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Research Paper

Effectiveness of Digital Archiving System of the Selected Offices in the Provincial Government of Laguna: A Basis For A Proposed Enhanced Archiving System

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ABSTRACT
This study aimed to bridge the existing gap in understanding the effectiveness of digital archiving systems within the selected offices of the Provincial Government of Laguna. The researchers sought to integrate user responses to determine the relationship between user awareness and the system's effectiveness. It utilized a descriptive-correlational method, employing a total population sampling approach. A total of fifty-five respondents from key offices were selected based on their experience with digital archiving systems. Data collection involved obtaining approval from the offices and distributing questionnaires via Google Forms. The instruments used included checklists and Likert scales. The gathered data were then analyzed using statistical treatments. The findings revealed that respondents were fully aware of the digital archiving system's duration, accessibility, and usage in terms of deployment and frequency. The system demonstrated high effectiveness in terms of sustainability, security, and storage capability. Correlation coefficients were employed to assess the relationship between awareness and effectiveness. Specifically, the study found that as awareness increased, the effectiveness of digital archiving systems in promoting sustainability and security also increased. The relationship between awareness and security effectiveness was stronger in usage-deployment. However, no significant relationship was observed between awareness of usage-frequency and storage capability. In conclusion, the study provided valuable insights into the awareness and effectiveness of digital archiving systems within the Provincial Government of Laguna. The findings underscored the importance of user awareness in influencing the effectiveness of such systems and highlighted specific areas where increased awareness could enhance sustainability and security.

Keywords: *Digital Archiving Systems, Provincial Government of Laguna, User Awareness, Effectiveness*

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I. INTRODUCTION

Background of the Study

In an era dominated by technological advancements, the efficient management of information becomes paramount for organizational success. According to Li (2022), due to the recent advances of Internet and information technologies, a massive quantity of archive data gets generated and it becomes difficult to handle it using conventional techniques. Archive management is the field of management related to the maintenance and utilization of archives The drastic increase in the size of archive data necessitates effective storage schemes, which can be accomplished by the use of data compression approaches. Generally, data compression techniques are used for reducing the count of data being saved from a system or network without compromising the data quality.

Even in the Philippines, there are local, smaller, or more specific instances where businesses require more digitalized methods in their daily operations. Based upon a local article that has the same idea, the study from the Philippines conducted by Bernal, et. al, "Ika Dress Shop Accounting Information System".

More recent technological advancements have made it possible to digitize files, which makes archiving easier. The Provincial Government of Laguna is introducing departmentalized archiving systems in the provincial treasurer's, provincial accountant, and provincial budgeting offices, but there is concern about how aware and effective they are. Is it capable of completing the massive task at hand—the one that millions of people's lives depend on.

Though there are new advancements and certain technologies that are slowly being implemented such as photo scanners that can help with the finalization of documents. It has been utilized during the time that the researchers were conducting their Practicum in the Provincial Government of Laguna such as the Iskolar ng Laguna program.

The researchers who are carrying out this study were previously given the opportunity to complete a work immersion in the accounting office of the provincial government during early 2020, enabling them to have personal experiences of how the archive in the provincial governments operates. Due to the numerous files and mounds of documents that need to be sorted through by attentive workers, finding a specific document can be a time-consuming process. The provincial administration is working to improve its data retrieval and archiving capabilities, but the majority of documents are still in hardcopy. With that, this study intends to bridge the gap with regard to the effectiveness of digital archiving systems in the selected offices of Provincial Government of Laguna through integrating the responses of the intended users as to the level of awareness. This research gap limits the researchers' understanding as to how the awareness of users is related to the effectiveness of digital archiving systems.

Archiving is a necessary part of all organizations, no matter their size. The ability to store and easily retrieve data for future reference or future usage is paramount to the operations of organizations on a daily basis. Due to modern advancements in technology, archiving has been made easier, but it has to be seen how capable and effective the new digital archiving systems are.

In addition, records management is the process of managing the lifespan of records, which has expanded with time and with the development of new media. Archiving in physical form is becoming harder and less efficient as time goes on, as information technologies advance and older formats are abandoned.

