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DEVELOPMENT AND EVALUATION OF LOCAL AREA NETWORK BASED ARCHIVING SYSTEM

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ABSTRACT

The goal of this study was to create the Local Area Network Based Archiving System, a cross-platform development system for electronic information storage, security, preservation, and retention. The system incorporates capabilities such as data storage for long-term preservation and retrieval, file searching and retrieval, security features such as user account information system and account access privilege levels, and an email-like messaging system. The researchers developed the Local Area Network Based Archiving System using the Agile Software Development Methodology to keep up with the stakeholders' ever-changing needs. After each iteration of the work cycle, this methodology employs a process of frequent feedback. Features are added or refined in each iteration to ensure that the study meets its goals and expectations. The developed system received an overall average weighted mean of 4.53 in the evaluation summary, which is considered excellent. The strongest point of the system, according to the respondents' responses, was its content, which received the highest average mean among the five major categories in the system evaluation. The system's mobile responsiveness was a huge plus, as it considerably aided accessibility. The system should also be deployed, according to the respondents, because it will provide a powerful answer to the ongoing challenges with storing, managing, securing, and retrieving electronic files. As a result, the researchers concluded that a Local Area Network Based Archiving System is required for the efficient operation of an electronic file storage system. Having centralized electronic file storage and retrieval system not only saves time and money in the long run but also allows for disaster recovery and business continuity.

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INTRODUCTION

A local area network (LAN) is a group of computers and associated devices that share a common communications line or wireless link to a server. LAN encompasses computers and peripherals connected to a server within a restricted area such as an office or an establishment. Computers and servers that provide services to other computers like file sharing, can communicate to each other via cables or wirelessly in a LAN. Additionally, LAN provides high-bandwidth communication over inexpensive transmission media and is an indispensable technology to be utilized specifically in remote data archiving. Rouse (2018) and Lohrey (2018) indicated, that the importance of electronic information storage and retrieval systems lies in the fact that electronic systems reduce storage space requirements and decrease equipment and labor costs.

Hence, in Biliran Province State University (BiPSU) and its college departments and offices, it has been observed that in terms of storing, preserving, and sharing information. Moreover, NSU requires to spend more money and manpower just for storing and managing its ever-increasing number of files. Aside from this, the pressure in terms of workload for both faculty and staff will be minimized. Vital business documents and other information are placed on file cabinets or in boxes. It is for this reason that the researchers are opted to conduct this study. By creating a system that applies several principles from social media and local area file-sharing systems, it is believed that storage and retention of business information will be much more efficient and, in a long run, will cost less than the traditional way. Also, this study serves as a starting point for the modernization of information storage and retrieval. Since not much research in line with this study is previously covered, it is imperative to conduct this research and expand the area.

LITERATURE REVIEW

According to Arous, Guo, & Peterson, (2014) computer file archiving systems and methodologies. Numerous issues are covered, including wide-area high-availability file archiving, archiving systems' volume-level management capabilities, and techniques and systems for storing file archiving metadata. The disclosed methods and systems may be used separately or in combination. A study by Rang & Coverston, (2015) that archiving a file that has multiple file parts stored on multiple object storage devices of a computer system includes the steps of saving the file parts on one or more archive devices, allowing one or more changes to be made to

the file during the saving step, and applying at least one of the changes made during the saving step to one of the file parts stored on a respective object storage device.

A study by Jomier et. al., (2009) stated that a web-based digital archiving system that processes large collections of data provides a flexible data management facility, a search engine, and an online image viewer. Furtheremore, Bulatov, (2021) stated that the use of Digital Imaging technology and will help to solve the problem connected to access and become as possible to view it through local area network or Internet.

