Implementation of Web Service in Processing of Data Base Financing Costumer Using Fragmentation Method

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Abstract. This research is to design the Implementation system of Web service of consumer financing data processing based on fragmentation in motor vehicle loan financing in accordance with the pattern of data processing and information needs at that location, then implement the design to know and measure the level of efficiency (ease), effectiveness (speed), accurate (data accuracy), and security (data security) and the process of disseminating data and information from the design offered. Implementation of consumer financing data processing is a database fragmentation system, wherein one network scale using more than one DBMS, DBMS used is MySQL and PostgreSQL. PostgreSQL is used for web-based applications developed with PHP programming language using AJAX Technology, and MySQL developed using Notepad ++ Application. Data connection process using Web Service. Based on the result of the research, it can be concluded that Webservice Implementation for fragmentation based consumer financing data processing facilitates the updating of consumer financing data in terms of ease, speed, accuracy, and data security.

Keywords: **Fragmentation, Web Service, Financing, Consumer**

1. Introduction

Information systems have been proven to increase economic benefits because they can automate and compute. The use of computer-based systems can improve company performance [9]. In this research will distribute the data through a web service from a variety of different applications i.e. consisting of two different applications and different types of database tools, using two different IE database PostgreSQL and MySQL. The use of fragmentation method to classify the same type of data from different databases using a web service for data services from their respective databases, data in a table in the database are separated into the different the fragment and every fragment is stored a number of different nodes [3].

Development of database system this is for the unification of the operational data and data access are controlled. Integration of data and control data has been implemented in the form of centralized data. Data used jointly and efficiency in data access should be accompanied by the development of a database system called base distributed, accessible anywhere and do a data storage in the different locations [6].

Web services that bridge the communication between different applications, so that different applications although being in one or different network can communicate using the standard protocol used by the web service. XML (Extensible Markup Language) is a language used to describe and manipulate documents are structured. XML is technically defined as a meta-markup language that provides a format for certain documents which have structured data.

Previous research already exists that raised about the distributed database as well as fragmentation. But it has yet to combine with the web service. Research on fragmentation and data replication to distribute data [5], using MySql as the database. Distribute data by replicating databases using Asynchronous Distributed Database Technology in a single DBMS, cannot be used on other companies that still use different applications and different databases. Other researchers have examined some of his discoveries to distribute data by measuring the efficiency and performance of DDMS in fragmentation for the allocation of data grouping technique (based on Clustering Technique) namely Clustering Decision Value (CDV) to reduce the problem of redundancies of data on data redistribution [1].

The researchers had previously used some kinds of methods in a distributed database, they distribute the database using a database. In this study, researchers combined two databases and using horizontal fragmentation methods for grouped data in a web service.

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Horizontal fragmentation reduces the density of the network and improves response time so that it can provide accurate information timely and relevant to all components of an integrated database on different at each branch office motor vehicle credit financing.

There are some components that are used by researchers in the utilization of the web service consumer, the use of data processing components to create an application that can help the consumer data processing on the web portal. The component that is used to process web service and the fragmentation of them: XML, SOAP, WSDL, UDDI [7].

This study implements the web service on processing the database by using the method of horizontal fragmentation of data processing system for web-based consumer finance. Consumer finance data processing using the web-based method of fragmentation is providing convenience in getting information consumer finance in 2 (two) different Office locations as well as increasing factors of availability (availability) and reliability (reliability) of database systems.

