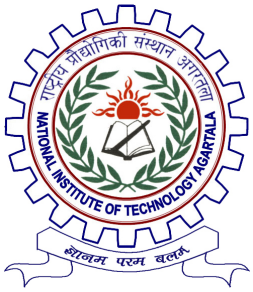
REPORT TITLE



Abc(11UCS001)
Def(11UCS002)
Ghi(11UCS003)
Jkl(11UCS004)
Xyz(11UCS005)

COMPUTER SCIENCE & ENGINEERING DEPARTMENT
NATIONAL INSTITUTE OF TECHNOLOGY,AGARTALA
INDIA-799046
March, 2020

REPORT TITLE

Report submitted to
National Institute of Technology, Agartala
for the award of the degree
of
Bachelor of Technology

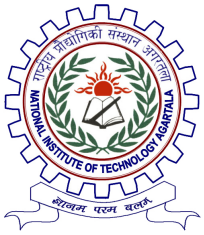
by

Abc(11UCS001)
Def(11UCS002)
Ghi(11UCS003)
Jkl(11UCS004)
Xyz(11UCS005)

Under the Guidance of

****

********** *Professor, CSE Department, NIT Agartala, India*



COMPUTER SCIENCE & ENGINEERING DEPARTMENT
NATIONAL INSTITUTE OF TECHNOLOGY AGARTALA
March, 2020

Dedicated To

To our Project Supervisor Mr. Swapan Debbarma, Assistant Professor, CSED, NIT Agartala for sharing his valuable knowledge, encouragement & showing confidence on us all the time. Each of the faculties of the department to contribute in our development as a professional and help us to achieve this goal.
To all those people who have somehow contributed to the creation of this project and who have supported us.

❝You can't teach people everything they need to know. The best you can do is position them where they can find what they need to know when they need to know it.❞

-Seymour Papert (MIT Mathematician)

REPORT APPROVAL FOR B.TECH

This report entitled "*REPORT TITLE*", by Abc(11UCS001), Def(11UCS002), Ghi(11UCS003), Jkl(11UCS004), Xyz(11UCS005), is approved for the award of ***Bachelor of Technology*** in ***Computer Science and Engineering***.

**********	**********
(Project Supervisor)	(Head of the Department)
********** Professor	********* Professor
Computer Science and Engineering Department	Computer Science and Engineering Department
NIT, Agartala	NIT Agartala

Date:_____

Place:NIT, Agartala

DECLARATION

We declare that the work presented in this report proposal titled "*REPORT TITLE*", submitted to the Computer Science and Engineering Department, National Institute of Technology, Agartala, for the award of the ***Bachelor of Technology*** degree in ***Computer Science and Engineering***, represents our ideas in our own words and where others' ideas or words have been included, we have adequately cited and referenced the original sources. We also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in our submission. We understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

March, 2020
Agartala

Candidate's Name	Candidate's Name
Candidate's Name	Candidate's Name

CERTIFICATE

It is certified that the work contained in the report titled "*REPORT TITLE*", by Abc(11UCS001), Def(11UCS002), Ghi(11UCS003), Jkl(11UCS004), Xyz(11UCS005), has been carried out under my supervision and this work has not been submitted elsewhere for a degree.

**********	**********
(Project Supervisor)	(Head of the Department)
********** Professor	********** Professor
Computer Science and Engineering Department	Computer Science and Engineering Department
NIT Agartala	NIT Agartala

Acknowledgement

We would like to take this opportunity to express our deep sense of gratitude to all who helped us directly or indirectly during this thesis work.
Firstly, we would like to thank our supervisor, **Mr. Supervisor Name**, for being a great mentor and the best adviser we could ever have. Her advise, encouragement and critics are source of innovative ideas, inspiration and causes behind the successful completion of this report. The confidence shown on us by her was the biggest source of inspiration for us. It has been a privilege working with her from last one year.
We are highly obliged to all the faculty members of Computer Science and Engineering Department for their support and encouragement. We also thank **Prof.(Dr.) Gopal Mugeraya**, Director, NIT Agartala and **Mr. Mrinal Kanti Deb Barma**, H.O.D, CSED for providing excellent computing and other facilities without which this work could not achieve its quality goal.

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List of Figures

List of Tables

Abstract

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Contents

CHAPTER 1

Introduction

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1.1 Motivation

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1.2 Goal

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1.3 Contribution of the Dessertation

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Table 1: First Sample Table

B.Tech	CSE
M.Tech	ECE
Ph.D	EIE

CHAPTER 2

Related Work

2.1 IEEE Learning Technology System Architecture (LTSA)

The IEEE 1484 learning technology standard committee (LTSC) developed an system architecture specification for learning technology. It is known as Learning Technology System Architecture (LTSA).

An architecture specification, LTSA, is being developed in close collaboration with the Aviation Industry CBT Committee (AICC), the European Commission PROmoting Multimedia access to Education and Training in EUropean Society (PROMETEUS) initiative (EC/DGXIII), the European Union Projects Allianceof Remote Instructional Authoring and Distribution Networks for Europe (ARIADNE), the European CEN/ISSS Workshop European Committee for Standardization, Information Society Standardization System, Learning Technologies Workshop (CEN/ISSS/LT) on learning technology and the IMS Project and Advanced Distributed Learning (ADL). The LTSA proposes the top level architecture for system design. LTSA model is generic enough to get applied on a variety of learning systems from different domains. LTSA covers a wide range of learning technology, computer-based training, electronic performance

support systems, computer assisted instruction, intelligent tutoring, education and training technology, metadata, etc[6].

2.1.1 IEEE LTSA Architecture Description

The five different levels of the architecture represent the different points of view of a learning process[6] (figure.1)

- *Layer 1*: This level defines the tasks of acquisition, transfer, exchange and discovery for the learner as a result of the interactions with his environment. The level is seen as two systems exchanging information.

- *Layer 2*: This layer defines the learner's reaction to the environment. The definition is based on the specific design features of learner related modules.

- *Layer 3*: A component system, normalized by IEEE, defines an organization of a learning process, seen from the data and control flow point of view.

- *Layer 4*: This level exploits the component system, directly, in order to formalize the technological design constraints. It allows the identification of the system's activities during the learning process. This provides the genric views of all the stakeholders and therefore, takes care of their interest.

- *Layer 5*: Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper.

2.1.2 A detailed description of LTSA system components at level 3

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1. *The interaction context:* This flow of data gives the necessary information for interpretation of the observations.
2. *The observations:* This represents the real-time unabridged information concerning the learner activities.
3. *The acquisition state:* The evaluating process can send or update a learner profile (e.g. a response to a correct answer within a given time).
4. *The learner profile:* The tutoring process can consult and modify learner information during the apprenticeship. This is a data-store which updates the learner profile as per data-base management system dictat.
5. *The evaluation:* It informs the tutoring process of the present state of the learner profile so as to optimize the learning process.
6. *The learner preferences:* The tutoring process negotiates the teaching parameters with the learning actor(s).
7. *The multimedia data:* This flow of data allows the learning process to use simultaneous pedagogical multimedia resources such as video, audio, text and graphics. All these contents are devloped and designed as per scheme of e-Learning.
8. *The locality:* This data or control flow indicates where to find a given pedagogical resource.
9. *The pedagogical contents:* This data flow has the coded pedagogical material. The content presentation, in an appropriate format, is an outcome of this data flow.

10. *The catalogued inquiries and information:* The tutoring process can carry out simple requests to find appropriate learning objects for a course. These requests may contain search criteria based on the learner's preferences, the evaluation results and the course information.

The role and the behavior of the different components are described using a learner scenario, which is divided into eight identified scenarios:

1. The teaching style, the pedagogical choices and the acquisition methods are negotiated with the learner.
2. The learning process is observed and evaluated in a context of action and interaction with the system.
3. The evaluating process gives observations and indications about the learner style and/or information about the functioning /the state of the system.
4. This data is stored in a data bank dedicated to the learner.
5. The tutoring process analyses the learner's performance from his assessments, his preferences, his past history and his future perspectives.
6. This same process searches for suitable learning object using resource bank requests.
7. The tutoring process extracts the pedagogical content from the proposed resources. It transmits the resource references to the diffusion process, organizing them, for example, into a pedagogical sequence.
8. The diffusion process extracts the pedagogical contents from the learning object to adapt it to the surrounding interface used by the learner.

2.1.3 Limitations of LTSA for e-Learning services

Some of the functional areas, that is not included in LTSA, are identified :

- The model does not regard the learning object designer as an integrated component in the learning process.

- The students evaluation records are stored but, the use is not specified. This brings ambiguity in case of e-Learning services to be provided and e-Learning services to be received to give services. The composition of services becomes difficult.

- For a distance mode learner, if the learner possesses some wrong/incomplete idea at the start and the feedback system fails to identify it, then the LTSA layer 2 algorithm falls apart under a never ending iterative cycle. The learner can never be sure, that his learning activities are properly registered. Moreover, the system never recognizes the incomplete feedback or shows the partial data that may have been registered for the future use.

- Students counseling is not included in the LTSA architecture. Students enrol courses by only knowing the name of the course without knowing the prerequisites or eligibility. Being in different service mode, these components are scheduled to run with one another and most of the time behaves like stand-alone service module. The selection of the courses is left to student's rationale and intuition without a suggestion from the mentor. The lack of student counselling makes the e-Learning system weaker than a formal education system.

- The model is based on client server, component based system. There is still possibility of making LTSA component more reuseable, loosely coupled and increasing the modularity of LTSA by extending it into SOA environment. The component may be used as services. But mapping the components into services does not fit into typical Client-Server architecture.

