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Web Based Computing Service To Promote Telemedicine Database Management System

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Abstract__Telemedicine systems with information changing and expanding periodically had been a major complexity for database administrative staff. So in this paper, we introduce a threefold approach to reduce and overcome the above stated complexity. It also focuses on other difficulties such as distance and time constraints. The threefold approach includes data fragmentation, web clustering and data distribution. This approach reduces the amount of data transmitted for each transaction, increases processing speed and improves response time.

Keywords: Data Fragmentation, Websites Clustering, Data Distribution.

1. INTRODUCTION

There are shortages of medical resources in rural areas or geographically isolated regions, so many physicians may be reluctant to serve in these areas. Therefore, people who live there will receive lower medical care than those who live in urban areas. There is an important need to develop a telemedicine system to improve the quality of medical services there and provide more educational opportunities to the physicians in these areas .Telemedicine can be defined as the providing of medical services over a distance. The Archiving and Communication System (PACS) will be used in the telemedicine process as this service requires patient history, medical images, and related information. By using PACS, we can find that the integrated telemedicine system consists of the following five subsystems: 1) Acquisition subsystem; 2) Viewing subsystem; 3) Teleconferencing subsystem; 4) Communication subsystem; 5) Database management subsystem. The first subsystem is the acquisition subsystem which collects multimedia information, then converts it to a standard format (e.g., DICOM 3.0). The second one is the viewing subsystem which displays and manipulates the images and other medical *information The third one is the teleconferencing subsystem which allows face-to-face interactive conference between physicians in rural areas and medical centres, this subsystem is not included in a PACS. The forth one is the communication subsystem which includes the connectivity method; local area networks (LAN's)and a wide area network (WAN) to transmit and receive data .The patient medical record consists of the patient complaint, history of illness, results of physical examination, laboratory tests, and diagnostic images. The medical information may be of the following types: text, voice, image [e.g., x-ray, computed tomography (CT), or magnetic resonance imaging (MRI)], and dynamic video (e.g., videoesophagogram and endoscopy) Thus, it is essential to design a medical information database for managing a huge amount of heterogeneous data. In some studies however, this approach may complicate archiving operations and introduce an inconsistency problem while concurrently accessing the image data. This management approach may make it difficult to access the videotapes and share them simultaneously. Moreover, the integration of video with text and images in a telemedicine system is a problem. To solve these problems, a data management methodology is proposed which is the fifth subsystem, by which medical information can be organized based on the patient's complaint as well as the medical history. This will support a unified interface for manipulating and accessing the different types of all medical information mentioned above. The management of medical databases and the user interface has been implemented as major components of a telemedicine system through in Medical. Com web-Portal.*

2. EXISTING SYSTEM

The researches done before this have focused mainly on designing database management systems with certain limited performance levels. It will be measured by amount of data transferred during the process. It can be either relevant or irrelevant data. As for as this type of processing is concerned it will increase the processing speed and response time. Many methods had been introduced to overcome this issue. All those techniques strongly believed that it can be achieved by utilising any of the services such as data fragmentation, website clustering, distributed caching, database scalability.Even after introducing this techniques the increasing number of medical transactions and communications makes this difficult task. None of the existing system combined the threefold approach together which makes them difficult in handling the database systems. Adding to this, there's not sufficient tools for handling the design, analysis and cost effective deployments of web telemedicine database systems.

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Some of these data records may be overlapped or even redundant, which increase the I/O transactions' processing time and so the system communications overhead. These works have mostly investigated fragmentation, allocation and sometimes clustering problems. The transactions should be executed very fast in a flexible load balancing database environment. When the number of sites in a web database system increases to a large scale.

3. PROPOSED SYSTEM

Our approach integrates three enhanced computing services' techniques namely, database fragmentation, network sites clustering and fragments allocation We propose an estimation model to compute communications cost which helps in finding cost-effective data allocation solutions. We perform both external and internal evaluation of our integrated approach. In our proposed system we develop a fragmentation computing service technique by splitting telemedicine database relations into small disjoint fragments. This technique generates the minimum number of disjoint fragments that would be allocated to the web servers in the data distribution phase. This in turn reduces the data transferred and accessed through different websites and accordingly reduces the communications cost.