2. Research Methods

2.1. Web Service Architecture

Consumer and service provider systems financing consists of two branches, namely FIF and FIF GBC Spectra in Gorontalo which can integrate consumer service and financing system as seen in Figure 1. Consumer services and financing available on the two web services that are built will be utilized by the user that will be applied based on the website.
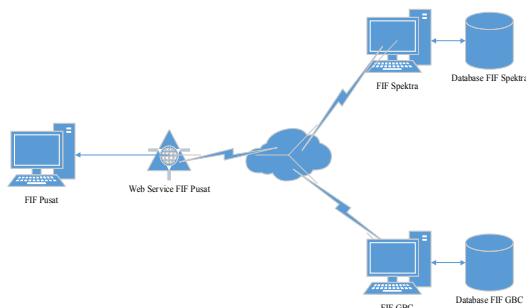

Fig. 1. Web Service Architecture Implementation FIF

2.2. The Design Of The System

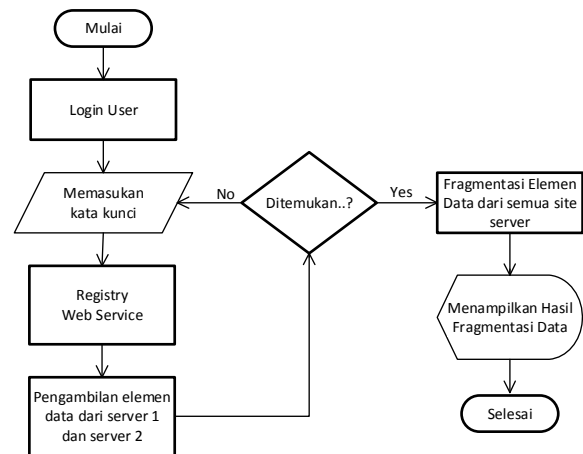Consumer finance system flowchart referred to in Figure 2.

Fig. 2. Flowchart design system

2.3. Data Fragmentation

Fragmentation consists of the breakdown of their relationship into a smaller relation or Fragments and saves the Fragment (other than the relationship itself), possibly on a different site. In Horizontal Fragmentation, each Fragment consists of a subset of the original relation line. In Vertical Fragments, each fragment consists of a subset of the columns of the original relation.

On horizontal fragmentation, a table of r is partitioned into a number of fragments of $r_1, r_2, \ldots \ldots r_n$ which is parsing database. Each database in the table should be minimal in r a fragment, such that the table initially can be recreated, if necessary [6]. A fragment can be di defined as a fragment r_i as follows :

$$r_i = \sigma_{pi}(r) \tag{1}$$

The application in the operation of the union of a number of fragments, then that is done is to table r, reconstruction with expression :

$$r = r_1 \cup r_2 \cup r_3 \cup r_4 \cup \ldots \cup r_n \tag{2}$$

3. Results and Discussion

The results of this research resulted in a software web service with the method of fragmentation for consumer data services and financing. Where this service web devices can provide the information to the administrator to locate the vehicle financing transactions of the two branches of the search results data by using a method of Fragmentation that results are visualized with using web-based information service system. The information generated is composed of the consumers of classification results where each consumer can be known doing the financing of more than one. So the administrator can know the number of vehicle motor vehicle credit financing is credited.

This software was created by using the programming language PHP, javascript, XML to parsing the data in the

form of elements of data into the form of a command program that will be processed. The process of inputting the data was derived from each branch and the data is stored in each database, the next step for the process of the search data from any database using the function of the components of the web service that consists of XML, NuSOAP, and WSDL. After that is done the fragmentation of data elements. The fragmentation results are shown in table form.

The system developed is the integration of the two branches of the Office of motor vehicle credit financing which was later merged into an integrated system using Web Services technologies and XML. Both systems integration services on the two branch offices that use technology facilities Web Services and databases. FIF Spectra using MySQL as its database, then to FIF GBC uses PostgreSQL as its database.
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Horizontal fragmentation contains a tuple tuple-partitioned or divided from a global relation R into a number of subsets $r_1, r_2., ... , r_n$. Each tuple contains a number of subsets of r. Each tuple in R must have more than one fragment so that a genuine partnership can be rearranged. A fragment in horizontal fragmentation can be defined as a selection on the global relation r. therefore a predicate Pi is used to assemble the fragments r_i.