Therefore, the only practical way for reducing the amount of data preserved from a system or network without sacrificing the data's quality is digital archiving. Digital archiving is challenging since it's more difficult to analyze and visualize information, and electronic media are more prone to data loss.

Documents and papers must be preserved and read clearly to avoid confusion and misplacement of data. The ability of the provincial government's archiving to preserve documents and papers for future reference and use as proof is essential for a province with many citizens and cities. Electronic mediums are more vulnerable to data loss than paper, leading challenges with digital archiving system.

Statement of the Problems

This was directed towards the main objective to identify the respondents' level of awareness and effectiveness of digital archiving in the selected offices within the Provincial Government of Laguna. Despite the growing reliance on digital systems, challenges persist in the realm of archiving within government offices. Specifically, it sought to answer the following questions:

1. What is the respondents' level of awareness on the digital archiving system among the selected offices of the Provincial Government of Laguna in terms of:
1.1. Duration,
1.2. Accessibility,
1.3. Usage
1.3.1. Frequency
1.3.2. Deployment?

2. How effective is the digital archiving system of selected offices in Provincial Government of Laguna in terms of:
2.1. Sustainability,
2.2. Security,
2.3. Storage Capability?

3. Is there a significant relationship between the respondents' level of awareness and the effectiveness of digital archiving systems of the selected offices in the Provincial Government of Laguna?

Hypothesis of the study

There is no significant relationship between the respondents' level of awareness and effectiveness of the digital archiving system.

Significance of the Study

Understanding the effectiveness of the digital archiving system is crucial for government offices aiming to enhance information management. This research contributes valuable insights to improve efficiency, reduce redundancy, and ensure the integrity of records within the Provincial Government of Laguna.

The researchers believe that the results of this study will be helpful and will benefit the following:

Practice. This research may help the employees of the selected offices speed up the processing of papers as the retrieval of evidence is faster and the required documents needed to proceed are easily gathered.

Policy. The more digitalized systems may allow for stricter application of policies already in place, making it so they are more easily followed compared to before using more physical systems. This may help them to avoid losing data as all of the documents are vulnerable to being destroyed or corrupted.

Social Actions. This research may increase the processing speed of papers, improving the quality of life for both employees of the Provincial Government offices and citizens of Laguna alike. This can help the employees have quick and secure access to the information they need, resulting in less downtime and fewer delays for better services to the citizens of Laguna.

Scope and Limitations of the study

This study focused on a specific set of offices within the Provincial Government of Laguna. The offices are the Accounting, Treasury, and Budgeting Departments, limiting its scope to ensure in-depth analysis. However, limitations may arise from factors such as resource constraints and variations in office practices. The availability of material that can be made accessible to the public is limited since some information in the Provincial Government is confidential and ought to only be known by a small group of people with the appropriate authority. The reason why the selected offices were chosen is that those offices have integral roles

in the Provincial Government of Laguna, and the digitization of the equipment and facilities of these offices is necessary. Additionally, the topic at hand is related to our course.

Definition of Terms

For a clear understanding of this study, the terms are defined operationally based on how they were used in the study.

Accessibility. Is the amount of authority accessible to the respondents.

Awareness. Is the respondent's current knowledge or perception of the Digital Archiving system.

Data. Is the raw information used in the files and can be used for future purposes. This is the information that is stored and used in the Provincial Government's Offices.

Deployment. Is defined on how the system is deployed, based on the user that will access the system.

Digital Archiving. The combination of modern technologies that improve the long-term data storing and retrieval process of the Provincial Government of Laguna.

Digital Archiving System. A comprehensive electronic system designed for the storage, retrieval, and management of digital records and documents.

Documents/File. Are the hardcopy/softcopy papers that contain significant information that is needed to be stored for future reference and proof by the provincial government and its offices.

Duration. Is the period of time that the system is being used.

Effectiveness. The degree to which the digital archiving system meets its objectives in enhancing information management within the selected offices.

Frequency. Is defined on how frequently the system is being accessed and used.

