Review on Different Approaches of Dynamic Web Service Composition

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Abstract— Web services are small applications that can be separately deploy and invoked by further software or services on the web. Service is a network addressable software component to perform a specific task. A service discovery mechanism can be used to find services that can be executed and satisfy a service request. In many cases, a single service is not sufficient to fulfill the user's request and services should be combined together. By using service composition that's possible .Paper describes different approach of dynamic web service composition and proposed approach in brief.

Index Terms— Web service, xml, Dynamic composition, Quality of service, Service repository, rating of service.

I. INTRODUCTION

Services are small components present on internet that cooperatively make a complete application environment [6].By using Web services, System development task is becoming very easy, where standalone and integrated apps can be published with less effort and with high security because there is no need to expose their implementation details. In web huge services are available for specific task, but here challenging task is choosing most appropriate services some time user not satisfied with one service for their task, so composite service is used. SOA enables that kind of seamlessly service binding, discovery and invocation of service at run time. In dynamic web service composition appropriate services choose and compose at run time. That kind of business process is build from composition of many services.

A Web service is a method of communications between two electronic devices over the World Wide Web. [9] Web Services are tiny components which used well known internet protocols. Internet contain many web services for different purposes like E-commerce, information services, trending between partners for business, some B-B services , sms gateways etc . Web service contains Application programming Interface (API), which is accessible over network & executes services at host machine .web services provide different kind of roles that are service provider, requester and broker.

Fig 1. Web service architecture [9]

The fundamental Web services platform is XML + HTTP. All the standard Web Services works using following components.

- SOAP (Simple Object Access Protocol)
- UDDI (Universal Description, Discovery and Integration)
- WSDL (Web Services Description Language)

SOAP is a lightweight protocol for exchange of information in a decentralized, distributed environment. It is an XML based protocol that consists of three parts: an envelope that defines a framework for describing what is in a message and how to process it, a set of encoding rules for expressing instances of application-defined data types, and convention for representing remote procedure calls and responses.

UDDI stands for Universal Description, Discovery and Integration. it is a directory for storing information about web services.

WSDL (Web Services Description Language) is an XML-based interface description language that is used for describing the functionality offered by a web service.[10] A WSDL description of a web service (also referred to as a WSDL file) provides a machine-readable description of how the service can be called, what parameters it expects, and what data structures it returns.

As atomic web services are limited in functionality, Web is not able to fulfill user request some time. So for better business application one or more services are combined together & provide appropriate response to the end user. At the time of service composition changing task is find appropriate service from many others and another task is composition of that service at abstract level. Mainly two kind of service composition are in picture. 1) Static composition 2) Dynamic composition

Static Composition

In this, business process , partners & services are known at time of designing of system and that are not change frequently .Designer manually build composition scheme & according to that flow services are composed one by one . This kind of composition is used for providing interaction to known components .this takes more time as well as Efforts.

Dynamic Composition

In this, business process, partners & services are changing at run time , in that also changing business partner policies .Business process should flexible enough and provide selection of service run time according to users requirement & context .in that kind of composition service composition scheme generated automatically & that not need user interaction. Therefore multiple service combined together according to users need & provide create high level business application. best example is tourism planner In that many services used like flight services , bus services , hotel services etc ,and that all are depends on each other .

II. DYNAMIC WEB SERVICE COMPOSITION APPROACHES

In this section we consider different kind of approaches for dynamic service composition.

2.1 Dynamic Web Service Composition and Parameters Matchmaking [1]

Service Oriented applications are becoming very popular due to ease of Web services Usage. Author proposed framework presents a Service Composition including user interaction. In matchmaking we have performed a check to compare number of input output parameters. If the number is same, composition is performed without any interruption. If numbers of parameters do not match the user is prompted to select or enter the required parameters.

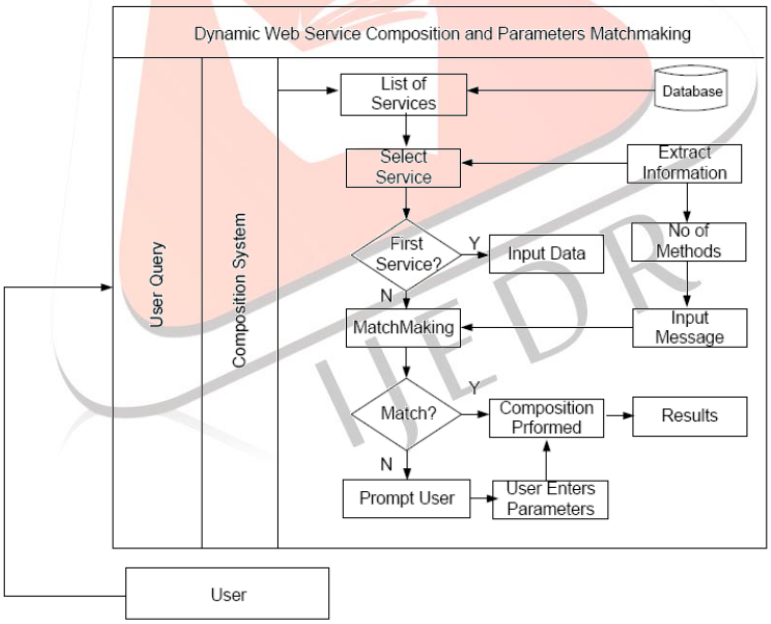

Fig 2 . Architecture of parameter matchmaking approach [1]

