ANALYSIS OF IMPLEMENTATION OF WEB SERVICE IN E-LEARNING PDITT DIKTI

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Abstract— This study aimed to analyze the application as a web service providers in accessing data on PDITT DIKTI. With the web service, a range of enabling interoperability between different applications platform. In this study, using waterfall method. This study includes analysis and design before implementation. From the analysis and design do web service become a major component to access data on e-learning PDITT DIKTI.

Index Terms— E-learning, PDITT DIKTI, web service.

I. INTRODUCTION

The development of information technology has been a lot easier for our work in solving the problem. One is a web service technology for data communication. Implementation of web service has several advantages, namely data communication via http or an open Internet protocol, in support by major players in the IT world such as Microsoft, SUN, IBM, W3C, Oracle. Web service built on the base text document with an XML format, so as to communications data is relatively lighter than the applications that access the database directly via a network.

E-learning to change the way of learning [1], the old way of learning the interaction of the learning process is done face to face, unlike the E-Learning, the interaction of the learning process can be done online.

PDITT DIKTI as the an education platform that partners with top universities in Indonesia, to offer courses online for anyone to take.

In this study, analysis and design to implement a web service on the E-Learning DIKTI, so the E-Learning content that is accessible in accordance with the methods provided. In addition, the presence of a web service supports scalability as a solution to exchange data between applications[2].

II. LITERATURE REVIEW

Research on the web service has a lot to do, among other research conducted by [3] who developed a web service for the implementation of secure remote form fill in field is

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applied to a word document. In this study the manufacture of form fields utilizing fill in form control and control features that are integrated with VBA toolbox that will call the function of the proxy class from the XML web service. The study was conducted by using SQL Server that is placed on a web server and uses VB as a programming language. With secure remote application form fill in this field, becoming a new solution to integrate desktop and web applications through XML web service. If the general solution is applied using a normal desktop application (with the creation of executable programs), then in the study was given a new solution with the help of a Microsoft Word document that has widely assumed to be owned by the user (especially in Indonesia)

Other studies conducted [2] implements the PHP web service as a data provider in mobile applications, testing of web service is done by creating a php file manually or use a SOAP web service, for easy retrieval is done by providing an additional layer in the form of PHP file that invokes the SOAP Web Service.

Research on the web service is also done by [4] analyze and design the web service to the university. design and manufacture of university information systems based on XML Web Services using Visual Studio. NET. The operating system used on the server is MS Windows 2003 Advanced Server and SQL Server 2000 database server programming languages used are: Visual Basic.NET for academic services, and Visual C # .NET for library services. Making the client application is done with a wide variety of applications: ASP.NET applications for Internet, and VB.NET for the console application. From analysis and design that has been done, the XML Web Services become a major component in developing the University Information System which makes it easy for programmers to build applications according to the function and appearance required.

From the results of the above studies and research indicate that the web service has been implemented widely in a variety of systems, and can be a solution for the integration and interoperability between heterogeneous information systems.

III. FUNDAMENTAL

3.1 Web Service
The web service is one form of a software system designed to support the interaction of machine-to-machine via Network. Web service has an interface described in a format that can be read by machine. Other systems interact with the web service using SOAP messages are generally sent via HTTP in the

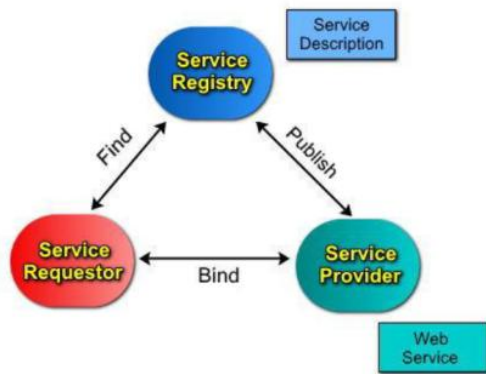form of XML. Web services architecture in general can be seen in Figure 1

Figure 1. *Web Service Architecture*

In the picture above, there are three components that make web service running. The three components include:

1. Service Provider, is the owner of web service function provides a set of web service operations.
2. Service request, an application that acts as a client of the service who are looking for and start the interaction with the services provided
3. Service registry, is a place where service providers publish their services.

3.2 XML

XML is an important part of the programmers who want to develop Web Services. This is because XML is built with the ability to transfer data between platforms. XML also has capabilities for data integration in addition to the exchange of data between platforms. XML stands for eXtensible Markup Language, was developed starting in 1996 and received recognition from the W3C in February 1998. The technology used in the XML is actually not a new technology, but it is a derivative of SGML (Standard General Markup Language) that has been developed in the early 80s and has been widely used in the technical documentation of large-scale projects. When HTML was developed in 1990, the initiators of XML adopted the most important part in SGML and based on the development generate HTML markup language that is not less great with SGML. As with HTML, XML also use elements that are marked with an opening tag (beginning with '<' and ending with '>'), a closing tag (beginning with '</' ends '>') and the element's attributes (parameters expressed in tag eg opening <form name = "datacontent">). Only difference, HTML define of initial tags and attributes that are used in it, while the user can define their own XML as needed. The following example XML document.

```
<pesan>
<dari>Nurul Hidayat</dari>
<buat>Ahmad Ashari</buat>
<subyek>Proposal</subyek>
<isi>Penelitian        tentang        web
serivce</isi>
</pesan>
```

3.3 SOAP

SOAP is an XML-based protocol used for exchanging information in a distributed system and decentralized, as well as IIOP (the CORBA), ORCP (the DCOM) and JRMP (on the RMI). Unlike the RMI, CORBA and DCOM, SOAP is a protocol that is independent of platform, programming model, and the transport protocol used in the process of exchange of SOAP messages.