In the proposed system we introduce a high speed clustering service technique that groups the web telemedicine database sites into sets of clusters according to their communications cost. This helps in grouping the websites that are more suitable to be in one cluster to minimize data allocation operations, which in turn helps to avoid allocating redundant data. We propose a new computing service technique for telemedicine data allocation and redistribution services based on transactions' processing cost functions.Develop a user-friendly experimental tool to perform services of telemedicine data fragmentation, websites clustering, and fragments allocation, as well as assist database administrators in measuring WTDS performance. Integrate telemedicine database fragmentation, websites clustering, and data fragments allocation into one scenario to accomplish ultimate web telemedicine system throughput in terms of concurrency, reliability, and data availability.

ADVANTAGES

Our integrated approach significantly improves services requirement satisfaction in web systems. This conclusion requires more investigation and experiments. This technique generates the minimum number of disjoint fragments that would be allocated to the web servers in the data distribution phase. Introduce a high speed clustering service technique that groups

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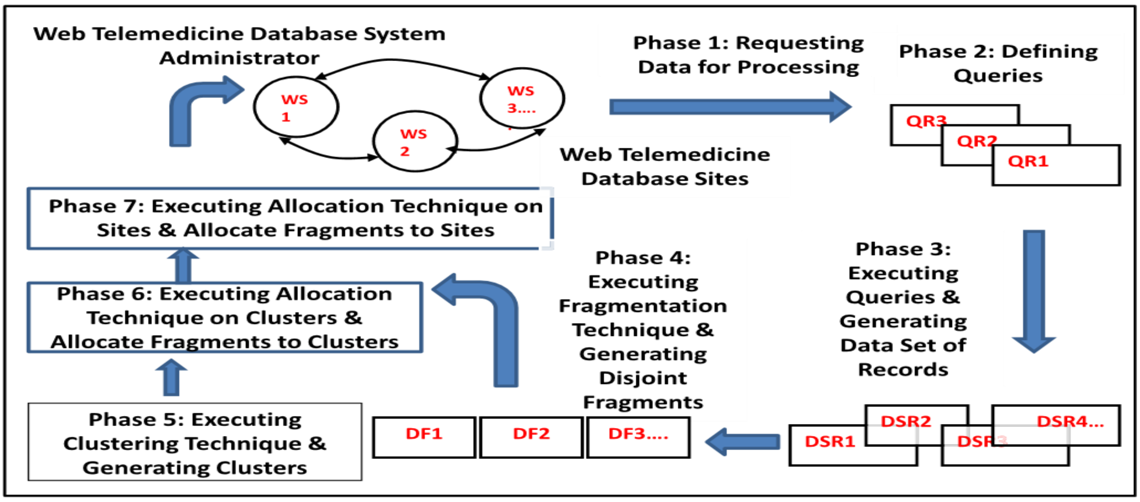
the web telemedicine database sites into sets of clusters according to their communications cost.

ARCHITECTURE DIAGRAM



Qr- Queries; Dsr-Data Set Of Records; Df-Disjoint Fragments; Ws- Web Database System

IMPLEMENTATION

Data Fragmentation

With respect to fragmentation, the unit of data distribution is a vital issue. A relation is not appropriate for distribution as application views are usually subsets of relations. Therefore, the locality of applications' accesses is defined on the derivative relations subsets. Hence it is important to divide the relation into smaller data fragments and consider it for distribution over the network sites. Each record in each database relation as a disjoint fragment that is subject for allocation in a distributed database sites. However, large number of database fragments is generated in this method, causing a high communication cost for transmitting and processing the fragments. In contrast to this approach, considered the whole relation as a fragment, not all the records of the fragment have to be retrieved or updated, and a selectivity matrix that indicates the percentage of accessing a fragment by a transaction is proposed. However, this research suffers from data redundancy and fragments overlapping.

Clustering Websites

Clustering service technique identifies groups of networking sites and discovers interesting distributions among large web database systems. This technique is considered as an efficient method that has a major role in reducing transferred and accessed data during transactions processing. Moreover, grouping distributed network sites into clusters helps to eliminate the extra communication costs between the sites and then enhances the distributed database system performance by minimizing the communication costs required for processing the transactions at run time.

In a web database system environment where the number of sites has expanded tremendously and amount of data has increased enormously, the sites are required to manage these data and should allow data transparency to the users of the database. Moreover, to have a reliable database system, the transactions should be executed very fast in a flexible load balancing database environment. When the number of sites in a web database system increases to a large scale, the problem of supporting high system performance with consistency and availability constraints becomes crucial. Different techniques could be developed for this purpose; one of them is websites clustering.

