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# A Common Methodical Framework and Dynamic Model of Private Services Composition

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***Abstract — since web service composition has recognized a focus towards the support of business to business and enterprise application integration. Also the evolution of service provider in web has impact on all the areas, but still some challenges are faced by the web service like quality of service, security and composition .Even though the business application is composed from number of offered web services, there is an access control issue that it must ensure that web service consumer has necessary authority to execute the web services that it requests. On the one side of the business world it has enormous XML-based standards to formalize the specification of web services and their flow composition and execution process .The issues faced over here is since there are web service interface like remote procedure call and the interaction protocol with preconditions, but there affects the different services composition by means of semantics and annotations. The proposed system assumes the concept of web services with framework of Service Oriented Architecture (SOA) and Performance Evaluation Process Algebra for the composition of the services. With the evolution of the semantic web the demand for the semantic based web services composition increased as it gives a better result when compared to the traditional method of discovering the contestant services for web composition. As we focus on semantics, the nature of composition also needs to be dynamic as the services from different vendor and its parameter are changing frequently. This paper comprises the task of using existing method for semantic web service and discusses the various problems raised by semantics and dynamic based web composition.***

***Keywords—Service Oriented Architecture (SOA), Performance Evaluation Process Algebra, Semantics, WSDL, Web Service Composition***.

## I. INTRODUCTION

The current trend in the software architecture is the reusability of the software component; as such it might be a different service from a common vendor, in order to reduce the code which is being written for every individual service the architecture of SOA accomplishing the task of maximum reuse of existing web services. Same kind of functionalities required by the applications is provided as a service, hence they are made reusable. These services need of platform – independent environment that can help the enterprise people can develop business process by merging the existing web services, which are from the different providers. To make the service as platform-independent their description are mentioned in the form of WSDL, since there is forcible need for composition of services they have to be handled effectively. Even though we have BPEL and WSDL standards for the dynamic composition of service both of them will results in terms of functionality of the web services. In this paper a composition is made between a private hospitals and blood banks, so that the desired patients attenders who really need of blood can identify the nearest areas blood bank by availing their current location in connection with mobile. Hence in order to establish a composition among these services and their access control authority, we follow the automation tool for semantic composition and performance evaluation process algebra for effective rate of data transfer.

## II. LITERATURE REVIEWS

As the need of service integration raised in the field of information technology and to move the business to the next higher level there should be a suitable composition which makes the service better and reusable. Rajesh Karunamurthy et al. [1] described a new systemic design for service composition, it holds business model, composition and description framework. Biplav Srivastava et al. [2] suggested two major approaches for the composition problem, (i.e.) compared with industrial and semantic approach and in venture with AI planning. PonHarshavardhan et al. [3] described for the quality of composition, semantic based service composition cover the way for dynamic composition. As far as a semantic web is considered to be the amount of available services and the ontology model size are huge. Armando Ordonez et al. [4] proposed the identification of the relevant phases for the convergent service composition and these will explore the existing approaches with their associated technologies for automating. Chouki Tibermacine et al. [5] propose a container representation for specifying architecture constraints. This model has been implemented as an extension to an Architecture Description Language that we have developed, which is called CLACS. The acquired process promotes the idea of specifying structural design constraints using the same paradigm of container-based development as for architecture description. Xia Zhao et al. [6] proposed the project of Living Human Digital Library, which provides the infrastructure for clinicians and researchers to trace, share data resources and collaborate at the processing level of data.

 

Sang Woo Han et al. [7] suggested an Open Media experiment for service composition tool to support media-centric service composition which enables the task of connecting the computing centric services to the network centric services. Sergio A.B.Cruz et al. [8] described a new approach using AI planning technique to improve the robustness of the produced geospatial Services composition. Tadeu Classe et al. [9] proposed e-ScienceNet, architecture to creation of scientific group of people in the circumstance of semantic e-Science, facilitating the creation and sharing of scientific data and services. M.Bugliesi et al. [10] proposed a formal model for the analysis of two levels of security and transactional correctness in service contract composition. Also used calculus to represent service contracts and their composition. Manuel Palomo-Duarte et al. [11] provide vibrant invariant generation to WS-BPEL, providing original solutions for several features that require special reflection, like highly multidimensional values in stored variables, a highly developed type system or unstructured code. Matthew Rowe et al. [12] proposed an approach to evaluate communities based on their role compositions, also behavior annotation that captures user actions within a given context and a semantic-rule based method to deduce the role that a user has within a community based on his/her reveal behavior. Huayi Wu et al. [13] proposed a new move in the direction of and developed a mechanism that allows clients to select the finest map layers at run-time. The assortment is based on the results of unbroken monitoring and assessment of the quality of WMSs. D.Sivabalaselvamani et al [15] proposed the SMS and GPS support of tracking the vehicle the same logistic is being applied in composition for various session handling. Sivabalaselvamani. D et al. [16] system suggested an intelligent transportation System used in traffic administration which makes distinctive user accessibility the same can be applied to the composition in terms of accessibility of request concurrently.

