

Link and Multimedia Archiving

¹Kim P. Miculob, ²Mellanie S. Gambe, ³Ryan E. Balisi
College of Computer Studies, St. Peter's College, Iligan City, Philippines

Abstract:- This research aims to establish a link and multimedia archive designed to assist students in their studies. The proposed system will streamline the process of archiving links and media, reducing the time spent sifting through a browser's history or other disorganized archiving systems. The primary focus of this study is on St. Peter's College students, intending to help them save time that can be better utilized for important tasks such as brainstorming for their school requirements. The Waterfall Model was employed in the development of this study. The Link and Multimedia Archiving systems are expected to significantly benefit both students and professionals, as they are designed to be user-friendly and aesthetically pleasing. Consequently, the Link and Multimedia Archive is now ready for implementation.

Keywords:- *Aesthetic, Desktop Application, Link and Multimedia Archiving, St. Peter's College, Waterfall Model.*

I. INTRODUCTION

Students encounter numerous assignments, projects, and reports that require extensive references from the Internet, particularly in the current era of online learning. Consequently, a well-organized storage system, allowing users to manage their references efficiently, becomes imperative to address this challenge.

The time invested in exploring the browsing history to identify websites visited by users is crucial. The vast amount of information absorbed by the Internet daily poses a recurring challenge for individuals. The constant evolution of search repositories compels users to preserve their links and media discoveries. However, some of these applications may be less user-friendly, leading to apprehension among users due to the complexities and adjustments required for understanding them. Consequently, many users disregard these applications and opt for a popular one known for efficiently saving media and links. Nevertheless, another issue arises with this renowned application, despite its user-friendly interface. While it effectively organizes multimedia by date, it lacks features for managing links, resulting in the recurring problem of time-consuming searches for saved links.

The ideal solution would be an application that addresses the concerns outlined in this document comprehensively, offering a one-stop solution. Such an application would prove particularly beneficial for students in their studies.

To tackle the aforementioned issues, the researcher will create a web link and multimedia application. This application will streamline the referencing process by efficiently managing saved references, ultimately minimizing the time users spend searching for relevant sources.

Archiving is the process of safely preserving unused data in any format for an extended period. This knowledge may or may not be used again, but it must be retained until the end of its designated retention period (Harris, 2021). Archiving is crucial because it prevents data loss, ensures that only authorized individuals have access to the correct records, and maintains organized and easily retrievable paperwork. This underscores the importance of archiving documents as a preventive measure against potential data loss. All documents are susceptible to loss, damage, or intentional or unintentional alteration, whether due to unforeseen circumstances or other factors.

The system is compatible with various operating systems, provided they support browsers such as Safari, Google Chrome, Microsoft Edge, and others. Minimal system specifications are required, as the system will be accessed through web browsers.

The researcher aims to enhance students' experiences in online classes by implementing a Radix Sort algorithm into the system. This algorithm will automatically sort all references and folders created by students, facilitating the efficient organization of gathered data.

The Theory of Acceptance and Use of Technology will be applied in the development of the system. These concepts will be used to examine participants' behaviors in accepting the system.

Additionally, this study provides students with a valuable strategy, as this research paper will serve as a reference for students who are also exploring the same idea as the researcher.

Furthermore, implementing and utilizing link and multimedia archiving will enhance students' time management for their activities, assignments, and reports in their classes. This system will reduce the time students spend searching for saved information.

Figures 1 and 2 below depict the Database Registration and Link, and Folder Database Frameworks. This framework illustrates the relationship between the system and its users. Users can access the system, and upon doing so, they have the option to create a folder or organize distinct data. Simultaneously, database manipulation occurs during the folder and data creation processes. The data is presented in descending order from the latest to the oldest, facilitated by a sorting algorithm.