Grouping websites into clusters reduces communications cost and then enhances the performance of the web database system. However, clustering network sites is still an open problem and the optimal solution to this problem is NP-Complete. Moreover, in case of a complex network where large numbers of sites are connected to each other, a huge number of communications are required, which increases the system load and degrades its performance.

Data Allocation (Distribution)

Data allocation describes the way of distributing the database fragments among the clusters and their respective sites in distributed database systems. This process addresses the assignment of network node(s) to each fragment. However, finding an optimal data allocation is NP-complete problem. Distributing data fragments among database websites improves database system performance by minimizing the data transferred and accessed during execution, reducing the storage overhead, and increasing availability and reliability where multiple copies of the same data are allocated.

Many data allocation algorithms are described in the literature. The efficiency of these algorithms is measured in term of response time. An approach that handles the full replication of data allocation in database systems. In this approach, a database file is fully copied to all participating nodes through the master node. This approach distributes the sequences through fragments with a round-robin strategy for sequence input set already ordered by size, where the number of sequences is about the same and number of characters at each fragment is similar.

However, this replicated schema does not achieve any performance gain when increasing the number of nodes. When a non-previously determined number of input sequences are present, the replication model may not be the best solution and other fragmentation strategies have to be considered. The fragment allocation problem in web database systems. He presented an integer programming formulations for the non-redundant version of the fragment allocation problem. This formulation is extended to address problems, which have both storage and processing capacity constraints. In this method, the constraints essentially state that there has been exactly one copy of a fragment across all sites, which increase the risk of data inconsistency and unavailability in case of any site failure. However, the fragment size is not addressed while the storage capacity constraint is one of the major objectives of this approach. In addition, the retrieval and update frequencies are not considered in the formulations, they are assumed to be the same, which affects the fragments distribution over the sites. Moreover, this research is limited by the fact that none of the approaches presented have been implemented and tested on a real web database system.

A dynamic method for data fragmentation, allocation, and replication. The objective of this approach is to minimize the cost of access, re-fragmentation, and reallocation. DYFRAM algorithm of this method examines accesses for each replica and evaluates possible re-fragmentations and reallocations based on recent history. The algorithm runs at given intervals, individually for each replica. However, data consistency and concurrency control are not considered in DYFRAM. Additionally, DYFRAM doesn’t guarantee data availability and system reliability when all sites have negative utility values. A horizontal fragmentation technique that is capable of taking a fragmentation decision at the initial stage, and then allocates the fragments among the sites of DDBMS. A modified matrix MCRUD is constructed by placing predicates of attributes of a relation in rows and applications of the sites of a DDBMS in columns. Attribute locality precedence ALP; the value of importance of an attribute with respect to sites of distributed database is generated as a table from MCRUD. However, when all attributes have the same locality precedence, the same fragment has to be allocated in all sites, and a huge data redundancy occurs. Moreover, the initial values of frequencies and weights don’t reflect the actual ones in real systems, and this may affect the number of fragments and their allocation accordingly.A method for modeling the distributed database fragmentation by using UML 2.0 to improve applications performance. This method is based on a probability distribution function where the execution frequency of a transaction is estimated mainly by the most likely time.

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Collaborative filtering:

In CF recommendation techniques, items among those liked by similar Users ("neighbours") are recommended to the active user. A user profile is built of the items that the user has rated highly, thus similarities in user tastes are deduced from previous ratings. Although widely used in commercial applications, collaborative RSs still have to overcome scalability and cold-start problems that limit their performance.

Content based clustering:

CB techniques, user profiles are built from the characteristics of the items that a user has rated highly, and the items that he or she hasn't yet tried are compared against them. The items with the higher estimated possibility of being liked are then recommended. Because CB techniques rely on more specific information about users and items, they're able to recommend new items. However, they must overcome the recommendations' limited diversity and possible overspecialization.

Other Techniques:

Knowledge-based and especially case-based recommenders have emerged as the primary alternative to CF recommenders, intending to overcome their shortcomings while efficiently handling the existing information overload. Case-based recommenders implement a type of CB recommendation that relies on a structured representation of cases, usually as sets of well-defined characteristics with their values. These systems generally recommend items similar to those that the active user has described in his or her request. Rule-based techniques generate item recommendations based on a set of rules extracted from a data corpus. ARs mining refers to transaction analysis aiming to discover interesting hidden patterns and frequent associations among existing items, usually expressed in the form of "if-then" statements.3 Recently, semantic analysis, latent factors, and probabilistic topic models arising from natural language processing have been successfully applied to information retrieval and RSs, especially for tag recommendations. The basic idea is that topics are sets of words from a given vocabulary, and documents are formed as probability distributions over topics.