## III. WEB SERVICE IN WSDL

The WSDL is written in XML-based language with the namespace container, which defines the description of the web service in terms of messages that provide a concrete definition of the data being transmitted and operations that a web service provides to send out the messages. Web service operation holds four major communication parts. The endpoint receives a message in terms of one-way communication and sends a message through notification, the second thing is endpoint receives a message and sends an associated message through request-response, and it sends a message and receives an associated message as solicit response. Operations are clustered into port types, which specify a virtual end point of a Web service such as a logical URL address under which an operation can be call upon. A Web Service Description Language *communication* element defines the data elements of an operation. Since the use of message in XML Schema is used explicitly for its platform-independence of data types. Each *communication or message* can have of one or more *parts*. The *parts* can be evaluated to certain parameters of a function call in a conventional programming language. Tangible protocol bindings and physical URL address port specifications complete a Web service specification. We take a sample WSDL section for a Blood Bank Service .Port type declaration are defined by simple string and operation task enforce the interrelate process. For example “Patients Attenders in Demanding Blood” is abbreviated as PADB; “Recognizing the Needy and Sending the Blood” is abbreviated as RNSB

## IV. WEB SERVICE IN SEMANTIC WEB

The Semantic Web focus the World Wide Web as globally connected database by means of converting the individual service in to a common vocabulary and annotations .At the basic semantic vocabulary are statement about web resource and its properties expressed in terms of Resource Description Format.RDF is the merging of three things as triple skin which is of subject, verb and object of the sentence, these will be identified by Universal Resource Identifier. RDF schema will express the sentence in terms of classes, properties, ranges and documentation for resources. DARPA Agent Markup Language defines a service class in order to model the web service with various properties like *presents*, *described By* and *supports.* In parallel properties have respective class service profile and model.

## V. AN MODEL SCENARIO FOR IDENTIFYING NEAREST BLOOD BANK – WEB SERVICE COMPOSITION

We describe a realistic case study; consider a business to business application which is composed from a number of offered services. In addition there is a right to use access control problem, as it must be assured that the web service end user has the necessary ability to execute the web services it requests.

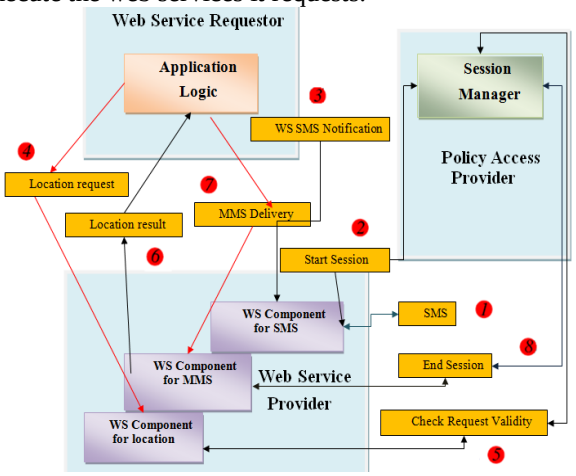


Fig I. A schema representation of different web service composition (Private hospital and blood bank service composition.)

 

The above scenario defines that several web services such as private hospitals and blood banks are combined to define the business logic of an application. Here we consider an application to Find the nearest blood bank to the patients attenders who are seeking for blood and for attenders it shows on a map. This could involve two things as such web services for Short Message Service and Multimedia Message Service handling in accumulation to the attenders Location web service. In addition, a user should not be able to gain access to location information of a random user. This is where the access control aspect becomes significant problem. Hence the requested web services, the web service provider (WSP) may need to correlate with some authorization element to check that the current accessing user has the correct ability to access the requested information. In addition the service provider may require some further conditions, such as that only one location call for may be made per session. Some of session conditions to be followed are

- ✓ An appropriate web service is responsible to monitor the user that if the user activates a service by sending an SMS to the service center number.
- ✓ As the *session starts* the message to be sent to the Policy Access Provider
- ✓ Once the session starts a notification is sent to the applicant that an SMS has reached
- ✓ As acknowledgement the application ask for the users locality from the location web service
- ✓ There will be a testing authority which the web service call the session manager from the policy access provider to validate the request
- ✓ If the validity process is true then the location service will sent back and the location to the application which might uses it to build suitable map for the user
- ✓ The map will be then passed as an MMS to the respective MMS server as a web service which then delivers it to the user.
- ✓ Finally the MMS service come to an end the session with the Session Manager

The above model is analyzed under the system of Performance Evaluation Process Algebra. It has three various model components that corresponds to the three relative things that mentioned in Fig I. Since the service provider has three distinct element, here we are interested in the session associated with the each service consumer .Hence concurrency is introduced in the model by allowing two or more session rather than by specifying the essential web service independently.