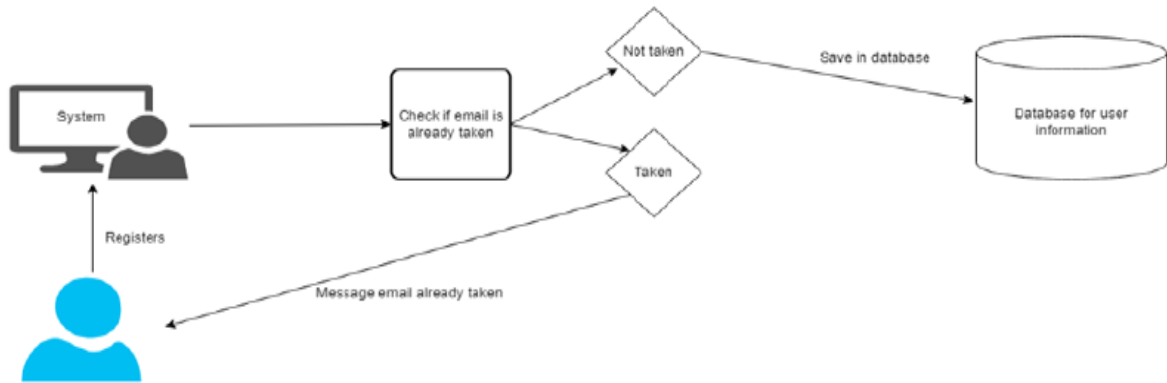


Fig. 1: Database Registration Framework

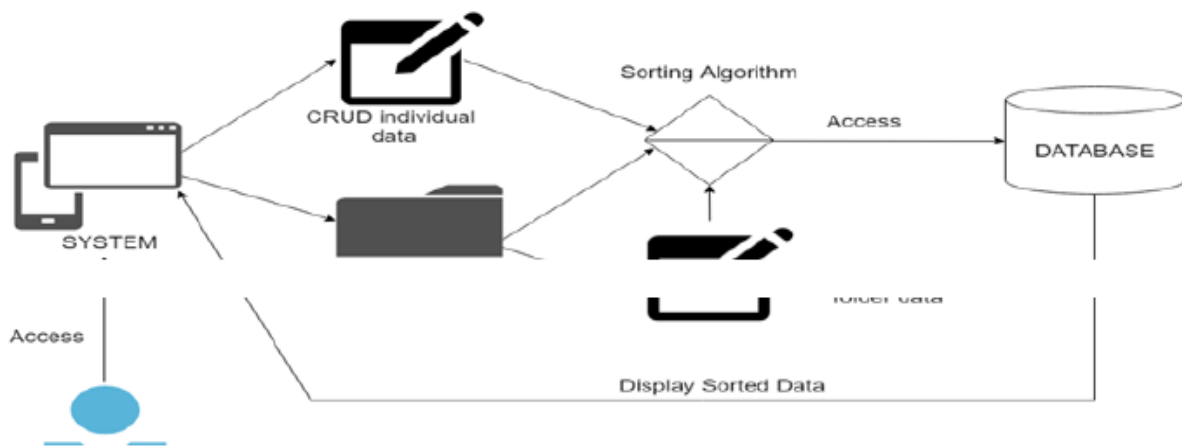


Fig. 2: Link and Folder Database Framework

II. LITERATURE REVIEW

Background information and theoretical basis for the study were provided in this section.

A. Web Archiving

With the fast-changing times, historical information required for enlightening the minds of future generations is also evolving, depending on its storage location and time. This variability gives rise to challenges in archiving.

A solution to the issue of digital preservation is web archiving, a complex process involving the collection and long-term conservation of web material. Web archivists strive to preserve not only the content but also the context and relationships between files. They aim to capture the dynamic and valuable elements of web pages, including active links, embedded media, and animations.

Hwang et al. (2020) stated that, due to the rapid expansion of web content, an online repository provides a standardized conceptual framework for the subsequent preservation of online materials. While it is challenging to discern the original, the authenticity of the material cannot be guaranteed. This system utilizes enhanced WARC fields and blockchain technology to store metadata ensuring the integrity of web content.

According to Kim et al. (2012), the significance of archiving has been evident for decades. With the rapid increase in the creation and dissemination of digitized data due to technological innovation, there is currently a widespread commitment to preserving electronic documents.

Additionally, Tokareva (2018) conducted a study on picture archiving in medical imaging. This study elucidates the design of a shared PACS server that manages large, high-quality healthcare images. The design takes into consideration the specifications of contemporary healthcare imaging equipment and adheres to global healthcare software imaging standards.

B. Sorting Algorithm

DEV MISHRA & GARG (2008) stated that radix sort is a stable, straightforward sorting algorithm. Also, it is a sorting algorithm that is an integer or whole number-based algorithm.

Radix Sort requires $O(d*(n+b))$ time, where b is the number base. For instance, the decimal equivalent of b is 10. According to "Mastering Algorithms with C," (199), d would be $O(\log(k))$ if k were the highest conceivable value.

Shaikh & Sasikumar (2017) say that the Radix Sort algorithm will begin by sorting up the more substantial number and then move on to the next most substantial number. Filter by the lowest substantial number first. It uses the Radix-Sort (A, d) pseudocode. Radix-Sort runs in (n) time for i=1 to d Stable-Sort (A) on digit I.

C. The Theory Used

According to MB. Alazzam (2015), the efforts or societal impact may be used to gauge how the technology (IT) is meant to be used. One's intention might influence the decision to embrace technology-enabling practices.

Additionally, Ahmad (2014) described it as a compilation of numerous studies on concepts and ideas of technology acceptance. The UTAUT is viewed as an experiment designed to standardize the nomenclature for parameters in different technology acceptance approaches and hypotheses.



Fig. 3: Waterfall Model (Sharma, n.d.)

The proposed system was developed using the Waterfall Model, shown in Figure 3. Also, Waterfall consists of six separate stages. Which are:

➤ Stage 1: Requirements

This was when information gathered from the observation was reviewed, and recommendations from the adviser, dean, and people with knowledge in creating the said system. Understanding the things that need to be developed, as well as their purpose and function, is the first step. It is critical to take a close look at the input and output (the finished result).

➤ Stage 2: System Design

In this stage, a system design is made after examining the necessary specifications from the first stage. Determining the components and system needs, along with the entire system design, is aided by this stage. The software code was being generated at this time.

➤ Stage 3: Implementation

With input from stage 2, the system is constructed as small programs known as units that are integrated into the next stage.

III. METHODOLOGY

The design and development of the suggested system were supported by the researchers' usage of the following approaches and strategies.

A. Research Site

In the academic year 2020-2021, the study was carried out at St. Peter's College (SPC) in Iligan City, Lanao del Norte, Philippines. The system's primary users were college students studying business administration, engineering, and computer studies. They were the participants in the survey conducted.

B. Research Design

The Waterfall Model is an application design technique for systems that enables system design and construction.

➤ Stage 4: Integration and Testing

Each part developed during the implementation stage is tested before being combined. The system must undergo continuous testing to look for flaws and defects issues. This stage is done to make sure they will have no problems in deploying the product.

➤ Stage 5: Deployment of System

This stage is where the system is done and ready to be used by the users.

➤ Stage 6: Maintenance

After deployment, this stage is executed for the user's satisfaction needs. This includes altering the system's configuration in order to increase efficiency. Such modifications are brought about by the customer-initiated change request or flaws found while the system is being used in real-world situations.

