the possible arrangement to the organizer. Cushy framework has been used for finding and matchmaking of OWL-S based Web services using its profile logic. The matchmaking activity relies upon the usage of both cushioned multi-set for addressing granular information and

clustering computation for social event OWL-S reports. An OWL-S service profile theory based framework is used for the recuperation of Web services subject to sub-sumption association and assistant case-based reasoning which performs area dependant disclosure.

Brogi et al. (2008) have shown a computation called Service Conglomeration Matchmaking (SAM), for sythesis arranged revelation of Web services. Hyper graph has been used to get effectively the conditions among strategies on the planned services. It plays out a fine-grained organize at the dimension of atomic technique of services. Semantic partition between thoughts in the logical characterization tree of transcendentalism is enrolled to choose the dimension of match to discover services. The coordinating system has used five particular channels: setting coordinating, profile examination, similarity coordinating, signature coordinating and limitation coordinating.

Talantikite et al. (2009) has presented a model of semantic clarifications for Web services revelation and organization. This technique has used a between related arrangement of semantic Web services depicted in OWL-S using the closeness measure (yields inputs likeness) between thoughts worked before any submitted interest.

(Mietzner et al. 2011) Service arranged undertaking structures which will by and large be heterogeneous, around coupled, organize unprejudiced language neutral and reliably running need to adjust to visit changes to their prerequisites and the earth. In order to address such changes, applications ought to be naturally versatile and flexible reinforced by fitting systems have proposed a model driven strategy for the dynamic change of Web services reliant on cosmology careful service designs.

(Sbodio et al. 2010) Show driven structure raises the dimension of reflection from strong Web service executions to unusual state service models which brief dynamically versatile and automated alterations through configuration plans and changes. The ontological semantics overhauls the service coordinating capacities required by the dynamic change process. Service formats rely upon OWL-S delineations and give the significant method to get and parameterize express gauges of direct of service models. Service alterations were performed on engrossed service models due to a change technique. This technique has the going with essential ideal conditions. First it has raised the dimension of reflection through which the organizer can reason about changes. Second predefined changes and motorization have reduced how much slip-ups can be mixed into the improvement strategy. Third the usability is improved through the plan of heading developed editors that energize the methodology steps. Finally the system can be used identified with untouchable modification methodology to semi-subsequently create service formats from which one can pass on service connectors. Robotized creation technique that explicitly uses the useful semantics of services to decide the time unpredictability

(Xu et al. 2010) Various Nature of Service (QoS) based Web services disclosure and sythesis segments have been made recently. QoS in Web services incorporates diverse non-useful parameters, for instance, response time, availability, execution, cost, reliability and security, etc. As progressively more Web services are available QoS limit is transforming into

an unequivocal factor to perceive the best services The general quality standard depicts quality as the totality of features and characteristics of a thing or service that bear on its ability to satisfy communicated or surmised needs. The going with points of view about quality are typical:

(Kritikos and Plexousakis 2009) Quality is considered as the proportion of usefulness that an service can offer to its customers. For example, if Service1 grants renting a vehicle other than booking flights and lodgings, and if this usefulness isn't given by Service2 or Service3, by then Service1 is advancing a predominant quality than Service2 and Service3. Quality techniques meeting customers' necessity and the service must be available continually. For example, if Service1 has shown that the Web service will be open 0.9999 of the time and meet the customers' necessity exactly; by then Service1 is considered as offering incredible nature of service. Quality depends upon the customers' understanding and want from a Web service and its regard is built everything considered over the period of the service's essence from the customers' analysis. For example, if Web services have dependably given express usefulness unequivocal execution levels reliably of their movement, by then they are said to give incredible nature of service.

(Xiong et al. 2008, 2009) These unmistakable points of view on quality require the QoS to be checked and assessed in an unforeseen manner. Quality as usefulness depicts the arrangement of an service and must be evaluated by taking a gander at the service against various services, offering relative functionalities Quality as conformance on the other hand it might be watched for each service only and generally requires the customer's comprehension of the service to measure the "ensure" against the "transport." At last, reputation can be seen as a sort of point of view to an service's consistency after some time in offering both usefulness and conformance attributes and can along these lines be assessed through the other two sorts of significant worth as time goes on.

