Review Article

IJCRR
Section: Healthcare
Sci. Journal
Impact Factor
4.016

LNW-A SYSTEM MODEL FOR A HIGH QUALITY EFFECTIVE E-LEARNING USING CLOUD ENVIRONS

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ABSTRACT

Higher education sector is dreadfully in need of quality teaching and learning by the provision of Information Technology (IT) services. A worthy teaching can perceptibly a superior ingredient for worthy learning. An effective resources should be made accessible in a centralized way for lifetime knowledge. At hand there is not a superior model for a centralized system where the resources can be accessed in a de-centralized (anywhere, anytime, any device) and automated way. The proposed approach articulates a centralized system model LNW for an effective learning platform in an automated approach by integrating Google cloud products, where the students can access the resources in a de-centralized manner.

Key Words: LNW(Lecture Notes Warehouse), LNSM (Lecture Notes Submission Model), LNVM (Lesson Notes Verification Model), ARCHIVES (Google Spread Sheets), Google Cloud SQL, Google App script, Google sites

INTRODUCTION

Cloud computing is commonly defined as "a model for user convenience, which contribute the computing resources(e.g. networks, storage, applications, servers, and services) on demand network access that can be rapidly implemented with minimal management effort or service provider interference" as enlightened by US National Institute of Standards and Technology (NIST). Good quality of service(Qos) level for the remote application can be achieved by cloud technology which effectively supports the use of large scale internet services. Cloud computing has many technologies such as Saas i.e. "Software as a Service", Paas i.e. "Platform as a Service", IaaS i.e. Infrastructure as a Service" which focuses on sharing data and computations over a scalable network of nodes [5].

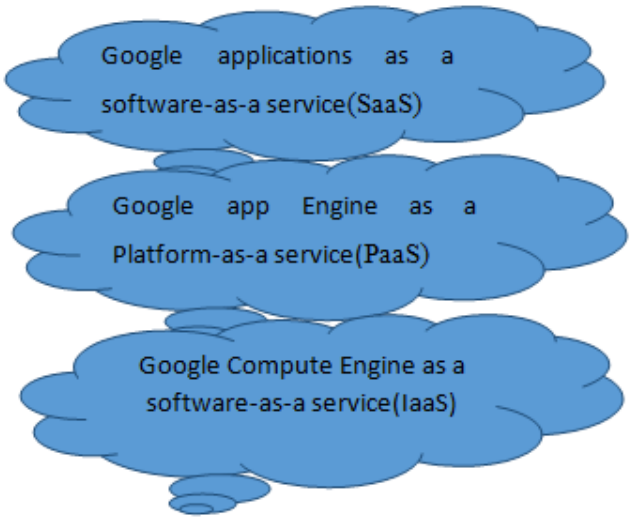

Figure 1: Cloud Service Framework

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Received: 05.10.2015 **Revised:** 02.11.2015 **Accepted:** 26.11.2015

SURVEY ON ATTITUDE TOWARDS INFORMATION SHARING

The academic institutions have various departments based on the stream where it's encompassing both odd and even semesters. Earlier the teaching was confined to the physical domain of the student, teacher and the institute [1]. Mostly, it leads to excess consumption of papers in preparing the lecture notes for the similar courses for each successive year. Also, there is not a centralized approach in order to access the lesson plan documents in a federal way. "Continuing education as a lifelong learning is primary perspective of both the job workforces and technical workforces in the entire future development of the country [2]. Sheng-cheng Lin put forward the concern of collaborative course plan development via team based knowledge sharing and creating is categorized at three levels –individuals, groups and organizational levels. Self-efficacy of using IT in teaching and professional network enlargement are the two major concepts for every academician[6]. Overall teachers overall regularity to use the internet(#10=3.5) was higher than the median value(=3.0)(t=5.4,df=205,p<0.01)[7]. Pierre Gorissen presented an online recording of lectures to afford students with any time-any place access. Recorded lectures were the replacement of missed lectures for learning purpose and to prepare for the examinations. Their results proved that there is a larger proportion of the students report shows that they watch (75-100%) of the recorded videos. Hence forth web/online lectures, recorded lectures apparently need a big platform to make the server sustainable for an organisation [8]. Similarly, the proposed approach has implemented a course content system in a cloud platform which significantly offers any time, any device, anywhere accessibility by the student community. Through centralized policy, course contents can be viewed and accessed by the students for their references at any time provided with their right to use privileges set by the educational institution. It will be extremely productive for faculty and student community in a very efficient way. With Google apis, the course contents are maintained, processed and retrieved efficaciously. A Google cloud application has been developed for the course plan maintenance and retrieval purposes.