By using this framework author solved main problem facing during dynamic WSC that is transactional support & correctness with use of user interaction but when we consider qos & other non-functional parameter than this framework is not very useful. This framework is only used when consider limited WS for small application.

2.2 AI planning based approach for dynamic web service composition [2]

This approach is capable for automated service composition. Advantage of this approach is flow management & fault tolerant. for the fault tolerant system in this approach process initiate from the starting phase but that's very time consuming .This approach is not much useful when consider qos criteria. Here fig describes architecture of the approach.

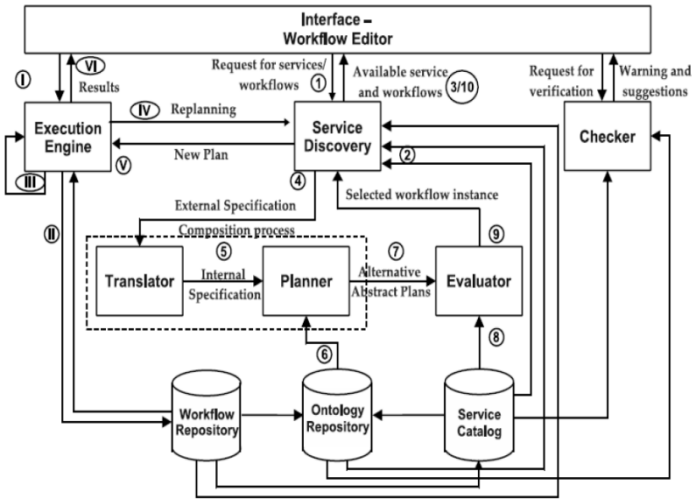

Fig 3. Architecture of planning based approach [2]

2.3 A QOS Broker Based Process Model for Dynamic Web Service Composition [3]

Author proposed a Quality of Service (QoS) broker based process model for Dynamic Web Service Composition (DWSC). The QoS broker in the proposed model is responsible for web service collection, selection, optimization and composition based on the service consumer's requirements. Fig describes architecture of the approach.

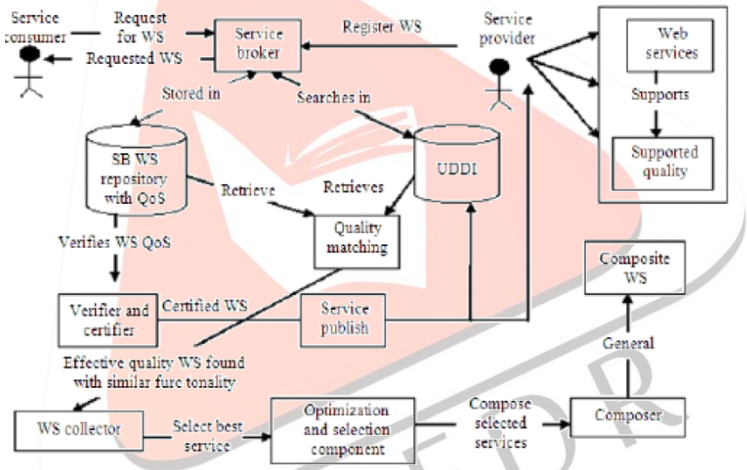

Fig 4. Architecture of qos broker based approach [3]

The proposed QoS broker based model for dynamic web service composition solves the problems associated with quality of web service. It also prevents the central repository from malicious service provider to publish wrong information. In spite of the advantages of the proposed model there are certain limitations. Only authorized person can be able to access the web services due to web service level agreement. & also not providing fault Tolerant environment

2.4 A Rule-based Web Service Composition Approach [4]

This paper proposes a rule-based service composition framework that supports user requirements and predefined business rules very well. The selection engine uses a multi objective no dominated sorting genetic algorithm (NSGA-II) which generates a set of Pareto optimal solutions that provides service consumers wider choices and thus helps increasing the decision support ability.

