

An Academic Live Streaming Multimedia for Video and Audio Workshop

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Abstract – This work creates unlimited privileges for academic users to access videos and audio contents for educational, entertainment, advertisement and other purposes. It allows users to become fully absorbed in its multimedia content by utilizing a variety of multimedia elements such as audio and video elements and its technologies. It creates a support for user reaction, it also provides statistical support to track the period when users listened to an audio or video content. It also provides a functionality for representing speech from audio or video content in text.

Keywords – Video portal, Audio portal, Multimedia, Archives, audio or video.

PART A

I. INTRODUCTION

Familiarly, academic archives network created of audio and video gateway encompasses all aspect and processes involved in uploading, streaming, downloading, embedding, promoting and sharing information contents with the inclusion of a user reaction system and such information are basically contained in the audio or video content. For a while, audio or video content providing website have become a very important branch of educational, entertainment and business services.

Web audio and video portal give users a complete amazing experience for whatever purpose it is used for. Some

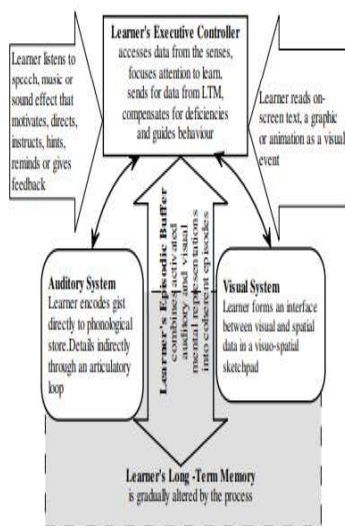
of the problems include: Limitations for Impaired individual, Inadequate Business Promotion, Limited audio and video content providing services and so on. This paper looks at the aim and objectives of developing a better online audio and video content providing service that will provide academic users an easy and accessible audio and video materials through downloading and streaming, also provide a more efficient uploading system to support both multimedia files of different archives, as well provide a user reaction system for feedback forum to contents; provide statistical analysis for users to track events on each audio and video contents; provide an easy search mechanism and synchronization and generate playlist automatically. Significantly, this work relates majorly in education by providing solution that will

allow students and scholars to learn from audios and videos. It can as well be used for e-learning and can improve knowledge transfer. Studies has shown that lyrics improves assimilation in children [1] and also, lyrics synchronization makes it easier for users to better assimilate, multimedia sound and when combined can help students to focus their attention on important visual events[2].

PART B

II. THEORETICAL BACKGROUND

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The structure and process of learning from multimedia according to the attentional control definition of multimedia learning.

Figure 2 Adapted from [2]

Figure 2 shows the structure and process of learning from multimedia according to the attentional control definition of multimedia learning. Web based audio and video portal alludes to a store for sound and video documents. In any case, what is the need of an archive if whatever is put away can't be recovered? Therefore, in this manner, the Web based audio and video portal gives streaming, downloading and sharing as strategies for recovering the media content. The work showcases on the web, virtual condition or organized condition in which clients store sound and video content for various uses and learning making it a dynamic spot.

III. LITERATURE REVIEW

In [3] users were once happy with content and still pictures on their pages. They needed to see video and hear sound and they need it quick. Clients also need quality to be in the same class as what they see on their TV. Technological progression has made arrangement of sound and video content simpler and speedier. The 4G innovation guarantees

speedier information rates opening up roads for application that necessities high data, for example, media streaming.

[4] Media content, for example, video and sound could be played on Adobe Player – a Flash Player. Yet, with the creation of HTML5 video and sound tags, it made video and sound insertion into the web simpler.

The work in [5] shows that Flash has been around for over 20 years. Amid the majority of that time, it has been the predominant stage for video and most other media on the web. Adobe expressed in 2013 that in excess of 400 million out of more than 1 billion connected desktop refresh to the new form of Flash player inside a month and a half of discharge.

According to [6] Flash player progressed toward becoming condemned because of its execution, utilization of battery on cell phones, the quantity of vulnerabilities that was found in the product and its shut stage nature.

In [7] Adobe pronounced that it would end bolster for Flash player in 2020, and kept on empowering the utilization of open HTML5 norms instead of Flash [8][9]. The declaration was composed with Apple [10], Facebook [11], Google [12], Microsoft [13] and Mozilla [14].