2.2 Mapping IEEE LTSA Framework in Client Server Model

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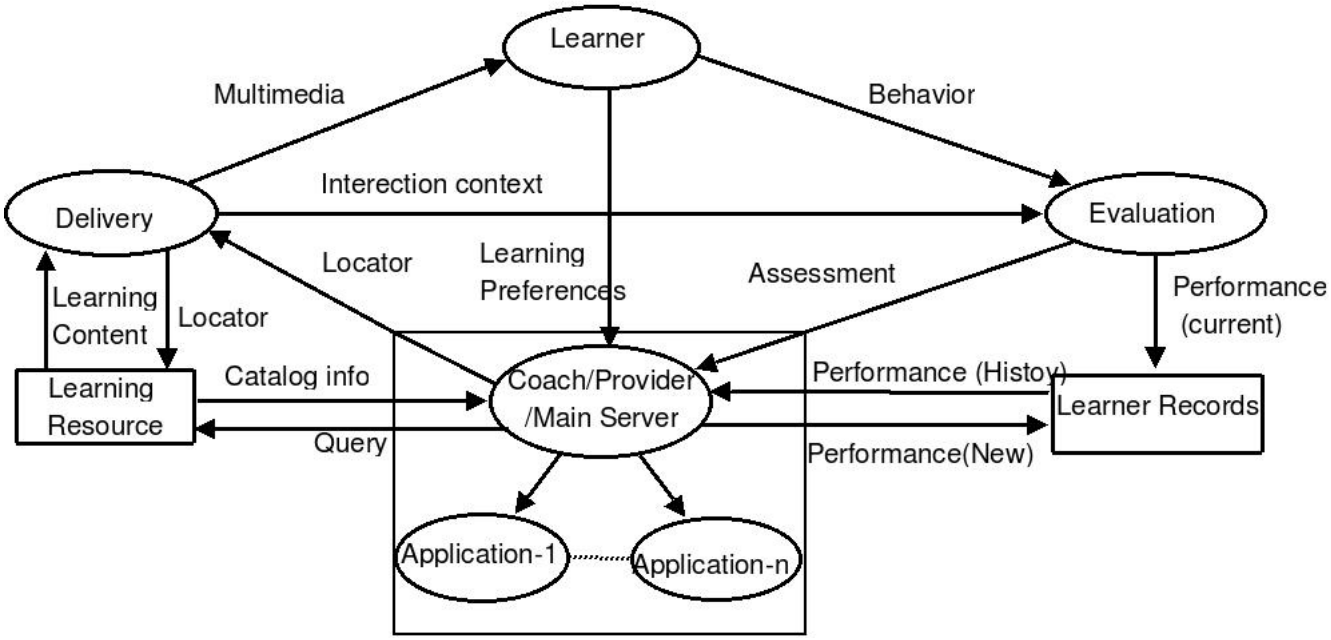

Figure 2.1: IEEE LTSA Client Server Architecture[6]

2.2.1 Limitation of client-server based IEEE LTSA framework

IEEE LTSA client server architecture is suitable for utilizing stand alone service components as evident from figure. 3 These service components do not own any responsibility towards offering themselves for preparation of composite services. It is obvious that composition compatability of services only comes as an after thought in this architecture making it as a 'limited service' architecture. Other limitations are:

- Learning content provider (server) may not be able to resolve concurrency. Many learner might try to connect to server at the same time. As any learner may like to connect at any time, it creates a bottleneck due to lack of concurrency. Even it may lead to typical denial of services (DoS).
- Since the learner and provider component may be devloped by different vendors, they may not be compatible with respect to data type, language, platform etc.
- Replication of provider due to different customization may make data inconsistant.
- It is incapable of providing real time services and therefore, works in a limited way in interactive mode. The security remains limited to authentication of the learner. Multilevel

security is usually not employed. The architecture generally works in trust based security mode. It heavily relies on operating system security features e.g. in unix OS, frequent use of 'chmod' command.

2.3 Security Framework

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2.4 Mapping IEEE LTSA Framework in Proposed Distributed System Architecture For Improvement

In a distributed system, learner actively issue requests to objects in servers. Servers passively provide access to objects that respond to client requests. Clients and servers are usually at different address spaces. Clients and servers both may be located on several machines physically (Figure.4).

2.4.1 Capabilities in the DSA for e-Learning

Distributed system broadens the scope of service composition by implementing compatability of services. Other capabilities of the system for e-Learning framework are as follows:

- This open system architecture allows new learning resources to be added to it, as and when required.

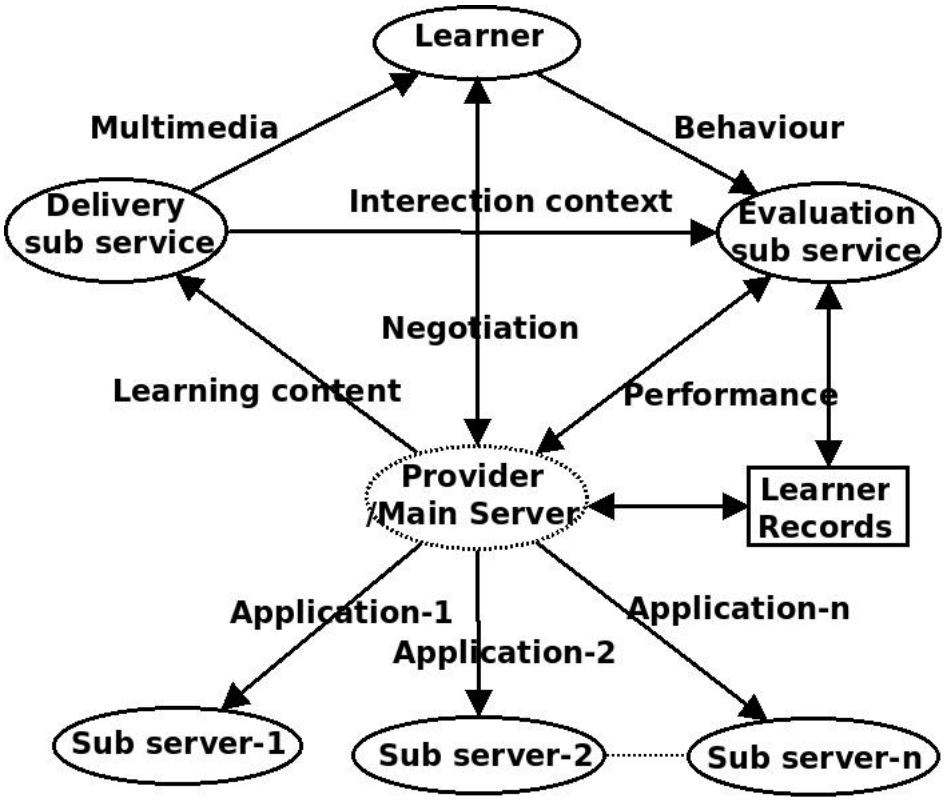

Figure 2.2: IEEE LTSA in Distributed System Architecture

- System is flexible and scalable.
- It is possible to reconfigure the system dynamically.
- No need to decide on locations for learning applications, each application can work at any location.
- No need of providing service compatibility separately, if a standard is followed.
- Concurrency of proccesses can be ensured by the very design of the architecutre.

2.4.2 Limitation of the Architecture

- Systems are very complicated to design and implement.
- Incapable of providing composite services unless predefined through a standard technology.

- System is not as much scalable as it should be in case of e-Learning requirement to cater the need of different learners of different capabilities and requirements.

2.4.3 Security for the proposed Distributed e-learning System

Security remains to be closely linked with performance of a e-Learning system in a distributed environment. While considering security from LTSA point of view, the design elements must take care of information access control, various security handlers and other security related processing (e.g. Kerboros or any other third party authentication server) [**?**].

Information Access and Control

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Security Handlers/ Processing

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turpis accumsan semper. minimally considered and must be the focus of active research for preparing secured service composition in e-Learning system [4].

2.4.4 Security Challenges for the extending e-Learning services

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- Network attacks usually target specific applications. The adaptation of control and coordination among the different mechanisms, whose capabilities are used in the adaptive response, is needed.

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CHAPTER 3

Mapping of IEEE LTSA Framework in Service Oriented Architecture (SOA) for further Improvement

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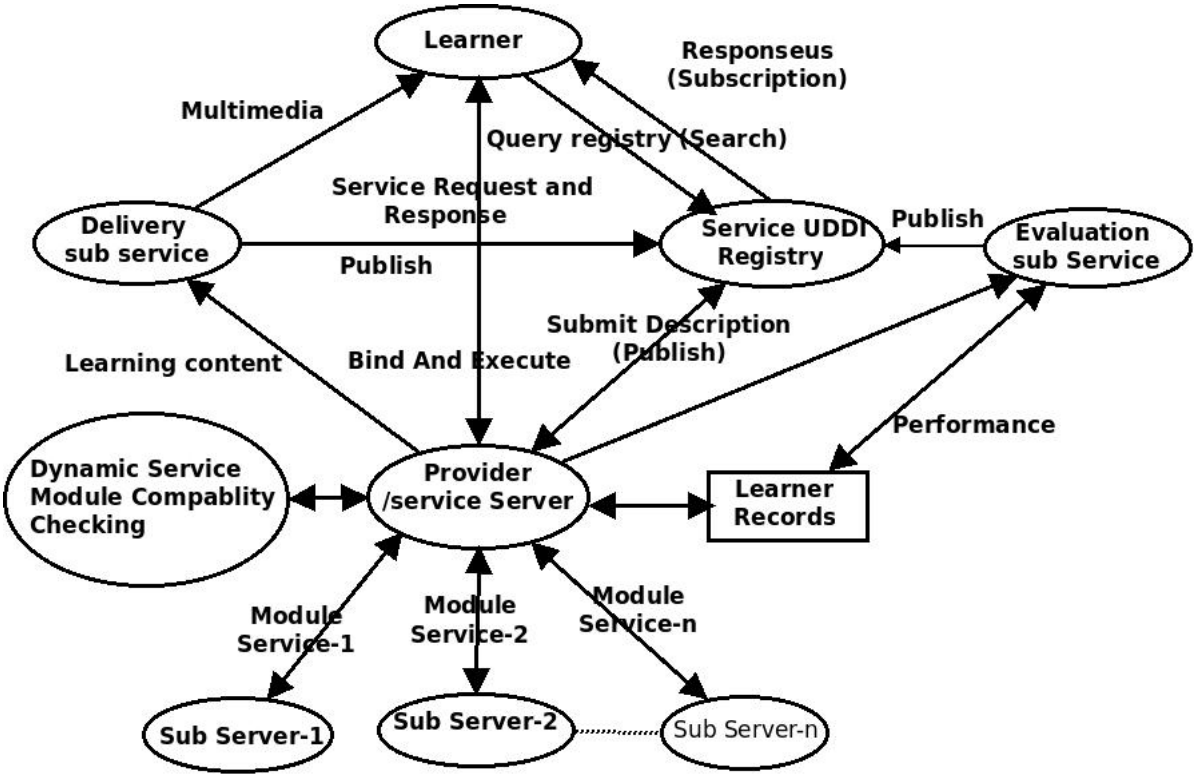

Figure 3.1: IEEE LTSA in SOA environment

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The proposed extended model of IEEE LTSA makes use of SOA architecture (Figure. 5). Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper.