(Rosenberg et al. 2008) For the most part, making between definitive business shapes is a trying task. The associates need to surrender to a common data bunch on the QoS prerequisites of the semantic Web service. The QoS necessities are ordinarily depicted using Service Level Understandings (SLAs) among the assistants A best down showing approach for Web service based business frames has been proposed to get the useful and non-utilitarian points using a development language (WS-CDL) which portrays the message joint efforts among the individuals. The development has been cleared up with SLAs for the unmistakable accessories. For every accessory in the process a course of action (in WS-BPEL) and the essential Web service positions were normally created. The Service Level Destinations (SLOs) from the accessory SLAs were thus changed over into courses of action that could then be actualized by a BPEL engine in the midst of execution. Web service organization allows the mechanized exchange of information among remote techniques through the service interface. A dug in all the way QoS structure among the included methodology squares chaos among the designers, dealers and purchasers.

3. Web Service Technologies

Web service is decently another innovation, which is utilized for executing the various kinds of service arranged

engineering. The fundamental motivation behind web service innovation is to give a way to programming to process over the stages and programming language and creating conditions.

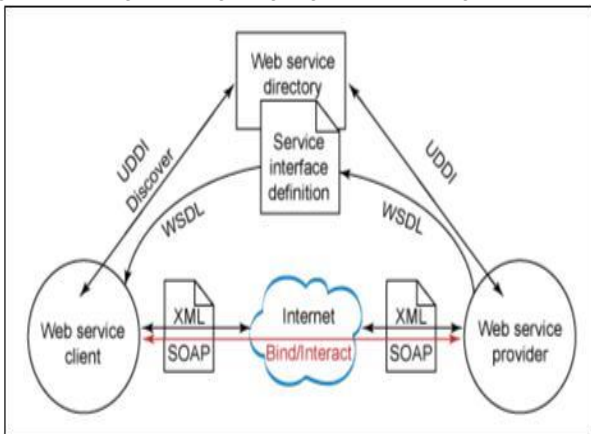


Figure 3 Web Service Core Technologies

The Web service core technologies are shown in Figure 1.2 and its description is as follows

1. extensible Markup Language (XML)

Figure 3 shows how XML language is used to portray the programming information structure, which principally centers on what the information is. The XML is one the standard language for Web service which is centered around for all intents and purposes.

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<note noteID="1">
  <to>Bob</to>
  <from>Al</from>
  <heading> web service </heading>
  <body> A new web service Applications </body>
</note>
```

Figure 4 Sample XML code

2. Web Service Description Language (WSDL)

Regularly, the web services are portrayed by utilizing standard component which is named as WSDL. A WSDL archive implies the web benefits supplier's task, the information types and furthermore the parameters of these activities. Also, it gives the various types of service interface and other data about service and it is gotten to by the service requestor.

3. Simple Object Access Protocol(SOAP)

The standard web service convention is known as SOAP. The SOAP message contains a XML design message as appeared in Figure 4. It likewise utilizes stage unbiased convention and programming dialects. This convention is additionally utilized for web client correspondence.

