

AMERICAN JOURNAL OF AGRICULTURAL SCIENCE, ENGINEERING AND TECHNOLOGY (AJASET)

ISSN: 2158-8104 (ONLINE), 2164-0920 (PRINT)

VOL: 5 ISSUE: 2 (2021)







PUBLISHED BY: E-PALLI, FLORIDA, USA

XN HITTHINH



The American Journal of Agricultural Science, Engineering and Technology (AJASET) is blind peer reviewed international journal publishing articles that emphasize research, development and application within the fields of agricultural science, engineering and technology. The AJASET covers all areas of Agricultural Science, Engineering and Technology, publishing original research articles. The AJASET reviews article within approximately two weeks of submission and publishes accepted articles online immediately upon receiving the final versions.

Published Media: ISSN: 2158-8104 (Online), 2164-0920 (Print).

Frequency: 2 issues per year (January, July)

Area of publication: Agricultural Science, Any Engineering and Technology related original and innovative works.

EDITORIAL BOARD

Chief Editor

Dr Mamun-Or-Rashid Professor, Dhaka University, Bangladesh

Board Members

Dr. Sumit Garg, IL, USA Professor Dr. James J. Riley, The University of Arizona, USA Dr. Ekkehard KÜRSCHNER, Agriculture Development Consultant, Germany Professor Dr. Rodriguez Hilda, USA Professor Dr. Michael D. Whitt, USA Professor Dr. Wael Al-aghbari, Yemen Professor Dr. Muhammad Farhad Howladar, Bangladesh Dr. Clement Kiprotich Kiptum, University of Eldoret, Kenya Professor Dr M Shamim Kaiser, Professor, Jahangirnagar University, Bangladesh Professor Dr Mohammad Shahadat Hossain, Chittagong University, Bangladesh Professor Dr. Nirmal Chandra Roy, Sylhet Agricultural University, Bangladesh Dr. Sandra Milena Camargo Silva, Materials Engineering, Colombia

Managing Editor

Md. Roshidul Hasan Professor, Department of Computer Science and Information Technology, Bangabandhu Sheikh Mujibur Rahman Agricultural University, Bangladesh



DEVELOPMENT AND EVALUATION OF LOCAL AREA NETWORK BASED ARCHIVING SYSTEM

Reymon M. Santiañez^{1*}, Benedict M. Sollano²

DOI: https://doi.org/10.54536/ajaset.v5i2.107

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.

KEYWORDS – Archiving System, Mobile Responsive, Local Area Network.

- ¹ Biliran Province State University, Naval, Biliran, Philippines
- ² Biliran Province State University, Naval, Biliran, Philippines

* Corresponding email: rmsnsu2015@gmail.com



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 longterm 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).

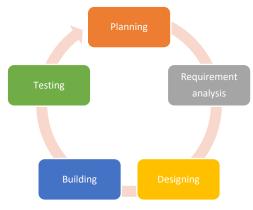


Figure 1. Agile Model

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.

ARCHIVES									
File Archive									
My Files 1 Depar	tment 🚺	Public 0	All 🚺						
Show 10 • entries						Se	earch:		
Item	11	Description	ţţ	Category	lî Type lî	Date	J1	Action	Į1
76359-mypdf.pdf		MYPDF.pdf			PDF	10/31/2016 06:35:00pm		± 0	
Showing 1 to 1 of 1 entrie	s						Previous	1	Next

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.



	Primove
Description	DROP YOUR FILES HERE
Categorize Select or enter your own category	Required Access Privilege
File Folder Set destination folder	Date and Time 01/19/2017 09-24:15pm
	+ Upload 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.

Member Login	-
Username	
Username	
Password	
Password	
🖌 Sign In 🗹 Sign Up	

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.



My Profile									
		Username:	user01			Gender: N	ALE		
	Name: Ad		Admin Sol	Admin Sollano Co		Contact #: 0	9255373999		
	p	Privilege:	ADMIN			Email: b	enz_soll@yahoo.	com	
	Details	Department:	СПСТ			Date Joined: 2	016-09-08		
🔿 Logout			Employee ID: 12200007				13/09/1995		
		Employee ID:	12200007			Birthdate: 1	3/09/1995		
Member Profil		Employee ID:	12200007				3/09/1995 Search:		
Member Profil	ea	Employee ID: Full Name	12200007		Department 1			View	
Member Profil	es entries				Department 11 CAS		Search:	View	
Member Profil	es entries Image 11	Full Name		Username ⊥†		Rank 11	Search:		
Member Profile	es entries Image 11	Full Name Aibee Sabonsolin		Username LT user03	CAS	Rank 11 USER	Search: Status I1 INACTIVE	Q	
Member Profil iow 10 • ID 12 • 9123 12200007 •	es entries Image 11	Full Name Aibee Sabonsolin User Benedict		Username [] user03 Benedict01	CAS	Rank IT USER MODERATOR	Search: Status J1 INACTIVE ACTIVE	۹ ۹	
Member Profil IO I 9123 12200007 12200007 12200007	estries	Full Name Albee Sabonsolin User Benedict Benedict Soliano		Username lj user03 Benedict01 user02	CAS CIICT CIICT	Rank JT USER MODERATOR USER	Search: Status 11 INACTIVE ACTIVE ACTIVE	۹ ۹ ۹	

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.