From [15] Google reported an arrangement to eliminate Adobe Flash in 2015, this move was a savvy advance for the online video and sound industry. Chrome 53, which Google discharged in September 2016, blocked Flash backend processes and other foundation forms. In Chrome 54, google revised the YouTube support to utilize HTML5 as a matter of course. Chrome 55 form default to the HTML5 video and sound player on all sites for all content. Different programs have since gone with the same pattern. A few programs still give snap to actuate Flash content.

Additionally, video/sound on request benefits requires streaming recordings/sound. Yet, these media report must have an area that the server can get to – consequently an archive/repository. The word archive/repository alludes to a place where or container in which things are or might be put away or offered available to be purchased. Online archive/repository includes storing on the web. GitHub offers plan for both private stores and free contents [16] which are normally used to have open source programming ventures.

Given by [17], as of April 2017, GitHub reports having very nearly 20 million clients and 57 million repositories [18] making it the biggest host of source code on the planet. Sites, for example, YouTube, Facebook and Twitter are not really repositories but rather they get to online archives for their bolstered video and sound contents. These video and sound

content must be stored before they can be recovered consequently permitting this venture offer repository services for both sound and video records.

GitHub provides an editor that shows archived source codes. YouTube provides streaming of archived video documents – this suggests stored records must be recovered. The fact that sound and video documents are included, one needs to fall back on streaming services. Video/Audio streaming includes the media record separated into number of fragments and after that transmitted into client. While transmitting the video in server, client side can consequently create the buffer for storing the partitioned fragment. If one buffer is full, the media can begin to play and naturally create buffer for storing outstanding sections. Streaming as an innovative practice was impractical until the point when information could be packed and decompressed to enable viewers to buffer.

Video data are normally encoded as frames to be shown at fixed frequencies. As video/sound data touches base at the client side, data is set into a buffer to be decoded and shown on the screen at the correct time. As the media data arrives at the client side from the server, data put into the client buffer at the fill rate at that point hauled out the drain rate and decoded and displayed [3].

With the HTML5 video and sound tags, the streaming of sound/video turned out to be to a great degree simple. In any case, recently, there has been a developing number of versatile clients requiring continuous sound/video steaming while they are moving. These clients travel through heterogeneous networks i.e. a remote gadget could disconnect from one network and reconnects to a network sooner or later. These heterogeneous networks have a few issues, since when the clients are disengaged the video/sound quits transmitting. Accordingly, this undertaking proposes Adaptive streaming to tackle such issue.

In Adaptive streaming, the wandering through these heterogeneous networks is alluded to as handoff and when these networks have diverse qualities it is alluded to as vertical handoff. To encourage streaming while the client meanders through various networks, the content must be adjusted to keep up the streaming respectable to the clients [4]. The adjustment procedure must be fit for keeping up the streaming content's quality to guarantee that the handoff appears as consistent as conceivable to the client.

Adaptation is a procedure which bundles the content being streamed according to the present eco-framework attributes. Here the eco-framework comprises of the end-client gadget, network attributes, content asked for streaming

and the intermediary nodes such as proxy. Diverse blends of these entities would influence the QOE (Quality of Experience) of the client. The end client's gadget screen measure, computational limit, battery control, accessible data transmission, loss because of remote networks, all assumes an essential part in choosing the last form of the content gotten by the client. The combination of all these activities assume an imperative part in the QOE of the client.

In [19], Streaming is arranged into three in view of geology. (1) Translational streaming, which needs to do with streaming of foreign content, (2) National streaming which places streaming organizations inside a limits of the country, (3) Diasporic streaming which incorporates streaming organizations of a solitary specialty or diasporic arrange.

By the work in [20], Web based audio and video content syndication can be considered as a complimentary instrument to entertainment, advertisement, e-learning and so forth and as such needs a feedback platform. This feedback platform makes Web based sound and video portal an online networking website. Online networking is a term that alludes to various electronic application through which clients associate with each other. Web-based social networking illustrations incorporate blog and professional networking sites. Client response systems are utilized, for example, commenting, likes or dislikes and sharing on any video/sound content.

PART C

System Analysis and Design can be defined as the way towards examining a system, recognizing issues related with a current system and utilizing the data accumulated to prescribe changes to the system.

This work would adopt observation as a fact finding technique. Here, studies would be done on the flow of media files, application of existing system and interacting with users. Observation methods are used because of the user's point of view.