MATERIALS & METHODS

System Design and Processes

Agile approaches, which divide work into smaller iterations or sections, do not require long-term planning in the traditional sense. Before initiating the development process, it is necessary to define the scope and needs of the project. Detailed plans are established in advance for the number of iterations to be performed, their duration, and the scope of each iteration JavatPoint, (2021) and Brush & Silverthorne, (2020). The agile model's goal is to provide the proper product incrementally and often through small cross-functional self-organizing teams, allowing for frequent customer input and course correction as needed Digite, (2020).
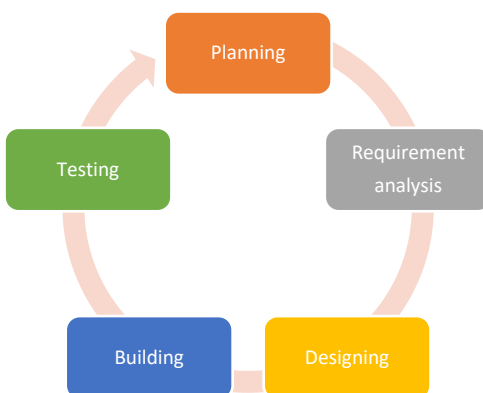
Figure 1. Agile Model

Planning

In this stage of development, the objectives, alternatives, and constraints of the project are determined and documented. The objectives and specifications are fixed to decide the techniques which are to follow during the life cycle of the project being conducted. In this stage, the researchers conducted the proposal of the system, scheduling of the activities, and gathering of data and other necessary information.

Requirement Analysis

It is the most important phase of this model. In this phase, to develop a cost-effective project, all available and possible alternatives are analyzed and decided if they will be used. This has been added to identify and resolve all the possible problems within the development of the project. The input variables of the research will be employed and utilized in this stage. The result of the quantitative research survey will be part of the analysis.

Designing and Building

In this phase, the actual development of the project is carried out. The output of this phase is passed through all the phases iteratively to obtain improvements in the same. In system development, teams perform the design and coding of the proposed study.

Testing

In this phase, the developed system will be submitted to the clienteles to determine if the system meets the user's needs and receives the customer's comments and suggestions, which help to identify and resolve potential problems/errors in the developed program. Intending to collect the customer's assessment, the teams have uploaded the system for it to be evaluated by its design, functionalities, and features. Any result of the evaluation whatsoever would be considered by the teams as buildings blocks in improving the proposed system and would be the basis for adjustments, modifications, and changes in the system TutorialsPoint.com, (2020).

Research Instrument

The respondents of the study were the employees of the Biliran Province State University. Among 222 regular employees, only 141 were involved in this study. This sample size is calculated from an online calculator with a 5% marginal error, 95% level of confidence, and the response distribution is 50%. The standardized questionnaire was being prepared for the evaluation of the system in determining the desired interpretation such as (*Outstanding, Very Satisfactory, Satisfactory, Fair, Poor).* The Likert Scale SurveyMonkey, (2018) is a 51, point scale 5 is the highest, and 1 is the lowest was used that offers a range of answer options from one extreme attitude to another. The respondents answered the evaluation questionnaire through the following criteria: functionality, navigation and design, system content and security, and technical details.

Survey Design

The research questionnaires were given to the employee of the university by the researcher and given enough time to answer the different indicators on the evaluation form to evaluate the system. The questionnaire given to the respondents was administered by the researcher and the gathered data from the respondents were assured utmost confidentiality.

RESULTS & DISCUSSION

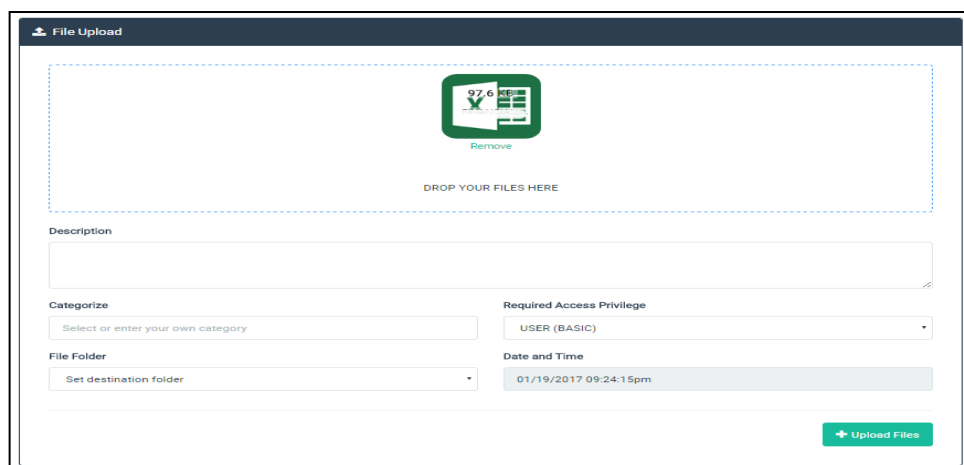### *Storage and Preservation of Documents and Records Electronically*