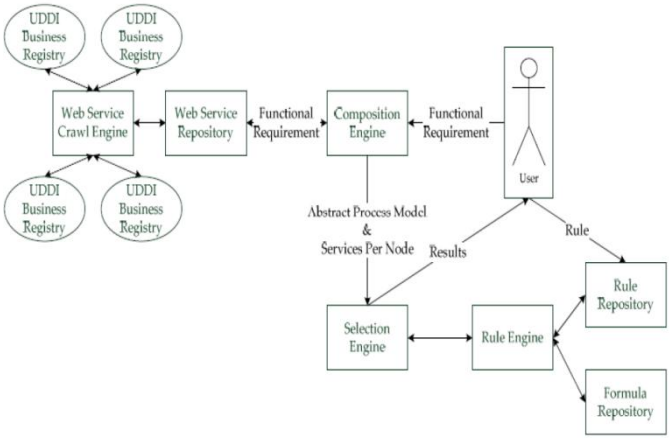

Fig 5. Architecture of rule based approach [4]

Here propose a composition framework which allows business rules being automatically transferred and executed by the selection engine. Advantage of this approach is crawl engine, because using that searching of service is become easy. But disadvantage of this is not fault tolerant & not give much optimized response time.

III. Comparison Of Approaches

Table 1: comparison between Dynamic web service composition approaches

	Approach	Advantages	Disadvantages
1	Dynamic Web Service Composition and Parameters Matchmaking	Using small user interaction avoid fault .	Not used for huge amount of web services , QOS parameter is not consider
2	AI planning based approach for dynamic web service composition	Automatic service Composition, By using planner effective composition is possible	QOS parameter is not consider, Not providing fully Fault tolerant Environment
3	QOS Broker Based Process Model for Dynamic Web Service Composition	QOS parameter is consider , Providing Correct result	Not providing Fault tolerant environment
4	A Rule-based Web Service Composition Approach	Using WSCE searching of service become easy	Response time is not optimized

IV.PROPOSED APPROACH

In our proposed work it will use quality of service parameters. On the bases of that parameters service selected. The proposed approach uses web services, whose selection is done on the bases of input parameters. During the selection of web service the proposed approach takes into consideration, data that are stored in the service repository (SR).

SR Contains 5 type of data

1. Response Time (Ts): The time interval between when a service is invoked and when the service is finished.
2. Service Cost (Cs): The price that a service requester has to pay for invoking the service.
3. Availability (a): It refers when service invocation request is produced at that time service is available or not.
4. Reliability (R): The probability that a request is correctly responded within the expected time.
5. Rating of service (RS): Information about service is successful composite or not?

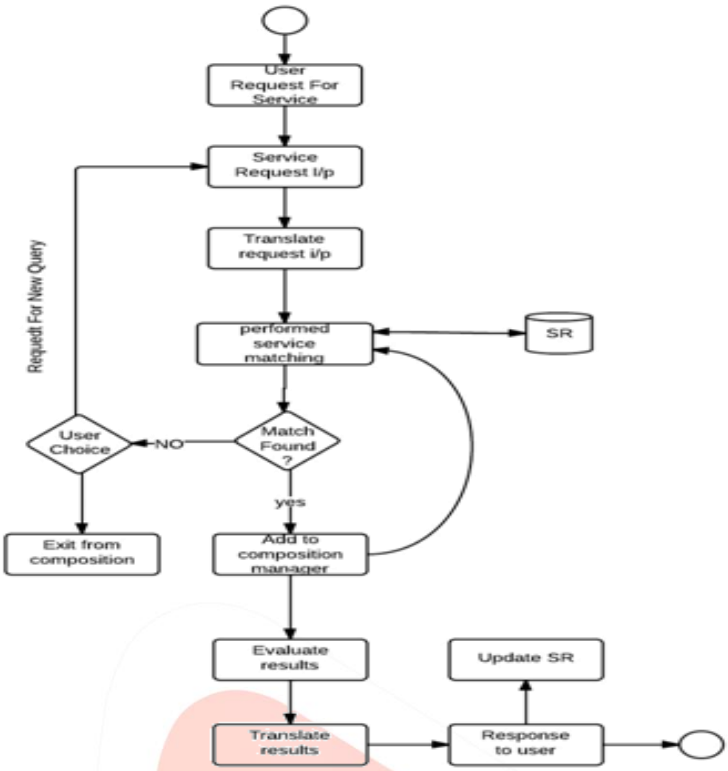

Fig 6. Architecture Of proposed approach

V.CONCLUSION

There are several approaches for dynamic service composition but some are not providing transactional correctness also some are not fault tolerant. Existing Approaches are not providing effective result based on consider parameters like response time, QOS, correctness and exception handling. As we know web services are increasing day by day and also increasing its usage for web application. So Quality Of service is primary goal of any system, using this proposed approach QOS is improved in context of response time. By calculating availability of services and rating of services correctness of result and searching of service is become easy and so for that less time is required for effective composition.

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