### *A. Patient Attenders Component*

The Patient Attenders action is simply represented in two local states. First state the Patient Attenders throw a request to the system via the getSMS action. Then for proper acknowledgement we have to wait for the response which prompts the getMap changeover if it returns successful. Now the association will happens for the user apparent system performance with certain throughput of the actions. This could be calculated directly from the stable state probability of concept under Markov chain

*Patient Attenders* $\overset{def}{=}$ *(getSMS, r1). Patient Attenders 1*

*Patient Attenders* $\overset{def}{=}$ *(getMap, T). Patient Attenders + (get508, T). Patient Attenders*

In above model sending of error message i.e. get508 and user requested map may occur at the same rate r8, MMS that transfer between the services is 10 times more rapidly than the message with the user

### *B. WS End user Component*

WS End user applies the simple pattern of states, once the notification session message acknowledged that the user is ready (via SMS message), it identifies and request the users current location also waits for the response. In case of valid request it turns out the location and is used to generate appropriate map for the user, which transfer through MMS message. This could be done by certain algebraic web service logic.

*WSEnd user1* $\overset{def}{=}$ *(notify, T).WSEnd user2*

*WSEnd user2* $\overset{def}{=}$ *(locReq, r4).WSEnd user3*

*WSEnd user3* $\overset{def}{=}$ *(locRes, T).WSEnd user 4 + (locErr, T).WS End user*

*WSEnd user4* $\overset{def}{=}$ *(compute, r7).WSEnd user5*

*WSEnd user5* $\overset{def}{=}$ *(sendMMS, r9).WSEnd user*

### *C. WS Provider Components*

Web service provider has three independent services; use of session confines a user's access to these services to be sequential. We assumed that there is a distinctive instance of the component WS Provider for each distinctive session. Since each would be in distinctive thread it is rational for there to be conflict at this level. The activities in the component are structured in the above scenario. One thing to be kept under consideration is that check valid action is specified twice, in order to capture the two possible distinctive outcome of the action. Here comes if the valid check then it returns success also the location must be returned to the service End user in the form of a map (getMap). Suppose if the invalid check it revels (locErr) then the error will be returned to the service End user (get508) and the session ends (stop session).

WSProvider1 $\overset{def}{=}$ (getSMS, T).WSProvider2

WSProvider2 $\overset{def}{=}$ (start Session, r2).WSProvider3

WSProvider3 $\overset{def}{=}$ (notify, r3).WSProvider4

WSProvider4 $\overset{def}{=}$ (locReq, T).WSProvider5

 

WSProvider5 $^{def}$ = (check Valid, 99.T).WSProvider6 + (check Valid, T).WSProvider10
WSProvider6 $^{def}$ = (locRes, r6).WSProvider7
WSProvider7 $^{def}$ = (sendMMS, T).WSProvider8
WSProvider8 $^{def}$ = (getMap, r8).WSProvider9
WSProvider9 $^{def}$ = (stop Session, r2).WSProvider
WSProvider10 $^{def}$ = (locErr, r6).WSProvider11
WSProvider11 $^{def}$ = (get508, r8).WSProvider9

### *D. PA Provider Components*

The Policy Access Provider task is simple one among these models, since it has the role of maintaining the thread for each and every session and it will carry out the validity check for service provider

$$PAProvider \stackrel{def}{=} (start\ Session, T).PAProvider + (check\ Valid, r5).PAProvider + (stop\ Session, T).PAProvider$$

The above algebraic representation is the stateless PAProvider which will be later compared with the alternative stateful form.