C. System Requirements

The system and software prerequisites for Link and Multimedia Archiving were described in this section.

➤ System Prerequisites

- *Desktop:*
- ✓ Windows 10 is a prominent Microsoft Windows operating system version that was made available on July 29, 2015. It is based on the kernel of Windows NT.
- ✓ Gigahertz (GHz) processors are commonly used to measure computer processing speeds. The gigahertz (GHz) is the standard measurement unit after personal computers eclipsed the 1,000 Mhz mark around 2000
- ✓ A gigabit (GB) or two gigabytes (GB) of RAM for 64-bit systems
- ✓ For 32-bit, 16GB of hard disk space OS and 32 GB for 64-bit
- ✓ The graphics hardware needs to support WDDM 1.0 and DirectX 9 or later. The majority of computing devices come equipped with a video card or display adapter called a graphics card that allows for the high-definition, colorful, and visually appealing presentation of graphical data. Another name for a graphics card is a graphics board, controller, accelerator card, or adapter for graphics.
- ✓ A regular super VGA resolution of 800 columns by 600 rows should be used for the display.

If the computer hardware supports Windows 10 and has enough space for another download, downloading and using the application will not cause problems. The problem arises then with how well the system or application is created.

➤ Software Prerequisites

- PHP and Python are popular programming languages for creating applications and websites.
- The combination of HTML, CSS, and JavaScript will help design the front end of the website.
- XAMPP-for server-side.
- MySQL for the database.

D. Tools and Techniques Used in the Study

This section presented the tools and techniques, including the Use Interaction Diagram, ER Diagram, Sequence, and Workflow Diagrams to picture the entire system.

➤ User Interaction Diagram

An externally perceivable capacity is depicted in a user interaction diagram. It must describe the manner in which the system works in detail.

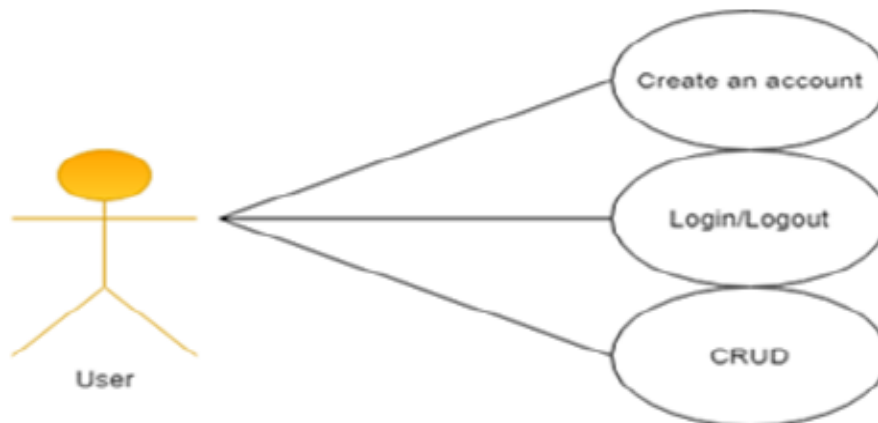


Fig. 4: User's Registration Use Case

As shown in Figure 4, a user interaction diagram explains the manner in which someone using that procedure or system will achieve a particular objective.

Here, in the user registration use case, the users can log in and out of the system after successfully registering users. The user needs a unique email address for the creation of an account. As soon as they finish creating an individual account, the users can log in/log out and have the power to create, read, update, and delete saved links and multimedia.

➤ Initial Step-By-Step Description

Before initiating this use case, the user has already connected to the Links and Multimedia Archiving Application sign-in and signup section.

- The user creates an account by clicking the signup button.
- After signing up, the user can log in to access and use the features inside the application. After accessing the application, the user can also log out.
- Users can now create a folder or section to save the links and media. The user then has full access if the user wants to read, view, update, and delete the saved links and media.

➤ ER Diagram

An entity-relationship model describes interrelated things of interest in a specific knowledge field. Different sorts of entities and their potential interactions are included in the original ER model.