The system methodology adopted for this system is the Object Oriented Analysis and Design Methodology (OOADM). An object contains encapsulated data procedures grouped together to represent an entity. Object Oriented Analysis and Design is a discipline of defining the objects and their interactions to solve a problem that was identified and documented during object-oriented analysis.

IV. ANALYSIS OF EXISTING SYSTEM

In Nigeria today, there are a lot of Media Websites. Most of these websites support only audio or video, and the ones

that supports both audio and video are very few. Most of these media websites provides direct links to copyrighted content which creates room for pirated content. They also get their videos from external websites using iframes which do not provide all functionalities such as saving an offline copy, media sessions etc. Also, a few existing system implements Progressive Web Application Technologies. Popular system such as YouTube only supports video contents, SoundCloud supports only audio content. However, experiences in taking an educational course on YouTube are not as real compared to when you take educational courses on an educational media platform. These problems resulted to the need for a new system where the academic users can navigate through unlimited audio or video content for diverse reasons.

V. ANALYSIS OF THE PROPOSED SYSTEM

Due to the underlying problem associated with the existing system, this paper uses web innovations and designs described below:

Requirement Analysis

This is a list describing what our proposed system can do in terms of:

- Input into the system
- Output from the system
- Storage of Data
- Processing of Data

The requirement document can be stated as follows:

- 1) Displays a homepage with audio and video links, also displays login and registration and uploading functionalities.
- 2) When registered, the user is authenticated and directed to the homepage
- 3) In the homepage, the user stream audio or video contents available and can upload any video or audio files he/she wants to store.
- 4) The user can save content for offline cases.
- 5) When logged out, the user is directed to the login page.

Use Case Diagram

This is a behavioral diagram in UML. A use case diagram is used to show the various services a computer-based system can render to end user(s).

In a use case diagram, we identify the following:

- The external entities of the system.
- The various services the system renders to the end users.

The use case diagram for web based audio and video portal is as follows in figure 2:

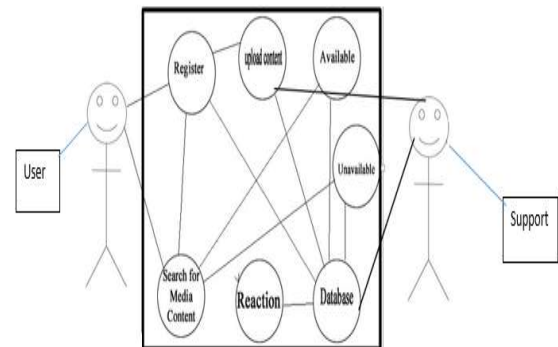


Figure 2: use case diagram of the system

Design of Proposed System

This system will achieve the following

- Uploading of audio or video contents
- Adaptive Streaming Support
- Playlist generation
- Progressive Web App implementation
- Downloading of content

Database Design

Database design is the process of producing a detailed data model of database. This data model contains all the need logical and physical design choices and physical storage parameters needed to generate a design in a data definition language, which can then be used to create a database. Table 1 to table shows the database table of the paper.

Table 1: "user" table

Name	Type	Attributes	Null	Default	Extra	Action
Id	Int		NO	"NA"	AUTO_INCREMENT	Primary Key
user_id	varchar(10)		NO	"NA"		
Email	varchar(100)		NO	"NA"		
Password	varchar(20)		NO	"NA"		
registration_date	Timestamp		NO	"NA"		
Authenticate	enum("0","1")		NO	"NA"		
user_folder	Text		YES	"NA"		

Table 2: "media" table

Name	Type	Attributes	Null	Default	Extra	Action
Id	Int		NO	"NA"	AUTO_INCREMENT	Primary Key
user_id	Int		NO	"NA"		
file_type	enum("video","audio")		NO	"NA"		
Folder	Text		NO	"NA"		
Artwork	Text		NO	"NA"		
Genre	varchar(30)		NO	"NA"		
album_id	Int		YES	"NA"		

Table 3: "Reaction" table

Name	Type	Attributes	Null	Default	Extra	Action
Id	Int		NO	"NA"	AUTO_INCREMENT	Primary Key
user_id	Int		NO	"NA"		
Comment	Text		NO	"NA"		
Like	enum("yes","no")		NO	"NA"		
Dislike	enum("yes","no")		NO	"NA"		
media_id	Int		NO	"NA"		

