AN ONTOLOGY BASED PRIVACY MODEL FOR SECURE DISSEMINATION IN WEB SERVICE COMPOSITION

A PROJECT REPORT

Submitted in partial fulfillment of the requirements for the award of the degree of

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IN

COMPUTER SCIENCE & ENGINEERING

Under the supervision of

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By

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(152213)

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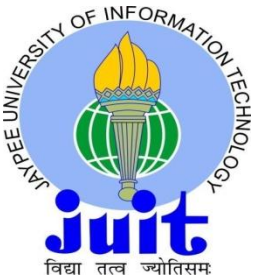

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY

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HIMACHAL PRADESH INDIA

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CERTIFICATE

This is to certify that synopsis report entitled **"AN ONTOLOGY BASED PRIVACY MODEL FOR SECURE DISSEMINATION IN WEB SERVICE COMPOSITION"** in partial fulfillment of the requirements for the award of the degree of Master of Technology in Computer Science and Engineering to Jaypee University of Information Technology, Waknaghat, Solan has been made under my supervision.

This synopsis has not been submitted partially or fully to any other University or Institute for the award of this or any other degree or diploma.

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ABBREVIATION

WS	Web Service
WSDL	Web Services Description Language
SOAP	Simple Object Access Protocol
UDDI	Universal Description, Discovery and Integration
XML	Extensible Markup Language
API	Application Programming Interfaces
QOS	Quality of Service
QOP	Quality of Protection
OWL	Web Ontology language
RDF	Resource Description Format
OWL DL	Web Ontology language description logic
SPARQL	Simple Protocol and RDF Query Language
SWRL	Semantic Web Rule Language

ABSTRACT

Web services (WS) has become a most important part of the Web because of its desirable features and as easy to use. Web services are hardware, programming language and operating system independent and support XML/SOAP. Web Service (WS) make it available over the internet and it is the most popular target for the web server hackers.

In the course of the thesis University, an environment with privacy based access control for Web Services was developed. Today, the Internet is the main change in the business operation companies are using the Web for selling product to find the consumer or partner in trading and to link existing application.

The goal of my thesis is to use the Secure Dissemination based on ontology for building ontology knowledge to provide data integration and model based on University and Facebook ontology model. This ontology focuses a secure dissemination and security provides on ontology based models that we are created. To enter and link all the concepts and data made for UNIVERSITY AND FACEBOOK model, we used the tool Protégé- OWL. The ontology based model provides all the information on individual class including data and information based on each class. Hence, the ontology based model has proven a better way for relating and managing the data.

Web Services are gaining more and more importance as a technology to develop distributed application. Web Services are system designed to support interaction between machine to machine over a network. There are many new standards and protocols that are introduced and find a new role in business applications when develop a project in web services. One of the most important issues is Security that needs to be addressed.

ORGANISATION OF REPORT:- The report is organized as follows: In Sect. 1, there is General introduction about ontology based Web Services is discussed.

In Sect. 2, there is an overview of literature survey in which different researchers have given their views about this topic.

In Sect. 3 Problem we find in our work is described and give and description about it.

In Sect. 4, a description about the proposed work on ontology-based approach is provided.

In Sect. 5 work plan and methodology is discussed. In this the main

In Sect 6. it explains the solution implementation and the related technologies.

Sect. 7 describes the evolution of the framework and concludes the paper with a positive note that by selecting the appropriate Web Services whose privacy policies are accordance with the user preferences.

CHAPTER 1

INTRODUCTION

Today, companies are dependent on thousands of different software applications in which each play a role in business running. These different software applications run on a different platforms and operating system that implements on different language. Web Service is a technology that allows different application to exchange business data on different platform. Now a days there are many platform and development tools available for Web Services. In future it will be the new development used for business application solution. In this the main services refers to a specific services that is a part of SOA (Service Oriented Architecture). It is used to describe the applications that communicate with SOAP. To access a Web services through its interfaces and bindings, in which they are designed using XML files, such WSDL. In Web Services the security challenges are present by these approaches that are originated and necessary. There are many features that make the Web Services attractive i.e. greater accessibility of data, connection of application to application and traditional security models and their control. In web services the main purpose of this is to inform people about securing web services that have issues and unsolved problems.

1.1 WEB SERVICES (WS) :-

Web Services is an important technology which allow different application to exchange the data on different platforms easily. Web Services is application software that accesses the web by using a URI which access by the client through protocols of XML based over the Internet. Web Services can be as software component that is an interface used for the communication of software to other software component. The communication architecture has three components:

- **Consumer: -** It is the entity that denotes the utilizing of the Web Service. The one who buy the services from the provider in Web Services.

- **Transport: -** It is used for the communication of the consumer that interacts with the services.

- **Provider: -** The one who provide the services to the consumer.

1.2 CHARACTERISTICS OF WEB SERVICES:- In Web Services there are following special characteristics:

1) XML BASED: - In Web Services the XML is used at representation of data and at layers of Transportations. By using XML it eliminates the operating system, networking and binding platform.

2) LOOSELY COUPLED:- In consumer of Web Services it must not be tied directly with the Web Services. The interface of the Web Services must change as many times without compromising the ability of the clients which interact with the services directly. In this the tightly coupled system defines that the client and the server must be tightly coupled with one another that defines if there is any change in the interfaces and after change the other system also be updated. If they accept the loosely coupled that tends to make the software more manageable and that allows simple integration between different systems.

3) COARSE GRAINED:- In this the object oriented technologies such as java uncovered their services through using individual methods. Building a java program from scratch it requires the several fine grained methods that composed into the coarse grain method that must be composed by either a client or another services.

4) ABILITY TO BE SYNCHRONOUS OR ASYNCHRONOU: - In this the system must be synchronicity that refers to the client binding by the execution of services. In the invoking of synchronicity the client is blocked and it waits for the services for completion of its operation before the services is continued. Asynchronous operation must allow the clients for invoking the service and execute the other function. Synchronous client receive the result after the service complete its execution and Asynchronous client receive their result at a later point in time.

5). SUPPORT REMOTE PROCEDURE CALL (RPCs):- In this the client have different parameters that invoke the functions, Metrics and Procedures on

remote objects which uses the protocols of XML based. The parameter used in this is support the Web Services must expose the Remote Procedure Calls.

1.3 WEB SERVICES STANDARDS :- In Web Services there are basic standards we used:

1.3.1 XML (EXTENSIBLE MARKUP LANGUAGE):- It was developed by a working group of XML that is formed under the support of the (W3C) in 1996. It is basically a syntax that is used to define the markup languages. In this there is an advantage that allows different documents for structuring in a standard way that make machine readable easily and is autonomous of platform equipped. Service requestor provides an easily communicate with each other and for communication it is important to use same platforms and for messages that can be communicate in Internet by using Standards.

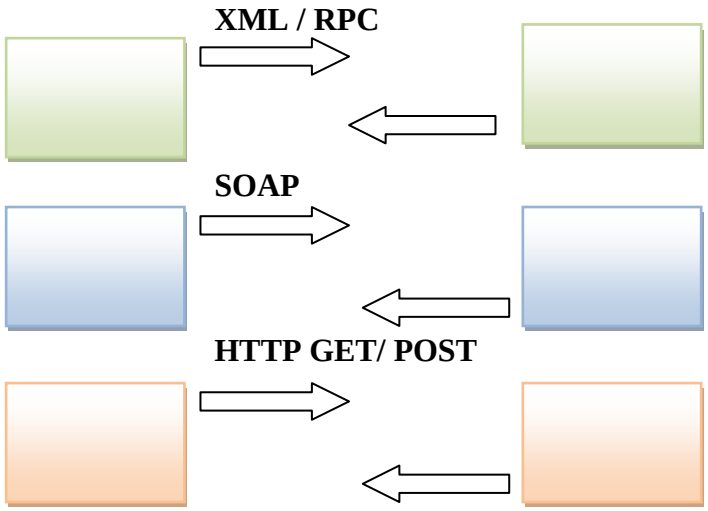

Fig 1.1: FORMS OF XML MESSAGES

1.3.1 SOAP (Simple Object Access Protocol):- It is a light weighted protocol that is used for information exchange in a decentralized or distributed environment. It is an XML based protocol that consist of three parts: an covering that defines in messages and how to procedure it, there are set of rules of encoding that is used for expressing application instances of data types and a gathering for remote procedure calls and its responses. It is used in top of any transport protocol

but the popular protocol used for transporting SOAP messages is HTTP. In SOAP messages there are XML based documents which contain some or all the elements in following described:

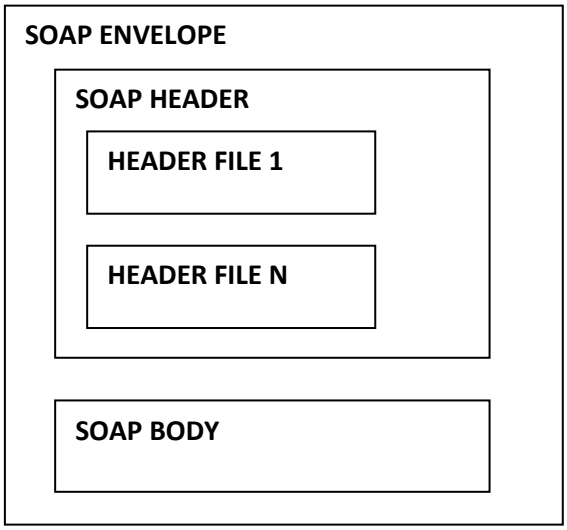

Fig 1.2: Main Elements of the XML SOAP Messages

- **Envelope:-** It specifies that the XML based document is a SOAP message that encloses the message we used itself.
- **Header:-** It contains the information that is appropriate to the message for example the date at the time of sending the message, authentication of the data received etc.
- **Body:-** In this it includes all the messages that has payload.
- **Fault:-** It carries all the information about the clients or the server that has an error within the SOAP messages.

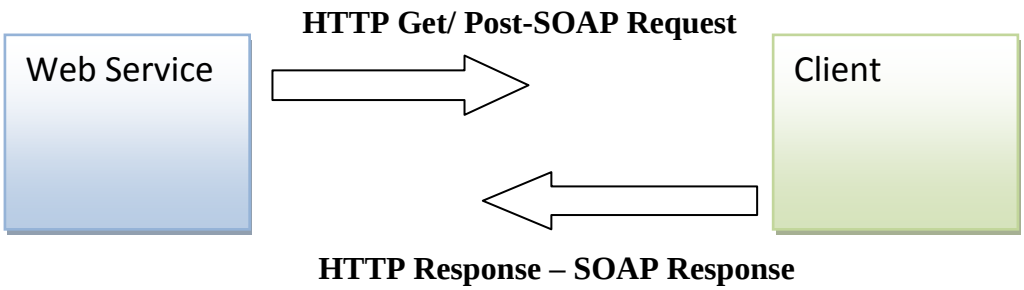

Fig 1.3: Illustration of SOAP messages between an HTTP server and Client

1.3.2 WSDL (Web Services Description Language):-

WSDL is developed for fulfill the requirement of Web Services description. It is used to create a way for specify the Web Service details. This is a general method for XML schema that is used for specifying the details of the interfaces bindings and other details. In this the WSDL file is an XML document based that describes a Web Service by using six elements:

- **Port Type:-** In this different groups and operations performances are described by the interface defined in Web Service.
- **Port:-** It specifies the address used for binding i.e. a port communication.
- **Message:-** It describes the names and format we used in sending the messages that is support by the services we used.
- **Types:-** It defines the data types we used when the services is used by an XML file for sending the messages between the clients and server.
- **Binding:-** It defines the protocols communication that is supported by the operations is provided at the time of system uses the services.
- **Service:-** In this it specifies the address that is used at the time of accessing the services we used.

1.3.3 UDDI (Universal Description, Discovery and Integration):-

UDDI is basically a directory service where businesses and organizations have to register, deregister and to loop up for web services. It is an platform independent framework used for describing services, discovering businesses and are integrating business services by using the internet. In this it is similar for the telephone system yellow pages a registry to enable the services provide for register to services requestor to find services.

1.3.4 HTTP (Hypertext Transfer Protocol):-

Hypertext Transfer protocol (HTTP) is the most popular and important option for transport of services. It is important protocol that is used and exists before the Web Services are introduced. It main aim is to make easy the transfer the request made in the browser to a web server that allow the communication through the firewalls. Web services take the advantage of this protocol for moving of SOAP messages and WSDL documents to change from one

computer to another computer. However HTTP is the mostly common protocol that is used in Web services.

1.4 WEB SERVICE ARCHITECTURE:-

The Web Service architecture can be described by using the SOA model. It includes its major components that is presented in this section

A) SERVICE PROVIDER

B) SERVICE REQUESTOR

C) SERVICE REGISTRY / BROKER

- Three operations that are performed by Web Services are
  a) Publishing:- Make a service available
  b) Finding:- That locates a service
  c) Binding:- That uses web services

I). PROVIDER: - It publishes the services that are available and offered the bindings for the services.

II). BROKER:- It allows the provider to publish their services. It also provides the method to locate services and their provider.

III). REQUESTOR:- It uses the service broker for finding a service and then invokes the services that are offered by a provider.

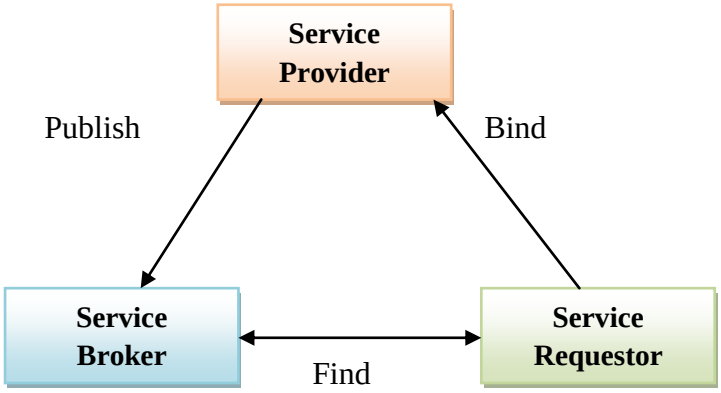

Fig1.4: WEB SERVICES ARCHITECTURE

1.5 WEB SERVICE ACCESS CONTROL:-

This model basically used for a web service to control the set of clients or their subjects that can appeal to the operations accessible by the services. It tells the properties that are used for the trust implement between the Provider and Requestor. This model is not a new model before used; this can be considered in the copy of database system that has an important part of the web services. Access control is compulsory used at the level of the entire web services or used in the single operation. There are different models of access control :

1.5.1 ROLE BASED ACCESS CONTROL: -

This is the most important and commonly used web service access control. In this model the roles are assign in which they have permission in order to secure access to the services.

1.5.2 ATTRIBUTE BASED ACCESS CONTROL:-

In this model they add the conventional Role based access control system. It makes the use of the attribute by the clients owned, the provider and some other related to the surroundings. In this the decisions that are made by the clients are allow or rejected the all attribute.

1.5.3 CONTEXT BASED ACCESS CONTROL:-

In this model both Role based access control and Attribute based access control models are provide the appropriate information in it.

1.5.4 SEMANTIC BASED ACCESS CONTROL: -

In this the transaction of the context must have limited services. In this the resources that must be blocked or restricted must based on the subjecting attributes and their properties of the objects. In this the rights can be applied on the time that are given or based on the session that must be provided.

1.5.5 GOVERNANCE BASED ACCESS CONTROL:-

In this model the transaction must be legislative controlled in which the organization they work or

share the information. The requestor for the information first verifies or regulate before getting the permission to use the services in it.

1.6 WEB SERVICE COMPOSITION:- In this model, it provides an open standard-based approach that is used for Web Services to connect for getting high level business process. The standards used in this are used or designed for the completing we compose in the Web Services; by using this it reduce the cost and time, overall effectiveness in business. This involves the number of existing web services composition so that we can produce more useful services and construct complex services. It can be viewed by using these processes:-

I). Merged web service specification.

II). It can choose the web service components.

III). Accomplish the merged web services.

The general composition of Web Services can be done in dynamic or static way which can be defined following approach. It contains three methods in web services 1) Manual / static 2) Automatic / Dynamic 3) Semiautomatic / Dynamic must be semantic group. This models used in the composition are workflow, Semantic and Graph based models.