### *E. WSComp Model Components*

The entire structure is specified by number of occurrences of the component that interact on their shared activity

$$WSComp \stackrel{def}{=} ((Patient\ Attenders\ [N_{PA}] \bowtie_{L1} WSProvider\ [N_{WSP}]) \bowtie_{L2} WS\ End\ user\ [N_{WSC}]) \bowtie_{L3} PAProvider\ [N_{PAP}]$$

Where the cooperation sets are

L1 = {getSMS, getMap, get508}
L2 = {notify, locReq, locRes, locErr, sendMMS}
L3 = {start Session, check Valid, stop Session}

and NPA, NWSEU, NWSP and NPAP are the number of instances of Patient Attenders, WS End user, WSProvider and PAProvider respectively.

## VI. PERFORMANCE ANALYSIS OF THE WEB SERVICE COMPOSITION

In this section a steady state analysis is carry out for service composition so that we can adjust the parameter of the system. In order to achieve this task we use revised version of the model in which the patient's attenders is explicitly modeled as a system component. The values for each rate are shown in Table I. In some scenario we are supposed to design a system in which it has to handle 30 independent attenders, and then the modeler may have certain constraints based on some parameter such as delay in network, because they are reduced by available technologies. Though there might be a number of degrees of independence which let her vary, as the number of threads of the control of the components of the system. The main objective is to send a reasonable service in a cost-effective way. Linear dependency is the best and simple example of cost function, since the number of copies of components or the rate at which the task is generated. Performance analysis of service composition is justified by passing various parameters ranging from r1-r9; each has its own values and the task that will be carried out based on the parameter passing.

Table I Parameters used in the performance analysis of the Web Service composition

| Parameter | Value | Explanation |
|---|---|---|
| **r1** | 0.0010 | rate at which *Patient Attenders* request maps |
| **r2** | 0.5 | rate at which a session can be started |
| **r3** | 0.1 | notification exchange between *End user* and *provider* |
| **r4** | 0.1 | rate at which requests for *Patient Attenders* location can be satisfied |
| **r5** | 0.05 | rate at which the *provider* can check the validity of the incoming request |
| **r6** | 0.1 | rate at which location information can be revisited to the *End user* |
| **r7** | 0.005 | rate at which maps can be created |
| **r8** | 0.02 | rate at which Multimedia Media messages can be sent from provider to *Patient Attenders* |
| **r9** | 10.0 *r8 | rate at which Multimedia Media messages can be sent via the Web Service |

The graph in Figure 1 shows the throughput of the getMap action as the number of Patient's attenders varies between 1 and 30 plus. Every graphical line indicates a given number of samples of the Web Service Provider component in the system. When the total figure of Patient's attenders is 25 - 30, two providers lead to a throughput which is two times as much as in the base structure pattern with single provider. Though the increase in the number of providers will benefit a less significance. Graph in Figure 2 shows the rate of effect where the user start initiates the request r1 with the getMap

 

throughput for variety of copies of WS End-user .Also it guarantees the satisfactory behavior with certain constraints and request rate is maintained under threshold. Additionally graph gives the insight view of number of operating threads of control of WS End user. Graph in Figure 3 shows getMap throughput is plotted adjacent to r5 for different PAProvider pool sizes. For optimal number of copies of PAProvider, arranging multiple copies rather than one considerably raised the quality of service of overall structure.