3.4 WSDL

Web Service Description Language (WSDL) is a standard language that provides a mechanism for describing Service provided by the system in this case the Web service, the location of the service and how to obtain it, is structured in XML format.

3.5 NUSOAP

NuSOAP is one of the toolkit are available for PHP programmers who want to work with SOAP services. The advantages offered by NuSOAP is because of its simplicity because it in fact as simple and easy that speed the better. NuSOAP their lead to increased profits using PHP as the programming language.

One of the advantages of NuSOAP is that NuSOAP not a PHP extension, so its use does not require special registration to the Operating System or web server. NuSOAP written in pure PHP code so that all web developers can use this tool without depending on the type of web server is running.

NuSOAP is a component-based web service toolkit. NuSOAP have a base class which provides methods such as variable and packaging serialization of SOAP-Envelope. Interaction is done with the web service client class is called the class "SoapClient" and class server called the class "soap_server". These classes allow the user to make the process of sending and receiving SOAP messages with the help of several other supporting classes to complete the process.

IV. RESEARCH METHODOLOGY

In general, the stages in this study include:

1. Identify the problem
2. Data collection
3. Hypothesis
4. Analysis
5. Designing Web service

V. ANALYSIS AND DESIGN

5.1 Analysis of system requirements

Analysis of E-Learning system requirements are modeled using the DFD. E-Learning system is divided into two parts, for the admin and the second part for the learner and lecturer. DFD can be seen in figure 2
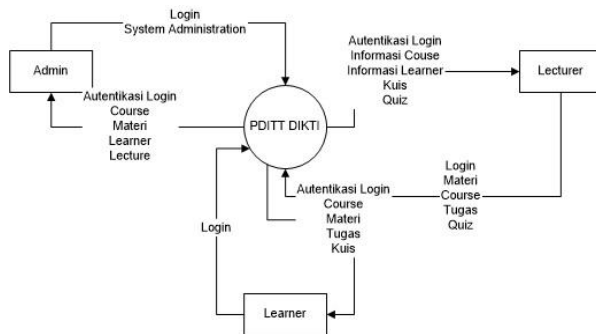
Figure 2. Context Diagram

5.2 Application Server Architecture

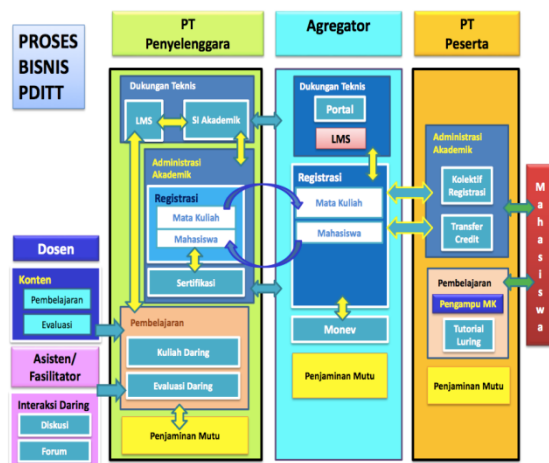The application architecture shown in Figure 3.

Figure 3. Application server architecture

5.3 Web Service Design

Based on the draft, it can be made a list of web method to be implemented can be seen in Table 1

Table 1. List of web service method

Service	Actor	Method/Function
KelolaMateriLearning	Lecturer	AddMateri() DeleteMateri() UpdateMateri() View() ViewDetail()
LihatDaftarLearner	Lecturer	LihatDaftarLearner()
Login	Learner and Lecturer	validateLogin()
ViewCourse()	Learner and Lecturer	ViewCourse()
CourseDownload		CourseDownload()

VI. CONCLUSION

Based on the analysis of the implementation of web service e-learning as a media service provider, it can be concluded that the web service can be applied to e-learning so as to provide convenience to users and application developers to access data in accordance with the functions provided by the service provider on E-Learning PDITT DIKTI.

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REFERENCES

[1] N. S. Salahuddin and H. Muchpud, "PEMBUATAN ONTOLOGY LEARNING OBJECT PADA," *Konf. Nas. Sist. Inf.*, pp. 282–286, 2012.

[2] M. Raditia and S. Surendra, "Implementasi PHP Web Service Sebagai Penyedia Data Aplikasi Mobile," vol. VI, no. 2, pp. 85–93, 2014.

[3] S. R. Wicaksono, "Implementasi Extensible Markup Language Web Service Pada Secure Remote Form Web Extensible Markup Language Implementation Service on Secure Remote Form," no. 98, pp. 103–113.

[4] B. Santosa, "ANALISA DAN PERANCANGAN WEB SERVICES UNTUK SISTEM INFORMASI UNIVERSITAS," *Konf. Nas. Sist. dan Inform.*, no. Xml, pp. 267–272, 2008.