

# Clustering and Discovery of Web Services Using the Scenario of Blood Bank Services in Internet of Things

<sup>1</sup> Jyoti L. Khachane, <sup>2</sup> Latika R. Desai

<sup>1</sup> Student of Computer Engineering, Computer Department,  
Savitribai Phule University of Pune, DYPIET, Pimpri,  
pune, 411018, INDIA

<sup>2</sup> Assistant Professor, Computer Department,  
Savitribai Phule University of Pune, DYPIET, Pimpri,  
pune, 411018, INDIA

**Abstract** - The internet of things is developed as a composition of things and internet. By using IoT, a number of devices will be working together to provide appropriate services to the user. Services are built by using the information gathered by IoT devices. The gathered information is raw as well as unstructured in the nature, so there is a need of converting it to meaningful services. User must be made aware of the presence of the services to benefit from it. Similar types of services are grouped together. Further, knowing the presence of a service, users can access services depending on their privileges, roles, preference and requirement. Service discovery will play an important role, as a large number of services could be available in the IoT scenario. Services should be provided only to legitimate users, while others should be prevented from access. Hence, context-aware service discovery and strong access control mechanism will be required in the IoT environment.

**Keywords** - *Web Service Discovery, Restful Web Services, Internet of Things, SOAP, Clustering Web Services.*

## 1. Introduction

IoT is the unique domain that will works on various things that enables human being to interact with web services as well as helps to obtain the goal of creating a smart world. In this context the research and development challenges to create a smart world. IoT works in all the fields such as making smart city, developing smart transportation system, making smart industry and many other things. The goal of Internet of Things is to connect the people, objects, places at anywhere by introducing various new paradigm. This is the aim of IOT to connect the people, places, things together. A Web service is a

type of software application providing platform for IOT based protocols. Web is a distributed system of documents running over the Internet which are interconnected. HTTP, URI and XML are the basic Web technologies. There are two categories of web services such as SOAP-based Web services and RESTful Web services. Generally SOAP-based Web services mainly uses Simple Object Access Protocol (SOAP) standard and RESTful Web services follows REST principles so they are resource oriented as well as they have lightweight approach. Since they work on top of HTTP directly so that they can perform lightweight operation on web.

The RESTful Web Services have less parsing complexity. Also these can work with http directly. So they have tighter integration with HTTP. So that RESTful web services are more feasible than SOAP based Web services. Web service is nothing but service Oriented Computing. Web services provide a platform framework that enables companies to run their business services over the Internet also which is independent in nature. URI is such thing whose interface bindings can be easily identified. It also can be easily described discovered by exchanging XML based messages as well as it also supports direct communication with each other.

## 2. Literature Survey

Restful web services are more suitable than arbitrary web services due to their lightweight approach as well as they are simple. These web services have capacity of directly transmitting data over HTTP. RESTful web services use REST principle with the REST-style. REST is called

Representational State Transfer. Zhang, Lili [1] proposes recursive measures of an asynchronous RESTful web service based on the BPEL extension. Various methods are explained in this paper which helps to access the RESTful web services from the Internet of Things. A BPEL model is published here for extending BPEL so that performance and speed will be increased. In [2] using wearable body sensors and smart phones smart healthcare system is implemented and designed. Motion Detection Algorithm is introduced here. Sensors can't save the large amount of raw data. To solve this problem, a temporary function in the mote application is implemented. With this function sensor data will be collected by the mote and will be stored in a text file on the access point so all raw data will be saved properly.

This paper focuses on problem that the existing health services are hospital-centered. These are going to be out-of-date and cannot meet people's requirements for their health care. GSD a Service Discovery Protocol is introduced in [3] having multiple user-controlled parameters which determines bounds of service caching, and discovery request propagation. Concept of hierarchical grouping of services is also introduced here. An autonomic service discovery criterion is discussed in [4]. A prime criteria is defined here that will be satisfied for an autonomic service discovery. Authors discuss about the survey and comparison of service discovery approaches. Hang Wu and Chaozhen Guo[6] makes us familiar with a method for using of Ontology Web Language for classifying Web Services so that Web Service discovery is possible.