Government Offices. Specific departments within the Provincial Government of Laguna involved in administrative and decision-making processes.

Security. This is the level of security that the archive uses; it determines who has access to the archive and what measures are needed to guard the important data that is stored within the Provincial Government of Laguna.

Sort. The action of properly arranging things so that they make proper sense in chronological order, alphabetical order, or by level of importance.

Sustainability. Is the standard of a digital archiving system of the Provincial Government of Laguna sustainable and length of time that it will be of use.

Usage. is used to describe how the system is used in certain conditions.

II. REVIEW OF RELATED LITERATURE AND STUDIES

This chapter presents previously written related literature, related study, synthesis, theoretical framework and conceptual framework that is pertinent and significant to the research being considered.

Review of Related Literature and Studies

Respondents' Level of Awareness

In a study made by Mohammed A. Alqahtani (2022). One of the essential stages in increasing cyber security is implementing an effective security awareness program. This work studies the present level of security knowledge among Imam Abdulrahman Bin Faisal University college students. A module was created to assist the students in becoming more informed.

In the findings of Huang et al. (2020). The archival knowledge involved in the field of PA comprises four principal categories: documentation, arrangement, preservation and appraisal. Three interactive factors involved in archivists' archival knowledge application in the field of PA behaviour: awareness, knowledge and action, which form a pattern of awareness leading, knowledge guidance and action innovation, and archivists' PA practice is flexible and innovative. The paper underscored that it is need to improve archival literacy among general public.

Respondents' Level of Awareness on the Digital Archiving System in terms of Duration

Digital archiving is the database-supported, long-term and secure storage of digital data that can be reproduced at any time. If information is stored for more than 10 years, this is referred to as digital long-term archiving. This electronic archiving of documents saves a lot of time and creates a good overview of private as well as professional documents (Odenthal, n.d.)

According to an estimate by Schüller (2019), about 80% of the material concerning endangered cultures and languages which is currently available is in the hands of individuals or people working in projects with a limited duration, who treat this material like books on shelves, storing it on inadequate storage media and in bad environmental conditions. We can thus speak of the great risk of major parts of our cultural memory

getting lost. Furthermore, materials stored in individual researchers' cupboards are hardly accessible for others. The emergence of digital technology has changed our views about storing, sharing, and accessing this type of information about cultural heritage completely. The modern state-of-the-art is indeed revolutionizing our preservation and access strategies. We understand that it is easy to create and distribute copies of digital material;–it is relatively easy to give access to digital material;–it is not relevant anymore to store the physical container such as an original tape as the incarnation of the content and that we should store the digital stream of information instead.

One of the hindrances to the widespread use of digital signature technology in records management has been the lack of methods for long-term preservation of authentic digitally signed records. Archives, feeling under pressure from new arriving technology, have refused to take on new functions (preservation and verification of certificates of digital signatures, essentially acting as certification authority for the duration of the records retention period).

Instead, archives have offered a combined solution where during the active stages of the records life-cycle technological means are used to prove its authenticity (e.g., digital signatures) and when the records reach the archive, organizational methods will be used to preserve the authenticity of records.

Respondents' Level of Awareness on the Digital Archiving System in terms of Accessibility

When planning for access according to the Digital Coalition Handbook (2023), a key consideration is the format in which digital objects will be delivered to users. Preservation and access share a strong link in the overarching objective of a digital preservation program, yet it's crucial to make a clear distinction between them. Digital archives, serving as the preferred means for open access to research data, play essential roles in knowledge infrastructures—robust networks of people, artifacts, and institutions. However, little is known about how these archives mediate information exchange among stakeholders (Borgman et al., 2019).

In Nigerian universities, many researchers face challenges accessing the system due to the apparent absence of proper digitalization and online visibility, as highlighted by Nazidi et al. (2023).

Responding to this issue, Wartman (2022) emphasized that a good archiving system improves efficiency and sustainability in inventory compilation. It also enhances the quality of inventory, particularly in terms of transparency and consistency.