```
<SOAP-ENV: Envelope xmlns:
SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/"
SOAP-ENV: encodingStyle="http://schemas.xmlsoap.org/soap/encoding/">
  <SOAP-ENV:Header>
    <t:Transaction-ID xmlns:t="some-URI">
      552511951722
    </t:Transaction-ID>
  </SOAP-ENV:Header>
  <SOAP-ENV:Body>
    <m:RemoteFunction xmlns:m="some-URI">
      <Parameter1>123</Parameter1>
    </m:RemoteFunction>
  </SOAP-ENV:Body>
</SOAP-Envelope>
```

Figure 5 SOAP Envelopes

4. Universal Description, Discovery, and Integration(UDDI)

The UDDI is a standard way to deal with find and distribute the Web service. Additionally, UDDI, WSDL and SOAP have a developing number of norms which is advanced with web service task. The motivation behind these methodologies is to furnish a superior web service with upgraded security, unwavering quality and usefulness.

4. Service Oriented Architecture

Service Oriented Architecture (SOA) is a development of appropriated registering, in view of the solicitation answer plan worldview for synchronous and non-concurrent Web services. The SOA is a key idea of present day data innovation. It is a design that speaks to programming usefulness as discoverable services on the system. service is a bit of usefulness, made accessible by a specialist co-op so as to convey its outcomes to an service shopper.

Interoperability: Interoperability implies, that the customers and services impart and see one another, paying little mind to the stage they keep running on.

Scalability: An service is said to be versatile, when an expansion of the assets in a framework results in expanded execution, in a way corresponding to the assets included. Web service occasions are regularly duplicated to scale, to help many numbers of clients.

Flexibility: Inexactly coupled services are ordinarily more adaptable than firmly coupled ones.

5. Web Services

A Web service is a product application, available utilizing standard Internet conventions. Web services consolidate the best parts of segment based improvement and the web. Like segments, Web services can likewise be reused, without stressing over how the service is actualized. In contrast to current segment advances, Web services are not gotten to by means of article model-explicit conventions, for example, the Distributed Component Object Model (DCOM), Remote Method Invocation (RMI) or Internet Inter-Orb Protocol (IIOP). Rather, Web services are gotten to by means of web conventions, for example, the Hypertext Transfer convention (HTTP). To be sure, Web services are another type of web applications. Web services are independent, self-depicting, particular applications that can be distributed, found and summoned over the web.

When a Web service is sent different applications and Web services can find and summon the conveyed service. The three significant elements of the Web services are the specialist co-op, service customer and service library (agent). The Web services design characterizes and portrays the jobs and the connection between the three players in an appropriated situation.

1. Web Service Architecture

The Web service design characterizes three players, every one of which assumes a one of a kind job and portrays the connection between them. The three players are the specialist organization, service shopper, and service representative. A service intermediary goes about as an archive for the product interfaces distributed by the specialist co-op. The specialist co-op portrays the service interfaces utilizing Web Services Description Language (WSDL) and sends them into the library called Universal Description, Discovery and Integration (UDDI), and the service shoppers get to these services over the Internet utilizing the Simple Object Access Protocol (SOAP).

2. Simple Object Access Protocol (SOAP)

Basic Object Access Protocol (SOAP) is a lightweight convention, for the trading of data in a decentralized, appropriated condition over the HTTP. Cleanser encoding is an expansion of the SOAP structure detail that characterizes how information esteem ought to be encoded in a XML group. The SOAP RPC is one of the plan objectives of the SOAP, and is utilized to exemplify and trade RPC calls, utilizing the extensibility and adaptability of XML.

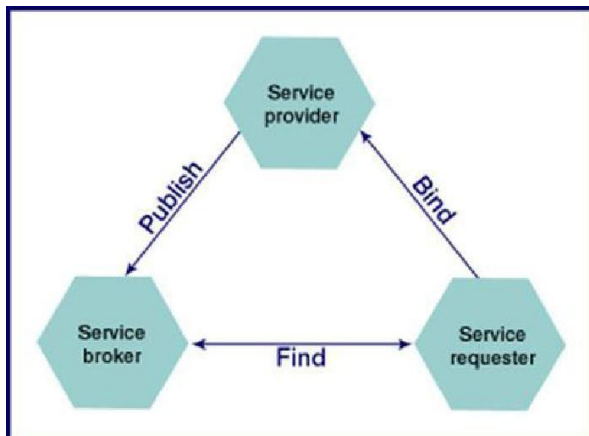


Figure 6 Web Service Architecture

3. Web Service Description Language (WSDL)

The Web Services Description Language (WSDL) is utilized for depicting the Web services. A WSDL report characterizes benefits as a gathering of system endpoints, or

ports. The WSDL is utilized as the defacto standard for specialist organizations to portray the info and yield parameters and the tasks of the Web services.

6. Conclusion

The primary point of this proposition is to improve the web service unwavering quality in various angles and it additionally applies continuously situation, for example, therapeutic field. These procedures are finished by utilizing Petri Net models. In this manner, this theory fundamentally centers on web service dependability investigation with the assistance of various types of strategies. Also, examine the unwavering quality, execution of the web service considers three fundamental factors, for example, effective seeking process in enormous number of web services, productively utilizing broadened Petri Net models and proficiently handle the stream and structure of web services. Every single test consequence of proposed techniques demonstrates the promising outcomes as far as every one of the measurements. In this work the FPLM-EQPN model demonstrates the dependable and versatile execution just as other two calculations which present the promising outcomes in solid way. Service arrangement offers a system to grow the capacity of single crude services and adventure the services reuse. In this overview, we talked about the idea of service arrangement in SOA and operator innovation; also, we inspected the four periods of web service piece. For each stage, characterization of the different strategies utilized has been examined. Additionally, a similar investigation of these strategies is led by talking about the principle highlights and constraints. The paper secured wide panoply of the scientific categorization of service sythesis so as to serve best the client as indicated by the solicitation he requested. The postulation convey to an end by featuring the original thought of making manageable system which utilizing the idea of setting of things and omnipresent condition. Different substances are incorporated utilizing philosophy, which gives a universal web service condition. Semantic system is one of the learning portrayal strategy utilized for correspondence between information architect and client. It needs legitimate culmination and precision. Because of the vulnerability of data about hubs and connections in semantic systems issues emerge in surmising and queering of learning. There is an item situated design of information portrayal that can be adjusted with opening filling ability and procedural connections. This postulation proposes an answer for concentrate learning from semantic systems ontologies in a self-loader method for information change into an inducing appropriate learning source.

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