3.1 Capabilities of the proposed Service Oriented Architecture based IEEE LTSA Model

The analysis of the model as presented in Figure. 5 brings out the following inherent capabilities in the proposed extended model of IEEE LTSA:

- *Reusability*- SOA based IEEE LTSA model provide reuseability of learning services because they are loosly coupled. A new composition of different services is possible by permutation, combination of the services and feasibility of their composition.
- *Interoperability*- SOA based model stresses interoperability, the ability of systems using different platforms and languages to communicate with each other. Each learning service provides an interface that can be invoked through a connector type. An interoperable connector consists of a protocol and a data format, that each of the potential user of the service understands. Interoperability is achieved by supporting the protocol and data formats of the service's current and potential users including learners.
- *Loose Coupling*- Coupling refers to the number of dependencies between modules. There are two types of coupling: loose and tight. Loosely coupled modules have a few well-known dependencies. Tightly coupled modules have many well known as well as unknown dependencies. Every software architecture strives to achieve loose coupling between modules. SOA promotes loose coupling between service consumers and service providers. A few well-known dependencies between consumers and providers may even be restored to become independent under imposed conditions. This may promote the composed components or modules to perform efficiently without infection of other components and modules. The conditional loose coupling allows to run the composed service faster in a stand alone manner.
- *Flexibility*-The loosely-coupled, document-based, asynchronous nature of services in an SOA allows e-learning applications to be flexible. With changing requirements, the adaptability comes faster.
- *Capability of providing composite e-learning services*- The proposed framework is having the capability like scaling, suitability of high performance, customerization and coupling/decoupling of services depending upon the circumstances.

CHAPTER 4

Validation of Proposed Models: Case Study-IGNOU web portal

4.1 Description of IGNOU Flexilearn System

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with following features:

- Any visitor to FlexiLearn site has the option to register for any particular course or a full length academic programme. A modular approach is followed wherein a registered learner can combine course credit to obtain a deploma or degree of his/her own choice.

- The platform provides self learning environment with a list of academic advisors/course guide to act as mentors.The personal learning environment will have interactive tools like discussion board, wikis, podcasting, RSS feeds etc.

- Each course will have the opton for both online assessment as well as offline one, as per the choice of learner. Examination is conducted 'on demand'.

- A complete mechanism is integrated through the e-portfolios of individual learners. e-portfolio keep a formal record of all formal and informal studies carried out by the registered learner. Certification of the course will be based on the stipulated time spent on a course and completion of all learning activities identified by the faculty for the fulfilment of the course requirement. It may have formal elements like any other education system e.g. grades, evaluation, rechecking etc.

4.2 Mapping of Flexilearn System into IEEE LTSA in SOA

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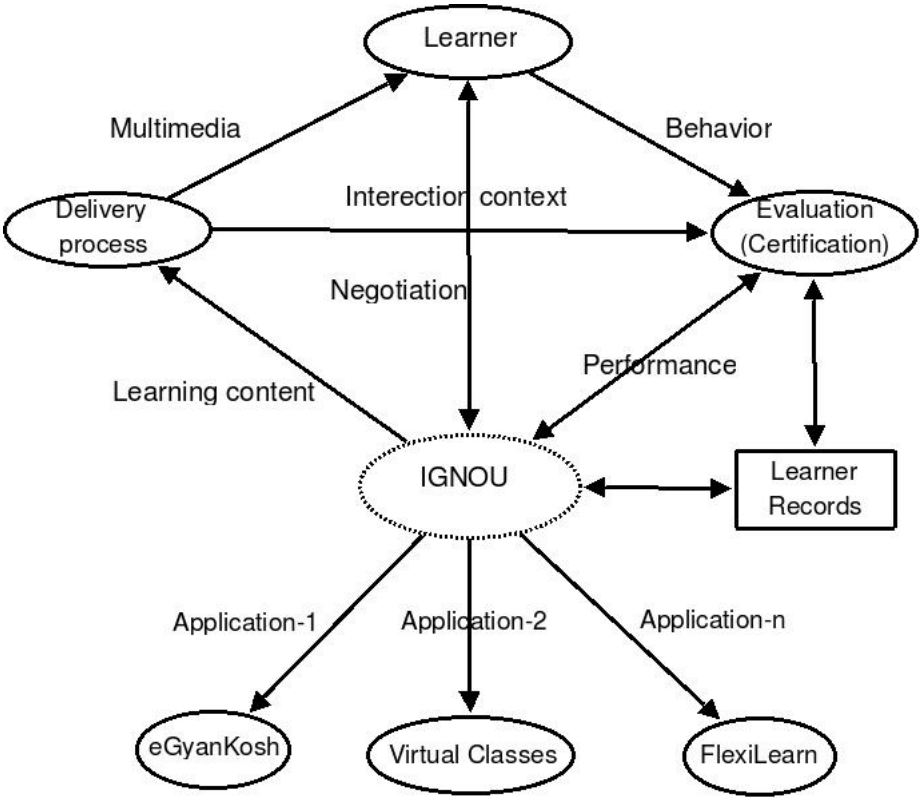

Figure 4.1: FlexiLearn Distributed System Architecture

4.3 Limitation of present Flexilearn system

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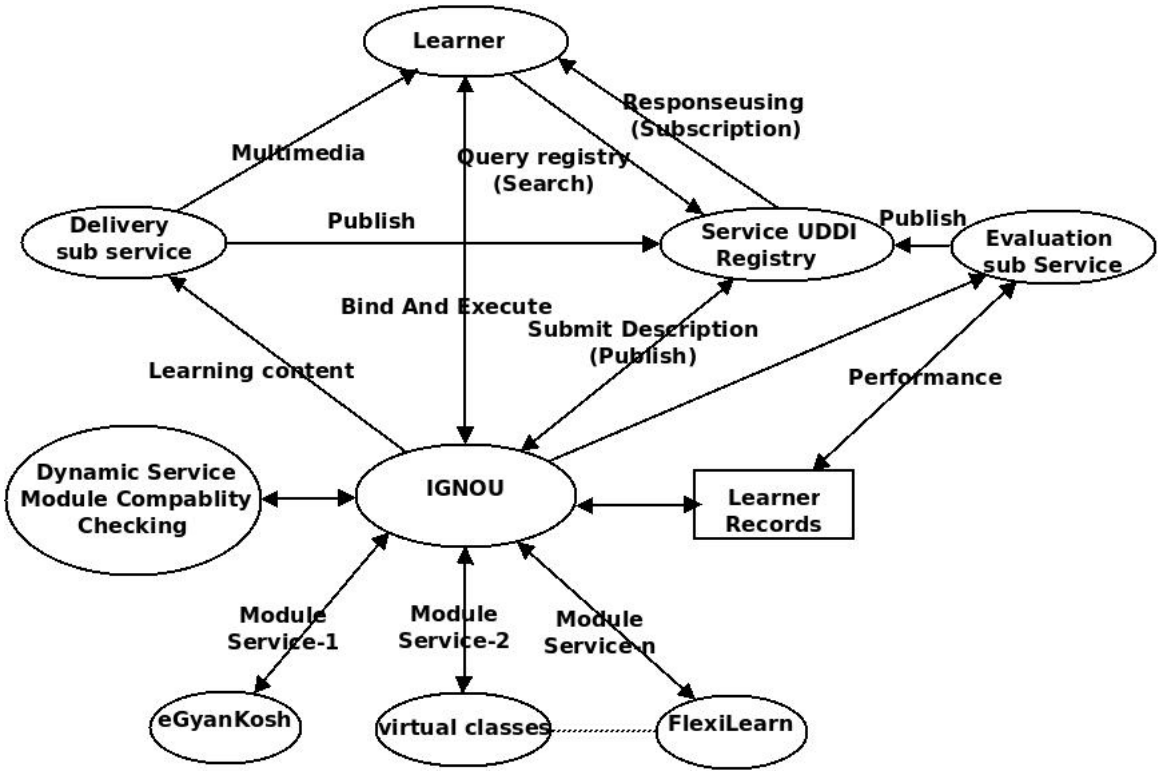

Figure 4.2: FexiLearn system in IEEE LTSA mapped in SOA

4.4 Comparision of IGNOU online services in terms of composition of services

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4.5 Security Capacity in the Proposed Model in SOA

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4.5.1 Approach To Protecting Services

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- *Protect services from the outside at deployment time by using WSM (web service manager) solutions*

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- *Protect services from the inside by building security into software development process*

Devloper of e-Learning services must validate the input usually in XML document format. Various types of attacks are, buffer overflow, SQL injection, XML injection, and XPath exploits. Static analytical tools are used for identifying such vulnerabilities.

- *Simulation of known attack patterns and fixing vulnerabilities*

Dynamic analysis tools are used during the query and analysis (QA) process to test, verify and validate the actual deployment. Stress-testing of SOA applications calls for designing different attack patterns. Vulnerabilities may be uncovered and resolved before deployment. This may be considered under preventive security maintenance.

- *Monitoring WSM solutions*

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4.5.2 Protecting Services from the Outside

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CHAPTER 5

Composition of e-Learning Web Services in SOA

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5.1 e-Learning web Services

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Table 2: 2nd Sample Table

B.Tech	CSE
M.Tech	ECE
Ph.D	EIE

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- Registration Service
- Computer Programming Lectures service (Textual Narratives)
- Computer Programming Lectures service (Multimedia Narratives)
- Online Examination Service

5.1.1 Registration Service

Registration Service is the service to check whether a user, going to utilize the service is authorized user or not. If user is already registered then he/she is allowed to avail the services otherwise, he/she is provided with 'register service' where he/she has to register first to access the services. This registration service has two functions 'Login' and 'Register'. Login method is to get into the system after successfull authentication such as login ID and 'Register method' is to register a user if he/she is not already the member of e-Learning system. (Figure.8)

Table 3: 3rd Sample Table

B.Tech	CSE
M.Tech	ECE
Ph.D	EIE

Table 4: 4th Sample Table

B.Tech	CSE
M.Tech	ECE
Ph.D	EIE

5.1.2 Computer Programming Service (Textual Narratives)

Computer Programming Lectures service (textual nrration) is service which provides the facility of downloading lectures in doc and pdf form. This service can only be accessed if the user is authorized by the system (Figure.9).

5.1.3 Computer Programming Service (Multimedia Narratives)

Computer Programming Lectures service (Multimedia Narratives) is the service which provides the facility of downloading audio/video lectures This service can only be accessed if the user is authorized by the system and the client system is having the authorized player of the files.

Table 5: 5th Sample Table

B.Tech	CSE
M.Tech	ECE
Ph.D	EIE

Table 6: 6th Sample Table

B.Tech	CSE
M.Tech	ECE
Ph.D	EIE

Table 7: 7th Sample Table

B.Tech	CSE
M.Tech	ECE
Ph.D	EIE

5.1.4 Online Examination Service

Online examination is examination system in which user can give the exam at his own pace limited by the system. Online examination service is basis of the online certification of courses. On-line examination service is used to check the ability of a user in computer programming. As soon as user gets authorized he/she can access this service and can attempt questions online through the examination process. After the successful submission of examination answering, the user will get the result immediately (Figure. 10).

5.2 e-Learning Web Services: Publish and Subscription Methodology

e-Learning system composed of number of services, some of them are primary web services and some are secondary as per need. Primary service are used for the coordination of other services as UDDI service and compatibility checking service. Secondary services include fully functioned stand alone services as registration service, online examination service, etc.