Q File Viewer		
	File Description	
PDF	A batch of pdf files	h
	Privacy	Department
	USER	CIICT
	File ID	
	36	
🔒 Item is locked. 🛛 🕺	File Name	
Purpose	14278-intro_to_agile.pdf	
	File MIME	File Type
	application/pdf	PDF
	Category	File Folder
	pdf	My Folder
G Request File	File Size	Upload Date
	427.10 kB	01/19/2017 08:33:15pm
	File Author	
	Admin Sollano	

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.

File Archive									
My Files 1 Department 0	Public	0 All 0	Review Uploads	3					
how 10 • entries							Searc	h:	
how 10 • entries	†₹	Department ↓↑	Author 1	Category ↓↑	Type↓↑	Size 🕼	Searc Date	h:	Action
		Department It	Author 11 Admin Sollano	Category ↓↑	Type ↓↑ Image	Size ↓↑ 180.41 kB		Ļţ	Action
Item				Category I 1			Date	↓† 55:45am	-

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.

🗅 My Files 🚺 🏦 Departi	ment Fil	es CIICT 9	Þ	Public Files 0	All Files 11				
now 10 • entries							Search: agile		
ltem	↓î	Author	↓ ↑	Department 1	Category 🙏	Туре ↓↑	Date	ţĿ	View 👃
14278-intro_to_agile.pdf		Admin Sollano		CIICT	pdf	PDF	01/19/2017 08:33:15pm		Q
		Admin Sollano		CIICT	pdf	PDF	01/19/2017 08:33:15pm		Q

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.

Notification					
My Account 2 Department 2 Requests 0					
how 10 • entries				Search:	
Entry	11	Status 🕼	Department 1	Date ↓↑	Action
An item has been added to your E-LOG: 75066-mypdf.pdf		UNREAD	CIICT	10/31/2016 12:06:38pm	 Image: A set of the set of the
Uploaded file: 76359-mypdf.pdf		UNREAD	CIICT	10/31/2016 06:35:00pm	 Image: A set of the set of the

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.

You are running Version: 3.9 which is the most recent version.	Released under <u>GPL License</u> That means its fr To help ensure future updates please d Donate Every penny or cent helps tasks - Add a NEW schedule - Yiew error loos	io consider to	2)				
Sche	duled tasks already on the system						
Job Name and script path		Time/Date last fired:	Time/Date of next execution:*	Interval fire every:			
"Daily Website Backup" - MODIFY - DELETE? Script path: http://localhost:8080/the-archives/action/backup_fun	ctions.php	14:30:46 on Oct 30, 2016	14:30:46 on Oct 31, 2016	1 day(s)			
* execution time will be within a time fram	* execution time will be within a time frame of: 60 minutes. To change the time frame window <u>clease see the readme file</u>						
	HELP? Please see the readme file						
PHP and MySQL applications that make ye	our life as a webmaster/website owner a little o	easier from: <u>DWal</u>	ier.co.uk				

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.

REFERENCES

Arous, A., Guo, C., & Peterson, J. (2014). Storage of file archiving metadata.

- Brush, K., & Silverthorne, V. (n.d.). *Agile Software Development*. Retrieved 5 2020, from http://searchsoftwarequality.techtarget.com/definition/agile-software-development
- Digite. (n.d.). What Is Agile Methodology? Overview Of Agile Software Development And Agile Models. Retrieved 05 2020, from https://www.digite.com/agile/agile-methodology/
- JavatPoint. (2021). Agile Model. Retrieved from JavatPointhttps://www.javatpoint.com/softwareengineering-agile-model
- Jomier, J., Aylward, S. R., Marion, C., Lee, J., & Styner, M. (2009, March 3). A digital archiving system and distributed server-side processing of large datasets. *Medical Imaging 2009: Advanced PACS-based Imaging Informatics and Therapeutic Applications*. doi:https://doi.org/10.1117/12.812227
- Lohrey, J. (n.d.). *The Importance of Information Storage & Retrieval Systems in an Organization*. Retrieved November 4, 2018, from https://smallbusiness.chron.com/importanceinformation-storage-retrieval systems organization-75891.html
- Rang, A., & Coverston, H. (2015). File archiving system and method.
- Rouse, M. (n.d.). *Local Area Network (LAN)*. (Techtarget) Retrieved November 5, 2018, from https://searchnetworking.techtarget.com/defini tion/local-area-network-LAN
- SurveyMonkey. (2018, November 6). *What is a Likert scale?* Retrieved from Survey Monkey: https://www.surveymonkey.com/mp/likertscale/
- TutorialsPoint.com. (2020). *SDLC Agile Model*. (TutorialsPoint) Retrieved from https://www.tutorialspoint.com/sdlc/sdlc_agile_model.htm