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University of Science and Technology

Collage for Graduate Studies & Academic Advancement

Multimedia Retrieval System

Case study: Postgraduate Faculty of Computer Science
and Information Technology

University of Science and Technology - SUDAN

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Information System

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ABSTRACT

The main objective of this research is to develop a multimedia retrieval system for e-learning purpose to retrieve multimedia data which contain a large collection of education multimedia database.

The fact, that the current system is time wasting, available subject materials for instructors in the postgraduate faculty of Computer Science & Information Technology, and the lack of the coordinator's knowledge of subject materials, assessments and the number of hours and whether there are enough or not.

This study aims at resolving some of the problems at the postgraduate faculty at University of Science and Technology have access to multimedia data they need in the faculty.

The tools comprised {Languages (html, php), Web server (Apache) and Database (MySQL)} for implementation of e-learning to enable all faculty users to have access to required data from a complete database and interfaces.

The research outcome proved the results that the multimedia data are available with great accuracy; but it was found the application that can be retrieved in the case of recorded lectures they display presentation and audio records together. But do not display the Lecturer, audio records, and power point presentation together.

المستخلص

الهدف الرئيسي من هذا البحث هو تطوير نظام استرجاع الوسائط المتعددة لأغراض التعلم الإلكتروني لاسترداد بيانات الوسائط المتعددة التي تحتوي على مجموعة كبيرة من قاعدة بيانات الوسائط المتعددة.

يعمل النظام الحالي الى اهدرا مزيدا من الوقت والجهد للوصول الى احتياجات الطالب ، المواد الاكاديمية المتاحة للطلاب في كلية الدراسات العليا في قسم علوم الحاسوب ونظم المعلومات، بالإضافة الى افتقار معرفة المنسق بالمواد المقرره ، وتقييمه لها ، وعدد الساعات كافيها ام لا .

هذه الدراسة تهدف الى حل بعض المشاكل في قسم علوم الحاسوب ونظم المعلومات بكلية الدراسات العليا - جامعة العلوم والتقانة ، وتتمثل هذه المشاكل في الوصول إلى البيانات التي يحتاجها الطلاب من مواد الوسائط المتعددة في الكلية.

تتألف الأدوات التي تم استخدامها في التطبيق {اللغات (HTML، PHP)، (Apache Server) وقواعد البيانات (MySQL)} . تعتبر هذه الادوات تعمل على دعم وتطبيق التعلم الإلكتروني لتمكين جميع المستخدمين في الكلية من الحصول على البيانات المطلوبة من قاعدة بيانات الوسائط المتعددة.

نتائج البحث، أثبتت أن البيانات الوسائط المتعددة متوفرة بدرجة كبيرة من الدقة، ولكن تبين من خلال التطبيق انه يمكن استرجاع المحاضرات التي تم تسجيل العرض والصورة معا . ولكن لا يمكن ان تعرض المحاضر الذي يقوم بأداء المحاضرة ، و التسجيلات الصوتية، و العرض معا.

1.1 Introduction

The continuous flow of information, lead to the invention of information technology; the computer, modern information systems and the remote sensing revolution; Which lead to the interaction between information and communication revolution. Among the institutions which appeared on the internet are the learning institutions which offer its services and to all instructors at any time, at any place.

E-learning includes all forms of electronically supported education and teaching. It is basically the computer and network-enabled transfer of skills and knowledge. E-learning applications and techniques include Web-based learning, computer-based learning, virtual education chances and digital collaboration.

Multimedia instruction will bring learners into a class where they can interact with the instructor and the topic. Multimedia instruction is more instinctive than old ways; instructor can imitate situations in actual life. In many circumstances instructors don't have to be there, learners will learn by themselves in the class. More significantly, instructors will have more approaches to animating students' passion of learning.

Video Conference (VC) is common to the masses and used in various applications of web based as well as E-Learning. In live (VC), the first step is recording and authoring of the lecture. Then, the second step is to store a large amount of multimedia data and to classify it by the appropriate multimedia database. The third step is to find the method to retrieve multimedia data relevant to queries.

The metadata of multimedia data are description of lecture contents like (Title of lecture, Name of teacher, Name of Subject, Date, and Time...etc). Users are nowadays widely familiar

with efficient text-based searches on the World Wide Web. However, when one wants to search multimedia collections through a text query, the missing relation between multimedia low-level features and human knowledge becomes a serious bottleneck.

On one hand, the system must mimic human perception and extract the relevant semantics from multimedia data. On the other hand, the system must be able to interpret the human request and rank documents according to their relevance.

The postgraduate studies in computer science & information technology was established in the University of Science and Technology in 2009. The college contains two departments, Computer Science and Information System. Each department has different programs, offering material programs to students such as using presentation power point, computer lab, and library and postgraduate studies.

This research explores the current state-of-the-art of retrieval techniques in multimedia database. Basically there are three major classifications of retrieval techniques for multimedia databases that are introduced in this research.