1.6.1 Classification Schema of Web Service Composition Problem:

- **Manual Vs Automatic Composition: -** In this problem only one can do the composition manually or automatically. If the composition is doing manually than it is important for the expert's domain to analyze the problem first and then it produce the solution, but this error – flat as per the reasons these were mentioned before. In Automatic Composition it occupied the software programs being with the AI algorithms.

- **Simple Vs Complex Operator:-** It involves the composition that is in order by using the Boolean expression i.e. AND operator which retrieve the data direct from the web services. Complex operator can retrieve their data

through the parallel processing by using other Boolean operators i.e. are NOR, OR and XOR and their constraints.

- **Small Vs Large Scale**:- In this the problem can be seen in using the Algorithm of AI and then the problem must be turn into the acceptable problem. So in this it is important use these types of algorithm and finds their results or solutions in small scale. In this the large scale of problems must have appropriated algorithms and in finding these results are risky of getting proper solution.

1.7 CONCEPT OF TRUST:-

For using the web services and sharing the information between one organization to other organization there is an important factor in this i.e. **TRUST.** The overall dependability of a network is shown in three aspects: - The Trust of Web Services, the user Trust and the transmission of network Trust. In this a user access for the resources in the different networks, the issues of trust is authenticated. The requestor authenticates for the resources and provide authenticate for the sources.

There are metrics of TRUST:-

A) Execution Time: - A services take time for the execution and the process runs the activities

B) Latency: - It is the time delay between the request send and the response receives, i.e. the messages that are sending reach the destination.

C) Response Time: - It is the required time of process start and completes the request service.

D) Availability: - The probability of services that the service up and uses for accessible.

E) Reliability: - The function that is correctly perform and having failure to the user.

F) Security: - In this the trust is between the requestor or provider that is based on security.

G) Privacy: - In the privacy must be established between the provider and requestor.

1.8 CHALLENGES IN WEB SERVICE:-

In this many of the Web Service have been used or taken with standards existing in it, In this there are number of challenges that standards the organizations are addressed but in the area of Discovery and Reliability of Web Services. There are some examples of challenges in it.

1) Attacks like denial of services.

2) To secure the degree of credential.

3) Implementation of services those are incorrect.

4) Services that are compromised.

5) Spread of many virus or malware, such as Trojan Horses.

The Challenges of Web Services are described below:-

1) **DISCOVERY:-** In this first we have to identify the Participants and create WSDL services that have been based on the definition registry of UDDI. In this the high no of services registered by the candidates. Its ranking performance for particular algorithms used for search for matching and composing of services must be differing. In this set of Web Services are available expand help bye advanced tools for identifying services must match functionality of customer and required security is important in it for service provider. It is important for them for describing the capabilities of services and their requirement by the requestor in an semantic way. The ontology web language for services is example but in this for integrate more work needs such as technology in registry of Web Services. The techniques used for semantic finding must have similar description and find a set of matching the request services. While using both OWL and UDDI can be used for specifying the properties of Security.

2) **END TO END QUALITY OF SERVICE AND PROTECTION:-** In Web Services there is no guarantee of providing Quality of Service (QOS) or Quality of Protection (QOP) for security services during attacks. For expected level performance of Web Services the QOS is important for overall performance of the system must be improved. The reliability of the Web Services system must improve and standards for messaging must provide in level of QOS. Both the standards have guaranteed delivery of message and ordering of messaging. The parameter of the

standard average latency out of scope because they are dealing with layer to layer protocol.

3) **OVERLAP BETWEEN OASIS AND W3C STANDARDS:-** In this overlapping of Web Services security have standards that are urbanized by multiple bodies are source of system developed. Moreover these standards must be updated having problem of interoperability testing of standards and formal specification is a need for Web Services.

4) **METHODOLOGIES FOR WEB SERVICE SECURITY:-** In this the most important communication of this is security are languages and protocols. As technology in web services become most adopted and need of methodologies and for developers to identify or help for security and attack to be analyzed in levels of protocols.

5) **AVAILABILTY AND PROTECTION FROM DENIAL OF SERVICE ATTACKS:-** In Web Services, to continue the operation as long as possible there is application for detecting denial of service attacks and to resume or recover of operation after attack. In this replicating the data and services it is important to have techniques to make sure continuity of operation after a fault. In this it is also important for the need of management and solution for service performance and to meet certain level of services.

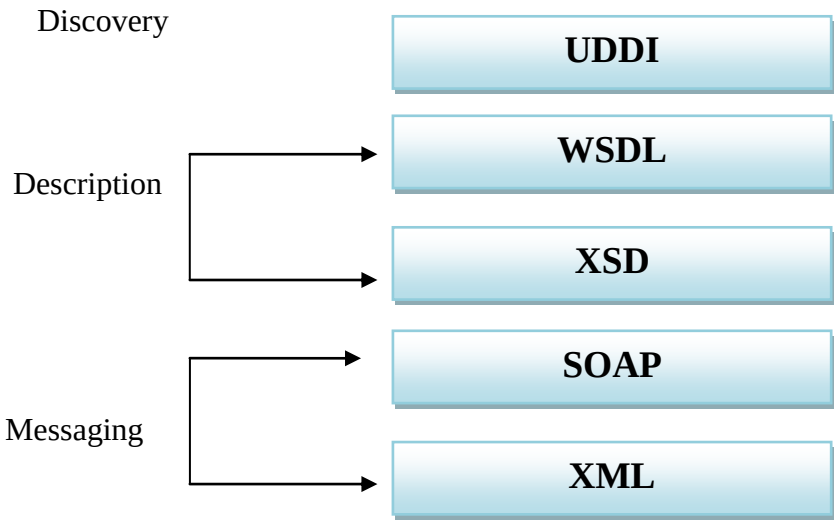

Fig 1.5: Web Service Protocols

1.9 ADVANTAGES:- In Web Services there are many benefits of Security

1) **INTEROPERABILITY:-** In Web Services it is most important profit in it. It works outside the network in which they offer developers a route to the solution. In this the services are developed have longer life and its offer better investment of the services which developed in it. In this developers also used the language they preferred in it.

2) **USABILITY:-** In this Web Services allow different business to be exposed in many systems over the Web. In this the clients have choice to choose the web services they need. Instead of reinventing the software for each clients only the application that are address in it are used for the client. With the help of this the client can choose their language code and tools of own choice.

3) **REUSABILITY:-** In this not only the component based model is developed but also the operation of services is also used in zero-coding. With the help of this it make easy reuse of Web Services in other Web Services. In this legacy code is also easily used.

4) **DEPLOYABILITY: -** In this the Web Services must deploy over the internet. With the help of this it can make it easy to deploy the Web Service over the internet even in the firewalls on the servers. In this inbuilt security is also providing.

1.10 DISADVANTAGES:- In Web Services there are many disadvantages

1) **LACK OF STANDARDS: -** In this using of existing standards about technologies of Web Services may cause failure or incompletion of transformation of transaction in Web services. By the incompatibilities of different service versions of UDDI, SOAP, HTTP and WSDL are used in the side of communication or at the time of Implementation.
2) **GUARANTED EXECUTION AND PERFORMANCE ISSUES:-** At the time of using internet the HTTP is not always there at the time of delivery

is guaranteed that request or response of the services. The HTTP is very transactional and that enables the server to handle different clients is not possible for maintaining connection for long term with all clients. To spending more effort in creating and terminating the clients connection.

3) **UNCHALLENGABLE INERFACES:-** As we can change the provided methods or the service parameter we used can cause the crash in the application. It is not always possible for the clients for using service and to inform them if there any change is done. As there is result of code the executing code must have complicated process.

4) **MATCHING REQUIREMENT:-** In this most useful solution is not possible for meeting the requirement of each customer.

5) **GRANULARITY:-** In this Web Services are most often used granularity in the operation of business in everyday specializing for work demanding process.

1.11 SECURE DISSEMINATION: - Secure dissemination of an XML file is one of the technique in which we want to guarantee about data integrity and confidentially about the data. It is a technique in which the irrelevant data does not meant for a legitimate consumer is unreachable and there is no information leak. The requirement of this is only for legitimate consumer can see the subscribed amount of data according to the access policy. The legitimate consumer has authority to access the data and how much of data must provide to all.

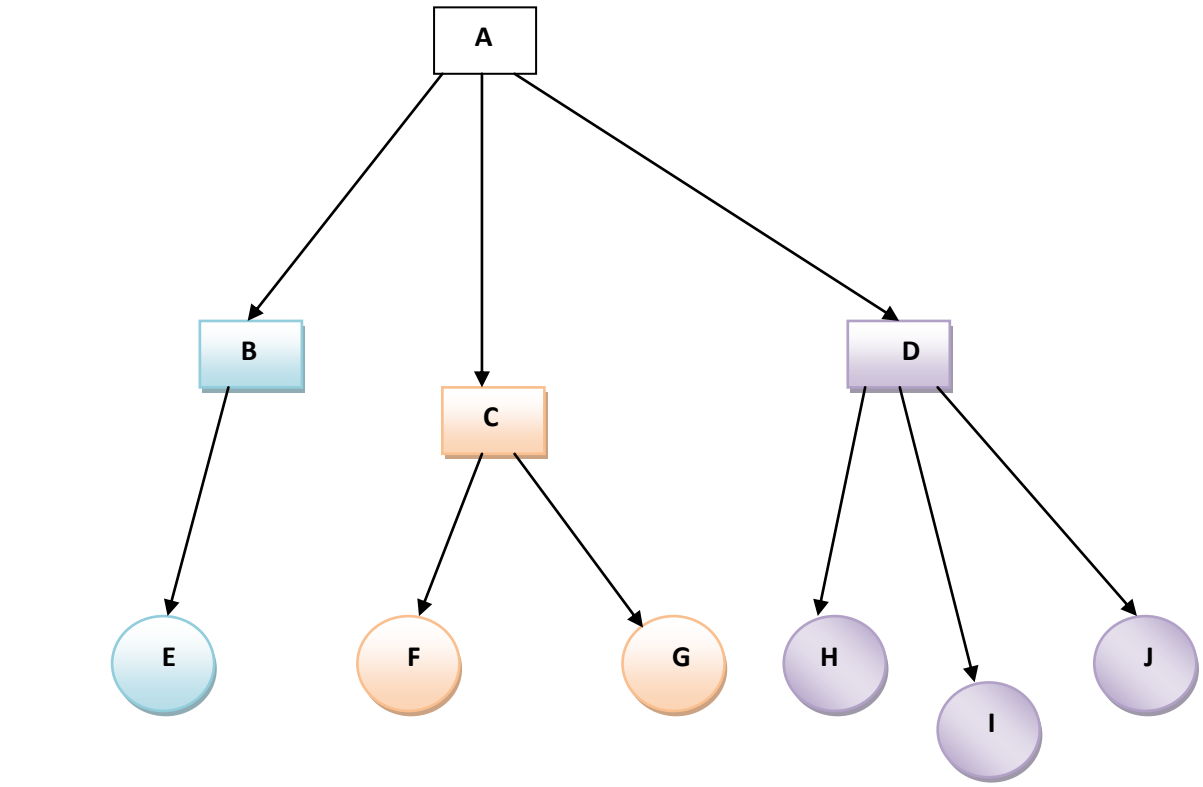

Fig 1.6: Tree Structure of an XML data

Consumer 1 Consumer 2 Consumer 3

CHAPTER 2

LITERATURE REVIEW

2.1 Literature:- In this Section there is an overview of papers by different researchers who has given their views on ontology based on security.

- **Artem. et al.** (2013), "Security Attack Ontology for Web Services." In this paper they have proposed a firewall / intrusion detection system (F/IDS) to deal with security threads and new type of attack as a particular host. F/IDS from different software should be distributed in web and have common vocabulary that provides the basis for F/IDS cooperation and evolution. They have presented an approach for describing vocabulary that is based on ontologies that defined in OWL / OWLS. As security attack ontology, which is easy to implement and deployed can allow different F/IDS to interact with each other to protect system from different attacks.
- **Teresa. et al.** (2009), "An Ontology Based Approach to Information Security." In this the terrorism attack have been occur and their proportions forced many national agencies and government review the procedures that are used to manage Information Security. In this new approach used to perform analysis on there data, such as data mining as well as sophisticated techniques. The use of data mining systems for national security needs to be evaluated not only against the citizen privacy being subject of abuse. They proposed an approach on ontology to firm and concept the terminology in the security information domain based on the relevant ISO/IEC_JTC1 standards.
- **Imen. et al.** (2016), "Enhancing Web Services Compositions with Privacy Capabilities." In this they have presented an integrated framework that enhances Web Service Composition with privacy protected on both sides customer and provider. In this it support the specification of privacy that concern based on various dimension, ranks, privacy aware adoptions strategies and secures data resulting from the execution of process.
- **Wanwisa. et al** (2013), "A Security Attack Risk Assessment for Web Services Based on Data Schemas and Semantics."In this they have proposed an initial assessment of command injection and DOS attack risks for web services based on analysis of WSDL data typing and semantics. In this the service consumer can

initially access and compare risks involved with the candidate services that are used for target service providers accessed the result and enforce proper validation of input.

- **Vigna. et al.** (2003), "A Stateful Intrusion Detection System for World Wide Web Services. In this paper they have proposed an approach for state ful intrusion detection called webSTaT. In this the approach to implement by extended the framework STAT to create a sensor in which it performs detection of web based attacks. In this WebSTAT also operated on multiple event streams and that is able to correlate with both network level and operating system level events with entries contained in service logs. The system that has been evaluated for detection process on web server. The result can be performed on high performance services.
- **Carminati. et al.** (2005), "Security Concisions Web Service Composition." In this they have tackled the problem of Web Services Composition that focused on security issues. An approach is used to compose web services according the security requirements of both side Web requestors and providers. In this they design efficient technique for the generations of tree composition for minimize the paths that should be computed.
- **Chun. et al.** (2008), "Ontology based semantic method for service modeling in Grid." In this an service oriented grid Hierarchical architecture is proposed with OOSA framework. In this the ontology that is used for solving problems of discovery and describing the services in it. In this the service composing is the main method that is used for providing a pathway suitable for a directed graph. In this the problem that are associated for managing ontologies in grid and mapping the mechanized for sharing the information in distributed environment.
- **Imen. et al.** (2016), "Enhancing Web Services Compositions with Privacy Capabilities." In this they have proposed an ontology based framework for evaluating attack effects. The ontology is the basis of their framework which provides security information needed in the whole measuring process. In this the AHP method is used for calculating the weights of security and evaluating index which is important in the environment of services. In this the better the attack effect is and the security in this system is worst.
- **Guan. et al**. (2016), "An ontology based Approach to security pattern selection." In this paper they have proposed the applications that promote the security pattern to the secure software development. In this the security pattern make it possible for

integrate the security for the development. However the number of securing pattern that are using and their representation forms make it difficult for selecting the right pattern for fulfill the given security requirement.

- **Rekha. et al.** (2016), "An Implementation Model for Privacy Aware Access Control in Web Services Environment." In thus paper they have select the reasoning SWRL rule based preferences by the user requesting with privacy ontology domain. In this a host of service provider is select by the web service provider and they protect the user privacy effectively as well as efficiently.
- **Malviya. et al.** (2011), "Developing University Ontology using Protégé OWL tool." In this they have focus on the process which is used for the description of information readable not only for humans for also machine readable information. This is fulfill by using the semantic web in which the web make the present web in that state when machine also understand the information and also help the human for better result.
- **Rajni. et al.**"Specifying Access Policies for Secure Content Dissemination of XML : A Technique Inspired by DNA Cryptography ".In this paper, they have summarized about the technique used in the Secure Dissemination. In this, they ensure that about the consuming data and the legitimate ones according the access policies. In this, they present a commonly used secure technique in which there is a break in the system but practically means. A multicast dissemination is used to implement the interface at the securing end by using the technique secure dissemination.
- **Rajni. et al.** (2016), "Approach and Impact of a Protocol for Selection of security in Web Secure Platform". In this, they have prepared optimized service registry that develop one better BLB or BLC application with agility. In this, the service requestor compares the list of web services and chooses the service based on its requirements. In this, the problem domain is that we have to choose the designed fuzzy expert system and technique in a rule based approach responds to quality of service changes in the web services.
- **R.Joseph. et al.** (2013), "A Literature Review on the Trust Management Web Service Access Control". In this paper, they present concepts about the Management of Trust in web services in Access control and analyzed the various strategies used in Trust Management by various trust models. The aim of the model is to provide the services quantitatively, uninterrupted manner of Trust.