Table 8: 8th Sample Table

B.Tech	CSE
M.Tech	ECE
Ph.D	EIE

5.2.1 Publishing e-Learning Web Services into UDDI

The e-Learning system, for local UDDI, is prepared and presented through the web portal (Figure 11) .UDDI service in Microsoft Web Server 2008 is configured. Registration service, Computer Programming Service (Texual Narratives), Computer Programming Service (Multimedia narratives) and online examination services are published on different systems and registered with service provider's name to UDDI by publish service of UDDI [**? ? ?**]. UDDI Service requires Provider's name and the service's WSDL file for it's publication in UDDI registry. The process is shown in figure.11; 12; 13.

- On the configured UDDI Services home page 'Publish' button is clicked. The configured UDDI open the page 'My UDDI'.
- On the 'My UDDI' page, the Providers tab is clicked and a number of options is shown through the menu.
- On the Providers tab, 'Add Provider' is chosen to be clicked. The 'My UDDI' (New Provider Name) page appears in the browser for providing option to add new providers name.
- On the 'My UDDI' (New Provider Name) page, the Edit button 'under actions' is chosen to be clicked. The name is required to be edit. The 'Name' text button appears.
- In the 'Name' textbox, New WebService is typed, and then Update button is clicked. The 'My UDDI' (NewWebService) page appears again in the browser with all the added information.
- 'My UDDI' (NewWebService) page provides the services, that is required to be checked then Add Service is another option that is avilable in this option. It is clicked. A number of options are again available.

Table 9: 9th Sample Table

B.Tech	CSE
M.Tech	ECE
Ph.D	EIE

- Under Actions, option Edit is selected to be clicked, the textbox of 'Name' is filled with service 1. The next step is to update the information by clicking Update.
- On the 'My UDDI' New Service 1 page, Bindings tab appears with a number of options.
- Add Binding tab is activated by clicking.
- Again the 'My UDDI' NewWebService Service1 http://" page, Edit button is chosen to be clicked. The Access Point textbox appears.
- In the Access Point textbox, the URL of the services composed is typed. Update button is clicked for required updation $http://computer\_name/Service1.asmx$ In the URL, computer_name is replaced with the name of the server that hosts the Web service. "$http://localhost$" in the URL should not be used..
- On the UDDI Services page, the 'Instance Info' tab is clicked.
- Again, on the Instance Info tab, Add Instance Information is checked out.

The client system searches the required services and their location, other details of services which are required to use those services are obtained. These services required to be composed, are available so that a learner or visitor to our e-Learning system can get the access of these services in a user friendly manner.

5.2.2 Searching e-Learning Web Services in UDDI

Web services can be searched in UDDI by using the keywords. 'Search' function of UDDI returns the service provider name, Service location with other details, through it's WSDL detail (Figure. 14).

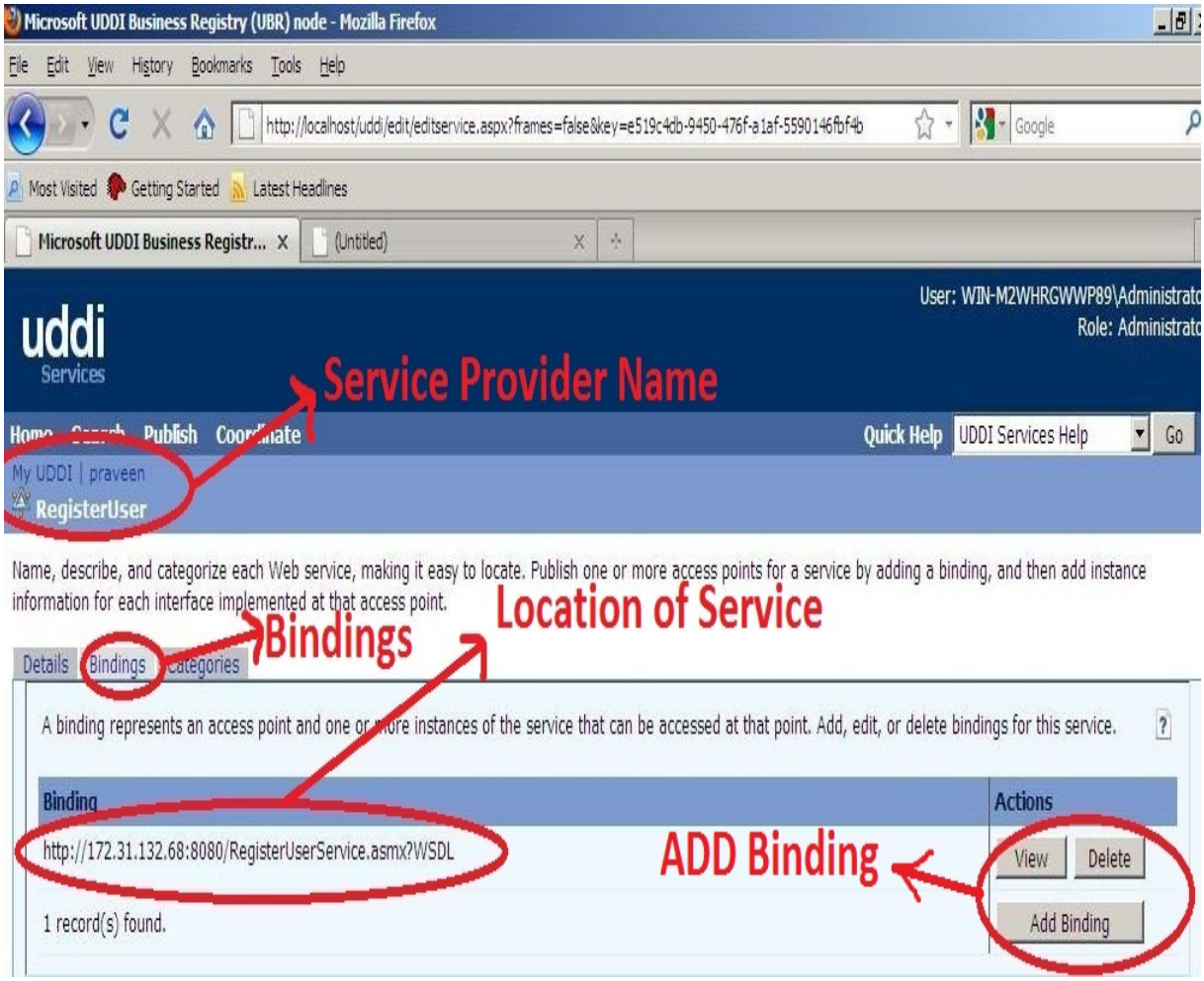

Figure 5.1: UDDI Service Binding Interface

5.3 e-Learning Web Services: Composition Technique

To provide learning facility to the user we considered three types of e-Learning services

- Computer programming Service (Textual Narratives)
- Computer programming Service (Multimedia Narratives)
- Online Examination Service

Each of these services is stand alone and totally independent from others. Besides these services, there are other services like registration service, this is also stand alone and independent

Table 10: 10th Sample Table

B.Tech	CSE
M.Tech	ECE
Ph.D	EIE

Table 11: 11th Sample Table

B.Tech	CSE
M.Tech	ECE
Ph.D	EIE

service registration service. Registration service can be composed to every of the service mentioned above.

- *Composition of Computer Programming Service (Textual Narratives) with Registration Service*

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Table 12: 12th Sample Table

B.Tech	CSE
M.Tech	ECE
Ph.D	EIE

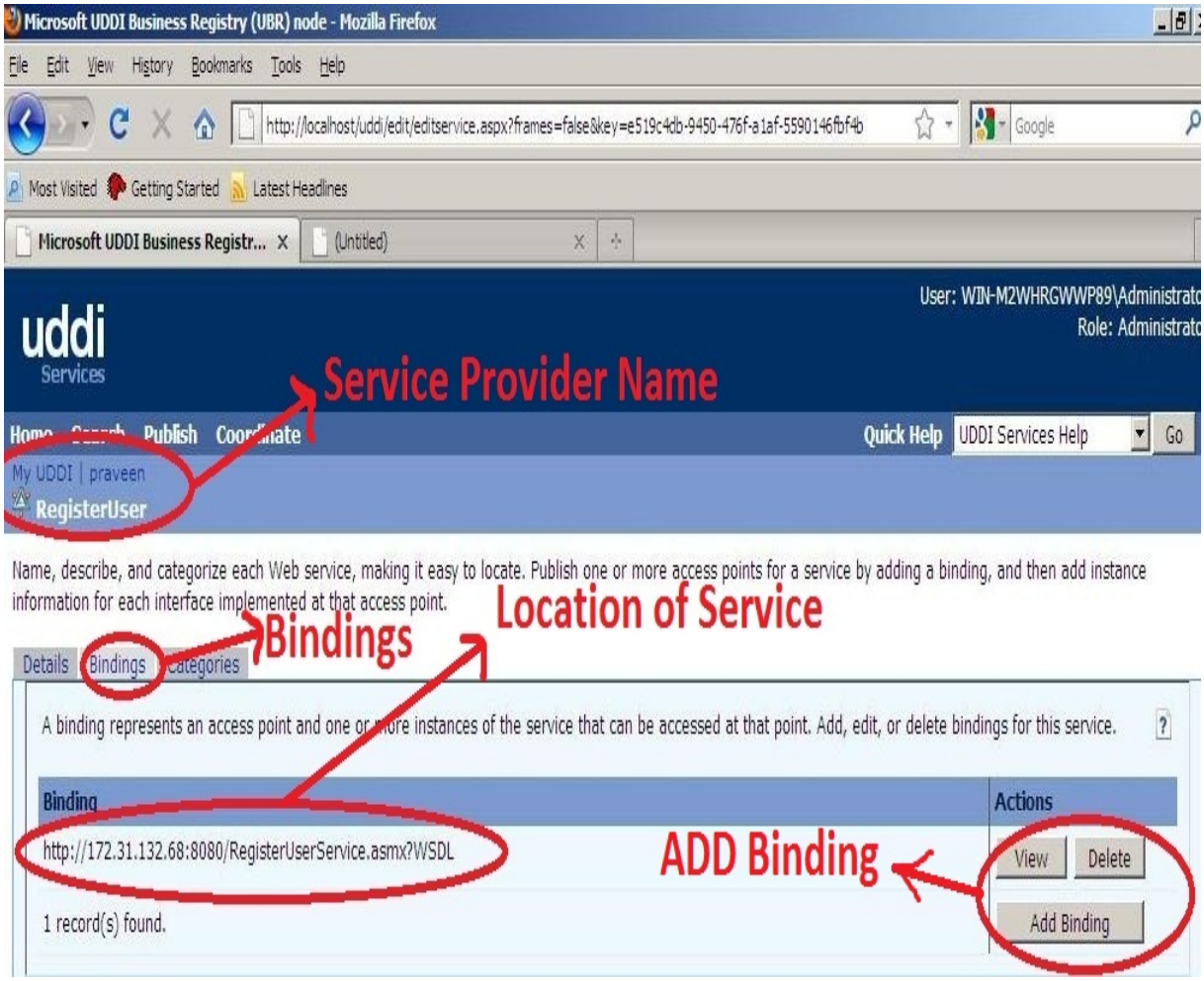

Figure 5.2: UDDI Service Binding Interface

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- *Computer Programming Service (Multimedia Narratives) Composition with Registration Service*