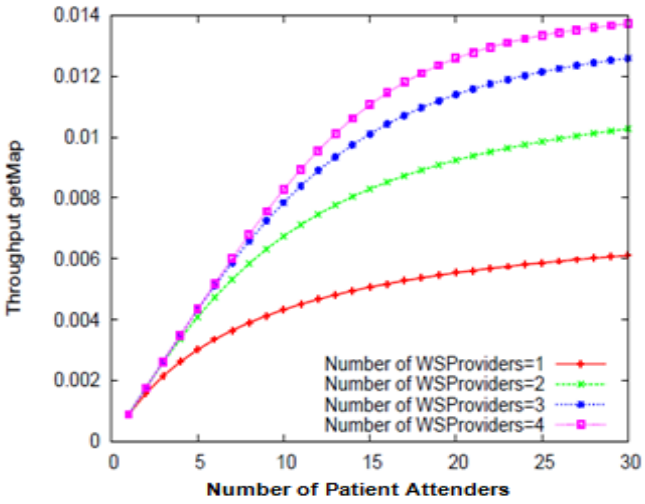


**Figure 1: Throughput of getMap for varying number of WSProvider and Patients Attenders**

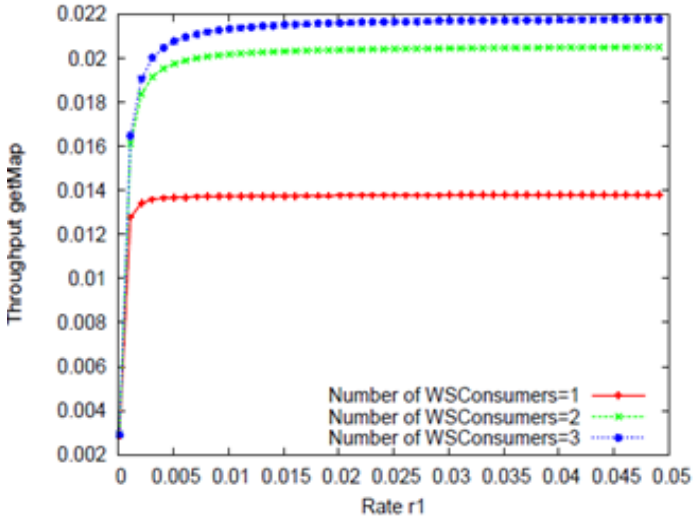


**Figure 2: Throughput of getMap for varying number of WSConsumer / End User and r1**

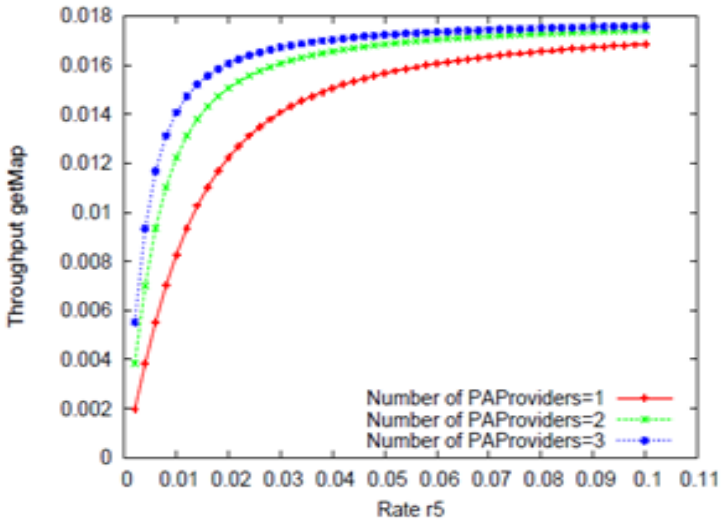


**Figure 3: Throughput of getMap for varying number of PAProvider and r5**

 

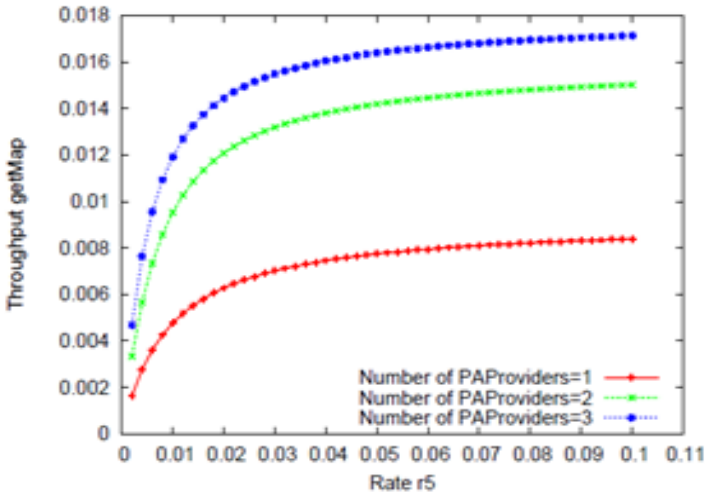


**Figure 4: Throughput of getMap for varying number of stateful PAProvider and r5**

## VII. CONCLUSION

This paper has offered the solution to the current existing problem in the process of composition of services between government and public Blood Bank Services along with the association of both private and public Health care Sectors. The idea of Service Oriented Architecture are applied in various dimensions and followed the description of the web services in terms of WSDL and requested message is handled via semantic web by means of annotations for the sentences. Since SOA can afford a better solution for accessibility issues when more than one user requesting for the blood, the concurrency of task will be through into separate thread so that multiple accessibility is achieved and the throughput has been effectively handled using performance evaluation process algebra where the service requestor, provider and policy access provider works according to their sessions and act as a dynamic framework. Still there need some interoperability, security concern and quality of service for better composition in future.

## VIII. FUTURE WORK

The future work will focus towards the composition of web services with the Pharmacy Department, Blood Bank and Health care which has common architecture and the interface which provide service to access all these together with the reliable annotations through the semantic web, hence these structure will be established and carried out by patients attenders , So the composition makes the thing available within the attenders location. Additionally there will be a need of security controlling framework that should allow the authorized and needed person to access all these resources.

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