### 3. Web Service Specification

#### 3.2 SOAP

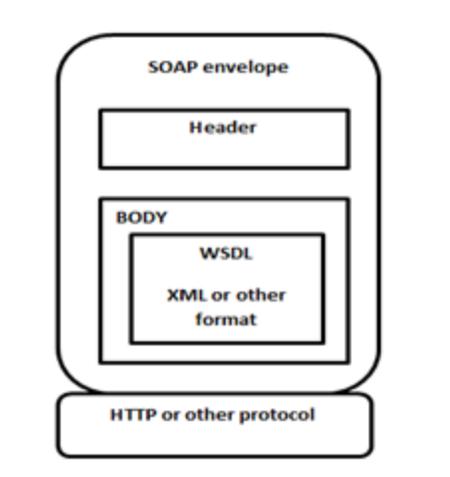


Fig.1. SOAP Architecture

SOAP is a Simple Object Access Protocol which is based on XML from the W3C. SOAP is able to exchange data over HTTP. It provides a standard method for sending XML messages between applications. Web services use SOAP to send messages between a service and its client. SOAP messages are platform independent and also they can be sent between applications programming language because all Web servers and browsers support HTTP. This quality enables web services their characteristic interoperability. Fig shows the SOAP envelop.

#### 3.2 REST

REST Representation State Transfer (REST) appeals to developers because of its simplicity. REST is better than SOAP, because of its lightweight approach. It also less wordy so that less volume is shipped when communicating. Representational State Transfer (REST) is a design of architecture that consists of set of principles that explains the network resources definition. It is vital to notice that REST is a style of software architecture as opposed to a group of standards.

#### 3.3 JSON

JSON is well-known as JavaScript Object Notation. Whereas every SOAP and REST use XML for interchange, JavaScript Object Notation (JSON) uses a collection of JavaScript. (JSON) typically uses name/value pairs. This will be just like the tags utilized by XML. Also, like XML, JSON provides flexibility to changes and avoids the brittleness of scaled record formats.

### 4. Proposed System and Implementation Details

In the system of web services that will be developed on the basis of IoT scenario. In this system there are some important components such as user, Wi-Fi router, android phones, image processing and image capture. These all components will be connected to the web services component. The database is also shown in this architecture. Here, user will interact with system through android phones as well as user will use Wi-Fi router for online help. User can access the web services for much purpose. In case of health care services user can use benefit of services like MRI, physician, ECG service. Figure 2 shows the proposed system architecture. In some critical condition if user will need blood. Then Fig. 3: Blood Bank Service Architecture. Blood bank facility also will be provided here. Using android phone user can send the images of patients' document to the doctor as well as

physician. In this way the user can get the online help from the available medical services. Android phone will directly co-interact with the web services. Also user can access these services through Wi-Fi by using mobile. All the information or records will be stored in database of the system. With the help of ER Database which is the rational data works in background, all the data will be stored in the system. The blood bank system architecture is shown in figure 3. In blood bank system, we have made sure that also in the worst case the blood will be made available to the patient. There will be three levels. The central blood bank, the smaller blood banks and hospitals. The central blood bank will supply to the smaller banks and they will supply to the nearby hospitals as per requirement. In android and web application for donors, Donors can register by filling up necessary information. Application will keep track of users' location using GPS or LBS data. Application will keep track of users' location using GPS or LBS data User can search the available donors nearby using the application. User can view the blood donation camp.

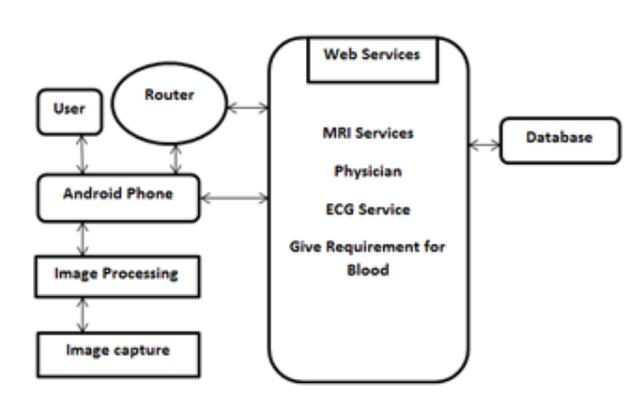


Fig2. Proposed System Architecture.