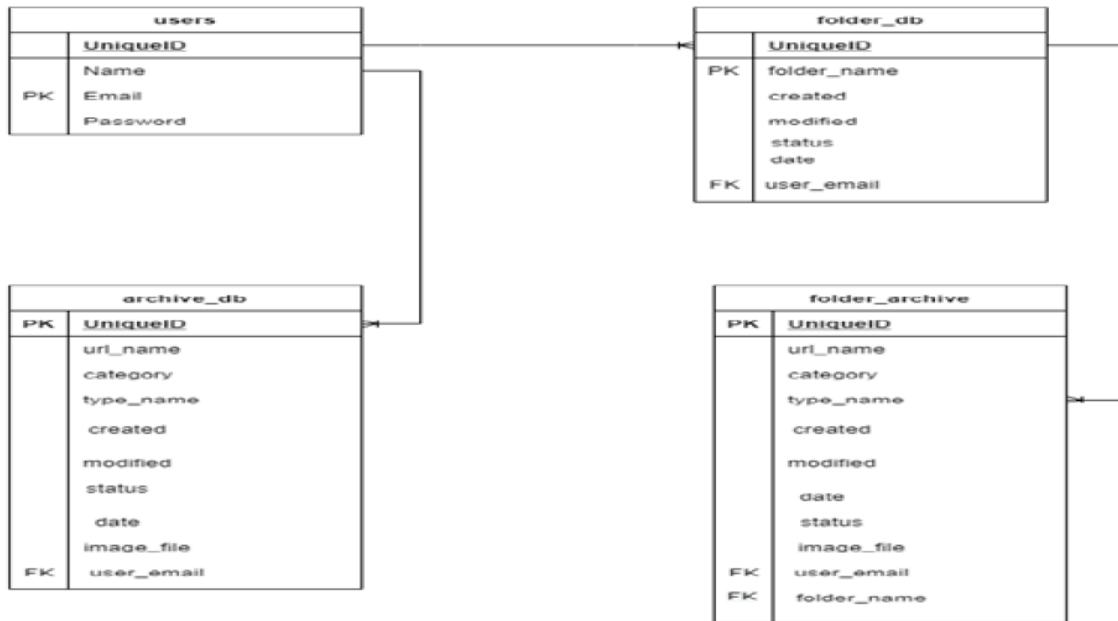


Fig. 5: Entity Relationship Diagram

Accordingly, Figure 5 shows that the system registers the users and makes their email the primary key to navigate through the various databases' tables quickly. The user can access the folder_db database, where the user can create a folder. Inside a particular folder name, another database table, folder_archive, stores the saved links and multimedia in the specific folder name for data organization. The users also have the authority to access the archive_db database table, where the users can save links and multimedia separately from the folders. The archive_db has its data organization by making the URL_name, category, and

type_name searchable. It also has a sorting algorithm that makes the latest added data appear on top by manipulating the created and modified rows in the table of archive_db, which is set to a data type of DateTime.

➤ *Sequence Diagram*

An ordered temporal series of object interactions is displayed in a sequence diagram. The objects involved in the scenario are shown, along with the communications that must take place for the system to function correctly.

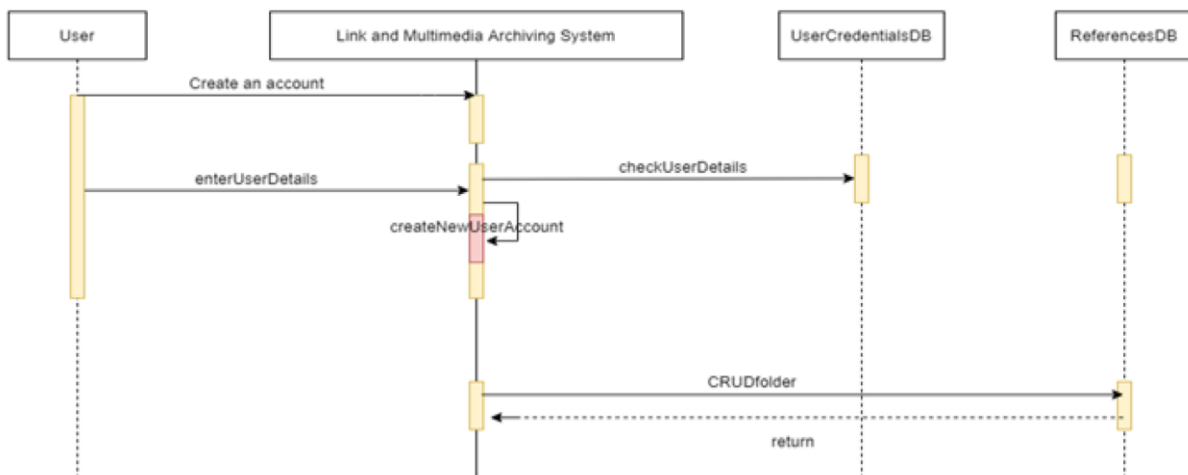


Fig. 6: Sequence Diagram

Figure 6 illustrates the user registration process. Initially, users must register their accounts to gain access to the system. Once an account is created, users can utilize the login and logout functions to access the Link and Multimedia Archiving systems. Upon logging in, users can

seamlessly interact with the system's database, enabling them to create, delete, and update their data.

➤ *Workflow Diagram*

These are visualizations of processes that support choice, iteration, and concurrency. They show various steps and procedures.

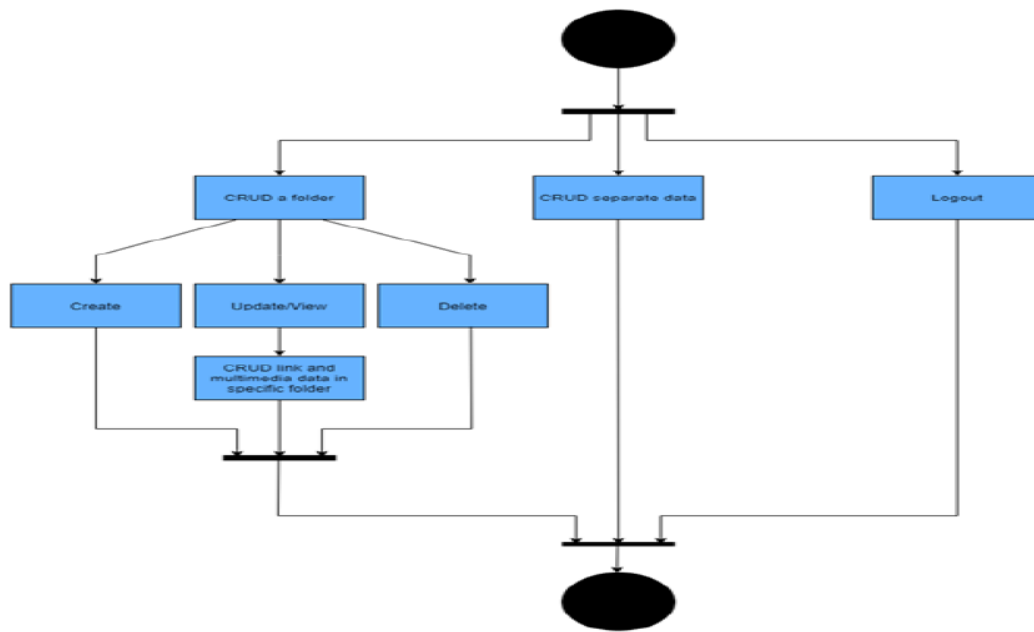


Fig. 7: Activity Diagram

Figure 7 indicates how the system works in the simple form of a diagram. First, users access the system, but before accessing the system, the user needs to register first. After successfully registering their accounts, the users can now access the system. The users can either add a separate record, create a folder, or log out of the system. Users can also add, update, or view the created folder and delete particular data items inside a specific folder name for data organization.