In the context of organizational performance at Access Bank Plc in Rivers State, Onunwor (2022) found a significant relationship between record management practices and overall effectiveness. The study concluded that continuous improvements in record management practices, such as file creation/tracking, e-mailing, and file maintenance, lead to corresponding enhancements in organizational performance. Recommendations include providing a catalog of organizational records to employees for easy tracking and adopting email dissemination to improve service delivery and attract potential customers.

Ding et al. (2020) highlighted the difficulty of accurately describing user authority in federated systems due to the complexity of users' multidimensional roles. They proposed a blockchain-based multidimensional user authorization and role-based access control mechanism to improve the efficiency of decision-making in decentralized access control. The mechanism utilizes colored coins to identify user authority and employs smart contracts for automatic execution, thereby enhancing robustness and security decision performance.

Trust is identified as a significant factor that mitigates uncertainty and reduces the perception of risk in cloud storage use, according to Burda & Teuteberge (2019). Their research model, empirically tested with survey data from 229 cloud storage users, demonstrates that trust plays a crucial role in influencing the intention to use cloud storage for archiving.

As information and communication technology becomes pervasive in society, repositories must earn the trust of the communities they serve, asserts Crabtree et al. (2020). Repositories should demonstrate reliability and capability in appropriately managing the digital data they hold. Trust becomes particularly crucial as society becomes increasingly dependent on digital data and the repositories facilitating its access and use.

Respondents' Level of Awareness on the Digital Archiving System in terms of Usage

In light of the developmental study by Villarosa (2021), the system not only provides a paperless records management system but also ensures an easier pace for retrieving and recording data, along with securing a reliable database backup.

According to Anene, Ozor, and Baro (2020), digital archiving is a process that involves storing information sources and resources in the digital space. Documents are stored, retrieved, and disseminated from repositories, contributing to efficient information management.

Building on this, Momoti et al. (2019) emphasized that the system is designed to monitor records of various types and formats, ensuring efficient passage through the entire lifecycle—from creation to use, storage,

and disposal. Recognizing the significance of records in organizations, they serve as essential resources for decision-making, good governance, and research.

As highlighted by Amaechi et al. (2021), the generated data may vary in terms of usage duration, with some intended for long-term usage and others for short-term needs. Proper space needs to be allocated to ensure the safe storage and easy recall of data when required.

Examining a specific aspect, Ramesh et al. (2020) explained that email archiving is a systematic approach to saving and protecting data contained in email messages. With email being a critical communication medium for business, archiving ensures quick access to information, preventing reliance solely on backup tapes and local workstations.

Respondents' Level of Awareness on the Digital Archiving System in terms of Usage with regards to Frequency

In another context, Kornbluh & Plichta (2022) outlined best practices for digitizing speech recordings for archival purposes. Current guidelines often lack adequate rationale and specificity regarding audio digitizing practices for spoken word digital repositories. The analysis includes considerations of frequency response, dynamic range, formant bandwidths, noise, and psychoacoustic and perceptual quality.

Furthermore, Chiueh & Lu (2021) emphasized that authenticity alone is insufficient to protect archived data from human errors or malicious attacks. Therefore, various redundancy techniques are employed to safeguard data integrity, ensuring a robust defense against potential threats.

Respondents' Level of Awareness on the Digital Archiving System in terms of Usage with regards to Deployment

In accordance with Jurasovic et al. (2019), the process of deploying and maintaining software in a distributed system involves various tasks such as software delivery, remote installation, starting, stopping, and modifying to configure or re-configure the system based on user needs. This is achieved through an agent-based framework where intelligent and mobile agents play a crucial role in implementing a distributed system, taking partial or full responsibility for software deployment tasks.

Building on this perspective, Dolstra et al. (2020) highlighted the shortcomings of existing systems for software deployment, emphasizing issues related to safety and flexibility. Safety concerns arise from challenges in enforcing reliable specifications of component dependencies and the lack of support for managing multiple versions or variants of a component. To address these challenges, the authors introduced Nix, a deployment system that utilizes cryptographic hashes to compute unique paths for component instances, ensuring both safety and flexibility in deployment operations.