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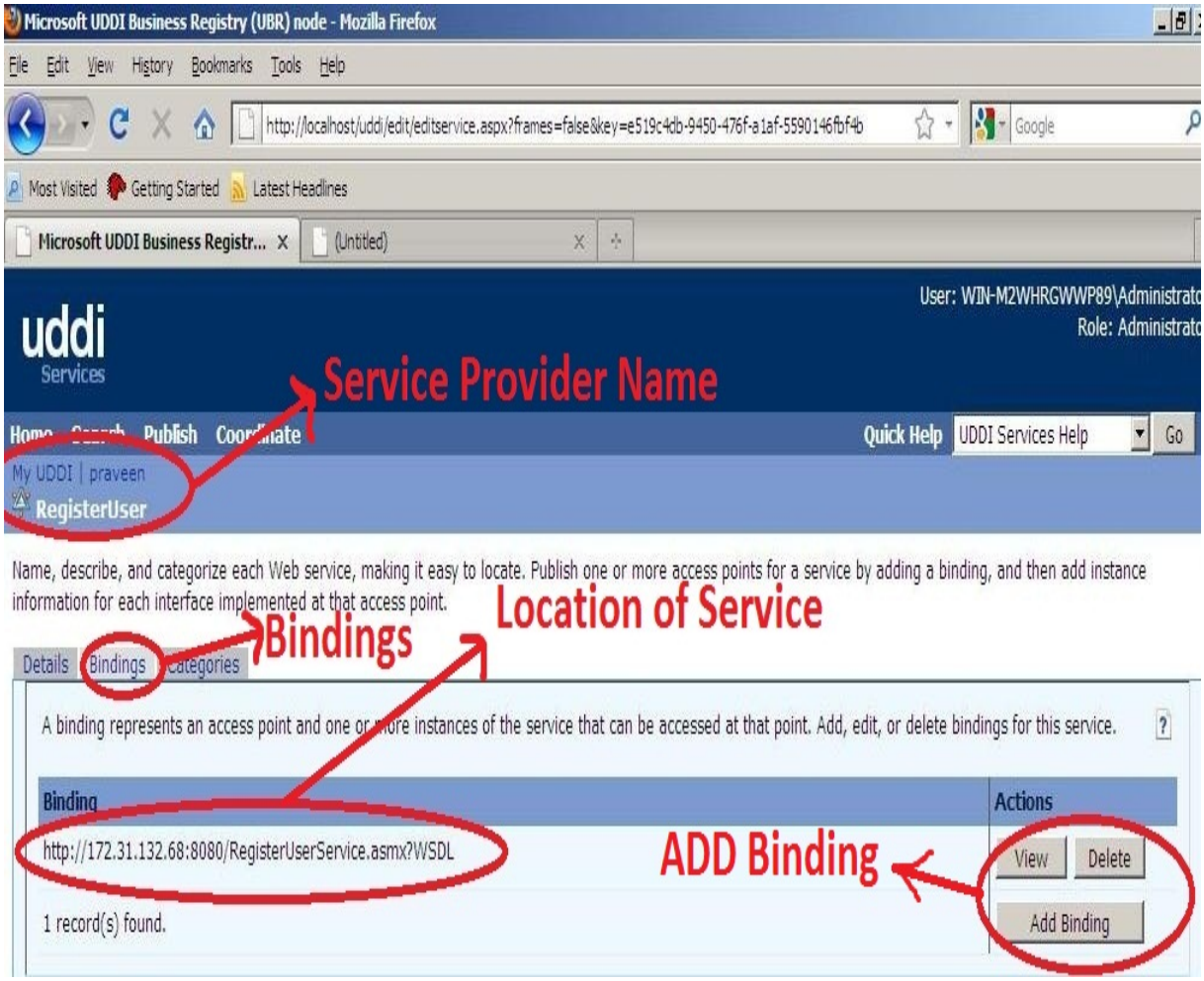

Figure 5.3: UDDI Service Binding Interface

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Table 13: 13th Sample Table

B.Tech	CSE
M.Tech	ECE
Ph.D	EIE

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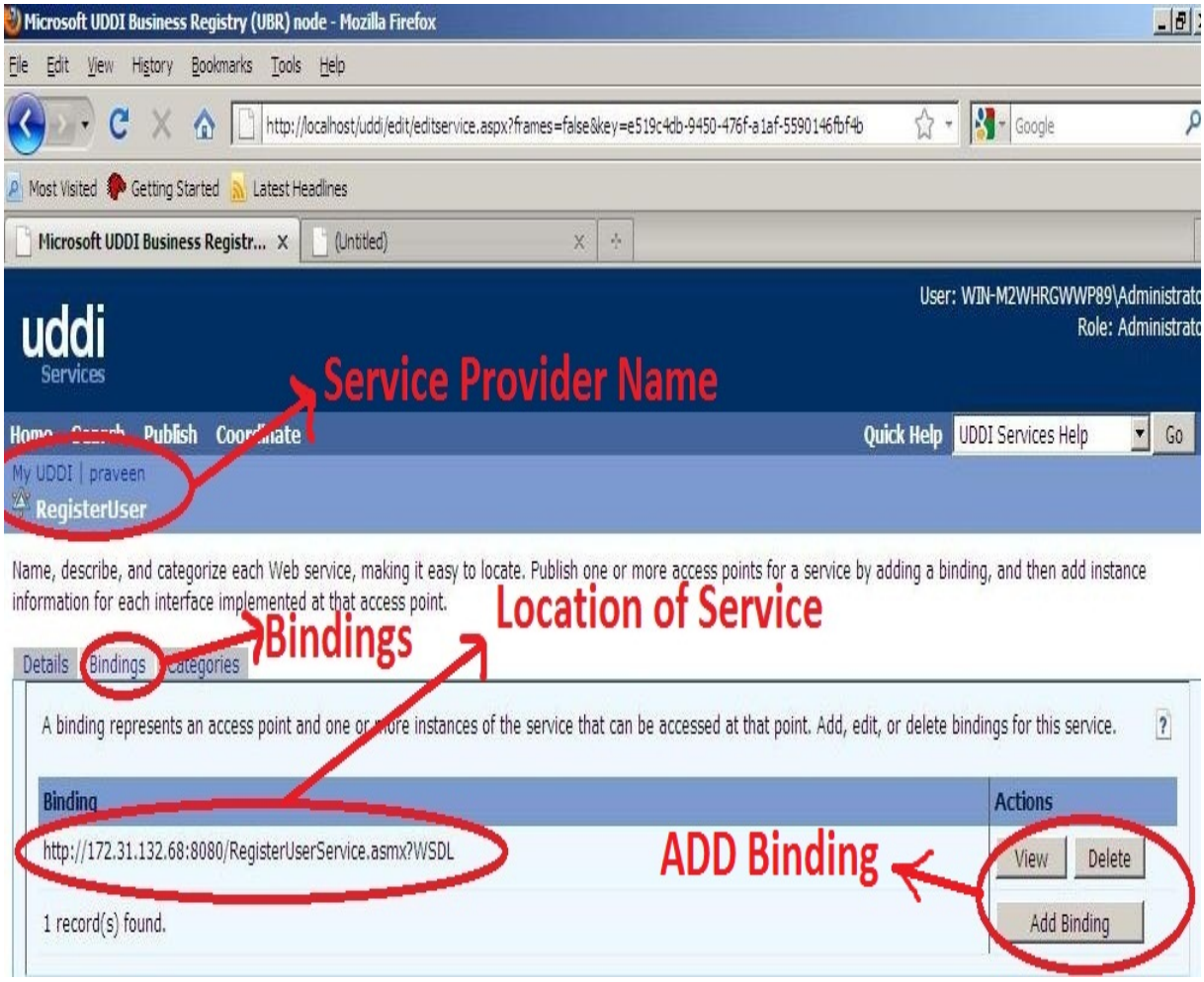

Figure 5.4: UDDI Service Binding Interface

Online Examination Service Composition with Registration Service

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Table 14: 14th Sample Table

B.Tech	CSE
M.Tech	ECE
Ph.D	EIE

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Table 15: 15th Sample Table

B.Tech	CSE
M.Tech	ECE
Ph.D	EIE

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5.3.1 e-Learning Web Service Composition Algorithm

Web services composition synchronization is achieved from services compatability and their on-the-fly binding from the option like'Add References'. When Registration service gets composed with computer programming service and online examination service the method makes application of the value of service for storing in a variable. After the successful completion of registration service the value stored in the variable is checked.

