بسم الله الرحمن الرحيم

University of Science and Technology

College for Graduate Studies and Academic Advancement

A Research project in:

Multimedia Archive System (MAS)

Storage of Video/Audio Lecture for E-learning

Case Study:

College for Graduate Studies - Faculty of Computer Science and Information Technology - University of Science and Technology - Sudan

Thesis submitted in Partial Fulfillment of the Requirements for the Degree of Master of Information System

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Abstract

The purpose of this research is to classify methods of storage multimedia data namely video/audio files. It where proposes method of storing video/audio files on file system (server) and its associated metadata and the path of video/audio files in a relational database. It is more efficient than storing the video/audio files in the Database since it offers several advantages such as reducing database maintenance cost and improve performance.

The methodology used was to insert metadata of video/audio lecture in the database. The video/audio files are stored in the server. To achieve this HTML language, PHP language, MySQL database and Apache Server were used.

HTML language to build the insertion form, PHP language as a bridge between html file − insertion form − and MySQL database. (Because it can't link html file with MySQL database directly), Apache Server to store video/audio files. And MySQL to store video/audio metadata such as (title, presenter, subject, description… and the path of video/audio on server).

The results are that the video/audio lectures and teaching materials are stored. This accelerates retrieval time and saves time and effort for students. This is reflected positively on the performance of students and system graduate program as a whole.

مستخلص البحث

الغرض من هذا البحث هو تصنيف طرق تخزين بيانات الوسائط المتعددة خاصة ملفات الفيديو والملفات الصوتية .حيث أنه يقترح طريقة لتخزين ملفات محاضرات الفيديو والصوت على الخادم (server) والبيانات الوصفية المرتبطة بها ومسار ملفات الفيديو والصوت في قاعدة بيانات علائقية .وهذه الطريقة أكثر فعالية من تخزين ملفات محاضرات الفيديو والصوت في قاعدة البيانات لأنها توفر عدد من المزايا مثل تقليل تكاليف صيانة قاعدة البيانات وتحسين الأداء.

المنهجية المستخدمة هي إدخال البيانات الوصفية لمحاضرات الفيديو والمحاضرات الصوتية في قاعدة البيانات .وتخزين ملفات الفيديو والملفات الصوتية في الخادم (server) .لتحقيق هذا الهدف تم إستخدام لغتي HTML، PHP وقاعدة بيانات MySQL و Apache Server .

وقد إستخدمت لغة HTML لبناء نموذج الإدراج، ولغة PHP كجسر بين نموذج الإدراج وقاعدة بياناتMySQL لأنه لا يمكن ربط ملف HTML مع قاعدة بيانات MySQL مباشرة. كما إستخدم Apache Server لتخزين ملفات الفيديو والملفات الصوتية .وقاعدة بيانات MySQL لتخزين البيانات الوصفية لملفات الفيديو والصوت مثل:(العنوان، المقدمة، الموضوع، الوصف ومسار ملفات الفيديو و الصوت على الخادم).

ونتائج هذا النظام تخزين محاضرات الفيديو والصوت والمواد التعليمية . مما يسرع وقت الاسترجاع ويوفر الوقت والجهد للطلاب .وينعكس هذا إيجابا على أداء الطلاب ونظام برنامج الدراسات العليا ككل.

1.1 An Overview

"Information and knowledge are the thermonuclear competitive weapons of our time. Knowledge is more valuable and more powerful than natural resources, big factories or fat bankrolls". [1]

The big trend for technology in recent years has led to a remarkable development in the different areas of science and knowledge, especially in the field of E-learning has found a great interest and it is became more prominent that ever. Video Conferencing (VC) technology now is becoming common to the masses. Is also playing an important role in different applications such as: distance education. The use of VC technology for distance education is not just due to it cost effectiveness, but also the practicality.

Video conferencing has played an active role in the dissemination of E-learning. Spread in recent video lectures and appeared a clear impact in facilitating the students' understanding and increase their numbers, because it is available to students at any time and in any place, so it was necessary to save these lectures and store them in an effective manner to the student can be obtained easily and conveniently and here comes the importance of a storage system. This thesis, discussed how to store video/audio lectures and slides attached with it by an effective way at multimedia database for safety and easy retrieval.