E. Sample and Sampling Method

Random sampling was used for a survey following UTUAT theory to gather information on the developed Link and Multimedia Archiving. In this case, 100 College students were considered: 57 from Computer Studies, 20

from Business Administration, and 23 from Engineering were considered participants.

IV. RESULTS AND DISCUSSION

The system assessment and layout results were presented in this part. This comprises the presentation, examinations, and justification of the information obtained from the surveys given to the respondents. This includes the tabular display of the data and the associated explanations.

A. End Product

Figure 8 below shows Registration where the user will create their account first by going to Sign Up and Clicking this button.

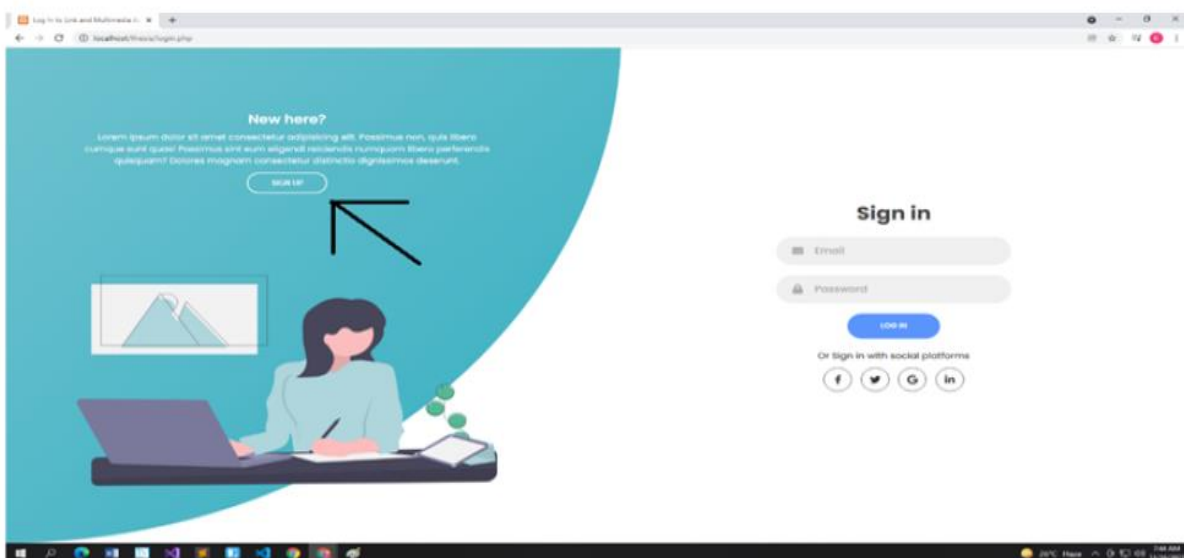


Fig. 8: Sign Up

This button will redirect the user to Sign Up to create an account, as shown in Figure 9.

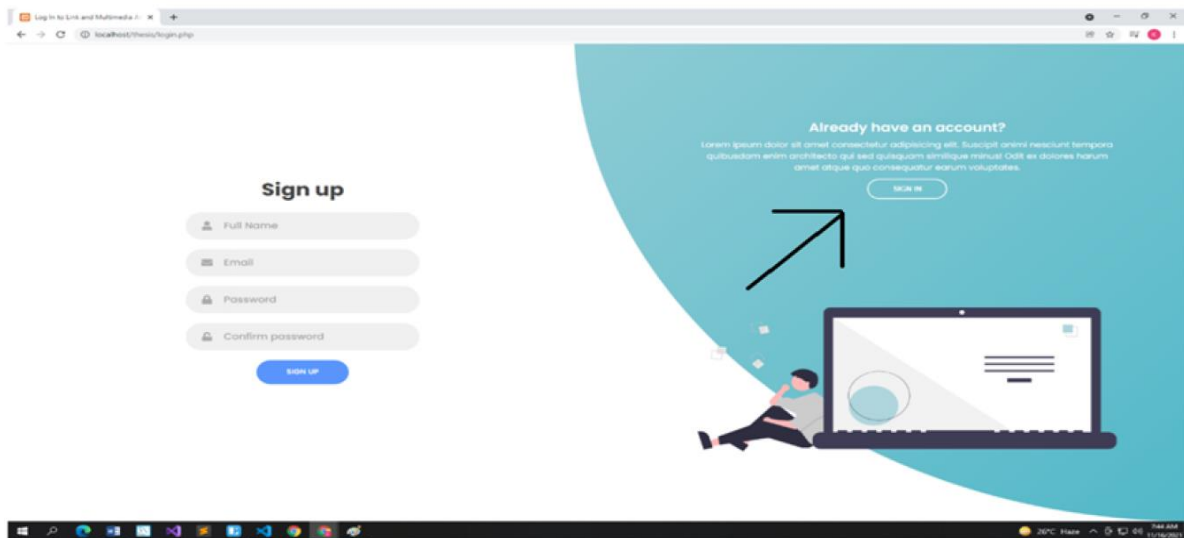


Fig. 9: Creating an Account

After creating an account, click this Sign In button pointed by an arrow in Figure 9, and it will redirect the user to where Sign In is located (Figure 8). There, the user needs to input the created email and password.