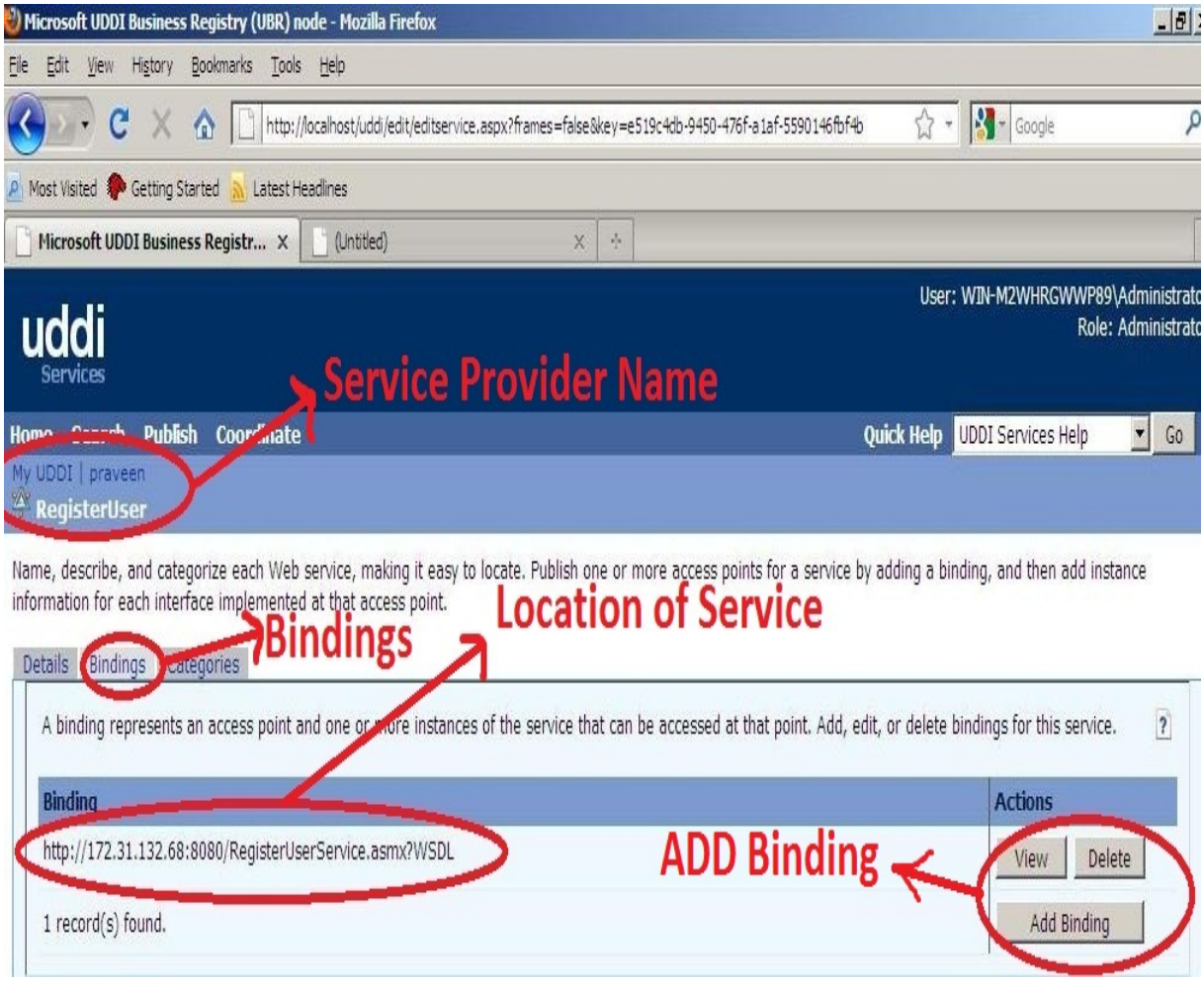

Figure 5.5: UDDI Service Binding Interface

5.4 e-Learning Web Portal: e-Learning Web Services and their Composition

The e-Learning portal under consideration provides three application that make use of the programming services to the end user computer programming service in doc, pdf document downloads, in audio/video file downloads and online examination to the end user. These functions are simple application through GUI in the stand alone mode in a client service architecture. However, the access and composition of these services for different application from different nodes at different logical locations calls for capacity building in distributed system architecture and compatability governance in service oriented architecture.

Alg. 1 Service Composition Method: A Sample

```
1   begin
2       Get service choice from user
3           Save choice into a variable 'var'
4       Call Login Service with a argument of saved variable (var)
5           Do Login (validation)
6           if user is valid) then
7               check variable (var)
8               call service which refer to (var))
9               Get the result of service
10              Return result
11          else Return error to caller of Login Function
12  end
```

5.4.1 Home page of the e-Learning web portals

Home page shows the sample services provided by e-Learning web portal. The services may be identified and accessed by the identity of service name. The functionality and implementation of services are hidden from the user and provides only output by interactive GUI to the user. Home Page shows links to all services availlable in the designed e-Learning web portal. By clicking these link user can access the complete functioality of composite services which are unknown to him/her earlier.

Home Page contains three links for each services (Computer Programming Service, Audio/video service and Online Examination service). The user can select any one of the service and can get composed service with Registration service (Figure. 17) with one of the available services.

5.4.2 Login page of the e-Learning Web Portal

When user click on any of the service links in the Home page, Login Page is presented on the monitor. If the user is not registered then he/she has to get registered first. for that he/she has to click on the register link (Figure.18) as shown.

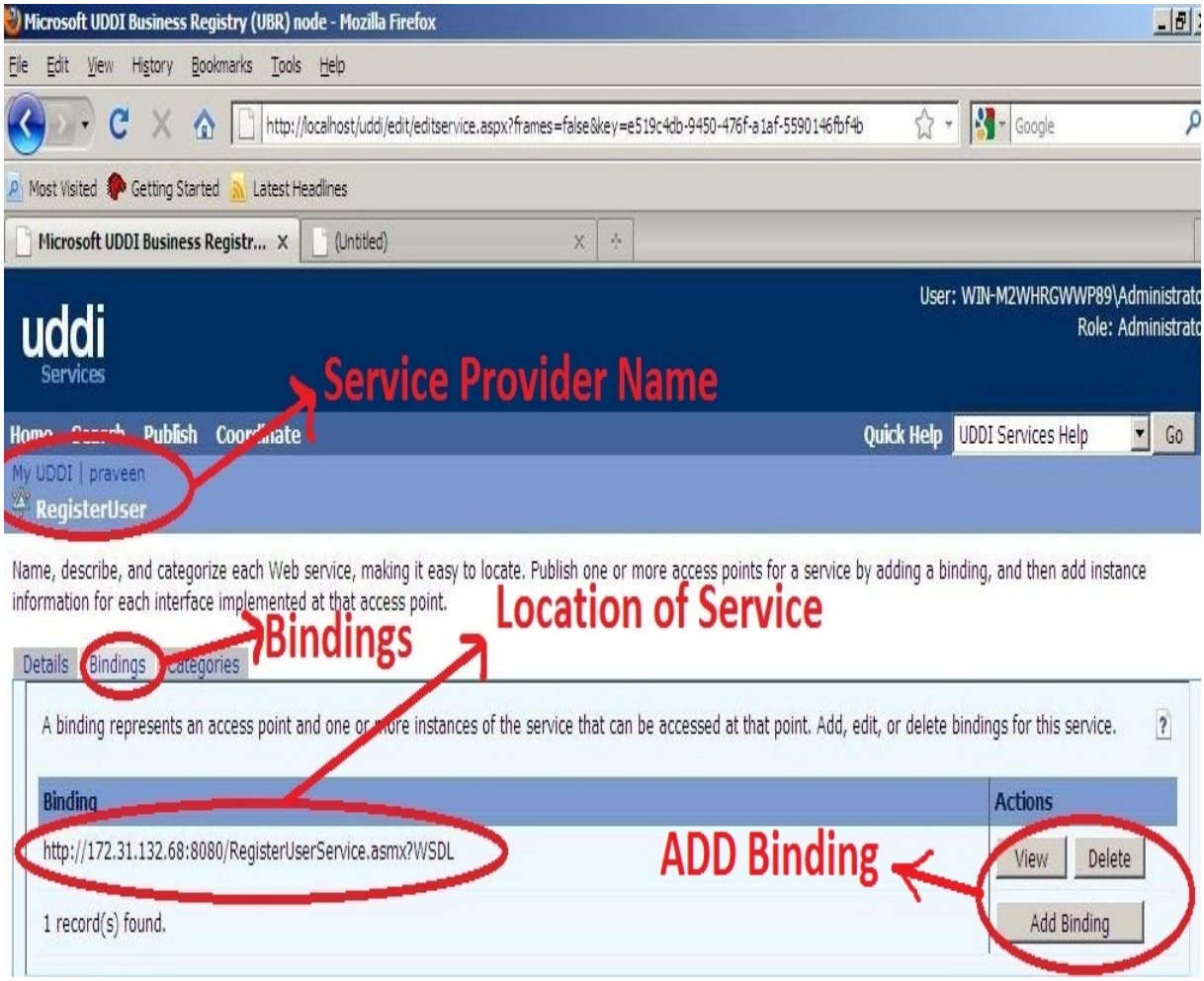

Figure 5.6: UDDI Service Binding Interface

5.4.3 Registration Page of the e-Learning Web Portal

If user is already registered then he can access services through login process. If the user is not registered then he/she has to register first by filling the Registarion page. He/She has to fill the required fields and submit for registration. The user is allowed to access other services which are composed with Registration service. Login service itself is automatically invoked when the user chooses to click on any service link (Figure. 19).

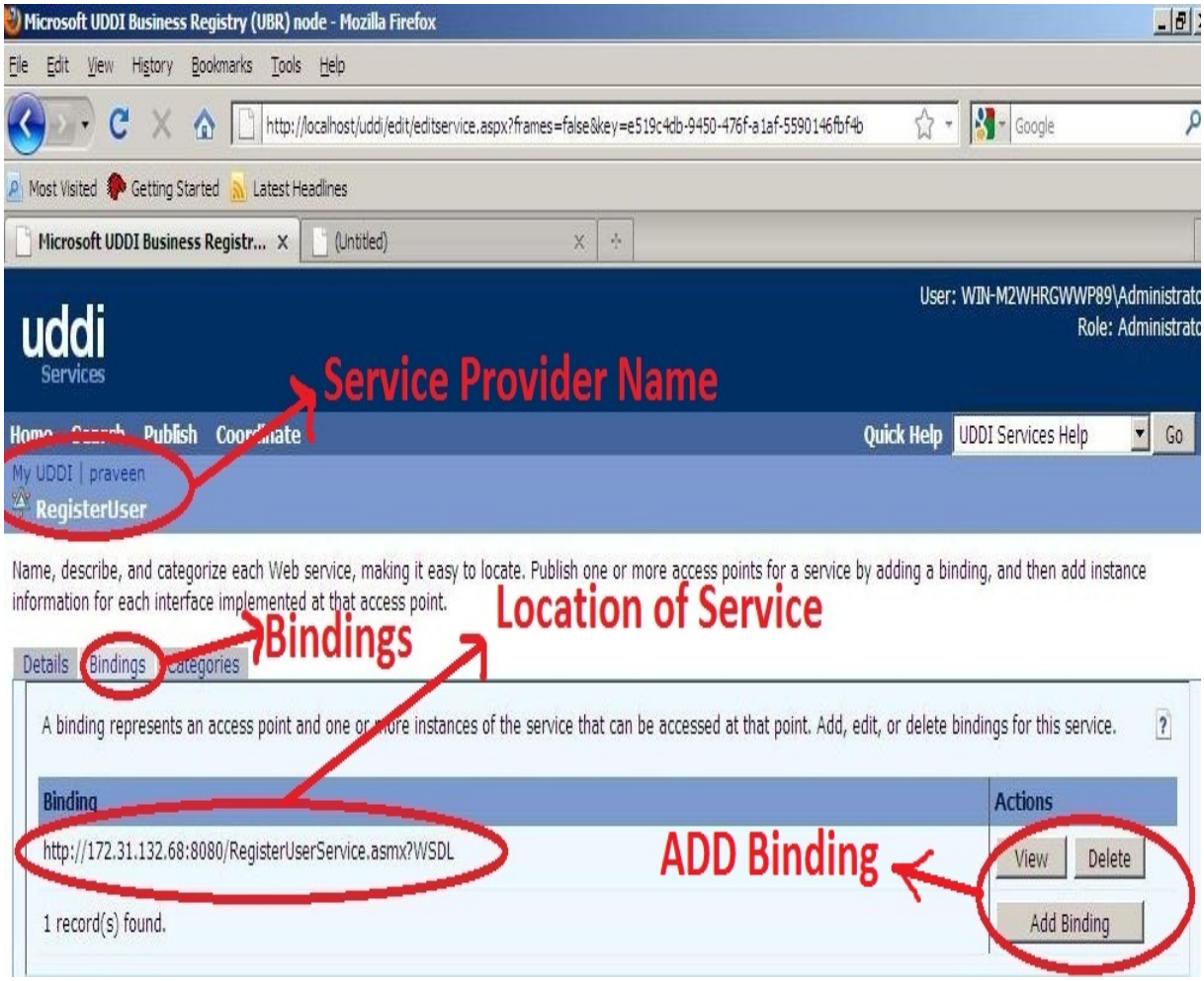

Figure 5.7: UDDI Service Binding Interface

5.4.4 Programming Service page the of e-Learning Web Portal

The e-Learning link on the Home Page provides the Registration service for user authentication. If the user is authorized then Programming Service Page offers the downloading-services from where user can download the lectures in doc or pdf format. Programming Service (textual/Multimedia narratives) is also similar in capacity to Programming Service for the lectures in doc or pdf format (Figure. 20)