Expanding the understanding of software deployment, Alan Dearle (2019) characterized it as a post-production activity performed for or by the customer of a software piece. In the contemporary software landscape, which often consists of numerous components offering and requiring services from others, the complexity of deployment is further heightened when these components are deployed into distributed and heterogeneous environments.

Effectiveness of Digital Archiving System

George Epstein (2019), stated that a computer is an electronic device that performs calculation and processes information. It handles a vast number of facts and figures and solves complex problems at incredibly high speeds.

Along with (Willie A. Jackson, 2019), a computer-aided document printing management system for the seamless transmission and reproduction of documents, created in digital format at a computer terminal, at a remote high-speed printing facility.

Also, techniques and equipment, such as computer program items, applying and using procedures for storage an active record in a database. An additional table is created within the database. The additional table can store metadata details about active records to be archived and removed from the database (Agrawal et al.,2020).

In addition, as stated by Chawan et al., (2018), Document management was also an important part of widespread labor forces in organizations and universities. As the volume of data develops bigger over time, it will become hard to store, retain, update and retrieve documents. When processed in a digital format, the data retains authenticity, thereby endangering security on a massive scale. As a technological solution, this proposal comes with effective management techniques. An ideal software must fill that gap around efficiency and safety.

Furthermore, the advent of ubiquitous computing has created a golden age for archaeological researchers and participating publics, but the price is a digital resource is now in jeopardy. The archaeological record, in digital form, is at risk not simply from obsolescence and media failure, but the domain is also unable to fully participate in Open Data. Without swift and informed consensus and intervention, archaeology will lose

the majority of its research data legacy and capacity to a digital Dark Age. It faces a number of challenges, distinct from those encountered in other domains: Many forms of archaeological research (including excavation) destroy the cultural resource, and the recorded observations become the primary record, derived from non-repeatable documentation; Archaeological data is often born-digital, and there are no paper surrogates for the primary record derived, for example, from the use of mobile devices on site, geophysical surveys or logging of experimental data by analytical laboratory equipment; Archaeological researchers are particularly creative and innovative in their methodologies; adopting, adapting and developing novel techniques and approaches, and requiring stewardship of a wide range of data formats, and more complex understandings of data reuse, but often lacking the proper workflow and data policy found in other sciences data, the result of decades of research funding, is being lost in most countries owing to a lack of appropriate persistent repositories with specialist knowledge (Wright and Richards 2018).

To ensure and guarantee the protection of the central library of Allameh Tabataba'i's digital resources, it is recommended in accordance with the research findings that the data acquisition units, the storage management hierarchy, media replacement, error control, and the recovery and recovery of damaged information under the OIS reference model's 71% of the Archiving subsystem's elements be used (Summer & Autumn, 2020).

Similarly, to Miglė Bareikytė and Yarden Skop (2022), they contend that digital archiving, particularly through civic community archives, is essential for recording military intelligence and preventing disinformation campaigns.

Also, knowledge graphs can raise the quality of computer intelligent identification by converting various types of digital archive text into data that computers can understand. In addition, dynamic timing and pertinence of the graph can increase the degree of archive integration according to the time node, update user data based on users' retrieval histories to improve service quality, and improve cooperation and communication between digital archives features can also be used as a useful reference to better optimize the digital archiving service (Xiong Huixiang & Yan Wuyue, 2021).

Additionally, this work created a mobile learning system focused on sharing mind maps that is coupled with important data stored in a digital archiving system. This technique allowed students to add to and record pertinent material that they had discovered onto the mind map in addition to the functions of conventional mind maps, enhancing the validity of their own knowledge. This stxudy employed mind map sharing to help learners gain information and incorporated digital archive data to examine the efficacy of this teaching strategy (Chang et al., 2018).

Thus, the developments in the creation and use of archive information resources include delivering practical retrieval tools, upgrading the utilization environment, refining archive utilization policies, lowering query barriers, and increasing the accessibility of archive information resources. The creation of an information resource base is essential for the growth of archive information resources. The idea is to gather and arrange archive-related data and improve collection resources. To increase the development efficiency of archival information resources, classification, sorting, and storage are used (Yufeng Mo & Luyuan Fan, 2018).