Table 4: "Playlist" table

Name	Type	Attributes	Null	Default	Extra	Action
Id	Int		NO	"NA"	AUTO_INCREMENT	Primary Key
user_id	Int		NO	"NA"		
playlist_name	varchar(100)		NO	"NA"		
media_id	Int		NO	"NA"		

Table 5: "Album" table

Name	Type	Attributes	Null	Default	Extra	Action
Id	Int		NO	"NA"	AUTO_INCREMENT	Primary Key
user_id	Int		NO	"NA"		
media_id	Int		NO	"NA"		
album_title	varchar(200)		NO	"NA"		
album_cover	Text		NO	"NA"		
date_created	Timestamp		NO	"NA"		

Table Relationships Diagram

Figure 3, the system to be produced is made up of the interactions of the above listed tables. The diagram below shows the relationship between them:

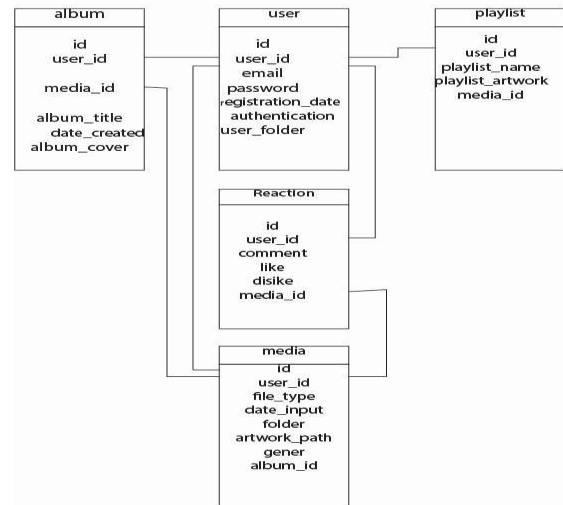


Figure 3: Table Relationship Diagram

System Architecture

The architecture of the system design is 3-tier. The tiers are presentation tier, middle tier and data tier. The presentation tier is user interface and it is designed using EJS template engine. The middle tier is also called business logic. It is designed using Node.JS and it runs on the server. The data tier is the part of the system that is responsible for the storing of data i.e. the database, and the database management system used for developing this system in MySQL Database. See figure 4.

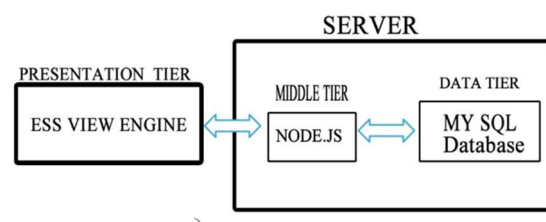


Figure 4: System Architecture

PART D

In System design we build the elements of a system such as the architecture, modules and components, the different interfaces of those components and the data that goes through

that system. This design work and implementation was carried out using JavaScript framework. The system is a web based platform designed research work for academic multimedia sharing. The admin support is responsible for uploading and approving new contents to the online store and the control every user activities.

Illustrated in figure 5 is the implementation Architecture.

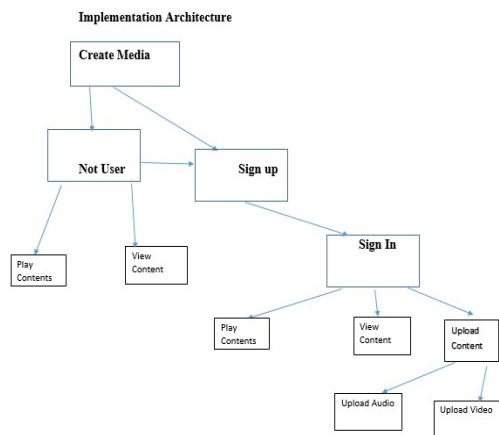


Figure 5 Implementation Architecture

The Design and Implementation Algorithm

- 1 Enter site
- 2 Register user
- 3 Login user
 - 3.1 View Video and Audio
 - 3.2 Stream contents
 - 3.3 Save session
- 4 Upload contents
 - 4.1 Contents include Audio and Video
- 5 Process contents
- 6 Continue input contents
- 7 Check data
 - 7.1 If correct data continue
 - Else view contents
- Exit
- End.