The following figure presents the file archive panel in which, the members can access the archived files. Next is the upload file form in which, the members can upload their files to be archived in the system.
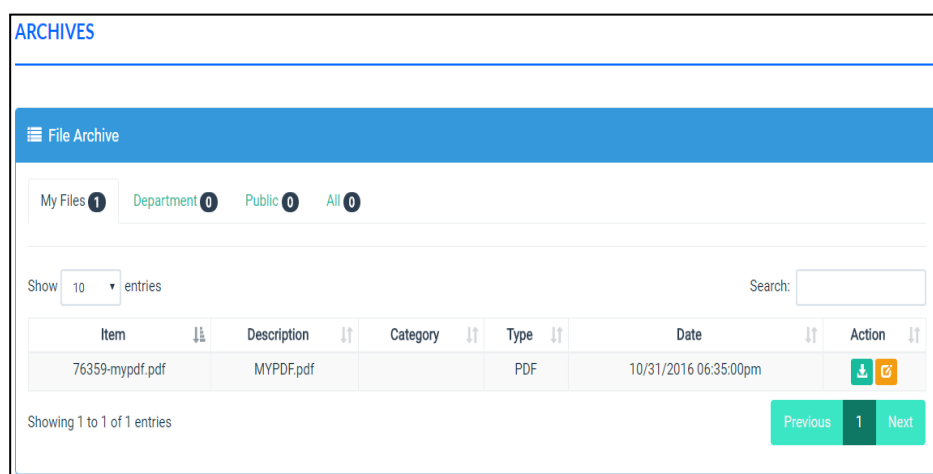
Figure 2.0 Archives list view

Figure 2.0 shows the archives list view. The My Files tab contains all of the members' files. The Department tab contains all of the members' department files. The Public tab contains all public files that are freely accessible or don't require permission to access. The All tab contains all the files from all departments; these files require permission from their respective owners.

Figure 3.0 shows the upload file feature. When a member uploads a file, it is automatically uploaded to their respective departments. Files are viewable to everyone but require permission from their respective owners before downloading. A file that does not require any access privilege is uploaded to public files.
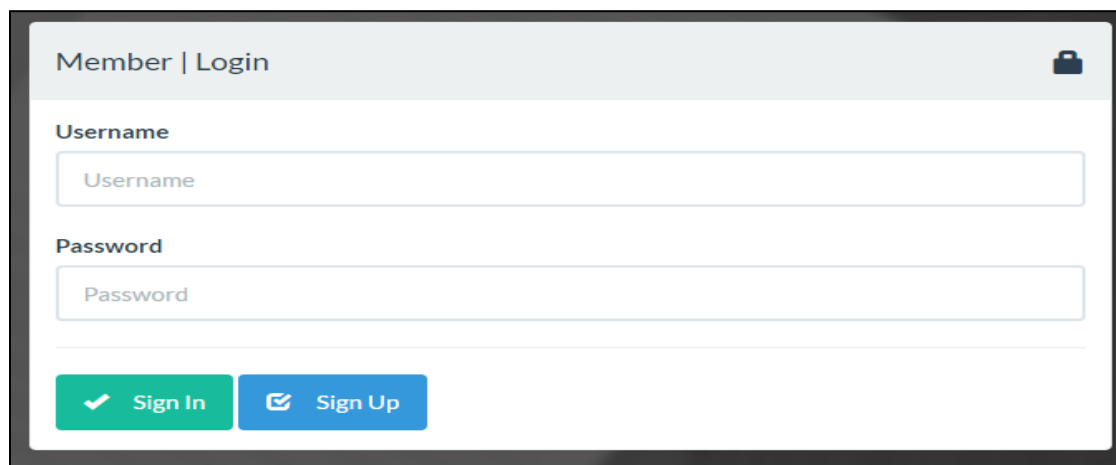
Figure 3.0 Upload file form

User Account Information System

The succeeding figures demonstrate the user account information system for member authentication and access privileges.