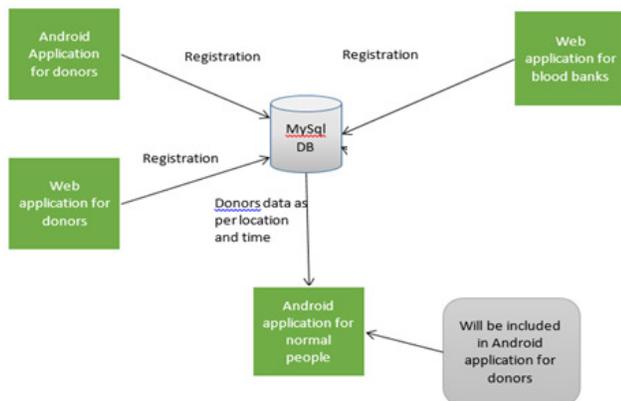
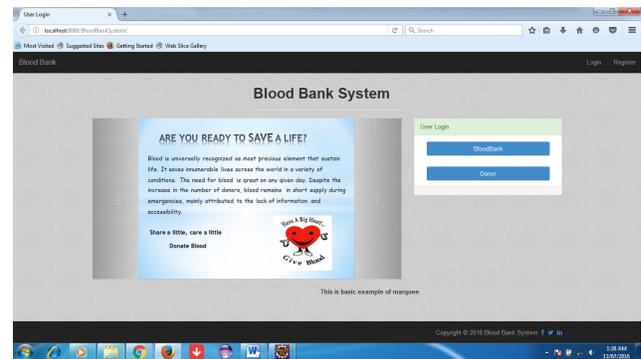


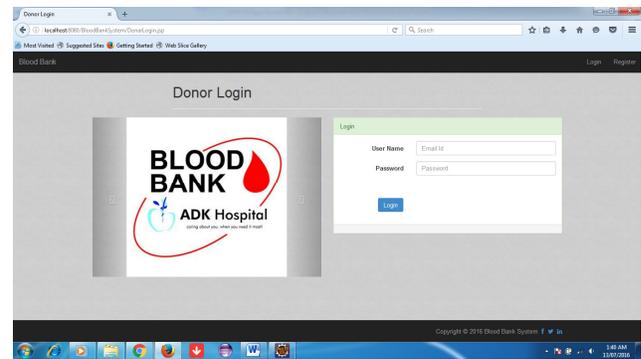
Fig 3. Blood Bank Service Architecture.

## 5. Result

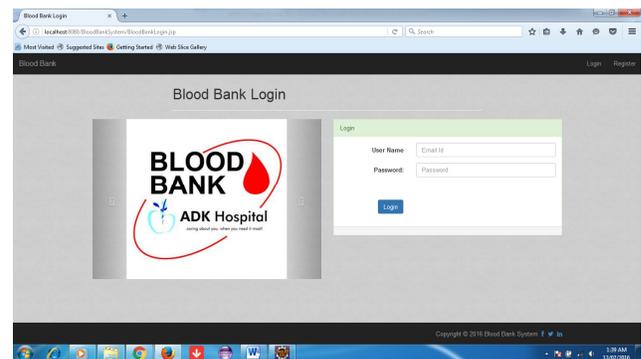
There are some screenshots for blood bank systems that are given below describing 1)user registration including donor as well blood receiver such as hospital, donor, blood bank. here hospital can contact to blood bank for blood requirement. Blood bank can also get information about donor for blood collection as per requirement. 2) Second screenshot shows donor login including user name password. 3)The next screenshot shows the blood bank login information that includes all required login information. After login user can also get information about blood donation camps. User can also know the history about the blood donor.



Screenshot1. Login Form



Screenshot2. Donor Login



Screenshot3. Blood Bank login

## 6. Conclusion

As there is clustering discovering of web services providing easy access control mechanism, blood bank system works effectively. As many deaths are occurred because of delay in blood supply. To overcome from this issue we are implementing this project. For the implementation of this topic that we need databases of doctor, blood bank, donors. GPS application is also required to trace the location of donors in cases of emergency.

## 7. Future Scope

In the future, IoT applications are going to be deployed in several domains like home automation, smart cities, intelligent transport and e-health. In every IoT domain, many devices (such as RFID tags, sensor nodes and actuators) are collecting data, sensing physical parameters, reacting and responding, to provide services to the end users. Most of the IoT devices have the capability of sensing environmental parameters but however don't have the intelligence to develop services having proper response of services depending on the detected data. Hence, the IoT devices should be grouped in clusters. One device in the cluster should be selected as cluster head to gather data from all cluster members and build services depending on that gathered information.

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