5. Conclusion:

In this work, we proposed a new approach to promote WTDS performance. Our approach integrates three enhanced computing services' techniques namely, database fragmentation, network sites clustering and fragments allocation. We develop these techniques to solve technical challenges, like distributing data fragments among multiple web servers, handling failures, and making tradeoff between data availability and consistency. We propose an estimation model to compute communications cost which helps in finding cost-effective data allocation solutions. The novelty of our approach lies in the integration of web database sites clustering as a new component of the process of WTDS design in order to improve performance and satisfy a certain level of quality in web services. We perform both external and internal evaluation of our integrated approach. In the internal evaluation, we measure the impact of using our techniques on WTDS and web service performance measures like communications cost, response time and throughput. In the external evaluation, we compare the performance of our approach to that of other techniques in the literature. The results show that our integrated approach significantly improves services requirement satisfaction in web systems. This conclusion requires more investigation and experiments. Therefore, as future work we plan to investigate our approach on larger scale networks involving large number of sites over the cloud. We will consider applying different types of clustering and introduce search based technique to perform more intelligent data redistribution. Finally, we intend to introduce security concerns that need to be addressed over data fragments.

9.2 Future Scope:

Therefore, as future work we plan to investigate our approach on larger scale networks involving large number of sites over the cloud. We will consider applying different types of clustering and introduce search based technique to perform more intelligent data redistribution. Finally, we intend to introduce security concerns that need to be addressed over data fragments.

References:

[1] Ismail Hababeh, Issa Khalil, and Abdallah Khreishah, "Designing High Performance Web-Based Computing Services to Promote Telemedicine Database Management System", IEEE TRANSACTIONS ON SERVICES COMPUTING, VOL. 8, NO. 1, JANUARY/FEBRUARY 2015.

[2] A. Tamhanka and S. Ram, “Database Fragmentation and Allocation: An Integrated Methodology and Case Study,” IEEE Trans. Systems, Man and Cybernetics, Part A: Systems and Humans, vol. 28, no. 3, pp. 288-305, May 1998.

[3] L. Borzemski, “Optimal Partitioning of a Distributed Relational Database for Multistage Decision-Making Support systems,” Cybernetics and Systems Research, vol. 2, no. 13, pp. 809-814, 1996.

[4] J. Son and M. Kim, “An Adaptable Vertical Partitioning Method in Distributed Systems,” J. Systems and Software, vol. 73, no. 3, pp. 551-561, 2004.

[5] S. Lim and Y. Ng, “Vertical Fragmentation and Allocation in Distributed Deductive Database Systems,” J. Information Systems, vol. 22, no. 1, pp. 1-24, 1997.

6] A. Morffi, C. Gonzalez, W. Lemahieu, and L. Gonzalez, “SIADBDD: An Integrated Tool to Design Distributed Databases,” Revista Facultad de Ingenieria Universidad de Antioquia ISSN (Version impresa): 0120-6230, No. 47, pp. 155-163, Mar. 2009.

7] M.T. €Ozsu and P. Valduriez, Principles of Distributed Databases.Third ed., 2011.

8] G. Mao, M. Gao, and W. Yao, “An Algorithm for Clustering XML Data Stream Using Sliding Window,” Proc. the Third Int’l Conf. Advances in Databases, Knowledge, and Data Applications, pp. 96-101, 2011.

9] M.P. Paix~ao, L. Silva, and G. Elias, “Clustering Large-Scale, Distributed Software Component Repositories,” Proc. the Fourth Int’l Conf. Advances in Databases, Knowledge, and Data Applications, pp. 124-129, 2012.

10] G. Decandia, D. Hastorun, M. Jampani, G. Kakulapati, A. Lakshman, A. Pilchin, S. Sivasubramanian, P. Vosshall, and W. Vogels,“Dynamo: Amazon’s Highly Available Key-Value Store,” Proc. ACM Symp. Operating Systems Principles, pp. 205-220, 2007.[35] http://en.wikipedia.org/wiki/MongoDB, Nov. 2013.