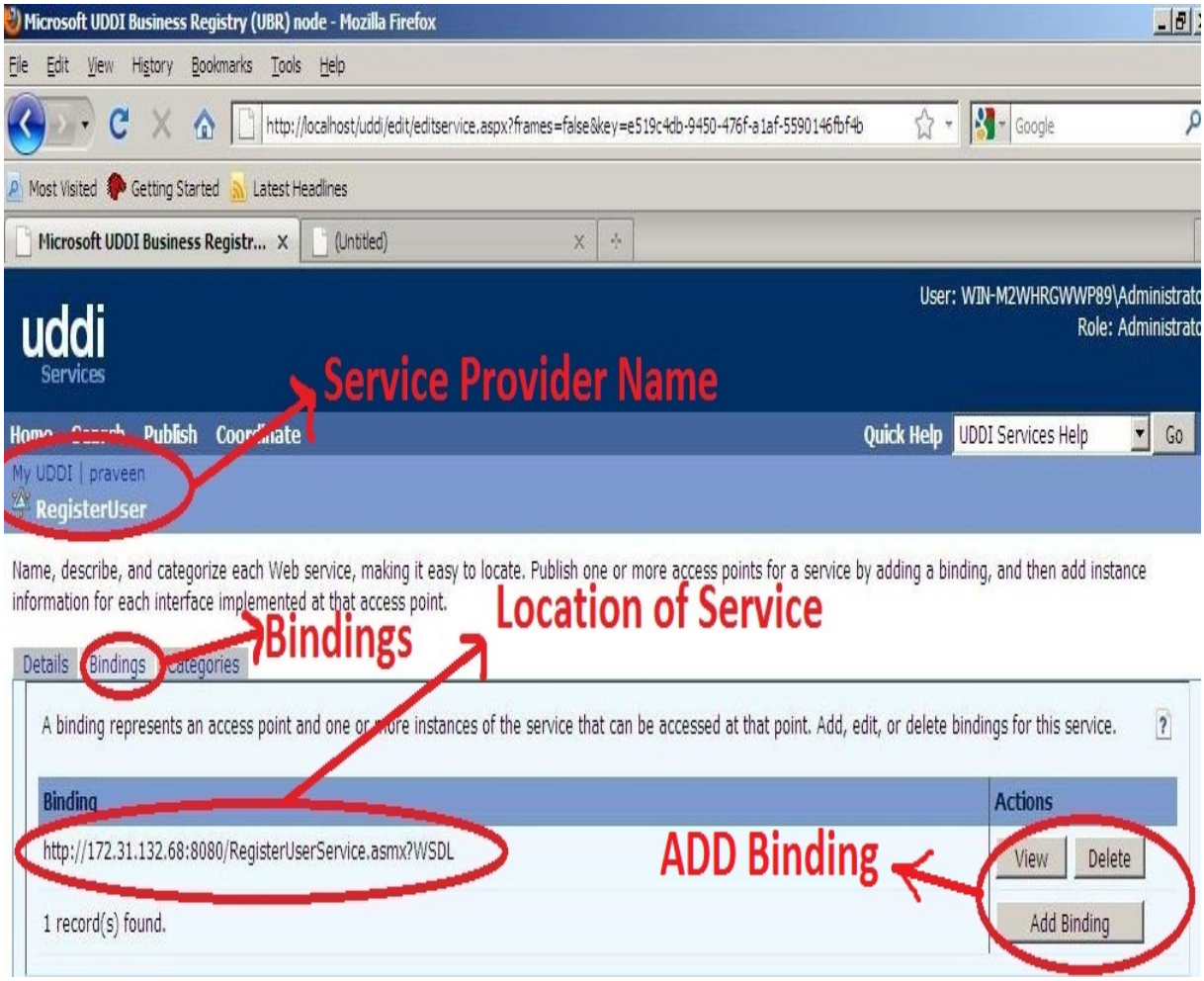

Figure 5.8: UDDI Service Binding Interface

5.4.5 Online Examination Page of e-Learning web portal

Online Exam page gets opened from the link on Home page. The service first invokes Login page on the monitor. The user is already registered then the user can avail the examination service. Otherwise the user has to register himself/herself first (Figure.21).