SYSTEM SEQUENCE ALGORITHM OF METADATA, USER, ONLINE SYSTEM AND DATABASE

```

User {
  wantsToFillForm = true
  session = null
  requestSite(data, onlineSystem, database, authorized) {
    return onlineSystem.getRequestData(authorized, session, data, database)
  }
  fillForm(data, onlineSystem, database) {

```

```

    session = onlineSystem.postFormData(data, database)
    return session
  }
  uploadMediaContent(authorized, onlineSystem, database, data) {
    onlineSystem.save(data, database, session)
  }
  getMediaContent(authorized, onlineSystem, database, data) {
    onlineSystem.getRequestData(authorized, session, data, database)
  }
  signOut() {
    session = null
  }
}

onlineSystem {
  getRequestData(authorized, session, data, database) {
    if (authorized) {
      x = database.return(data)
      return manageData(x, session)
    } else {
      x = database.return(data)
      return manageData(x, null)
    }
  }

  postFormData(data, database) {
    if (data in database) {
      return session
    } else {
      //add data to database
      return session
    }
  }

  save(data, database, session) {
    //store data in database using user generated session
  }

  manageData(result, session) {
    if (session != null) {
      //filter result based on user generated session
      result = edited_result
      return result
    } else {
      return result
    }
  }
}

```

Playing Audio contents

The screenshot shows the Chrome DevTools Network tab. The top panel displays a list of network requests, with the first one selected. The details panel on the right shows the response of the selected request, which is a video file. The list of requests includes various video and audio files, such as 'vid_1529900223938_mp4363_video.mp4' and 'vid_1529900223938_mp4360_audio.mp4'.

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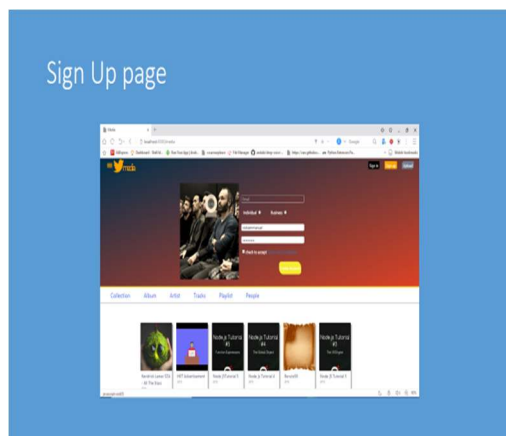


Figure 9. A screen shot of portal page for sign up

VII. CONCLUSION

This work was put together by the use of certain software tools like HTML which is a markup dialect utilized for planning the structure of a website page substance. The HTML is the base of a website page content. It enables information to be shown. The HTML components are the building pieces of HTML pages; the **CSS which is** Cascading Style Sheet is utilized to characterize styles for the site pages, including the plan, design and varieties in show for various gadgets and screen sizes; **BOOTSTRAP which** influences front-end to web improvement less demanding and speedier; PHP is an instinctive, server side scripting dialect. PHP is a famous dialect for making dynamic and intuitive website pages. It can be implanted into HTML and can likewise be utilized to compose HTML tags. PHP in this venture is of incredible significance as it is less demanding to use to recover data and show to HTML; Node.JS is an open source, cross-stage JavaScript run-time condition that executes JavaScript code server-side. Node.JS contains V8 engine which changes over JavaScript into low level codes which makes it workable for developers to compose JavaScript at the server side.

The V8 is a Google open source elite JavaScript engine written in C++ and utilized as a part of Google Chrome the open source program from Google to executes ECMA Script. **XML an** Extensible Markup Language, XML is utilized to store information and can be utilized with dialects, for example, PHP, JavaScript.

MySQL is an open source relational database management system (RDBMS) that keeps running as a server giving multi-client access to various databases. SQL is a database dialect used to embed, recover, erase and refresh put away information. This is accomplished by building a question that fits in with in constructed linguistic structure.

JavaScript is a cross-organize, dissent masterminded scripting lingo. Inside a host circumstance. The basic use of JavaScript is to make functions that are executed on the client-side-the browser and communicates with the document object model of the page.

Finally, the software development was generated to overcome the shortcoming of lack of academic multimedia repository. This system will simplify the process, ensuring that optimum attention is given to online allocation of archive resources and reduce the pains of searching all over the net for video contents. The application software developed can be adapted and customized in other institutions of learning to ease the burden of the resource sharing process.

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