- **Rekha. et al.** (2014), "Privacy Aware Control in Web Services". In this, there is an issue that is solved about the management protection about the personal information or data of user are measured now days. By using binary search tree prioritization based technique in which the sum of the weighted methods can extended the access control method and help in selecting the services as rule as the preference of other information privacy.
- **Furkh. et al.** (2013), "Semantic Web Composition Approach Overview and Limitation". In this paper, an overview is given about semantic web services approaches. In this the work has been done before by using two categories i) Support of Quality of service with approach ii) Support of Quality of service without approach. Comparing these approaches in some categories i.e. Scalability, correctness and awareness of Quality of service. In this they identified that the semantic web service we are using but if we compared to the approaches with QOS support rather than without using QOS support.
- **Ronak. et al.** (2015), "A Survey on Web Service Selection and Ranking Methods".In this paper they have solve the issues of similar functionality of web services that select the similar services selection. The approach consider as the secondary approach is Quality of service for selection of service. For getting the accurate value of parameters we monitoring the requirement of web services. In the recent study there are different aspects of web services that affect the accurate value of QOS method of computation used.
- **Zaidi. et al.** (2011), "A Semantic Web Services for Medical Analysis using the OWL- S Language". In this they have develop two ontology's i.e. are analysis of medical; ontology domain and analysis of medical by using web service ontology. In this first they contain 200 concepts and useful for users. In second they contain 74 web services and used for guiding the agents of software to discover and execute web services with human being interaction.
- **Shridevi. et al.** (2016), "A Novel Approach for Web Service Annotation Verification and Service Parameters Validation using Ontology". In this they have proposed a system that provides accurate results of services used in Web Service Semantic for public user. In this the data instance or values are taken and test cases executed with values of legal and illegal. The outcomes may be in normal or

abnormal situation of termination. In this if the values come in abnormal then the outcomes of result are correct.

- **Rekha. et al.** (2013), "Trust Based Privacy Preserving Access Control in Web Services Paradigm". In this paper the overview of model of Trust and evaluation in privacy preserving access control of web services in a new way or lot of issues are still there that is open. In this the trust is calculated between the requestor and provider that share their information in formal methods.
- **Rajni. et al.** (2016), "A Novel Technique for Privacy Aware Control in Web Service". In this they have proposed the different graphs in which they will show the system tool more than the traditional system. The reason behind it is execution of different policies and the execution of policies will be take more time as compared to the traditional system.
- **Jyoti. et al.** (2015), "Improved Framework for Web Service Life Cycle Activities based on Composite Web Service". In this they improve the Quality and Security of Web services and also improve the performance of web that will change the effect of the life cycle of activities in Web services. The idea behind this is done from various online shopping applications that are the backbone of the sales market. But the main issue is about Security, Quality and Performance of Web Service in this have to be improved.

CHAPTER 3

PROBLEM DESCRIPTION

Description: - Web Services is a homogenous architecture for systems modular in which we can made functionality from existing structure block and in which we can recognized the communication between various elements. An association of Web Services must meet the requirements maintain a useful environment. In this first we have to access the rights to a single Web Services must not be fixed if there is total number of services that are available must grows too large that it maintains it physically. The dynamic technique is used for the levels to adjust if needed automatically. However it must important to have facility to change the rights of access yourself too. Else there is need of administration that is unable to modify the access to the restricted data if it is essential for use.

On the other hand the system has to be available to every user that has to be available to every user that has authorization of data to be used. What's a perfect safe system has important if nobody can use it? To meet the above necessities of a mechanism it is utilized by most of the people that use every day: TRUST. The aim is to generate a partnership of Web Services in which the security is guaranteed by the common techniques safety for transport and Privacy used for the purpose of Trust based approach model access by the control system.

In Web Services there is no model created on ontology based model using secure dissemination. The Secure dissemination model is based on the Security, Privacy and Trust. We are creating the model by using secure dissemination based on Security that provides the data to legitimate customer only. It is a technique in which the irrelevant data does not meant for a legitimate consumer is unreachable and there is no information leak. The requirement of this is only for legitimate consumer can see the subscribed amount of data according to the access policy. So in this thesis we have to solve the problem of security by using technique secure dissemination on ontology based model in web service composition.

CHAPTER 4

PROPOSED SOLUTION

In the development of ontology using Protégé 3.4.2 version have created the model of UNIVERSITY and FACEBOOK as an example for the development using Protégé Editor.

STEP 1 Classes and class Hierarchy:- First step is to give the UNIVERSITY based classes and class hierarchy. All the concepts are focused on TEACHING, NON-TEACHING and STUDENT. In this there is another FACEBOOK model based on the classes and class hierarchy. All the concepts are focused on PERSON PROFILE, POST and FRIENDS.

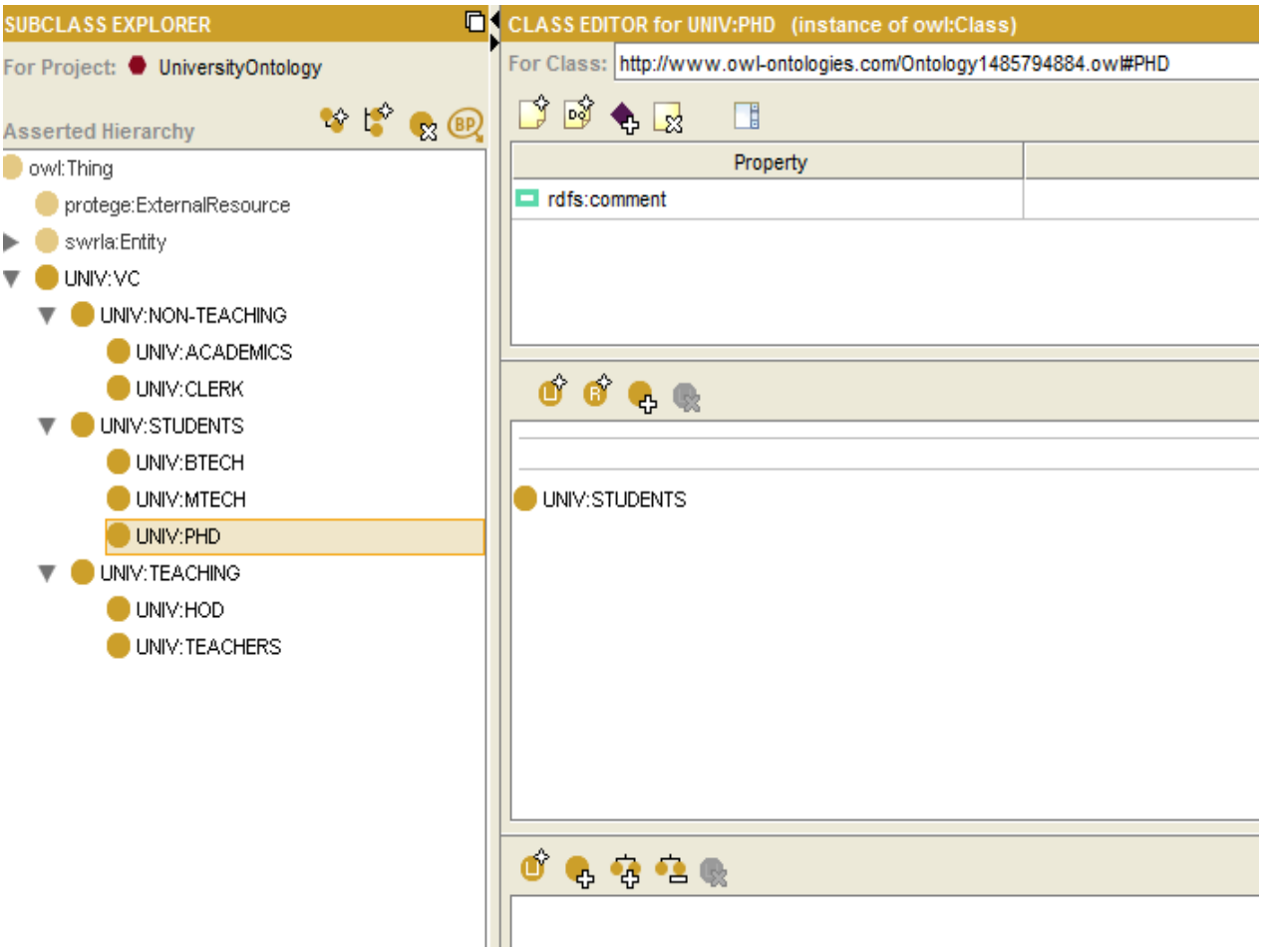

Fig 4.1: Classes of UNIVERSITY MODEL

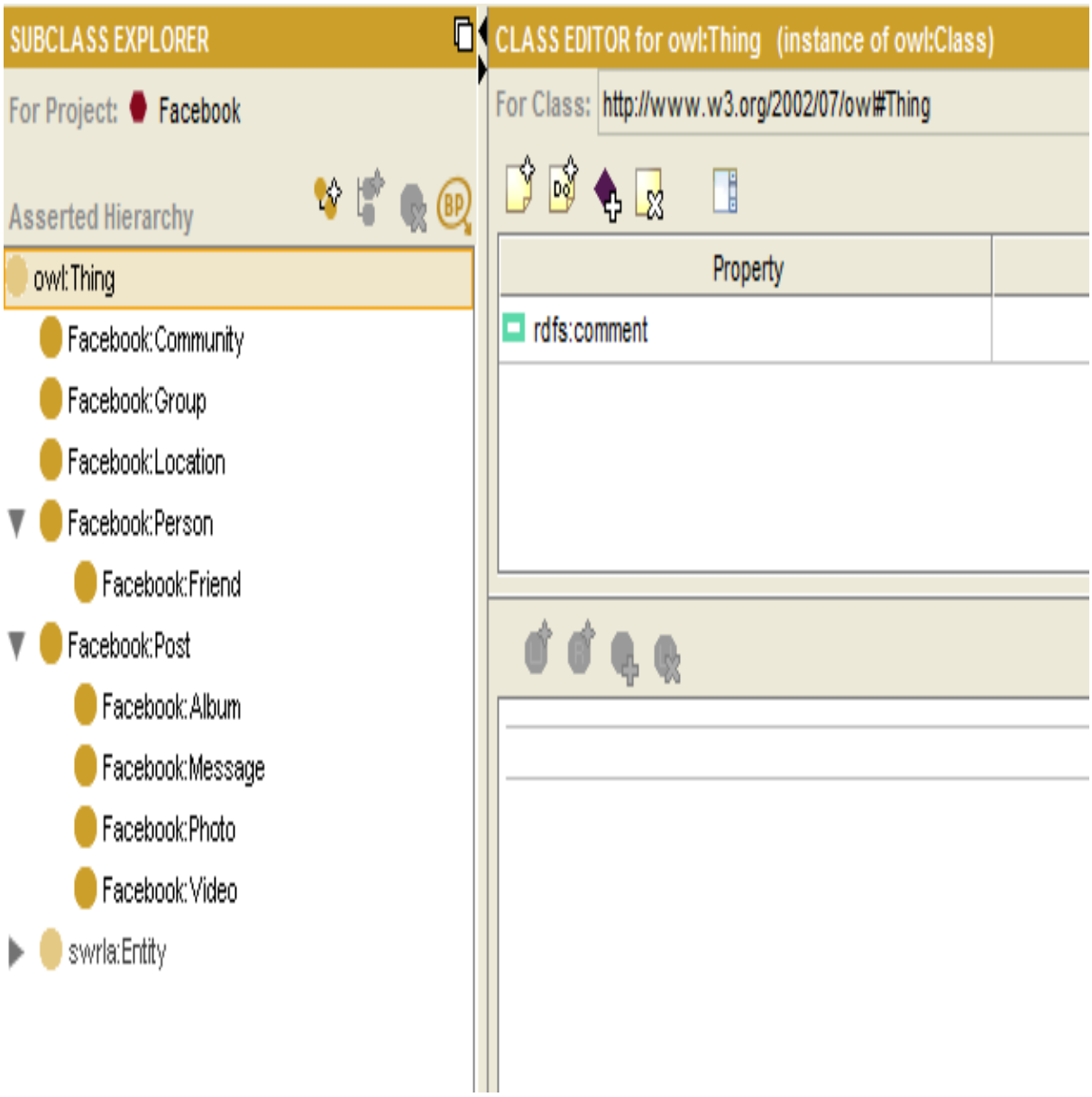

Fig 4.2: Classes of FACEBOOK MODEL

STEP 2 Object properties of Ontology: - In this we define the object properties according to our relationship which is add between the classes. In this we show the relationship between individual to individual.

;’