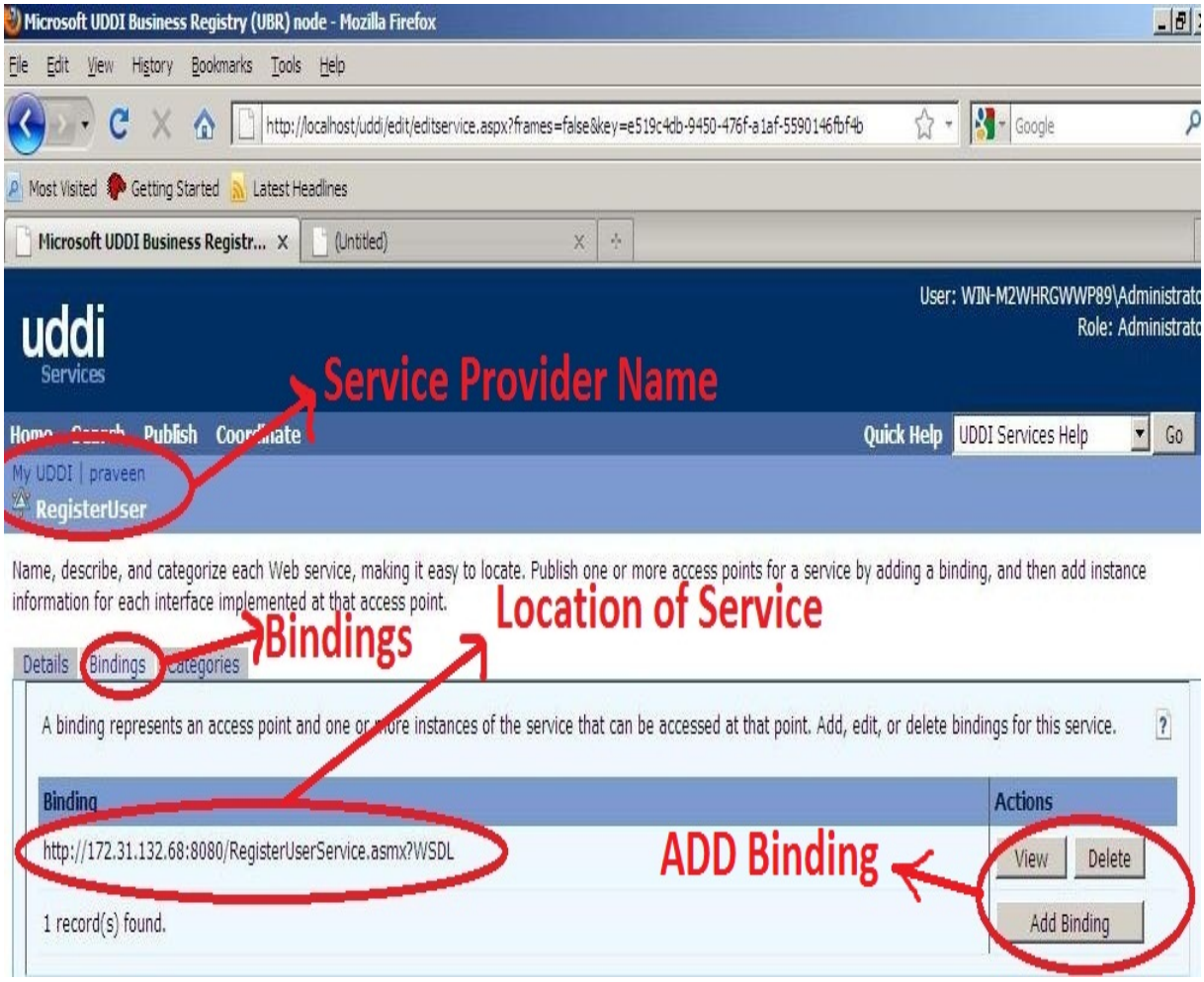

Figure 5.9: UDDI Service Binding Interface

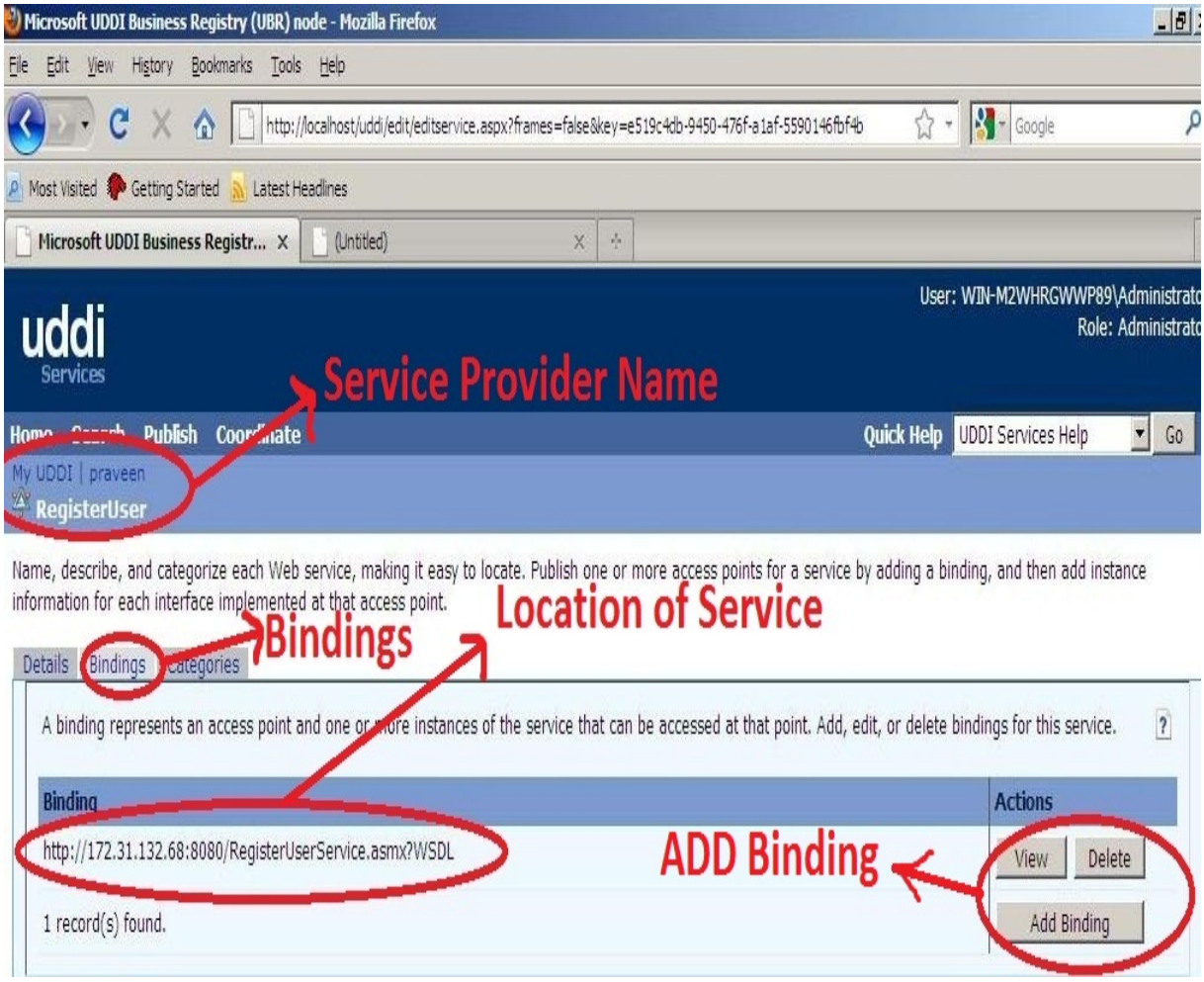

Figure 5.10: UDDI Service Binding Interface

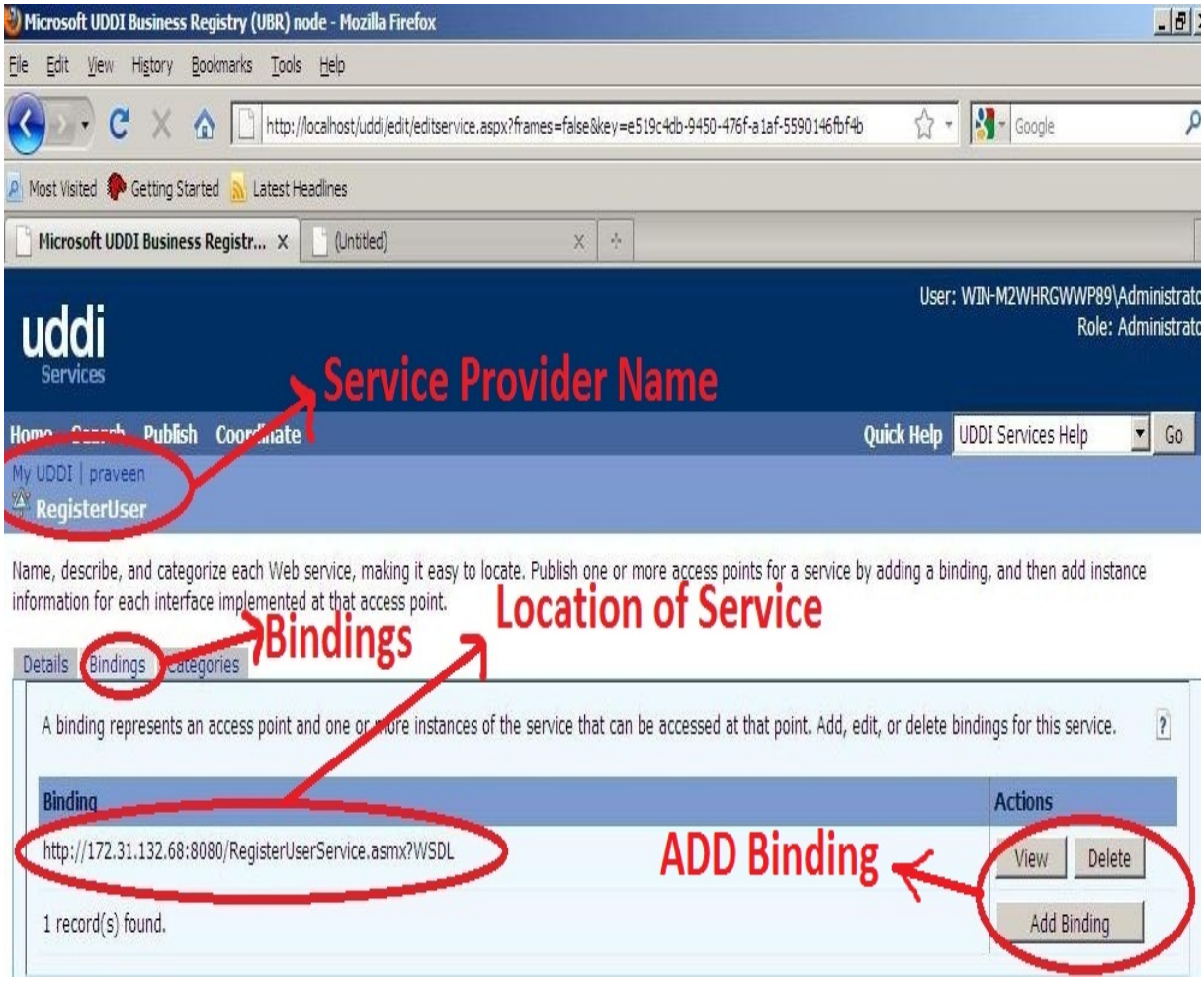

Figure 5.11: UDDI Service Binding Interface

CHAPTER 6

Conclusion & Future Direction of Work

6.1 Conclusion

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6.2 Future Direction of work

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The prospect of research of research orientation in this field encourage one to reactive more in composite web services in SOA.

References

[1] Eric Gamess and Imad Mahgoub. A Novel VANET-Based Approach to Determine the Position of the Last Vehicle Waiting at a Traffic Light. In *The 2011 International Conference on Wireless Networks (ICWN '11)*, July 2011.

[2] E. Bas, M. Tekalp, and F. Salman. Automatic Vehicle Counting from Video for Traffic Flow Analysis. In *2007 IEEE Intelligent Vehicles Symposium*, Istanbul, Turkey. June 2007.

[3] P. Daigavane and P. Bajaj. Real Time Vehicle Detection and Counting Method for Unsupervised Traffic Video on Highways. In *International Journal of Computer Science and Network Security*, Vol. 10, No. 8. August 2010.

[4] C. Pornpanomchai, T. Liamsanguan, and V. Vannakosit. Vehicle Detection and Counting from a Video Frame. In *International Conference on Wavelet Analysis and Pattern Recognition (ICWAPR '08)*, Hong Kong. September 2008.

[5] M. Lei, D. Lefloch, P. Gouton, and K. Madani. A Video-Based Real-Time Vehicle Counting System Using Adaptive Background Method. *The Fourth International Conference on Signal-Image Technology and Internet Based Systems (SITIS'08)*, Bali, Indonesia. December 2008.

[6] M. Litzenberger, B. Kohn, G. Gritsch, N. Donath, C. Posch, N.A. Belbachir, and H. Garn.

Vehicle Counting with an Embedded Traffic Data System using an Optical Transient Sensor. In *The 10th International IEEE Conference on Intelligent Transportation Systems (ITSC '07)*, Seattle, WA, USA. September 2007.

[7] Caballero-Gil, P. Security Issues in Vehicular Ad Hoc Networks. University of La Laguna, Spain.

[8] Seuwou, P., Patel, D., Protheroe, D., Ubakanma, G. Effective security as an ill-defined problem in vehicular ad hoc networks (VANETs). In *Road Transport Information and Control (RTIC 2012)*, IET and ITS Conference on (pp. 1-6). IET.

[9] András Varga and OpenSim Ltd. OMNeT++ User Manual Version 4.2.2

APPENDIX I

Publications Related to Report Work

1. Kumar, Prveen., Samaddar, Shefalika Ghosh., Samaddar, Arun B. & Misra, Arun K., (2010); **Extending IEEE LTSA elearning Framework in Secured SOA Environment**, The 2nd IEEE International Conference on Education Technology and Computer (ICETC 2010), IEEE Education Society (ISBN: 978-1-4244-6368-8), Shanghai China, June 22--24, 2010. **(Accepted)**

2. Kumar, Prveen., Samaddar, Shefalika Ghosh., Samaddar, Arun B. & Misra, Arun K.(2010); **Extending IEEE LTSA elearning Framework in Secured SOA Environment**, IEEE Transaction on Leatning Technology. **(Under Peer Review)**

APPENDIX II

Biographical Sketch

First Student's Name

Madhya Banamalipur, West Side of Central Jail, Agartala PIN-799001, E-Mail: abc@gmail.com, Contact. No. +91-1234567890

- Pursuing B.Tech. in Computer Sc. & Engg. branch from N.I.T,Agartala with CPI of 8.34/10/00.
- Intermediate from N.S.Vidyaniketan,Agartala under (T.B.S.E), Tripura with 58% in 1996.
- High School from N.S.Vidyaniketan,Agartala under (T.B.S.E), Tripura with 60.66 % in 1994.

Second Student's Name

Madhya Banamalipur, West Side of Central Jail, Agartala PIN-799001, E-Mail: abc@gmail.com, Contact. No. +91-1234567890

- Pursuing B.Tech. in Computer Sc. & Engg. branch from N.I.T,Agartala with CPI of 8.34/10/00.
- Intermediate from N.S.Vidyaniketan,Agartala under (T.B.S.E), Tripura with 58% in 1996.
- High School from N.S.Vidyaniketan,Agartala under (T.B.S.E), Tripura with 60.66 % in 1994.

Third Student's Name

Madhya Banamalipur, West Side of Central Jail, Agartala PIN-799001, E-Mail: abc@gmail.com, Contact. No. +91-1234567890

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- High School from N.S.Vidyaniketan,Agartala under (T.B.S.E), Tripura with 60.66 % in 1994.

Fourth Student's Name

Madhya Banamalipur, West Side of Central Jail, Agartala PIN-799001, E-Mail: abc@gmail.com, Contact. No. +91-1234567890

- Pursuing B.Tech. in Computer Sc. & Engg. branch from N.I.T,Agartala with CPI of 8.34/10/00.
- Intermediate from N.S.Vidyaniketan,Agartala under (T.B.S.E), Tripura with 58% in 1996.
- High School from N.S.Vidyaniketan,Agartala under (T.B.S.E), Tripura with 60.66 % in 1994.