E-learning is a contemporary way of learning using multimedia and communication abilities of modern computers and mobile devices (cellular phones, smart phones, and palmtops). It is creating a paradigm shift in the way training education is viewed and delivered.[2] There are many benefits that can be achieved by e-learning that

has an impact of universities goals Such as: performance improvements, cost reduction and improve quality of education.

The main obstacle in the popularization of E-learning is the significant expenditure of time and costs to store multimedia materials. Therefore can reduce the problem by find ways to properly store and classify large collection of multimedia files for easy retrieval, search and reference. From this standpoint, need to talk about the storage system previously and currently.

Previously, the data was stored in the operating system files, but after the tremendous development in the world of communications, and information technology can no longer store the file system that the vast amount of data, so it appeared databases are capability to store huge amounts of data, preserve and protect them, DBMS to manage data has many features as well as data independence, efficient data access, data integrity and security, data administration and concurrent access and crash recovery. They are many examples of DBMS such as Oracle database, MySQL. Also appear another type of database called multimedia database to stores a new type of data (multimedia data such as audio, video).

After the second communications revolution, which led to the emergence of Web applications (Electronic applications) such as E-commerce, E-health, E-government, E-learning, all of these applications are useful but E-learning is a very important field - because e-learning systems improve effectiveness of teaching in and out of classrooms and augment distance learning experiences by integrating multimedia and internet content with traditional instructional content. Network conferencing and video streaming

techniques are also used in some e-learning systems for users to participate classroom discussions remotely and to conveniently access instructional content online.[3] Therefore here the main focus to explain how to store video/audio lectures by effective method to help make retrieval very easy and that led to create revolution in E-learning field.

Multimedia database as noted above is type of database Specialized to store multimedia data. Media divided into two parts: continuous (dynamic) and discrete (static).Continuous media such as audio and video change with time. Discrete media are time independent such as text, image and graph. All data are stored in the database in binary form. Multimedia data characterized as large size than the traditional data such as text. Need to reduce the storage size to fit bandwidth by using international standards data compression techniques such as JPEG, MPEG and MP3.[4]

Multimedia database have many features such as it is capable of handling huge volume of multimedia objects which a general database fails to do effectively, It will surely help to develop multimedia applications in various fields like teaching, medical sciences and libraries and Using multimedia database, can develop the excellent teaching packages.[4]

1.2 Problem Definition

The storing and classifying huge collection of computer data present a similar challenge of physical file filing, exactly video's / audio's files – video/audio lectures. It needs to classifying and efficient, effective ways to store it, to save effort and time. The case study of this project is U.S.T- College for Graduate Studies & Academic Advancement - Faculty of computer science and information technology - Sudan. Since the students make a lot of effort and waste a plenty of time to obtain educational materials and sometimes instructors don't find own materials.

1.3 Research Objective

To find ways to properly store and classify large collection of multimedia files for easy retrieval, search and reference. Because multimedia data require high capacity, fast access time and high transfer rates from the storage media.

1.4 Research Questions

Huge amount of video/audio data is being generated these days all over the world especially in E-learning field – video/audio lectures - led to ask many questions:

- Is the student able to get these materials easily and without any mistakes?

- Is the instructor trusts in the access educational materials to students completely?

- Is coordinator able to know any educational materials completed and which are not?

To answer these questions requires efficient and effective ways to store, access, and retrieve these data.

1.5 Research Methodology

1.5.1 Analysis:

Needs requirement, Current system and Problems of Current System.

1.5.2 Design:

Proposed System, Solution and Architecture.

1.5.3 Implementation:

Pages design, Link pages and Link pages with database and server.

1.6 Thesis Structure

The thesis is organized into four related chapters. This chapter (Chapter 1) presents an overview on E-learning, storage system and multimedia database and finally find problem statement, objective research questions and methodology for this thesis.

Chapter 2 gives an overview of literature review that leads to a study on various related work (previous researches -some of ideas from relevant previous findings in area of this thesis - and storage system in details such as why multimedia database, and indexing system by using metadata (types, standards) and multimedia container format).

Chapter 3 about is the core of the thesis, which presents Research Design and Methodology (how to storage video's files by using MySQL database, HTML, PHP languages, and Apache server and the implementation of this system).

Chapter 4 gives evaluation to project results, limitations and recommendations of all thesis.