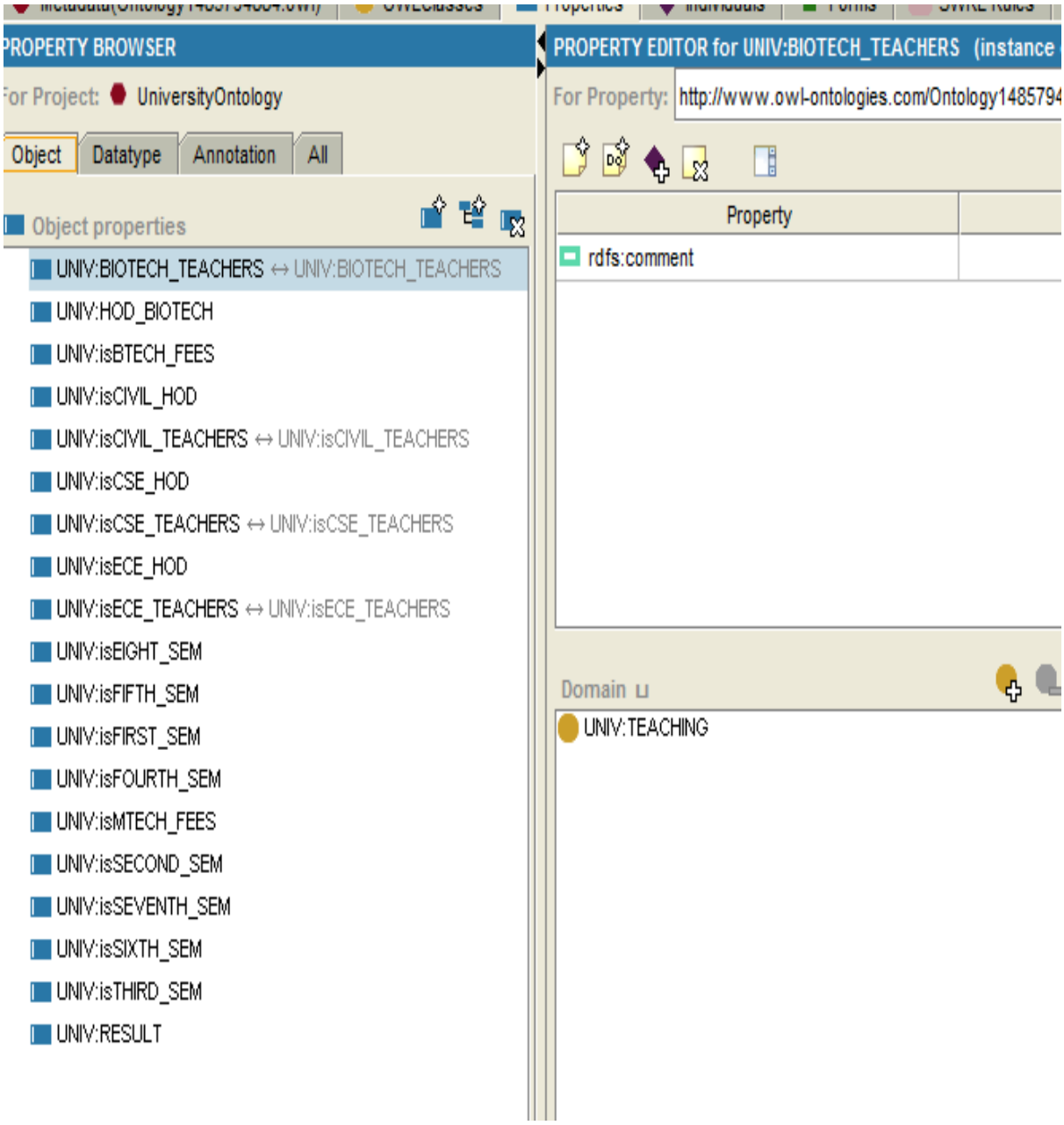

Fig 4.3: Object Property type of UNIVERSITY MODEL

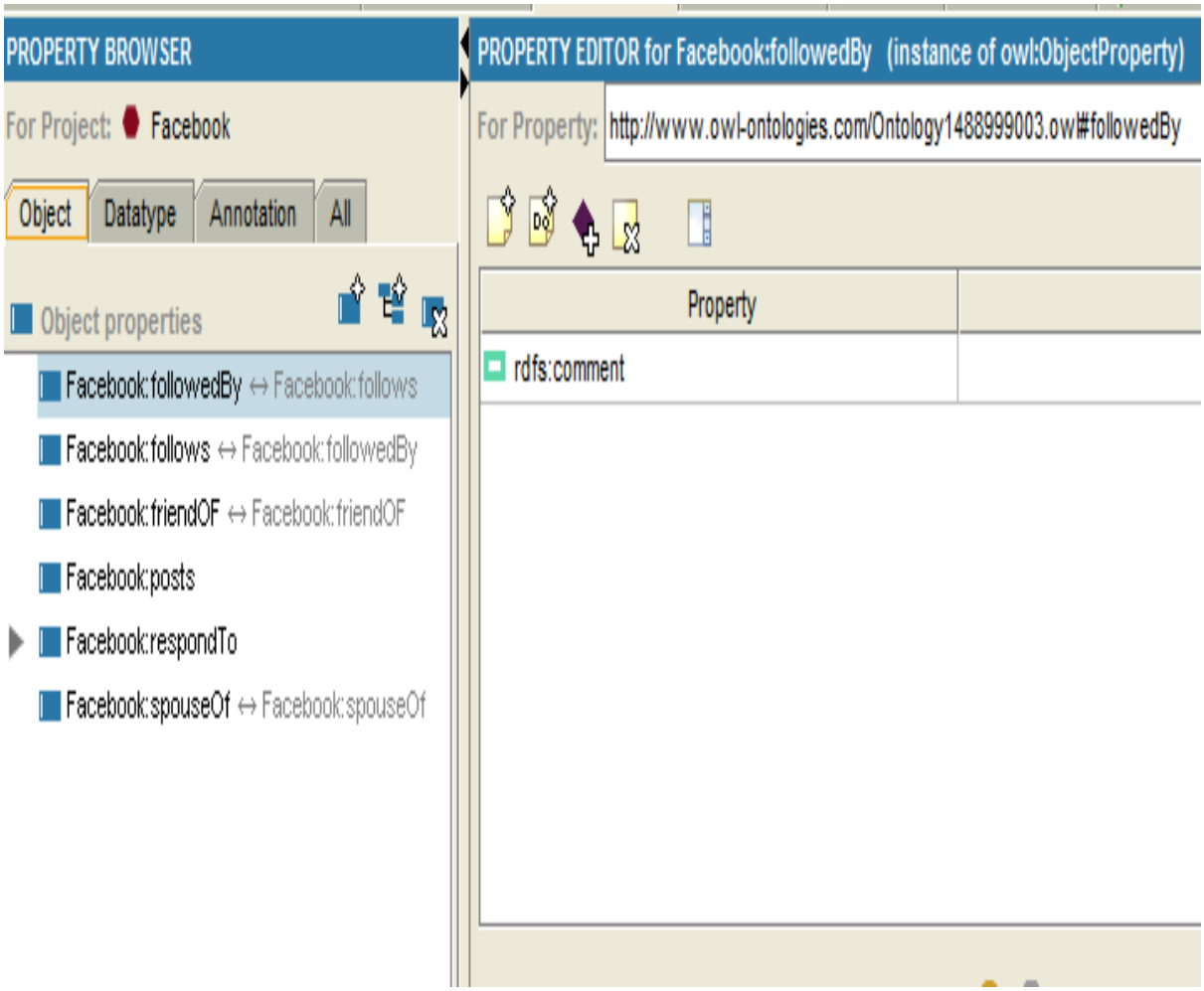

Fig 4.4: Object property type of FACEBOOK MODEL

STEP 3 Data properties of ontology:- In this we display data properties of university ontology which show the relationship between individual and data accurate.

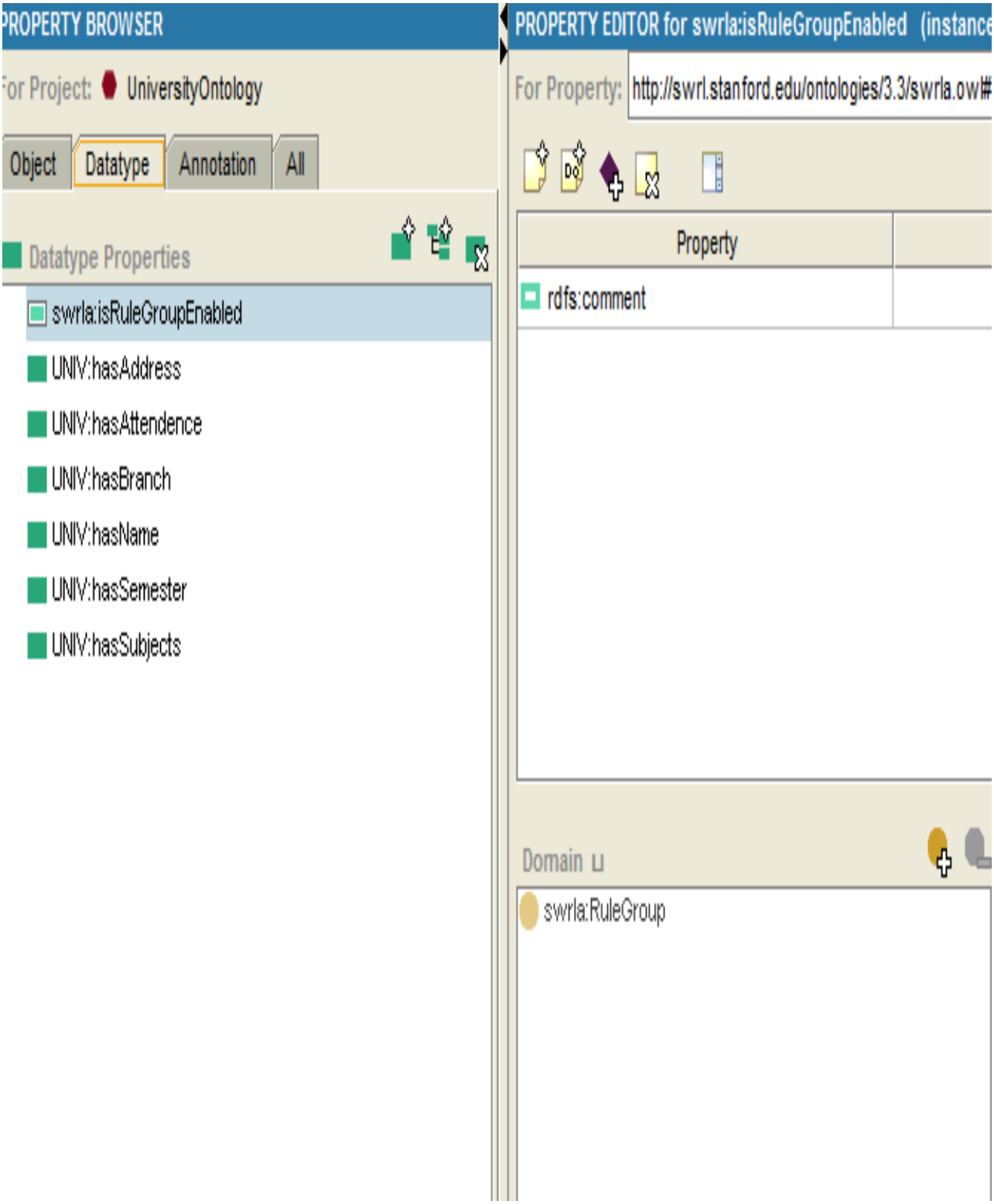

Fig 4.5: Data type property of UNIVERSITY MODEL

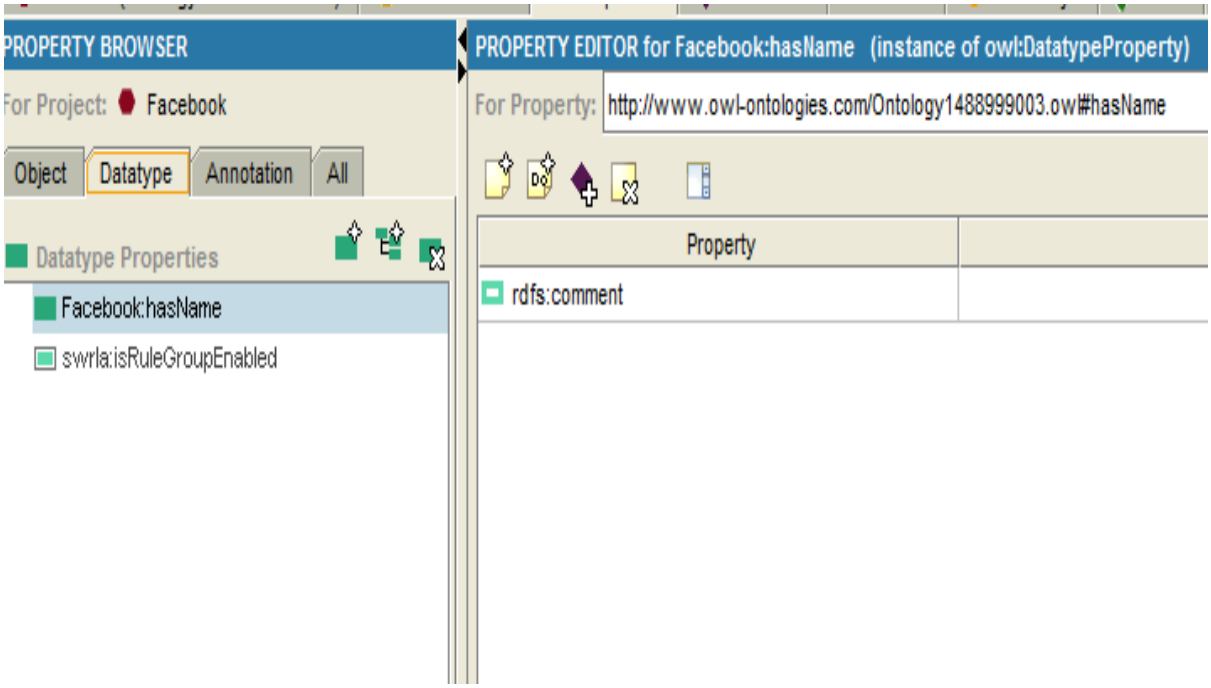

Fig 4.6: Data type property of FACEBOOK MODEL

STEP 4 Property and relationship:- In this we define the link between all the classes and the property use for the relationship between individual to individual. Other property we use is data properties that show the bond between the individual to data types. In this we also define the object domain properties and ranges.

STEP 5 Axioms used of Ontology:- In this three axioms are used for the ontology:

i). Axioms for Classes

ii). Axioms for attributes

iii). Axioms for instance

i). Axioms for classes:- In the axioms is used for describing the relationship between the classes, individuals and attributes taking for the model we are creating. In this there are four axioms that we take for creating model is axioms of classes, the survival of class, equivalent disjoint of class and describing all the axioms that use rdf language using rdf: id, rdfs: subclass Of, owl: equivalent Class and OWL: disjoint with classes.

ii). Axioms for attributes:- In this the attributes we describe the relationship between attributes that can divided into different parts: rdf used for sub Property of, equivalent

Property and inverse of and limitation of function we used and the relation of symmetric and transitive property.

iii). **Axioms of instance**:- In this there are two types of axioms that are used for creating the instances we used i.e. members that are used symphony and attributes used for the model we create in which each class and each value of attributes.

STEP 6 Instance of ontology: - In this first we have to select all the classes on the right side of the class and create all the instances we used in it for creating the model. In this we use rdf: we take the state of the class and one instance of the same class we create. In the one instance it can be belongs to one or many classes.

STEP 7 Reasoning of ontology:- In this for building correct and ontology for consistent reasoning this is the important part for creating model. In this by selecting the reasoner tab we select the consistency and find the value of the logic implicit. In this by selecting the tabs we can create the value of reflexive knowledge and transmission knowledge.