Fragmentation of consumer data
The result of the fragmentation of consumer data processed from the table of the consumer database on each side. Following the results of the deliberations of the horizontal fragmentation attempted in Figure 3 and Figure 4.

Fig. 3 Service Consumer Data Page

Will do a second fragment of the table based on the column no_ktp.

Predicat no_ktp = ' 7571022708950001'

$$r_i = \sigma_{Pi}(r)$$

TK1= σ no_ktp=' 7571022708950001' (Konsumen spektra)
TK2= σ no_ktp=' 7571022708950001' (Konsumen gbc)

Data fragmentation Results relationships service consumers attempted in Figure 5 :

Fig. 4. results page fragmentation of consumer data service

The result of the fragmentation of data service costs
The result of the fragmentation of data service costs cost tables prepared from the database on each side. Following the results of the deliberations of the horizontal fragmentation attempted in Figure 5 and Figure 6.

Fig. 5. Page service data service costs

Will do a second fragment of the table based on the column no_ktp.

Predicat no_ktp = ' 7571050807870002'
$$r_i = \sigma_{Pi}(r)$$

TK1= σ no_ktp=' 7571050807870002' (Biaya spektra)
TK2= σ no_ktp='123456789' (Biaya gbc)

Data fragmentation test results relationships service financing is shown in Figure 6.

Fig. 6. The results page fragmentation data service financing

Conclusion

The results of research and discussion, then the web service using the methods of Fragmentation can be applied in data processing of financing. It brings some conclusion as follows :

1. Retrieved the implementation of web service consumer finance data processing that uses 2 (two) fruit database with emphasis on one of his horizontal fragmentation method.
2. Implementation of the web service consumer finance data processing which is designed can provide information about a web-based database at the same time implementing it.
3. Implementation of the web service consumer finance data processing provides convenience in getting information out of data processing and consumer financing.
4. Implementation of the web service data processing financing provides convenience in accessing the databases separate in 2 (two) different branch office location.
5. In the application database, further research using the method of storage of data is more complex that is by using replication. The implementation of this method can further improve the performance of the system and at the same time to compare with the results of research that the author has created.

References

1. Al-Sayyed, R.M.H., Al Zaghoul, F.A., Suleiman, D., Itriq, M., dan Hababeh, I, A New Approach for Database Fragmentation and Allocation to Improve the Distributed Database Management System Performance. *Journal of Software Engineering and Applications* 7, 891-905. (2014)
2. Chatterjee, Sandeep., and Webber, J., *Developing Enterprise Web Services: An Architect's Guide,* Prentice Hall PTR, New Jersey. (2003)
3. Fathansyah, *Basis Data*, Informatika, Bandung (2012)
4. Luong, V.N., Nguyen, H.H.C., and Son Le, V., An improvement on fragmentation in Distribution Database Design Based on Knowledge-Oriented Clustering Techniques. (IJCSIS) International Journal of Computer Science and Information Security, Vol. 13, No. 5 (2015)
5. Niswatin, R.K., Sistem Informasi Terdistribusi Pada Manajemen Invetarisasi Peralatan Laboratorium. *Seminar Nasional Teknologi Informasi dan Multimedia*, ISSN : 2302-3805. (2013)
6. Ramakrishnan, R., dan Gehre, J., *Sistem Manajemen Database, Edisi 3*, Andi, Yogyakarta. (2003)
7. Short, S., *Building XML Web Service for the Microsoft .net Platform*, Elex Media, Jakarta. (2003)
8. Silberschatz, A., Korth H. F., dan Sudarshan, S., "*Database System Concept", Sixth Edition*, McGrawHill Inc, USA. (2011)
9. S. Suryono, J. Endro Suseno, C. Mashuri, A. Dona Sabila, J. A. Mita Nugraha, M.H. Primasiwi. RFID Sensor for Automated Prediction of Reoder Point (ROP) Values in a Vendor Management Inventory (VMI) System Using Fuzzy Time Series, American Scientific Publisher, Vol. 23, 2398-2400. (2017)