Once the user redirected to the dashboard where recently created folders and saved data are presented, navigate to Links/Media—the user can see it on the left

side below the dashboard and click Add Data (see figure 10) to add a new folder. It will display above/first on the list of saved data for proper data organization by dates. To edit data, click the orange icon in Action to edit data. The same goes for deleting data. Click the red icon in Action to delete the data created.

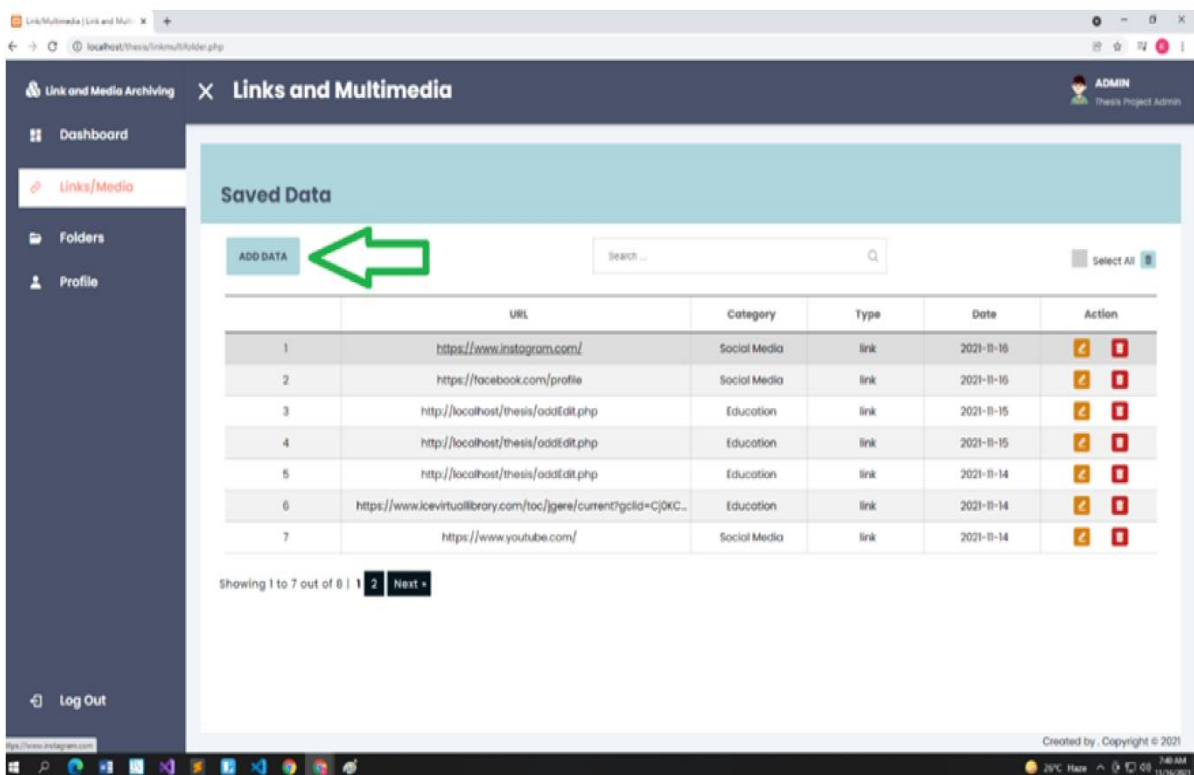


Fig. 10: How to add, edit, and delete data outside a folder

Navigate to the folder below Links/Media for a proper organization to create a folder. Click Create a folder to create a folder (see green arrow in Figure 11), and to edit,

delete, or view the folder, click the icons on Action, the same as the functions when adding data explained above.