Figure 4.0 Login page

Figure 4.0 shows the login page. The sign-in button authenticates input username and password. The sign-up button redirects the client to registration.

Figure 5.0 shows the member profiles. Here, a member can search and view the profiles of other members of the system. The system administrator can adjust a member's rank or privilege level. The system administrator can also update a member's account status. When a member becomes inactive, the system administrator will set the member's account to inactive. Members must personally apply for the activation of their accounts.
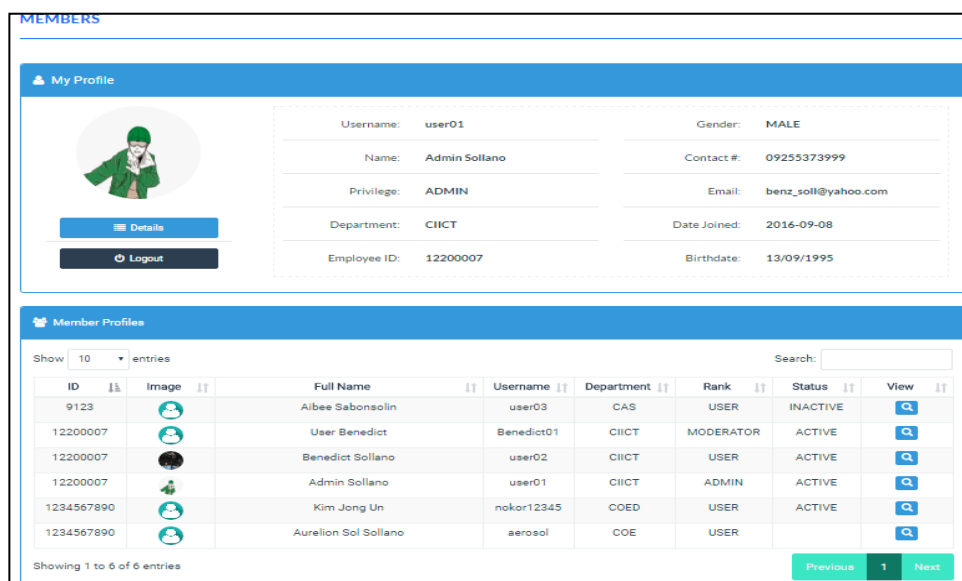
Figure 5.0 Member profiles

File Request System

This part presents the file requesting system which was listed as a security feature. This functionality enforces consent, prevents exploitation, unauthorized distribution, and bootlegging of files within the system.
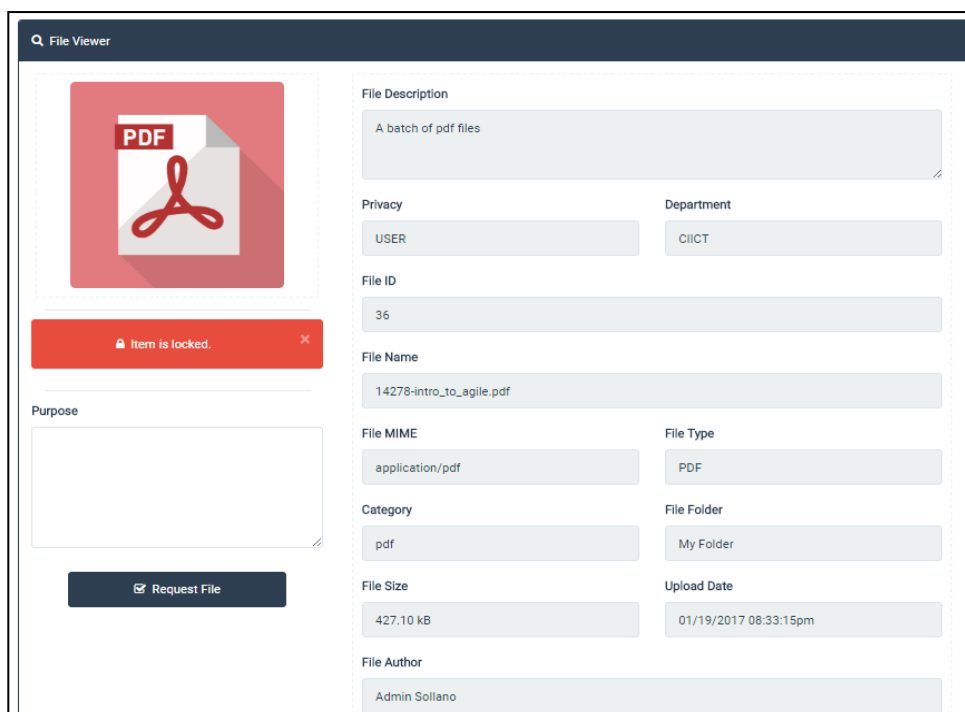