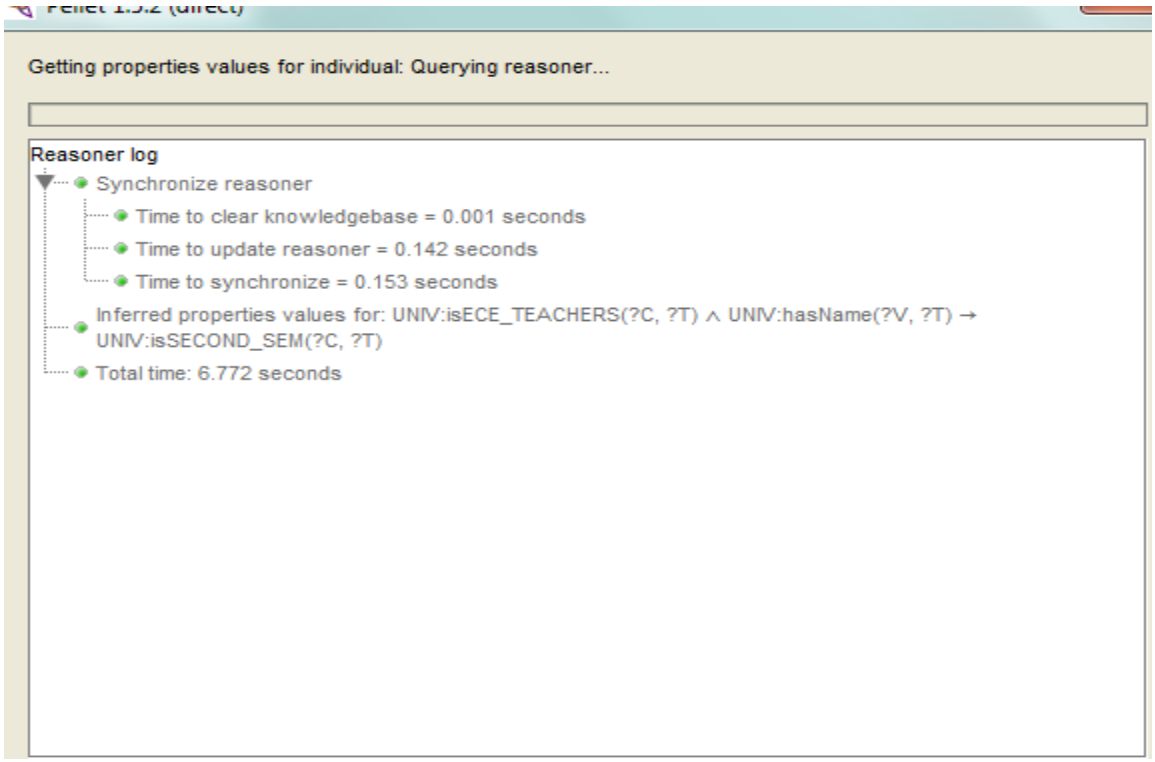

Fig 4.7: Reasoner Tab of UNIVERSITY MODEL

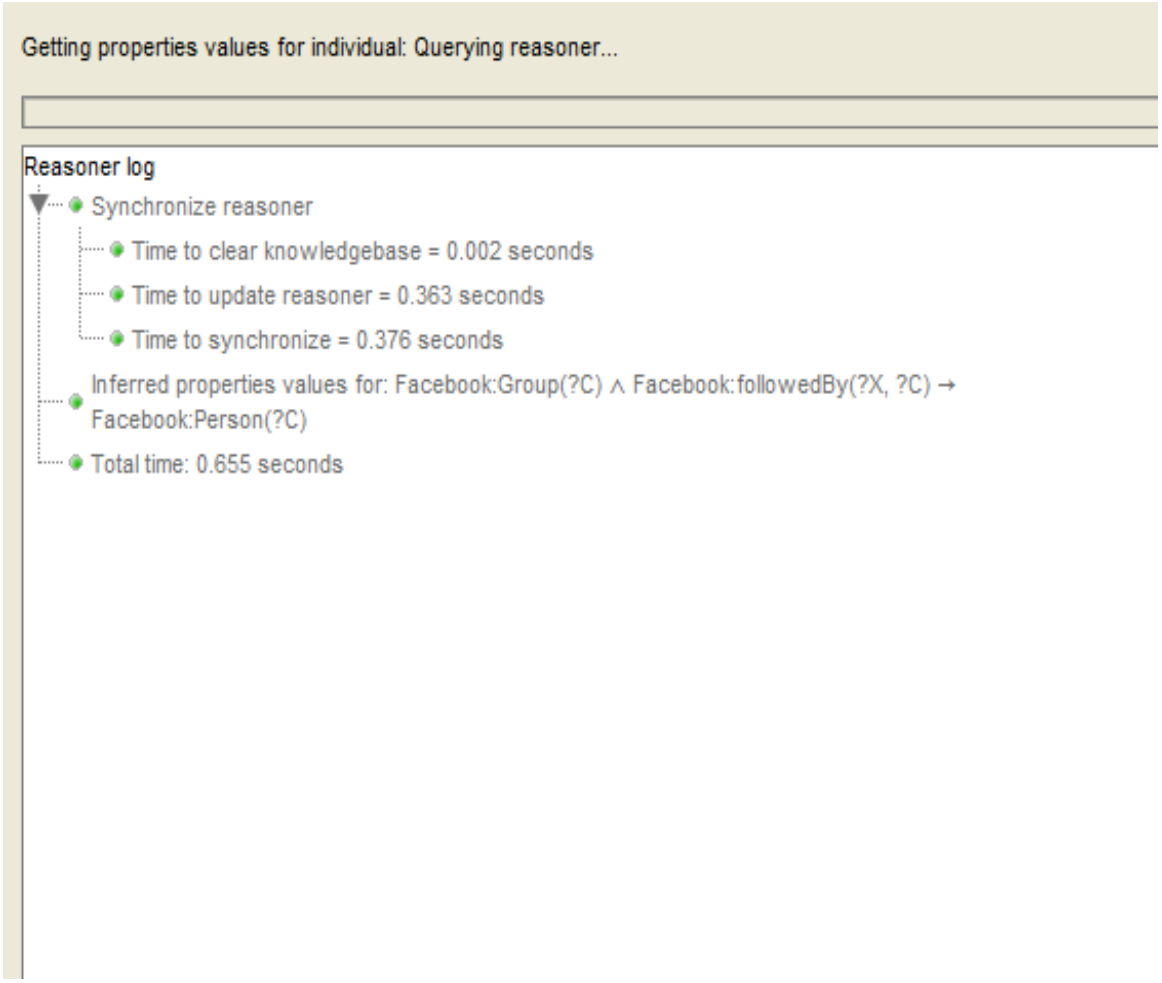

Fig 4.8: Reasoner Tab of FACEBOOK MODEL

4.1 OBJECTIVE OF THIS RESEARCH WORK:-

1). Examine the possible advantage of using the ontology and applications reasoning used for this system.

2). Identify the planned ontology and application reasoning that is included with the application. In this ontology it shall be precise by using the protégé OWL Editor tool.

3). Identify and execute a web service based application that makes the application reasoning available from web services

4). Identify and implement the Protégé and Jess tools for developing the ontology based model using SWRL Rules editor.

CHAPTER 5

WORKPLAN AND METHODOLOGY

In this section the Work plan and Methodology is shown in fig 16 flow diagram of analysis and identification of ontology in Web Services.

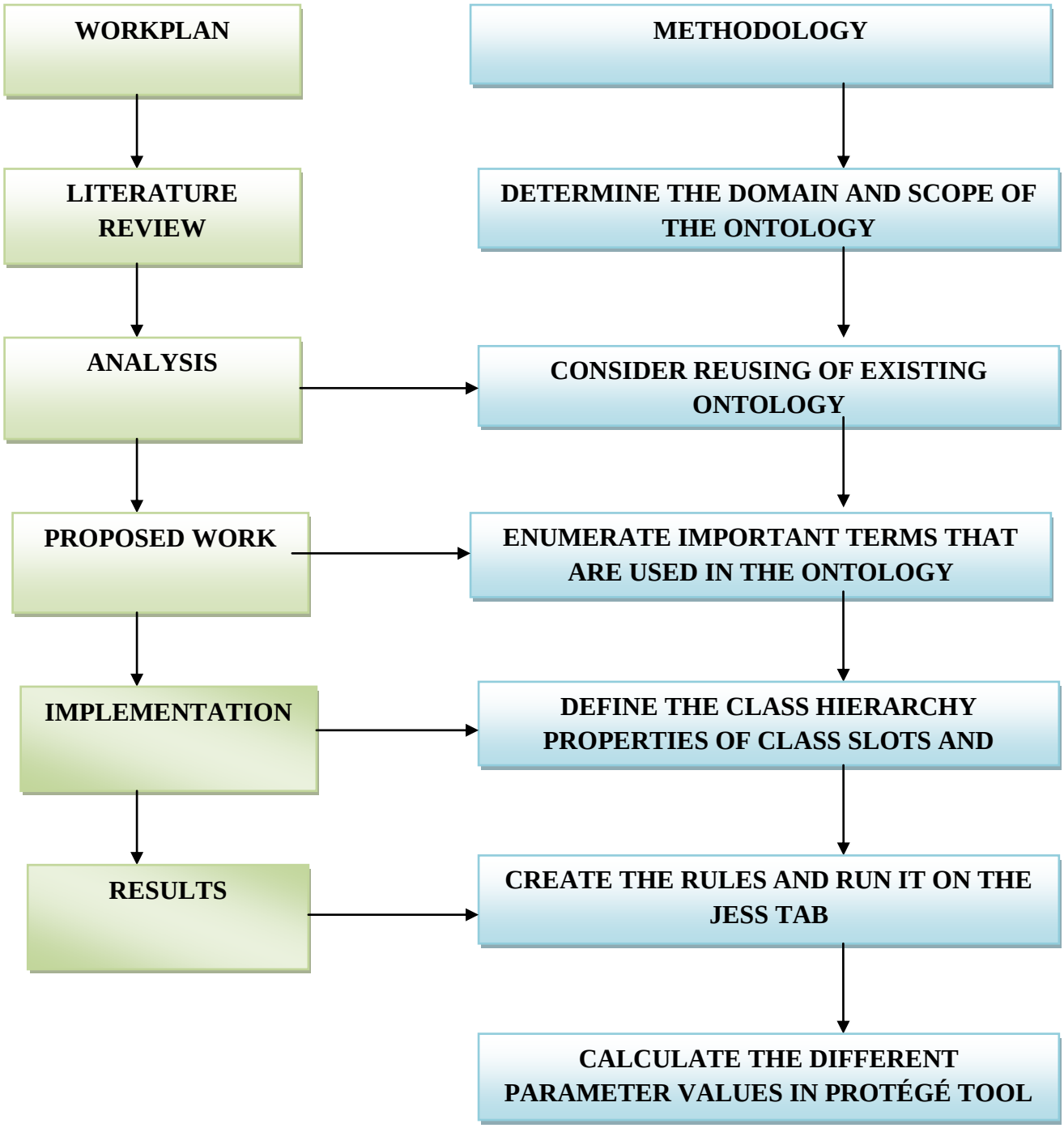

Fig : WORKPLAN AND METHODOLOGY

CHAPTER 6

IMPLEMENTATION AND RESULTS

Overview of Ontology Engineering: - Today the current Web is based on HTML in which it can display the information simply. Many researchers are working on the Semantic Web which is an intelligent and meaningful web. In Semantic web the ontology is the important part and with the help of ontology we can focus on only the concept that are the main and the information relationship used in the ontology.

1). SEMANTIC WEB: - Semantic Web is the common framework in which it allows the data to be shared in different computer and applications are reused enterprises and communication. It is an extension of the current Web in which we can share the information gives in defined meaning. The data that is web defined must be linked in such a way that it can be effective discovery; understanding is common, reuse of particular knowledge across various application. So the need of the data should be available for machines that are further processed. In this the data should be combined and merged. The Semantic Web is used to extend the principles of the Web from data to document. In this if data has to be accessed then using the general architecture of semantic web i.e. URI's. In this if we are using different data from different documents than the data must be interrelated with one another document. So it means a common frame work is also create that allows different data is to be shared and can be reused with other applications, enterprise and to be processed by roots automatically as well as manually. For the Semantic Web idea it has become the important part of our daily life.

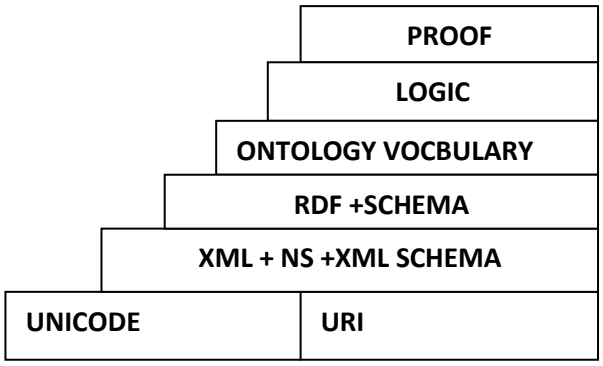

Fig 6.1: SEMANTIC WEB LAYER

1) ONTOLOGY:- Ontology's are the important part of the semantic web, but at the same time of using ontology by the engineer they need to know about the ontology's and

how to solve the problem in the business purpose. There are some reason for the ontology's we use:

I. For sharing the common understanding for solving the problem and the information for the development of the structure among the people or the agents of the software. In this there is use of several websites and software agents who can share their data from ontology.

II. To enable the reuse of the knowledge domain. In domain knowledge it can be developed by ontology that reuse of the knowledge as much time the user wanted to use it.

III. For making the explicitly of domain Assumption. In this system all the user using the knowledge domain must store a common ontology that must learn the meaning of terms used in the ontology.

IV. Analyzing of domain knowledge. In this when we are using domain knowledge and find the availability of knowledge that means it is started analyzed the domain.

V. Separating the domain knowledge from the operations knowledge and find the solution of the problem by reusing the domain through separation.

A) OWL (WEB ONTOLOGY LANGUAGE):- In web ontology language is the advanced version then the other languages. We are using in OWL ontology the three main classes:-

a) OWL-LITE:- In this OWL it supports the type of users that has need of classification hierarchy and the limitation that are used in it. For example if we use the cardinality than it permits the value in order to 0 and 1.

b) OWL - DL:- In this it supports the user who wanted the maximum expressiveness and retained the value of computational computer. In OWL – DL it included all the

languages that are used in OWL – DL for constructing which can be used only for restricted classes.

c) **OWL – FULL:-** In this it supports the user who wanted the maximum expressiveness and the value of syntax used in RDF where in this there is no guarantee of computing the computational value. OWL – Full allows the ontology for the meaning of predefining the used of vocabulary in this i.e. (RDF and OWL).

B) **XML – XML SCHEMA (Extensible Markup Language) :-** XML is an markup language that is used for designing the structure of data documents on Web that is used to design the transport protocol and stores all the information on the web. XML is used for the data transmission between all the applications in the web. It define the element structure of an XML document and describe the grammar of XML- based that has the ability of sharing the documents with common schema in which it allows the integration of data through Semantic Web.

D) **RDF – RDF SCHEMA (Resource Description Language) :-** It is the technique which is used for representing the web information and provide structure of document used in it. In RDF data structure the data is enable and exchange. In this the data is also reuse as many times the provider wanted and the system is based on XML that have the structure in graph. RDF schemas are the extension of RDF in which it is classified the basic of classes and proportions are used by the RDF knowledge representation language.

E) **SPARQL:-** It is a RDF query language that is used for the query data from the resources of the semantic Web. In this the users has the authentication of data to be retrieved and operate the data stored in RDF format. SPARQL query is used to provide the mechanism of answering the questions of the user query and allow users to write their query about the data from the ontology.

PREFIX AB: <http:// example.com/example ontology >

SELECT SPARQL QUERY

"What are the names of the Subjects of class Semantic V"

Frequently used Elements of RDF Schema:-

i). rdfs: range : property: define the property range.

ii).rdfs: range : property : define the property domain.

iii). rdf : type : define the instance type of class.

iv). rdf: subclassof: define the class is a subclass of another class.

v). rdfs: SubPropertyof: define property is a sub property of another properties.

6.1 IMPLEMENTATION:-

1) SOLUTION APPROACH

2) TOOLS FOR DEVELOPING ONTOLOGIES

3) DESIGN SPECIFICATION

4) GENERAL STRUCTURE OF MODEL DOMAIN ON ONTOLOGY

1) SOLUTION APPROACH:- For developing the ontology based we need to know about the conceptual based idea and then the structure of the concepts of working area in order to have a complete model of the domain. In this we illustrate the classes, properties, individuals and set of rules for those classes. For designing the tool we used is PROTÉGÉ EDITOR Tool, more available tools in the protégé for design the ontology based model.

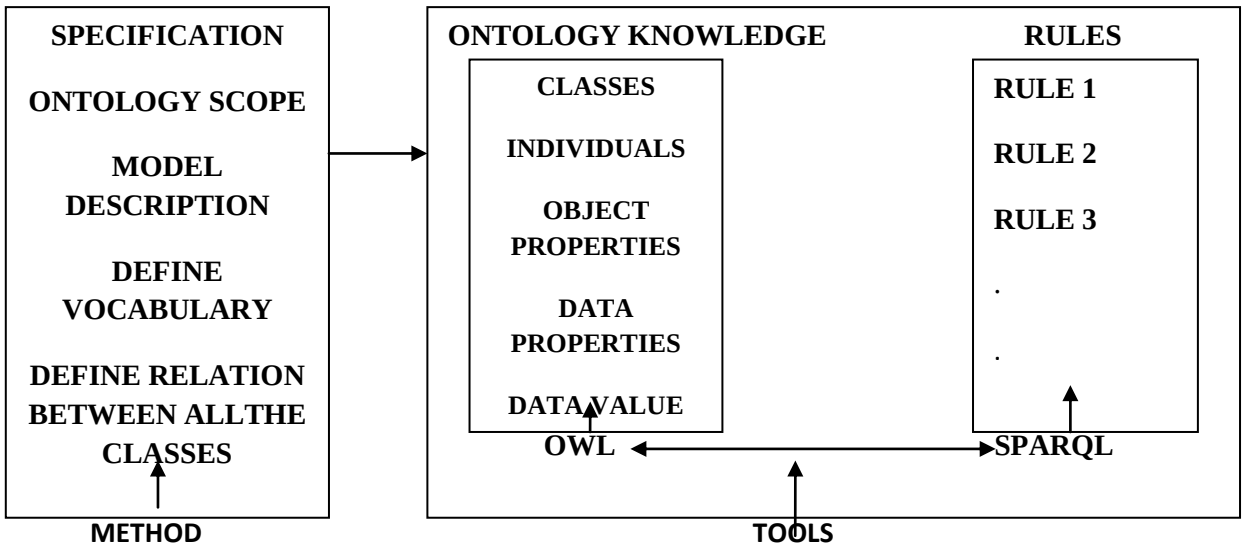

Fig 6.2: WORKFLOW OF ONTOLOGY MODEL

2. **TOOLS FOR DEVELOPING ONTOLOGIES:-** In this there are many tools and environment that are available for building ontology's. The tools have the facilities for ontology to develop the process and have future for ontology application. There are many ontology tools for building the ontology model such as OntoUML, Webonto, Onto Edit and Protégé. Finally the protégé tool is latest used for building ontology and this is the mostly used tool because of its reward. In this the different tools used for creating ontology has assessment of editor tools in terms of availability, graphical, extensibility and developers.