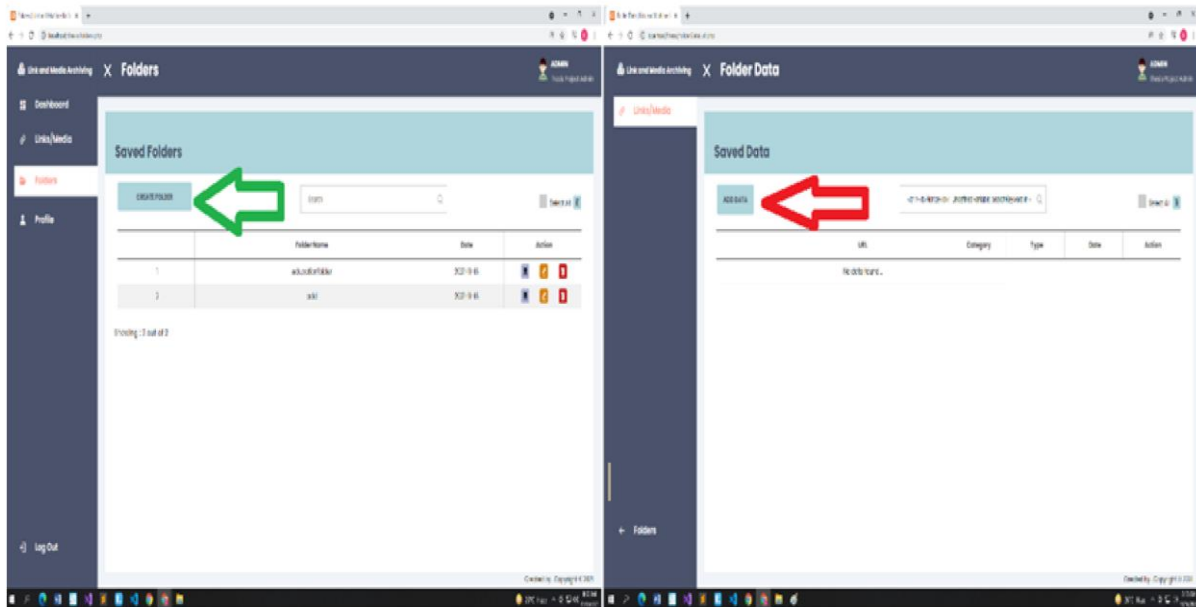


Fig. 11: Create, edit, and delete folder. Add, edit, and delete data inside the folder.

The figures below are the themes available in the Link and Multimedia Archiving systems. To select a theme, go to profile on the left side of the design below folders and

click the dropdown pointed by the red arrow (see Figure 12). Then select the theme the user wants.

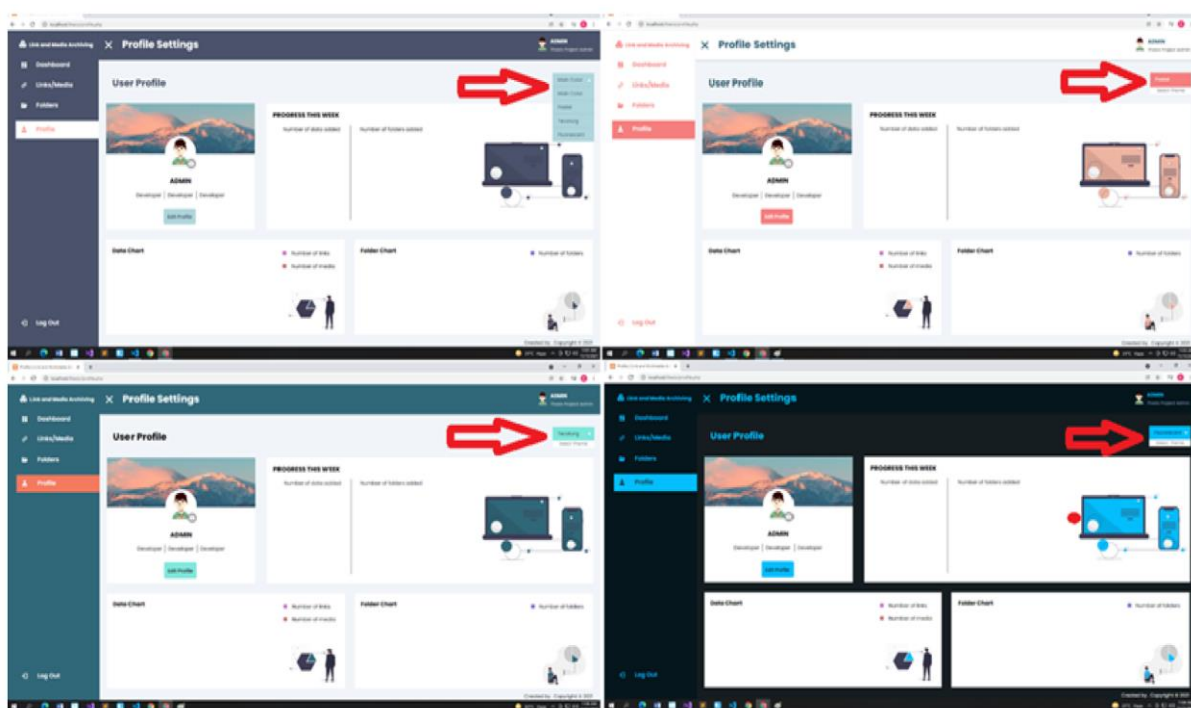


Fig. 12: Selecting a Theme

To log out, click the logout pointed by the red arrow in Figure 13, and it will redirect the user to Log In. From there, the user need to Log In again because the system has

the function of turning off the back arrow on browsers to add security to the data saved.