EXISTING SYSTEM

In India, the higher educational institutions are not balancing with their counterparts in the advanced world. The survey shows that more than 50% of the developing nations are following the conventional method for managing the information system. Due to lack of infrastructure, the information is being stored in the standalone computers and different department systems [3]. It's disappointing that though the nation has well-qualified educators and state-of the-art lavatories. Studies have shown that this could be largely attributed to the absence of information to the managers of education in India. Core curriculum, Tutoring and Valuation are the chief support component in Education Developmental Transformation (EDT) [4]. Also, universities and colleges are huge consumers of paper. Because of every official auditing like NBA, ISO, NAAC, AICTE etc. pertaining to each semesters, educational institutions are consuming huge volume of papers. In tune with the world-wide organizations aiming to reduce their environmental foot way, academic institution in India must stick on to paperless management systems. Entire universities and college should take a responsibility in commencing this for the development in the future. The 20th century is a digital book yet most of the educational institutions spend lots of money on paper and for storing the records of the same. This literally translates that most of the details are still recorded and stored in paper. Places for storing such documents has become vast trash which is practically impossible to refer and manage. Besides the environmental damage by factors such as vehicles, constructions etc., papers contribute to some extent. Some institutions query their database (store list of available documents) to check the existence of physical records only. On day to day basis more industries are moving towards digital data. Still most of the educational institutions are relying on paper records only. There is a major chance for damage when paper records are used and more time is invested for the incompetence. Hence forth, backups of papers are environmentally and economically imprudent. For deploying most of the applications in educational institution require dedicated hardware and software. Allocated dedicated hardware and software has to be maintained till the application is in use. Systems deployed this way require fixed LAN environment. This results in increased investment for deploying software besides costs of application development [9].

PROPOSED SYSTEM

SYSTEM SPECIFICATION

The initial step for any developer is to gather the information for the specific application and analyse its storage capability. Google drive is a storage source which has been introduced by Google for all the Gmail account holders where any type of files such as pdf file, images, excel sheets, media files, email inbox, document can be stored up to 15 GB of memory limit. The account holders have to pay for Google in case the storage is exceeding the free limit according to the assortment of purchase plans. The various Google products are Google document, Google Spreadsheet, Google app script, Google calendar, Google drawing, Google sites etc. In order to access all these products, the Gmail user should click on the gear icon for drive.google.com

The programming language which is implemented for the proposed model is Google app Script. Google app script is similar to java script which provides a platform for the developers to integrate all the google products effortlessly in terms of code. The script editor tool is available and the code can be directly debugged and executed without installing the same or additional software's. The only requirement for the developers is internet with a valid Gmail account.

With respect to Google products,

Google cloud SQL, a remote database where the instance can be purchased from the Google by the developer for storing the Big data (course content). It makes the developer to easily move the data to the application using Google app script. The database connection is implemented in the script in order to retrieve the tuples from remote database. The norms and procedures should be followed with respect to their patent. In a single instance, many databases and tables can be created with in. The packages available for the purchase plans includes RAM, Included storage, Max storage, Included I/O per day, Charge per day and maximum concurrent connections.Google spreadsheets are used for the centralized view for both the academician and students fraternity by anytime, anywhere through any device. The system will update every 24 hours and it reflects in the archive sheet (Google spreadsheet). Hence forth, the complete access by the end users is directly from the Google spreadsheet rather than accessing from Google database. Google sites service is used for hosting the web application like a web site. Google site service operations are similar to IIS (Internet Information Services).