Features	**Ontololingua**	**Onto Edit**	**WebODE**	**Protégé**
Developer	Stanford University	Ontoprise	UPM	Stanford university
Availability	Free Web Access	Freeware and Licenses	Free web access license	Open source
Extensibility	None	plugins	plugins	plugins
Software-architecture	Client/server	Standalones and client server	Client/server	Standalone
Graphical views	No	No	No	Yes

TABLE 6.1: ONTOLOGY EDITOR TOOLS

In this project we have selected for creating a ontology model with protégé system. The advantages of protégé system are:-

- Protégé is an free open source background and used for many platforms.
- Protégé has user friendly platforms.
- Protégé has inbuilt query tabs option in which with the help of tabs we can create the query very easily.

- Protégé is individual tool in which we can use it without using the Internet.

In protégé platform it consists of two ways of ontology modeling:-

I. **PROTÉGÉ FRAMES:-** In this it is a frame editor of protégé that is used for enabling the users for building ontology's of frame based according to Open Knowledge Based Connectivity (OKBC) protocols. In this the model is consist of classes' slots (i.e. Rules and Properties), facets (i.e. Restriction of Rules) and axioms. In this an ontology with in OKBC can be made of consists the set of classes arranged in hierarchy model of a domain concept, Set of slots associated with describing the properties and relationships and set of instances used for classes.

II. **PROTÉGÉ OWL:-** In this it is used for enabling the users to build the ontology on OWL. A OWL is used for the description of classes, properties and their instances. In other words an ontology is amiable that is used for automated reasoning and have classification hierarchy that check the inconsistency can be determined by the reasoner automatically. In this protégé classes are compatible with JAVA and UML classes that can be used without methods to be attached and arrange in the hierarchy of inheritance. They support multiple inheritances in the hierarchy.

3. **DESIGN SPECIFICATION:-** In this we describe all the elements that are used for designing the ontology based model and have the ability to conceptualize different ideas for creating the ontology domain. There are different steps for developing the ontology model that defines the vocabulary and relation between the different concepts as mentioned.

A. First we have to determine the domain and its scope for building ontology.

B. Identify the entire important concept used in the ontology.

C. Define all the classes and class hierarchy used in the ontology.

D. Define all the object properties and relation between the properties of object used in the ontology.

E. Define the individual instances used in the ontology.

F. Check the Consistency, Response Time and Inference time of the model used in the ontology.

G. Implement the working domain of the ontology.

4.1 GENERAL STRUCTURE OF UNIVERSITY MODEL DOMAIN:-

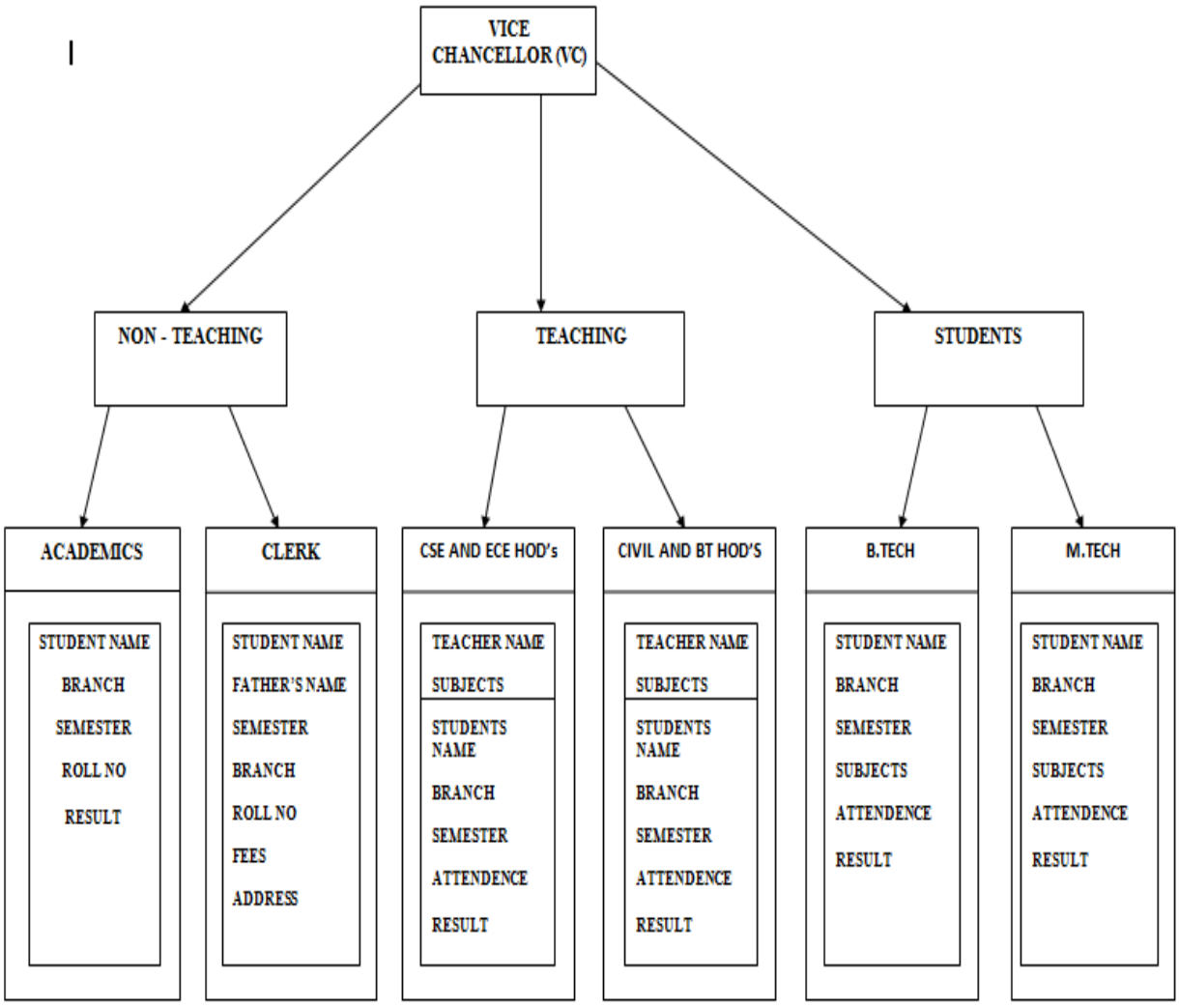

Fig 6.3: General Structure of UNIVERSITY MODEL

The general structure of ontology is developed and basically used for data storing, concept link and data for University based model in ontology. The ontology contain information of

three main domains: the first domain is NON- TEACHING domain that tells the general information of ACADEMICS and CLERK such as STUDENT NAME, BRANCH and SEMESTER etc. The second domain is TEACHING in which it tell the general information of HOD and TEACHERS such as SEMESTER, SUBJECTS, STUDENTS NAME, BRANCH, ATTENDENCE etc. Finally the last domain is STUDENTS that give the general information about B.TECH and MTECH students such as NAME, SEMESTER, BRANCH, RESULT, and ATTENDENCE etc. This structure is designed in Protégé Tool.

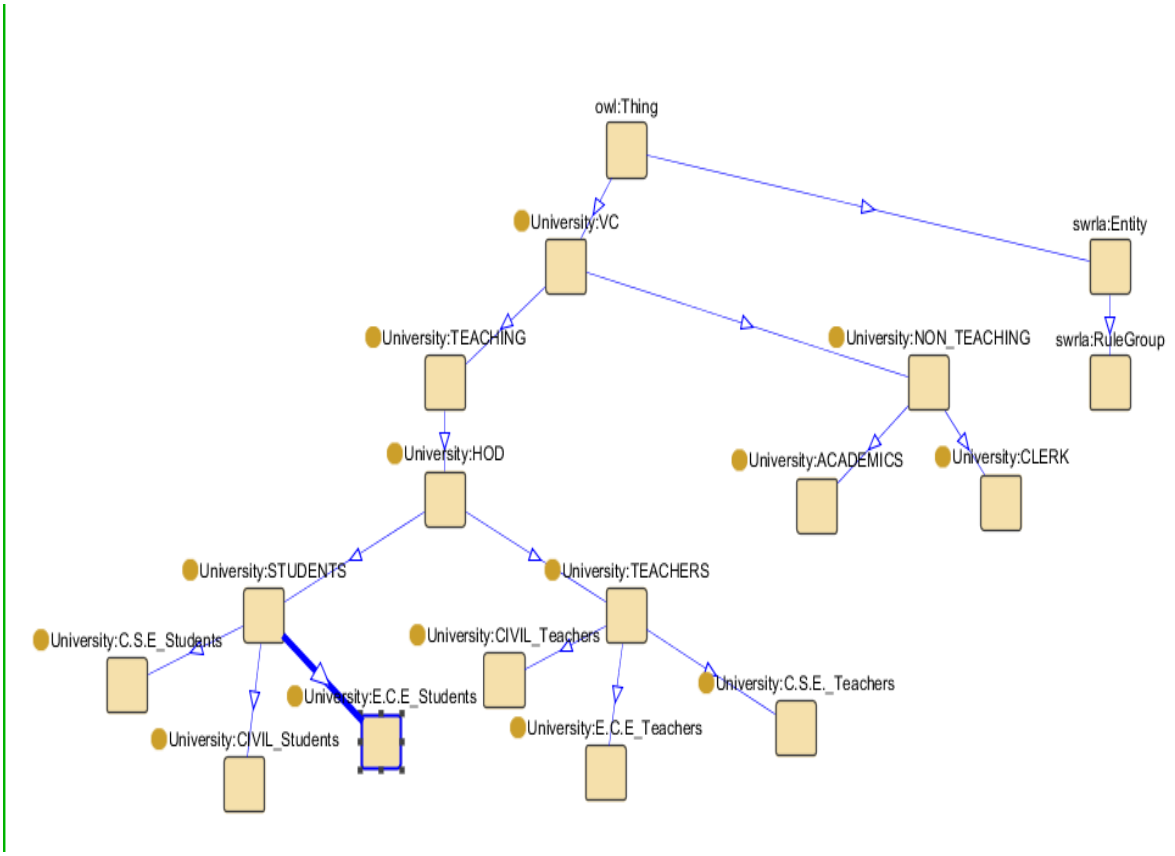

Fig 6.4: UNIVERSITY MODEL DOMAIN IN ONTOLOGY

4.1.1 RULES CREATED IN SWRL TAB OF UNIVERSITY MODEL:-

1. http://www.owlontologies.com/Rule117_//Biol_Teachers_is_Collecting_Information_of_Names_of_Third_Sem_Students
2. http://www.owlontologies.com/Rule116_//Biol_Teachers_is_Collecting_Information_of_Names_of_Second_Sem_Students

3. http://www.owlontologies.com/Rule58_//_Academics_is_Collecting_Information_of_Result_of_Mtech_Fourth_Sem_Students
4. http://www.owlontologies.com/Rule83_//_BioTech_Teachers_are_Collecting_Information_of_Subjects_of_Eight_Sem_Students
5. http://www.owlontologies.com/Rule62_//_Ece_Teachers_are_Collecting_Information_of_Subjects_of_Btech_Fourth_Sem_Students
6. http://www.owlontologies.com/Rule123_//_Clerk_is_Collecting_Information_of_Address_of_Btech_First_Sem_Students
7. http://www.owlontologies.com/Rule113_//_Civil_Teachers_is_Collecting_Information_of_Names_of_Seventh_Sem_Students
8. http://www.owlontologies.com/Rule144_//_Bio_Teachers_is_Collecting_Information_of_Attendence_of_Second_Sem_Students
9. http://www.owlontologies.com/Rule44_//_HOD_of_Biotech_is_Collecting_Information_of_Biotech_Teachers_and_Fifth_Sem_Students
10. http://www.owlontologies.com/Rule134_//_Clerk_is_Collecting_Information_of_Address_of_Mtech_Forth_Sem_Students
11. http://www.owlontologies.com/Rule148_//_Bio_Teachers_is_Collecting_Information_of_Attendence_of_Sixth_Sem_Students
12. http://www.owlontologies.com/Rule147_//_Bio_Teachers_is_Collecting_Information_of_Attendence_of_Fifth_Sem_Students
13. http://www.owlontologies.com/Rulle57_//_Academics_is_Collecting_Information_of_Result_of_Mtech_Third_Sem_Students
14. http://www.owlontologies.com/Rule11_//_HOD_of_Civil_is_Collecting_Information_of_Civil_Teachers_and_Third_Sem_Students
15. http://www.owlontologies.com/Rule39_//_Clerk_is_Collecting_Information_of_Fees_of_Mtech_Fourth_Sem_Students
16. http://www.owlontologies.com/Rule156_//_Civil_Teachers_is_Collecting_Information_of_Attendence_of_Sixth_Sem_Students
17. http://www.owlontologies.com/Rule71_//_CSE_Teachers_are_Collecting_Information_of_Subjects_of_Fifth_Sem_Students
18. http://www.owlontologies.com/Rule87_//_Civil_Teachers_are_Collecting_Informatio

n_of_Subjects_of_Fifth_Sem_Students

19. http://www.owlontologies.com/Rule42_//_HOD_of_Biotech_is_Collecting_Information_of_Biotech_Teachers_and_Third_Sem_Students
20. http://www.owlontologies.com/Rule81_//_BioTech_Teachers_are_Collecting_Information_of_Subjects_of_Seventh_Sem_Students
21. http://www.owlontologies.com/Rule130_//_Clerk_is_Collecting_Information_of_Address_of_Btech_Eight_Sem_Students
22. http://www.owlontologies.com/Rule100_//_ECE_Teachers_are_Collecting_Information_of_Names_of_Second_Sem_Students
23. http://www.owlontologies.com/Rule26_//_HOD_of_Civil_is_Collecting_Information_of_Civil_Teachers_and_Eigth_Sem_Students
24. http://www.owlontologies.com/Rule83_//_Civil_Teachers_are_Collecting_Information_of_Subjects_of_First_Sem_Students
25. http://www.owlontologies.com/Rule150_//_Bio_Teachers_is_Collecting_Information_of_Attendence_of_Eight_Sem_Students
26. http://www.owlontologies.com/Rule122_//Biol_Teachers_is_Collecting_Information_of_Names_of_Eight_Sem_Students
27. http://www.owlontologies.com/Rule30_//_Clerk_is_Collecting_Information_of_Btech_Fees_of_Fourth_Sem_Students
28. http://www.owlontologies.com/Rule78_//_BioTech_Teachers_are_Collecting_Information_of_Subjects_of_Fourth_Sem_Students
29. http://www.owlontologies.com/Rule126_//_Clerk_is_Collecting_Information_of_Address_of_Btech_Fourth_Sem_Students
30. http://www.owlontologies.com/Rule140_//_CSE_Teachers_is_Collecting_Information_of_Attendence_of_Sixth_Sem_Students
31. http://www.owlontologies.com/Rule56_//_Academics_is_Collecting_Information_of_Result_of_Mtech_Second_Sem_Students
32. http://www.owlontologies.comRule55_//_Academics_is_Collecting_Information_of_Result_of_Mtech_First_Sem_Students
33. http://www.owlontologies.com/Rule20_//_HOD_of_Civil_is_Collecting_Information_of_Civil_Teachers_and_Sixth_Sem_Students