A multimedia database system is comprised of a multimedia database management system (MM-DBMS) that manages a multimedia database, which is a database containing multimedia data. There has been much interest in databases that store multimedia data, which comprises static media, like text and images, and dynamic or continuous media, like audio and video. Conventional database systems are designed for managing textual and numerical data. Storing and retrieving such data is often based on simple comparisons of text or numerical values. However, this method of storing and retrieval is not adequate for the multimedia data, since the digitized representation of these data types does not convey the reality of these media items.

In this research, the focus is on the challenges in multimedia data retrieve, present methods of how to achieve accuracy, and indicate how to obtain improvements of availability in the near future. The proposed method is to store multimedia objects in a relational database, which offers several advantages over file system storage, like secured back up, concurrent login, and faster retrieval.

This research that shows retrieval methods can retrieve multimedia data by using relational database system such as Mysql and the application of archiving multimedia streaming in delivering such data. The results show that this results in significant improvement in data retrieval availability and accuracy. This will have significant impact in numerous areas involving the applications of multimedia database such as e-learning.

Users are more familiar with entering text as queries rather than uploading query multimedia. The first challenge of content-based video search is how to automatically generate appropriate query videos or audios related to the text queries.

1.2 Problem Statement and Research

For retrieval purposes, large amount of multimedia data are indexed before they are stored. This creates an increasing problem as search engines collect large amounts of multimedia data. While in text retrieval queries are expressed in the form of text, whereas in multimedia systems this is more difficult.

Demand for techniques that handle multimedia documents is increasing with the wide spread use of multimedia-dedicated applications. All these applications use manual annotations done by users and metadata provided by content owners to enable multimedia search. Thus, doing the entire process automatically, or even semi-automatically, can greatly decrease the search and the access costs of such applications.

This project explores the system of e-learning site to help students of postgraduate faculty of computer science & information system of "University of Science and Technology", since the users make a lot of effort and waste a plenty of time to reach multimedia data they need for the postgraduate studies in faculty of computer science & information system. In addition the research explores the lack of coordinator knowledge of material subjects, assessments and the number of hours needed and whether they are enough or not.

1.3 Research Objectives

In recent years advanced technology has increased the availability of multimedia information for computers. This trend leads to the merging of the need of computers and educational institutions for the purpose of efficiently handling multimedia information in computer applications. This capability is able to support many new multimedia applications, such as interactive television, video conference, and video-on-demand systems.

The postgraduate college of computer science & information Technology at "University of Science and Technology" wants to establish an e-learning site to permit all students to have access to the video or audio lectures and the course materials they need.

The main objective of this research is to develop the multimedia retrieval system for e-learning purposes; to retrieve multimedia data designed a large collection of education multimedia database.

The retrieval characteristics of multimedia data are very different from those of traditional data, and multimedia database has a significantly heavier demand on all components of computer systems. In particular, multimedia data requires high capacity, fast access time and high transfer rates from the storage and memory.

The performance of multimedia requests on multimedia database has not so far been studied in detail. A detailed analysis of retrieval methods has been provided to handle multimedia data, present a retrieval method (video or audio record, presentation text, and other materials) and multimedia objects on these multimedia databases. the evaluation is based on an approach of three retrieval experiments (only text retrieval, only video or audio retrieval, and text combined with video retrieval).

1.4 Importance of the Research

Students at the faculty face some problems like wasting time to have access to the department in search for lectures or any other material they need from the program courses; such as presentation of slides, audio, video lectures and so on. After observing the above mentioned problems in the postgraduate college the research proposes the establishment an e-learning site to guide postgraduate studies at the computer science students and help them to get access to the information they need.

1.5 Research Scope

The postgraduate faculty of computer science & information technology of "University of Science and Technology" wants to establish an e-learning site to guide postgraduate students.

1.6 Research Questions

- ✓ Do students who need to prepare their lectures usually find sources?
- ✓ The time needed to have access to material courses!
- ✓ Possible mistakes encountered after all the time spent!
- ✓ Does the coordinator know the number of hours for each subject?
- ✓ Whether the time is sufficient or not?

The observation of this process triggered the coordinator of postgraduate at the faculty of computer science & information system, who is part of the team carrying out this research, project to try to find a solution for this problem.

1.7 Research Methodology

1.6.1 Analysis

- Requirements.
- Current system.
- Problems of current system.

1.6.2 Implementation

- Design of server.
- Design of pages.
- Link of pages.
- Link pages with database.

1.8 Research Organization

The structure of the research is organized as follows. Chapter 2 discusses previous research, multimedia & media type, types of multimedia database, multimedia database management system, multimedia database content, and information retrieval, methods of retrieving multimedia data, multimedia information retrieval, metadata types and Dublin core metadata. Chapter 3 discusses research design and methodology, and implementation explains research problem and objective; system analysis of postgraduate of faculty of computer science and information system and describe the proposed framework in detail. Experimental results and conclusion are provided in chapter 4.