The proposed system has implemented three models such as course content submission system, Course content pattern verification and Technical verification to validate the course content for each and every courses.

DESIGN OF USER INTERFACE

Submission section and technical verification section are designed for user interface. Pages are designed for the above mentioned sections respectively. According to the user identity, respective pages are rendered. The user identity is their Google account ID. For submission section, submission page is rendered and displayed on the browser. The user can upload the document URL that is obtained from Google drive. The uploaded document is validated against the following constraints. 1) The size of the document should not exceed 2 MB (developer-defined). 2) The user is restricted to the number of documents defined by developer for each module. 3) The uploaded document should be in the prescribed pattern (user can download the pattern guideline to be followed from the home page of the website). 4) Only pdf files are allowed. First level verification is pattern verification. It is carried out by system internally. If the document satisfies the above guidelines, system will notify the user that the document is sent for next level verification by technical verifier. Technical verification section is displayed for technical verifier. This section lists the pending documents for verification.

PROPOSED ARCHITECTURE

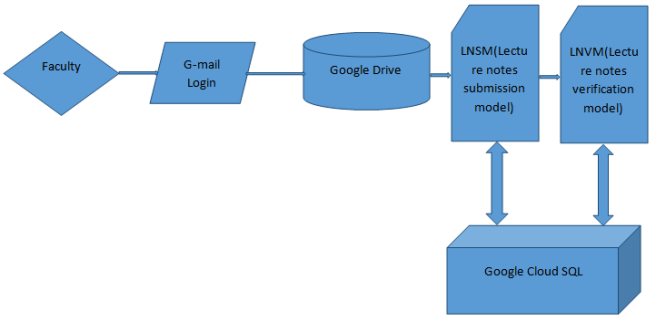

Figure 2: A Collaborative LNW Architecture Model

IMPLEMENTATION

The foremost modules in this architecture are LNSM (Lecture notes submission model), LNVM(Lecture notes verification model), Database (Google cloud SQL) and archives.

The LNSM is designed to submit the course content by the faculty members according to the course content pattern. In this system model, verification process has to be done for the submitted documents. Once the document is uploaded in the Google drive by the faculty, the corresponding person should assign the access rights to the developer email id by sharing it. The respective URL of the document will be stored as an index in the database. Lecture notes have to be verified by the format verifier as well as technical verifier and then the document will be kept as a centralized view for access using Google Spreadsheet.