34. http://www.owlontologies.com/Rule1_//_HOD_is_Hod_of_Cse_Hod_of_Civil_Hod_of_Ece
35. http://www.owlontologies.com/Rule47_//_HOD_of_Biotech_is_Collecting_Information_of_Biotech_Teachers_and_Eight_Sem_Students
36. http://www.owlontologies.com/Rule27_//_Clerk_is_Collecting_Information_of_Btech_fees_of_Btech_First_Students
37. http://www.owlontologies.com/Rule154_//_Civil_Teachers_is_Collecting_Information_of_Attendence_of_Fourth_Sem_Students
38. http://www.owlontologies.com/Rule68_//_CSE_Teachers_are_Collecting_Information_of_Subjects_of_Second_Sem_Students
39. http://www.owlontologies.com/Rule98_//_CSE_Teachers_are_collecting_Information_of_Name_of_the_students_of_Eight_Sem
40. http://www.owlontologies.com/Rule5_//_HOD_of_CSE_is_Collecting_Information_CSE_Teachers_and_Sec_Sem_Students
41. http://www.owlontologies.com/Rule121_//Biol_Teachers_is_Collecting_Information_of_Names_of_Seventh_Sem_Students
42. http://www.owlontologies.com/Rule76_//_BioTech_Teachers_are_Collecting_Information_of_Subjects_of_Second_Sem_Students
43. http://www.owlontologies.com/Rule13_//_HOD_of_ECE_is_Collecting_Information_Of_ECE_Teachers_and_Fourth_Sem_Students
44. http://www.owlontologies.com/Rule48_//_Academics_is_Collecting_Information_of_Results_of_Btech_Second_Sem_Students
45. http://www.owlontologies.com/Rule135_//_CSE_Teachers_is_Collecting_Information_of_Attendence_of_First_Year_Students
46. http://www.owlontologies.com/Rule65_//_Ece_Teachers_are_Collecting_Information_of_Subjects_of_Seventh_Sem_Students
47. http://www.owlontologies.com/Rule54_//_Academics_is_Collecting_Information_of_Result_of_Eight_Sem_Students
48. http://www.owlontologies.com/Rule136_//_CSE_Teachers_is_Collecting_Information_of_Attendence_of_Second_Sem_Students
49. http://www.owlontologies.com/Rule15_//_HOD_of_CSE_is_Collecting_Information_

of_CSE_Teachers_and_Fifth_Sem_Students

50. http://www.owlontologies.com/Rule94_//_CSE_Teachers_are_collecting_Information_of_Name_of_the_students_of_Fourth_Sem
51. http://www.owlontologies.com/Rule115_//Biol_Teachers_is_Collecting_Information_of_Names_of_First_Sem_Students
52. http://www.owlontologies.com/Rule101_//_Ece_Teachers_is_Collecting_Information_of_Names_of_Third_Sem_Students
53. http://www.owlontologies.com/Rule102_//_Ece_Teachers_is_Collecting_Information_of_Names_of_Fourth_Sem_Students
54. http://www.owlontologies.com/Rule138_//_CSE_Teachers_is_Collecting_Information_of_Attendence_of_Fourth_Sem_Students
55. http://www.owlontologies.com/Rule18_//_HOD_of_CSE_is_Collecting_Information_of_CSE_Teachers_and_Sixth_Sem_Students
56. http://www.owlontologies.com/Rule91_//_CSE_Teachers_are_collecting_Information_of_Name_of_the_students_of_First_Sem
57. http://www.owlontologies.com/Rule162_//_ECE_Teachers_is_Collecting_Information_of_Attendence_of_Forth_Sem_Students
58. http://www.owlontologies.com/Rule93_//_CSE_Teachers_are_collecting_Information_of_Name_of_the_students_of_Third_Sem
59. http://www.owlontologies.com/Rule50_//_Academics_is_Collecting_Information_of_Result_of_Btech_Fourth_Sem_Students
60. http://www.owlontologies.com/Rule73_//_CSE_Teachers_are_Collecting_Information_of_Subjects_of_Seventh_Sem_Students
61. http://www.owlontologies.com/Rule23_//_HOD_of_Civil_is_Collecting_Information_of_Civil_Teachers_and_Seventh_Sem_Students
62. http://www.owlontologies.com/Rule106_//_ECE_Teachers_is_Collecting_Information_of_Names_of_Eight_Sem_Students
63. http://www.owlontologies.com/Rule64_//_Ece_Teachers_are_Collecting_Information_of_Subjects_of_Sixth_Sem_Students
64. http://www.owlontologies.com/Rule161_//_ECE_Teachers_is_Collecting_Information_of_Attendence_of_Third_Sem_Students

65. http://www.owlontologies.com/Rule60_//_Ece_Teachers_is_Collecting_Information_of_Subjects_of_Btech_Second_Sem_Students
66. http://www.owlontologies.com/Rule10_//_HOD_of_Civil_is_Collecting_Information_of_Civil_Teachers_and_Third_Sem_Students
67. http://www.owlontologies.com/Rule38_//_Clerk_is_Collecting_Information_of_Fees_of_Third_Sem_Students
68. http://www.owlontologies.com/Rule28_//_Clerk_is_Collecting_Information_of_Btech_Fees_of_Second_Sem_Students
69. http://www.owontologies.com/Rule157_//_Civil_Teachers_is_Collecting_Information_of_Attendence_of_Seventh_Sem_Students
70. http://www.owlontologies.com/Rule149_//_Bio_Teachers_is_Collecting_Information_of_Attendence_of_Seventh_Sem_Students
71. http://www.owlontologies.com/Rule131_//_Clerk_is_Collecting_Information_of_Address_of_Mtech_First_Sem_Students
72. http://www.owlontologies.com/Rule97_//_CSE_Teachers_are_collecting_Information_of_Name_of_the_students_of_Seventh_Sem
73. http://www.owlontologies.com/Rule33_//_Clerk_is_Collecting_Information_of_Btech_Fees_of_Seventh_Sem_Students
74. http://www.owlontologies.com/Rule34_//_Clerk_is_Collecting_Information_of_Btech_Fees_of_Eight_Sem_Students
75. http://www.owlontologies.com/Rule159_//_ECE_Teachers_is_Collecting_Information_of_Attendence_of_First_Sem_Students
76. http://www.owlontologies.com/Rule69_//_CSC_Teachers_are_Collecting_Information_of_Subjects_of_Third_Sem_Students
77. http://www.owlontologies.com/Rule70_//_CSE_Teachers_are_Collecting_Information_of_Subjects_of_fourth_Sem_Students
78. http://www.owlontologies.com/Rule84_//_Civil_Teachers_are_Collecting_Information_of_Subjects_of_Second_Sem_Students
79. http://www.owlontologies.com/Rule160_//_ECE_Teachers_is_Collecting_Information_of_Attendence_of_Second_Sem_Students
80. http://www.owlontologies.com/Rule112_//_Civil_Teachers_is_Collecting_Informatio

n_of_Names_of_SIxth_Sem_Students

81. http://www.owlontologies.com/Rule7_//_HOD_of_Civil_is_Collecting_Information_of_Civil_Teachers_and_Sec_Sem_Students
82. http://www.owlontologies.com/Rule114_//_Civil_Teachers_is_Collecting_Information_of_Names_of_Eight_Sem_Students
83. http://www.owlontologies.com/Rule103_//_ECE_Teachers_is_Collecting_Information_of_Names_of_Fifth_Sem_Students
84. http://www.owlontologies.com/Rule43_//_HOD_of_BioTech_is_Collecting_Information_of_Biotech_Teachers__and_Btech_Fourth_Sem_Students
85. http://www.owlontologies.com/Rule75_//_BioTech_Teachers_are_Collecting_Information_of_Subjects_of_First_Sem_Students
86. http://www.owlontologies.com/Rule6_//_HOD_of_ECE_is_Collecting_Information_of_ECE_Teachers_and_Sec_Sem_Students
87. http://www.owlontologies.com/Rule139_//_CSE_Teachers_is_Collecting_Information_of_Attendence_of_Fifth_Sem_Students
88. http://www.owlontologies.com/Rule119_//Biol_Teachers_is_Collecting_Information_of_Names_of_Fifth_Sem_Students
89. http://www.owlontologies.com/Rule67_//_CSC_Teachers_are_Collecting_Information_of_Subjects_of_First_Sem_Students
90. http://www.owlontologies.com/nullRule78_//_Bio_Teachers_is_Collecting_Information_of_Subjects_of_Fourth_Sem_Students
91. http://www.owlontologies.com/Rule24_//_HOD_of_CSE_is_Collecting_Information_of_CSE_Teachers_and_Eight_Sem_Students
92. http://www.owlontologies.com/Rule110_//_Civil_Teachers_is_Collecting_Information_of_Names_of_Fourth_Sem_Students
93. http://www.owlontologies.com/Rule163_//_ECE_Teachers_is_Collecting_Information_of_Attendence_of_Fifth_Sem_Students
94. http://www.owlontologies.com/Rule166_//_ECE_Teachers_is_Collecting_Information_of_Attendence_of_Eight_Sem_Students
95. http://www.owlontologies.com/Rule143_//_Bio_Teachers_is_Collecting_Information_of_Attendence_of_First_Sem_Students

96. http://www.owlontologies.com/Rule95_//_CSE_Teachers_are_collecting_Information_of_Name_of_the_students_of_Fifth_Sem
97. http://www.owlontologies.com/Rule142_//_CSE_Teachers_is_Collecting_Information_of_Attendence_of_Eight_Sem_Students
98. http://www.owlontologies.com/Rule22_//_HOD_of_ECE_is_Collecting_Information_of_ECE_Teachers_and_Seventh_Sem_Students
99. http://www.owlontologies.com/Rule61_//_Ece_Teachers_is_Collecting_Information_of_Subjects_of_Btech_Third_Sem_Students
100. http://www.owlontologies.com/Rule118_//Biol_Teachers_is_Collecting_Information_of_Names_of_Forth_Sem_Students

4.1.2 RESULTS OF UNIVERSITY MODEL DOMAIN IN ONTOLOGY:- In this we have observed the Performance of our model and techniques we have proposed. Our main finding is that to find the measuring time taken for decision of Privacy Policy used.

- Our first result is taken as the comparison of No of Policies and Average Query Response Time. In this we have chosen the Privacy Policies and calculated the Average Query Response Time and then we added 180 Privacy Policies. The result is almost linear and also satisfied.

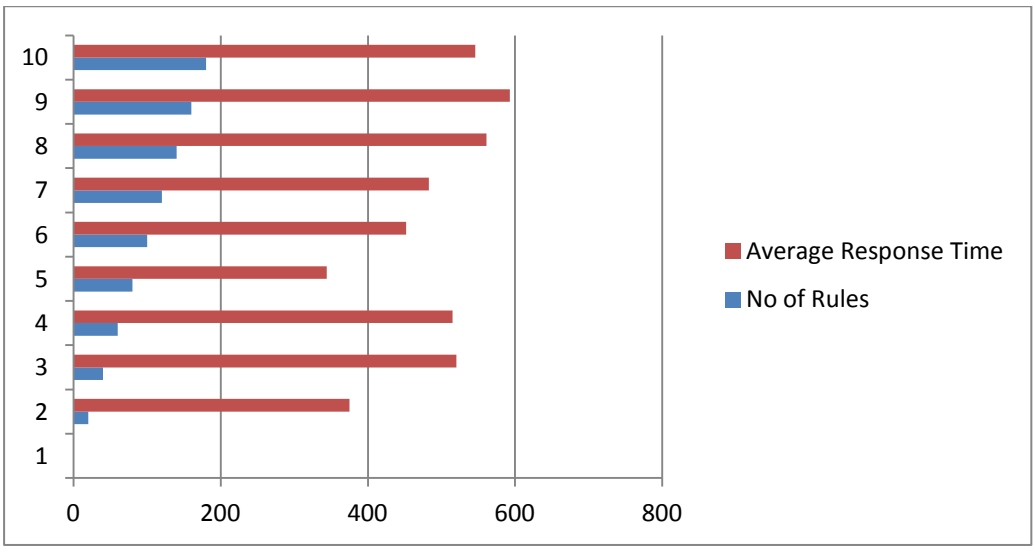

Fig 6.5: Average Query Response Time Vs No of Rules

TOTAL NO OF AVERAGE QUERY TIME CALCULATED IS: 0.456

- In the Second result, we have calculated the Inference Time for different No of Policies and created a graph of Inference Time and No of Rules of different rules set.

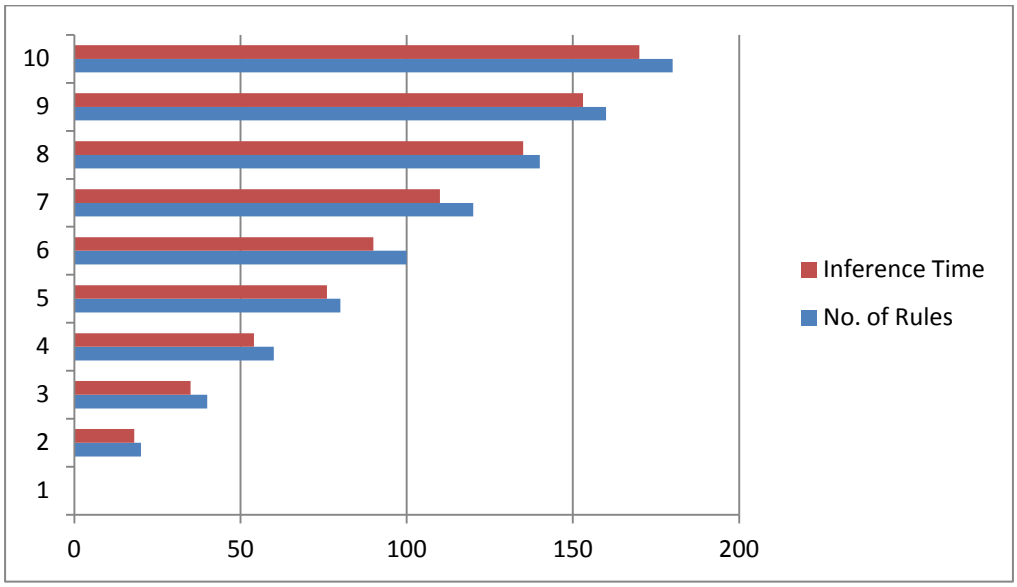

Fig 6.6: Inference Time Vs No of Rules

TOTAL NUMBER OF INFERENCE TIME CALCULATED IS: 8.44

- In the third result we have calculated the Consistency Check time of the different No of Rules. In this we have see the change on the No of Privacy Parameter in access control policies that Increase the Response Time but Complexity is increased naturally and thus acceptable.