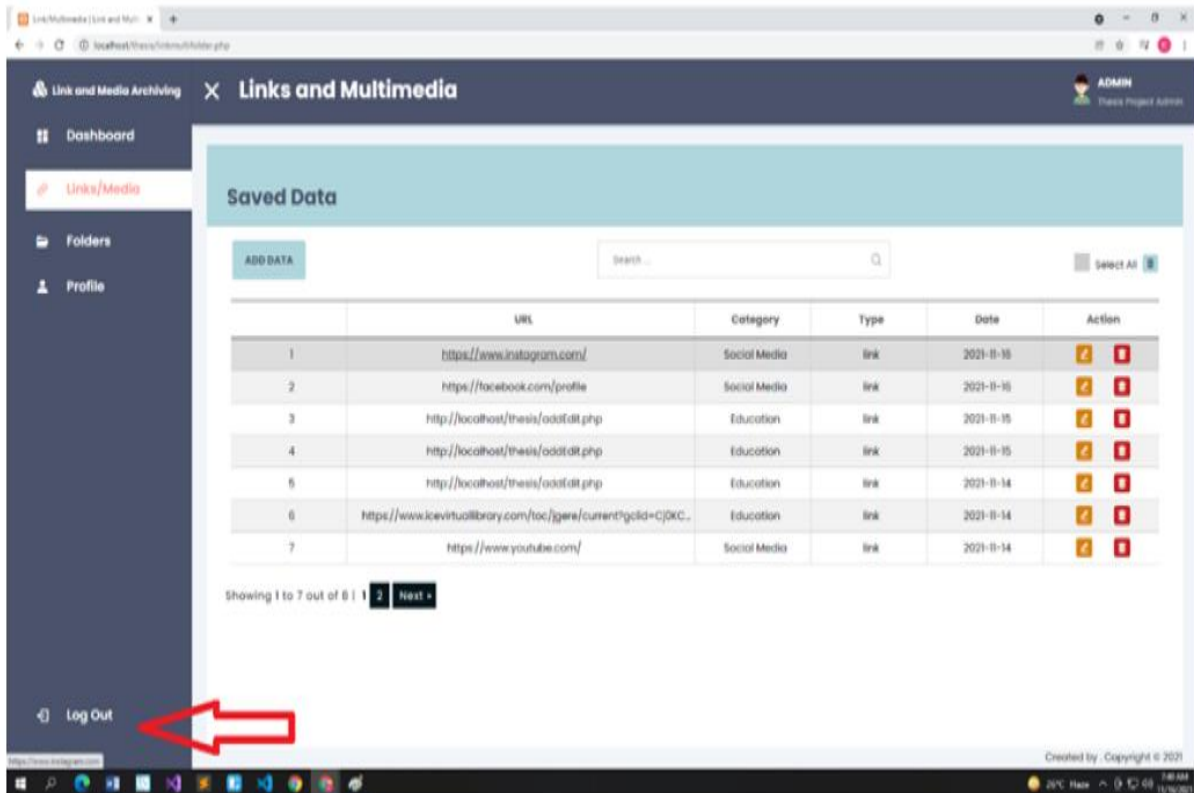


Fig. 13: How to Log Out

- **Objective 2:** Evaluating Link and Multimedia Archiving by the College of Computer Studies students will help assess whether users accept the system.

Table 1: Respondents' Demographic Data (N=10)

Character		Frequency	Percent
Gender	Male	57	57
	Female	43	43
Age	18-20	0	0
	21-25	93	93
	26-30	7	7
Educational Background	Computer Studies	57	57
	Business Administration	20	20
	Engineering	23	23

The table above shows the surveyed students' demographic data, including their gender, age, and educational background. With this, the authors will know

the references of students on applications based on these factors.

Table 2: Data for archiving system adoption using UTAUT indicators

Indicator	Mean	Std Deviation	N
pe1: I find archiving systems helpful to my studies	4.71	0.64	100
pe2: Archiving systems do not have that much impact on my studies	4.65	0.67	100
ee1: My experience in using archiving systems is good	4.63	0.66	100
ee2: Archiving systems are hard to understand and use	4.29	0.86	100
si1: If my friends told me to use a specific helpful application, I would try it	4.78	0.59	100
si2: My friends' suggestions about web applications or software are not that important to me	1.05	0.3	100
fc1: I do not have any idea where to find these archiving applications	1.95	0.41	100
fc2: I am a computer literate student, and finding applications that would help me is easy	4.27	0.87	100
bi1: I plan to use archiving systems shortly	4.39	0.85	100
bi2: I predict that I will use archiving procedures someday	4.71	0.64	100
use1: I use archiving applications for my studies	4.53	0.75	100
use2: I use archiving applications for my personal use	5	0.29	100

Table 2 is a set of questions given to the surveyed students for the authors to know how the students accept an application and how this application will help the students. Here we can see the factors affecting this application's acceptance by students.

Expectation results a variable in the UTAUT model refers how one particular believe applying a system will assist in achieving productivity at work. The expectation of effort level of easiness related to using—any mechanism. Social influence is the a level where others' (family, friends, and peers) beliefs (whether these beliefs if they are good or bad) will be affected—a user of the new system. In UTUAT, the concept of facilitating conditions relates to how individuals perceive that the functional and organizational frameworks needed to execute the system have been placed.

According to Venkatesh et al. (2003) Behavioral intentions are the extent to which a person has made deliberate choices about how to engage in a particular prospective action.

V. CONCLUSION

These are the conclusions derived from the study's findings. The system will help students and future researchers who want to use the method when deployed. Easy manipulation and organization of links and media shorten the time spent finding specific records or saved items and boost productivity as the time spent searching will focus on doing what is essential.

The idea of the system will surely help many people in the future. If it is fully developed and adds some data security, it will attract users as one of the aims is to be aesthetic. Students these days prefer appearance rather than the use of something. That is why the system has something that will attract students while at the same time helping them with some useful functions for their research and other data archiving.

Lastly, the participants of this study show that the Link and Multimedia Archiving systems will benefit students.

VI. ETHICAL APPROVAL

In March 2021, the researchers received approval from the Office of the Research and Creative Works and the Dean of Computer Studies, Business Administration, and Engineering in St. Peter's College, Iligan City, Philippines. Additionally, the researchers were permitted to conduct survey activities by the School President with the students from the three (3) Colleges. Also, the researchers received the written agreement of every participant in the study. The researchers let those involved know that the information would be disseminated while maintaining data privacy and asked for their consent.

VII. DATA AVAILABILITY

A. Underlying data

Figshare: Link and Multimedia Archiving
<https://doi.org/10.6084/m9.figshare.24130041>

This project contains the raw data for evaluating the desktop application by the students.

- Raw-data.xls

B. Extended data

Figshare: Link and Multimedia Archiving
<https://doi.org/10.6084/m9.figshare.24130041>

The project contains extended data.

- Questionnaire.docx

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