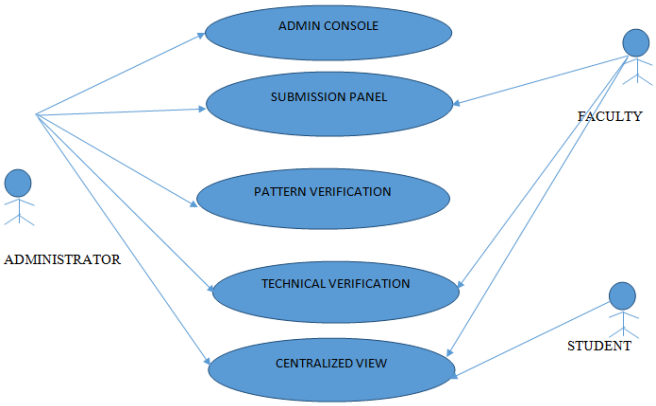

Figure 3: LNW Use Case Model

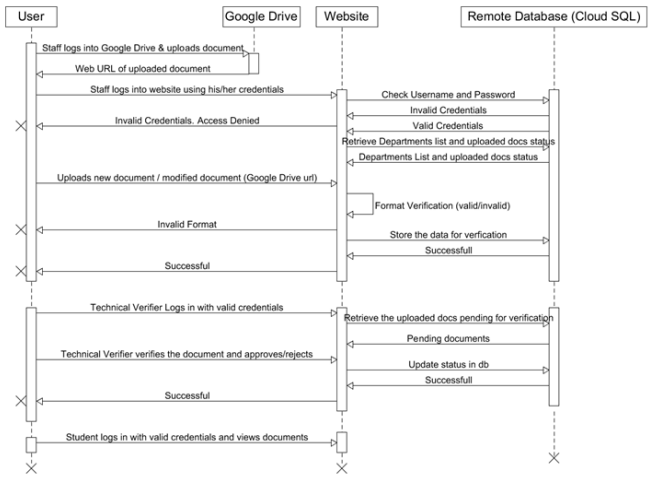

Figure 4: LNW Sequence Diagram

MECHANISM OF LNW MODEL

Faculties' logs into google drive using their respective google account. In google drive, they will upload the document prepared by them as per the given template. Upon uploading the document, unique web URL for the document is returned. Faculty copies the URL and logs into website using their google account. Access to the website is provided to all faculties' using their google account username. If access is not granted, the faculty should get in touch with the website development team for access. Once the faculty logins to the website using their google account, authentication initiated. Post authentication (google account is verified by google not by website) authorization for website is initiated.

The website performs authorization check for the entered google account. If the access is granted to the faculty, then the website lists all the departments. Faculty choses their corresponding department. Upon selecting the department, the faculty is navigated to a webpage to enter documents (Uploaded in google drive) web URL. Upon clicking on save, the document is verified by the system for allowed pattern. This is called as Pattern Verification. Pattern verification is performed by the system. If the pattern is not valid, the user is asked to upload valid document (Upload modified document in Google Drive and re-submit the URL). If the pattern is valid, the data is saved in database for second level verification by Technical Verifier. The user is notified as "The document is submitted for second level verification by Technical Verifier".

The technical verifier logs into the website using his/her google account. Post authentication, authorization is checked. Once authorized, the technical verifier is presented with the list of documents pending for second level verification. The technical verifier downloads the document and verifies is manually. If document is valid, the technical verifier accepts the document which will be reflected in the database as valid document. Faculty is notified of the status as well. If the document is not valid, the technical verifier enter his/her comment and rejects it for re-submission. Rejected documents will be verified by the corresponding faculties'. Post verification from their end, the documents are re-submitted. All the approved documents are listed when a student/faculty logs into the website using his/her google account. Students/Faculty can view and download the documents.

ADVANTAGES:

The proposed system overcomes lots of drawbacks compared to traditional system like physical space required to store, maintain and preserve the documents. All the data is stored digitally in centralized database which results in easier and faster access anytime anywhere any device. Server maintenance and load sharing mechanisms are taken care by Google server. Application can serve 1000s of requests seamlessly without any crashes. The system is fault tolerant and can serve requests 24x7. Mirroring technology drawbacks such as increased memory usage and application crash are overcome by Google server using various algorithms and compression techniques. Traditional system results in redundancy of efforts when data is lost. The proposed system prevents data loss. It also saves lots of paper which contributes to healthy ecosystem.

CONCLUSIONS AND FUTURE WORK:

Cloud computing is still evolving and attracting the attention of developers/researches from various fields. This article explains how the application integrated the Google products. Thus the high energy efficiency is obtained in the cloud. Agents/Applications are not installed on end user machine for accessing the application. The application is provided as website which can be accessed anytime anywhere any device. The proposed system digitalizes the data for current use as well as future use. The proposed system is not restricted to course content only. The future work of the paper aims to extend this system to implement certificates management system, alumni details maintenance, mapping programme and course outcomes for auditing purposes, attendance maintenance system and so on.

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