Figure 6.0 File request system

Figure 6.0 shows the file request system in action. Unless a member is the system administrator or a department moderator, is required to request permission from the file owner. The System

Administrator and the Department Moderator (provided that the file came from the same department as the Department Moderator) have direct access to files.

Screening of Uploaded Files

The figure below shows the system administrator or department moderators' control for screening uploaded files. This security feature stops unwanted files to be archived into the system.
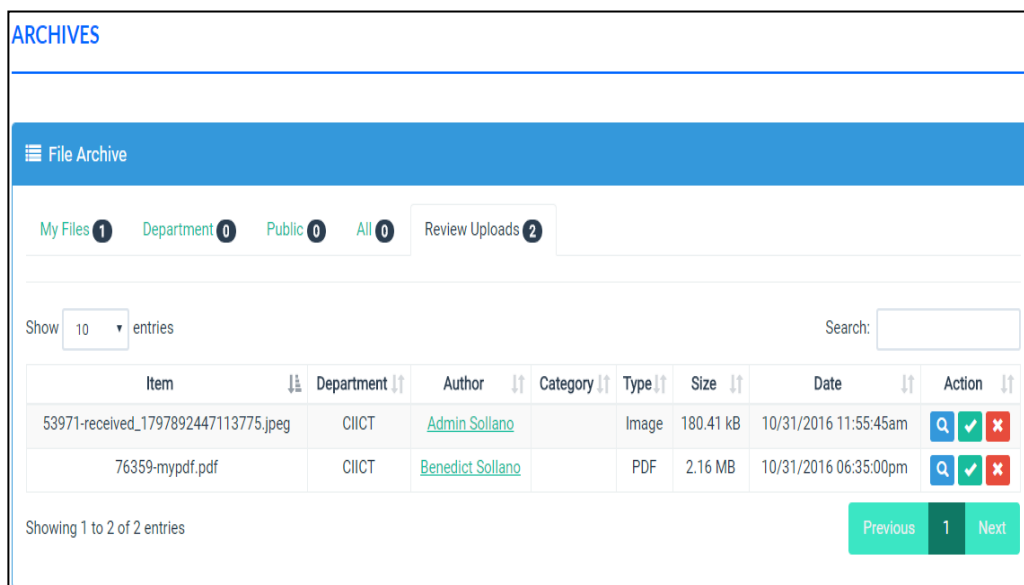
Figure 7.0 Screening of uploaded files