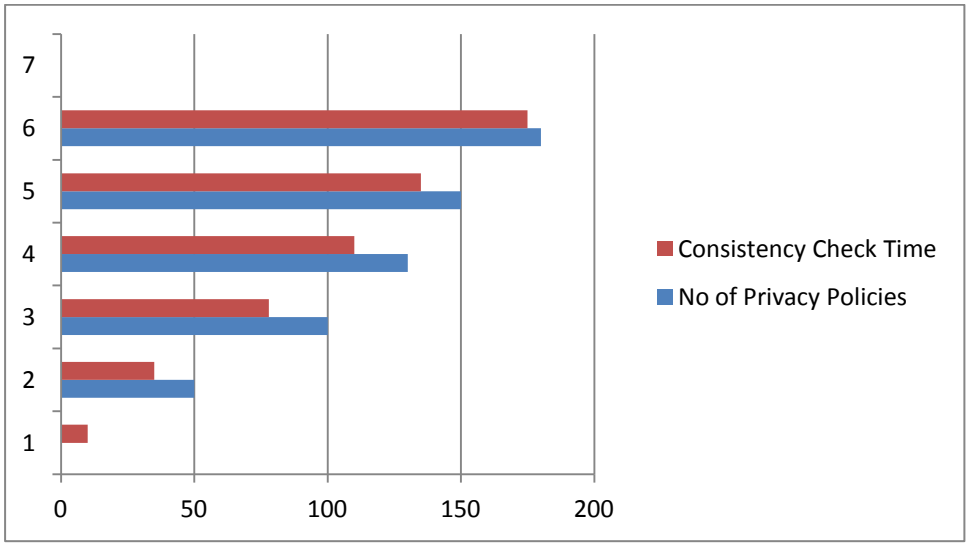

Fig 6.7: Consistency Check Time Vs No of Rules

TOTAL CONSISTENCY CHECK TIME CALCULATED IS : 16.5

4.2 GENERAL STRUCTURE OF FACEBOOK MODEL DOMAIN:-

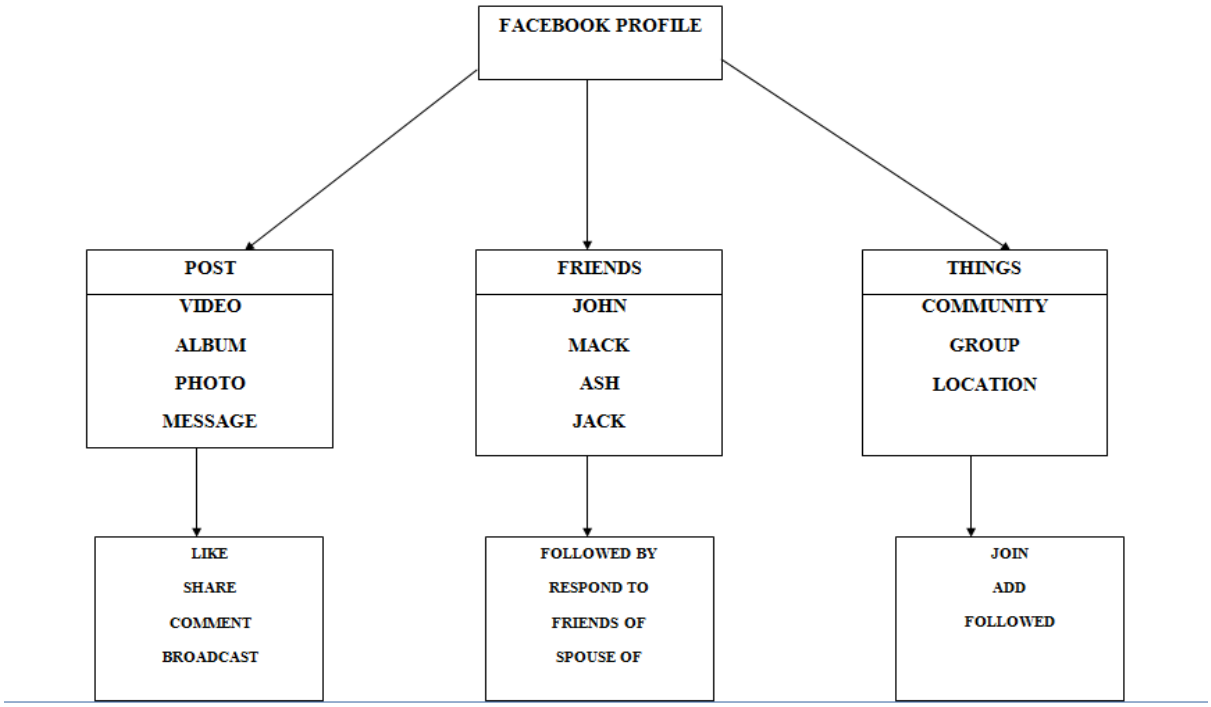

Fig 6.8: General structure of Facebook Model

The general structure of ontology is developed and basically used for data storing, concept link and data for FACEBOOK based model in ontology. The ontology contain information of three main domains: the first domain is POST domain that tells the general information of Video, Album, Photo and Message. The second domain is FRIENDS in which it tell the general information of Friends, friends of Friends etc. Finally the last domain is THINGS that give the general information about Community, Groups, Location. This structure is designed in Protégé Tool.

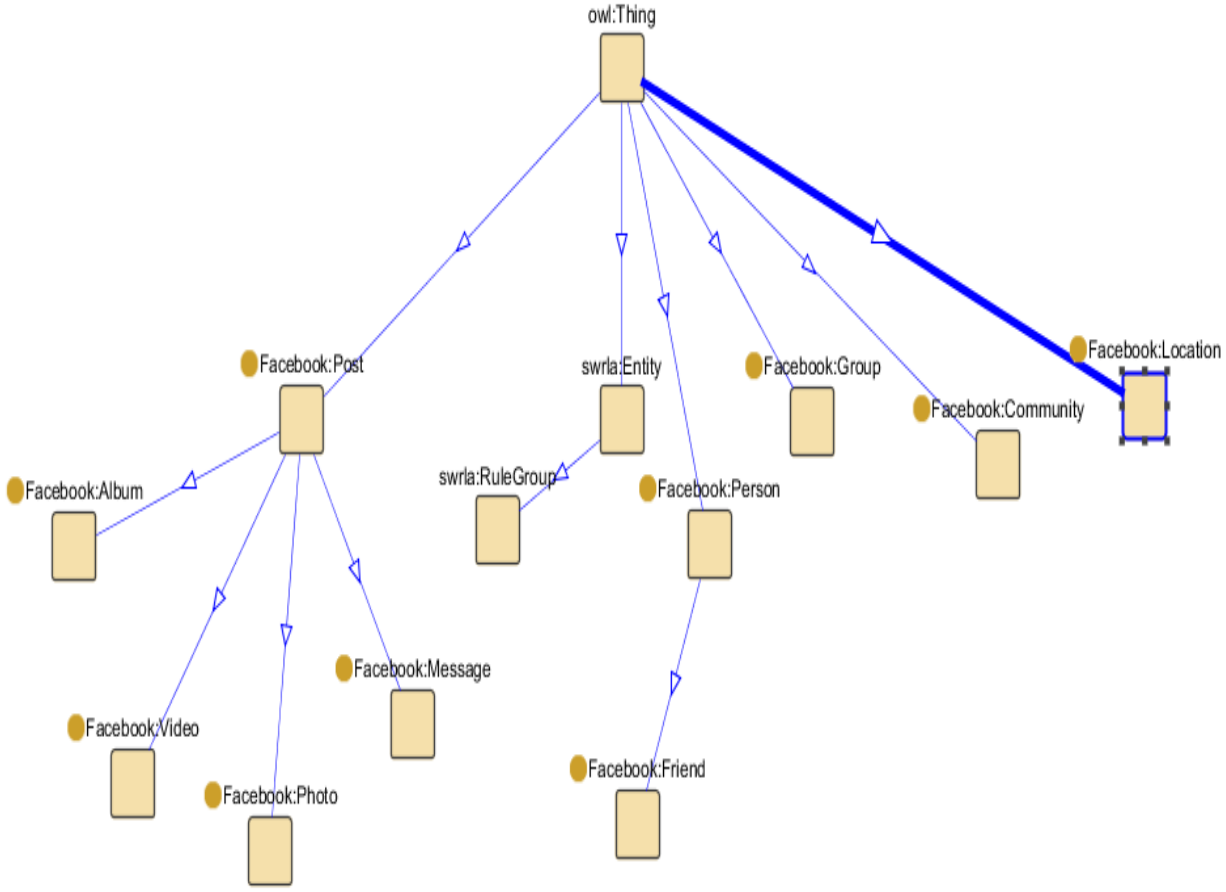

Fig 6.9: FACEBOOK MODEL DOMAIN IN ONTOLOGY

4.2.1 RULES CREATED IN SWRL TAB OF FACEBOOK MODEL:--

1. http://www.owlontologies.com/Rule_9_//_A_person_has_expressed_in_the_post_of_the_friend
2. http://www.owl-ontologies.com/Rule_1_//_In_a_group_a_friend_follows_a_post
3. http://www.owlontologies.com/Rule_3_//_A_person_is_respond_to_the_posts_of_Friend
4. Rule_23_//_A_person_respond_to_cooment_of_person_friend_photo
5. http://www.owlontologies.com/Rule_11_//_A_person_is_comment_on_the_Album_of_the_Friend
6. http://www.owlontologies.com/Rule_17_A_person_is_respond_to_the_video_of_the_

friend

7. http://www.owl-ontologies.com/Rule_21_//_A_person_is_spouse_of_person_friend
8. http://www.owlontologies.com/Rule_22_//_A_person_has_expressses_in_the_photo_of_Person_friend_Post
9. http://www.owlontologies.com/Rule_12_//_A_person_is_commnet_on_the_photo_of_the_friend
10. http://www.owlontologies.com/Rule_8_A_person_is_comment_on_the_post_of_the_friend
11. http://www.owlontologies.com/Rule_13_//_A_person_is_respond_to_the_message_of_friend
12. http://www.owlontologies.com/Rule_5_Group_is_respond_to_the_post_of_the_friend
13. http://www.owlontologies.com/Rule_14_A_person_is_comment_on_the_video_of_the_friend
14. Rule_24_//_A_person_follows_the_location_of_person_friend
15. http://www.owlontologies.com/Rule_6_//__Person_is_followed_by_the_location_of_friend
16. http://www.owlontologies.com/Rule_16_//_A_person_is_respond_on_the_photo_of_the friend
17. http://www.owlontologies.com/Rule_10_//_A_Group_is_followed_by_the_friend_of_the_person the_friend
18. Rule_25_//_A_person_is_followed_the_group_of_person_friend
19. http://www.owl-ontologies.com/Rule_2_//_A_Person_is_responding_in_a_post
20. http://www.owlontologies.com/Rule_15_//_A_person_is_respond_on_the_album_of_the_friend
21. http://www.owlontologies.com/Rule_4_//_Community_is_respond_to_post_of_the_friend
22. http://www.owlontologies.com/Rule_18_A_person_likes_the_album_of_the_friend
23. http://www.owlontologies.com/Rule_20_//_A_person_likes_the_video_of_the_friend
24. http://www.owlontologies.com/Rule_7_//_A_Person_is_spouse_of_the_person_friend
25. http://www.owlontologies.com/Rule_19_A_person_likes_the_photo_of_the_friend

4.2.2 RESULTS OF UNIVERSITY MODEL DOMAIN IN ONTOLOGY:-In this we have observed the Performance of our model and techniques we have proposed. Our main finding is that to find the measuring time taken for decision of Privacy Policy used.

- Our first result is taken as the comparison of No of Policies and Average Quer Response Time. In this we have chosen the Privacy Policies and calculated th Average Query Response Time and then we added 25 Privacy Policies. The result almost linear and also satisfied

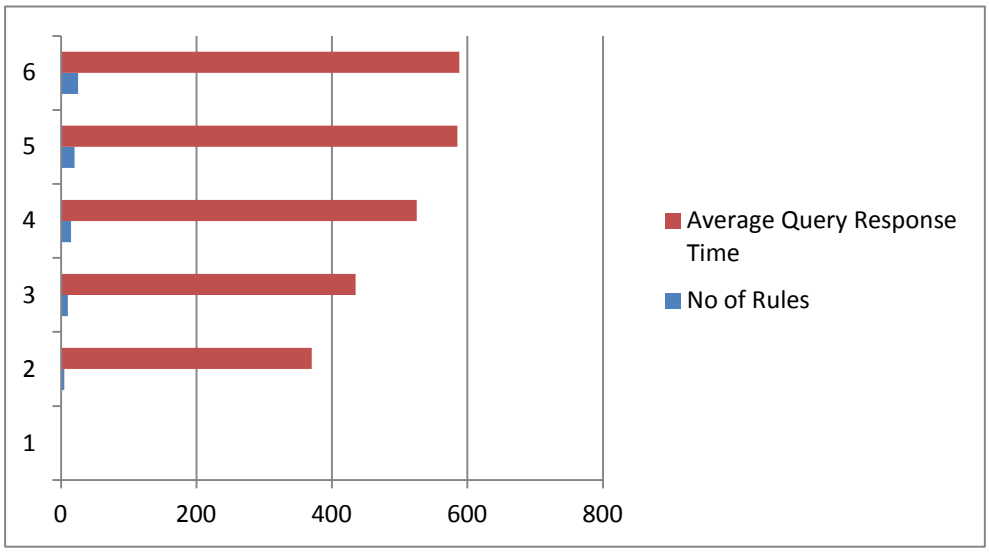

Fig 6.10: Average Query Response Time Vs No of Rules

TOTAL AVERAGE QUERY RESPONSE TIME IS: 0.589

- In the Second result, we have calculated the Inference Time for different No of Policies and created a graph of Inference Time and No of Rules of different rules set.

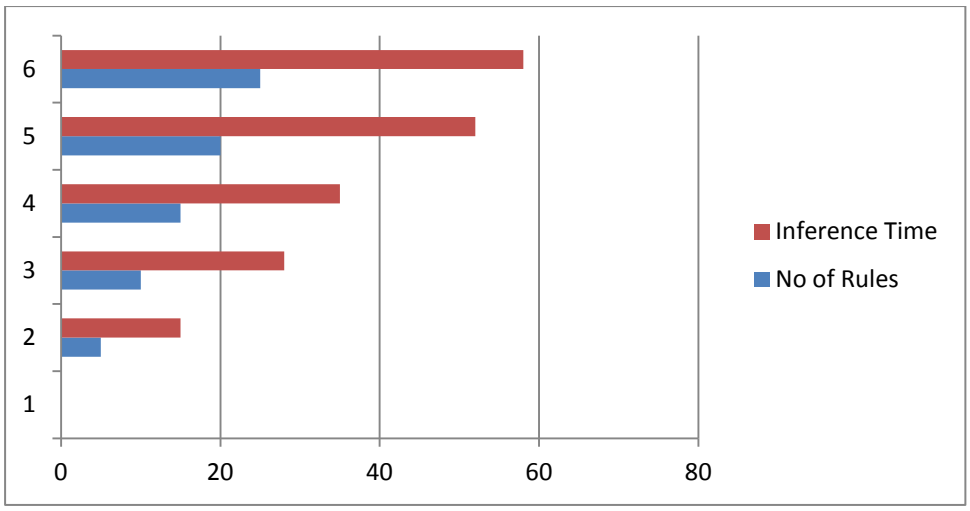

Fig 6.11 : Inference Time Vs No of rules

TOTAL INFERENCE TIME CALCULATE IS : 2.866

- In the third result we have calculated the Consistency Check time of the different No of Rules. In this we have see the change on the No of Privacy Parameter in access control policies that Increase the Response Time but Complexity is increased naturally and thus acceptable.

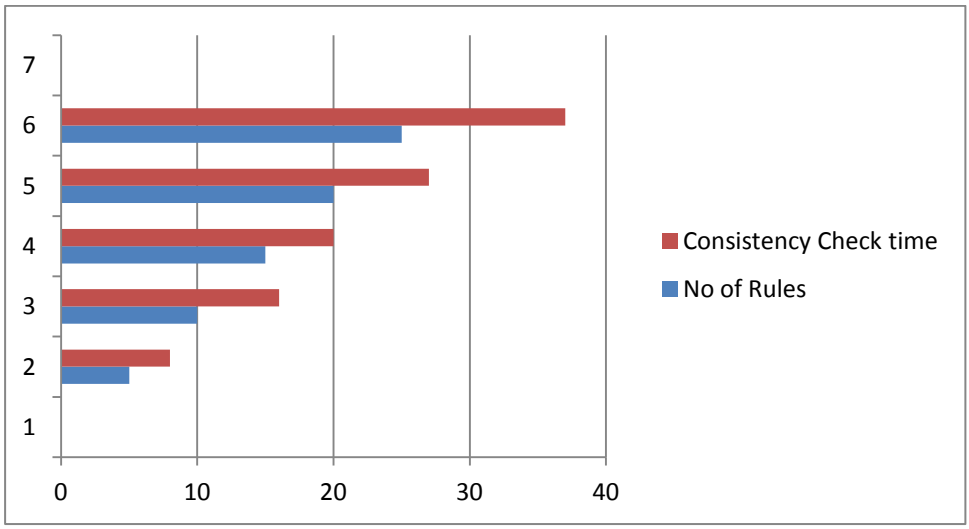

Fig 6.12: Consistency Check Time Vs No of Rules

TOTAL CONSISTENCY CHECK TIME CALCULATED IS: 3.625

CHAPTER 7

CONCLUSION AND FUTURE SCOPE

Benefit Organization Gives an open, benchmarks based approach for interfacing web benefits together to make larger amount business forms. Guidelines are intended to lessen the multifaceted nature required to make web administrations, subsequently diminishing time and expenses, and increment general effectiveness in organizations. Security is essentially about ensuring resources. Resources might be unmistakable things, for example, operations or your client database or they might be less substantial. Recognize that security is a way, not a goal. Security is about hazard administration and actualizing powerful countermeasures.

A standout amongst the most critical ideas in security is that compelling security is a mix of individuals, process, and innovation. It is vital to build up Protection and Security show. Numerous scientists are worked here. They proposed many models to set up protection and security. Secure Spread of a XML document is one of the systems to guarantee information trustworthiness and privacy. A safe scattering method to such an extent that superfluous information not implied for a honest to goodness buyer is difficult to reach, there will be no data spill.

In this thesis we attempted to propose a cosmology based Surmising model utilizing SWRL rules for secure dispersal for better Web Benefit Organization.

In future we can create ontology based models by using secure dissemination based on security, trust and privacy models. By using secure dissemination we can create ontology based model and check the parameters based on the model that we create on protégé tool.

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