Figure 7.0 shows the archives panel. The Review Uploads tab which is currently on display is where the system administrators or the department moderators control all the uploaded files. Here, they can inspect, and accept or reject a file.
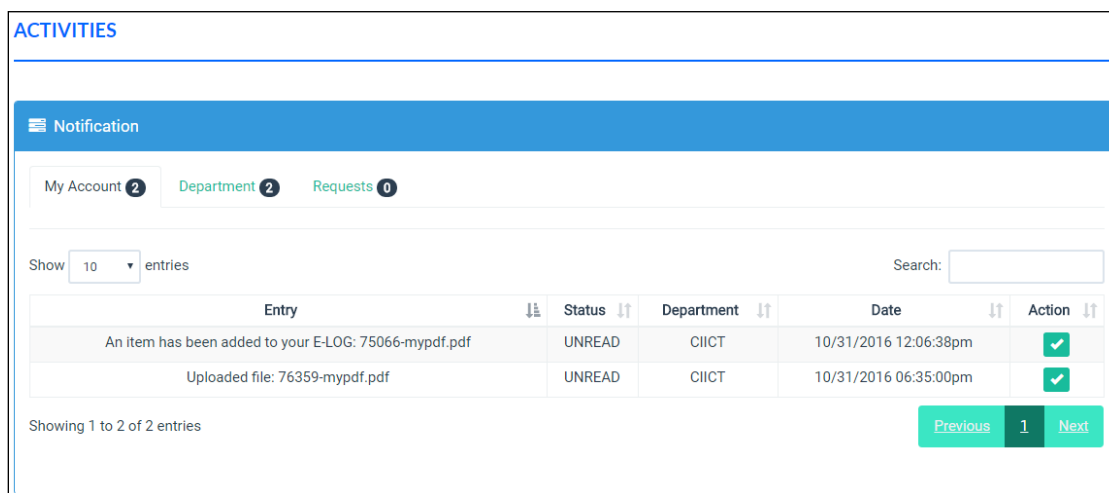

Figure 8.0 Search and sorting function for every list view

Figure 8.0 shows the search function of the system. The search function goes through every column of the table and displays the list of items that have the same series of characters with the search input. Each column in the table is also sortable. The list, as shown in the figure, was ordered by date.

Keep Track of Records and Activities Through Logs and Notifications

The succeeding figure shows the Notifications panel in which members can view the activities tied to their accounts, departments, and accept or reject the requests to their files.

Figure 9.0 Notifications and logs

Figure 9.0 shows the notifications panel. This is where a member can view their file requests, personal activity log, and department activity log. Members may delete their activity log by clicking on the check button under the action column.

Automated Backup of System Database and Member Data

The following figure shows the script scheduler module of the system called PHPJobScheduler. This module allows automation tasks within the system. In the Local Area Network Based Archiving System, this module was used to automate data backup. This module also allows other scripts to be automated, given that the script was built using the PHP programming language. This feature is only accessible to the system administrator.

Figure 10.0 shows the control panel for PHP Job Scheduler. When a job is set, PHP Job Scheduler then automates it. PHP Job Scheduler routinely executes jobs or commands or a server-side script in this case, on schedule. This panel is only accessible to the system

administrator. A job was set to execute a full website data backup including the database with an interval of 1 day, meaning, daily.

Figure 10.0 PHP script scheduler module

System Evaluation

This section presents the final objective of the study which is to evaluate the functionality of the archiving system. The respondents were asked to fill out a standard web application evaluation sheet and, again, the researchers used the following as their method in data scoring: 4.3 to 5.0 – Outstanding; 3.6 to 4.2 – Very Satisfactory; 2.7 to 3.5 – Satisfactory; 1.9 to 2.6 – Unsatisfactory; and 1.0 to 1.8 – Poor. The succeeding table shows the summary of the evaluation and the detailed system evaluation results.

Table 1.0: System Evaluation Results

Indicator	Mean	Interpretation
Functionality	4.52	Outstanding
Navigation and Design	4.53	Outstanding
System Content	4.55	Outstanding
Security and Technical Details	4.51	Outstanding
Overall Evaluation Rating	**4.53**	Outstanding

Table 1.0 shows the summary of evaluation ratings. System content, which pertains to the substance of the LAN Based Archiving System, has the highest weighted mean of 4.55 which is described as outstanding. Navigation and design, which is about the overall design and accessibility of the system's user interface, follow system content with a weighted mean of 4.53

which is also described as outstanding. After navigation and design come system functionality, which concerns the usability of the system, with a weighted mean of 4.52. Lastly, security and technical details got the least weighted mean of 4.51. Overall, the average weighted mean is 4.53 or an outstanding.

CONCLUSION

After a systematic analysis of the findings of this study, the following conclusions were drawn: The Local Area Network Based Archiving System is a very useful tool in storing, securing, retrieving, and preserving digital files. With the additional functionalities and features included, not only that the LAN Based Archiving System improve file management, but it will also promote better communication through messaging and file sharing, saving time that was otherwise spent on unproductive activities.

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