Another concludes that schools must manage this component, yet despite how important it is, it still doesn't get enough attention. In primary schools, where there is a paucity of staff and just one school operator is responsible for managing the archives, this disregard for management is evident. Because of this, a great deal of data gets lost, corrupted, and disorganized. To boost school digitization and improve archive administration, a one-gate digital archive is being built. This will improve educational services (Dewi et al., 2023).

Another paper develops an archive release model and an archive search model to address the issue of managing the confidentiality of digital archives in a cloud environment. The main idea behind these models is to rigorously encrypt all archive files and the data they contain on a trusted local server before submitting them to the cloud for storage to ensure the security of the archive data there. It has favorable implications for advancing the use and advancement of cloud computing technologies in the management of archives (Xie et al., 2022).

Also, according to Syukhri Syukhri and Pita Gusmayenithe (2021) the administration section's computerized method of filing incoming and outgoing mail will benefit from the adoption of this archiving application by making it easier and more effective.

Additionally, as more digital technologies are created and implemented, data in archaeological digital archives are growing exponentially, yet the contents of project archives are still, in some ways, relatively fragmented. This may be due in part to the results being published in a variety of forms (May et al., 2023).

Then, Manurung et al., (2018) stated in their study "Implementation of Recording System Regular Spending Cost Based Software Online Accounting for Record Expenditures on the Company" that a company's finances must be recorded at any costs incurred with the company, including the promotional, advertise, water and electricity costs, and other necessary costs.

Furthermore, Obotu (2018) on the study entitled Evaluative Study of Digital Record Management System in the Hospitals in Minna Metropolis. The study stated that record management practice is imperative in any type of industry as it ensures quality service delivery especially in terms of health. Records are among the vital tools that an organization or management requires in order to attain the missions and visions of an organization. The purpose of a record management is to ensure quality, accuracy, accessibility, authenticity and security of information both paper and electronic systems.

Also, as the development rate of digital data has expanded, a number of existing preservation strategies and models have been discussed and published in literature along with a full comparison. Turkey is one of many western nations that has changed its paper-based systems for the preservation of government data to the smart system (Shaban et al., 2022).

Moreover, in a study conducted by Li, J. (2022) The current archiving technology today rapidly evolves, allowing for a better learning environment. Though this may be the case there are still issues that affect archives from becoming digitized securely.

Effectiveness of Digital Archiving System in terms of Sustainability

Jacqueline Thomas (2018) presented the advantages of using a database. According to her, you would be hard- pressed to find a decent system of keeping and managing information without the use of a database. In recent years, the increased flexibility and user-friendliness of databases make these systems a crucial business component. File cabinets can be compromised. Also, they can be stolen, accidentally destroyed, or lost. Databases add another level of security to valuable information. Not only can a database be stored in a remote facility unaffected by devastating events such as fire or thievery, but a database can also be password protected. This locks out any eyes that should not view sensitive reports.

Additionally, digital archiving techniques and digital archiving devices are unveiled. An example procedure consists of keeping an initial relational data framework created regarding a primary interaction of an archiving procedure; identifying a standing of the first relational data structure in a second iteration of the archiving procedure (Gong 2020).

Along with technology development, dynamic archives management must use technology to make archive management more accessible and faster. This technology-based archive management is called electronic archiving. The electronic filing makes it easier for employees to manage records (Astri, 2020).

Additionally, the rapid progress of innovation today significantly affects life in the public arena in various exercises, especially in the workplace (Iswandi et. al 2018).

On the other hand, the second study by Bawono et al., (2022) Implementation of digital archives using a dynamic archive information system study reports that the archive management in this institution still needs to be improved. It is due to the lack of staff or archivists and facilities in the archive room; the previous studies show that human resources determine the smooth running of activities in archives in an institution. Staff or archivists in such institutions should be able to analyze the appropriate documents for archiving or be observant of quality viewing documents.

Document stacking by utilizing innovation is a principle of proof in archival supervision, for example, limiting the shortage of essential data in the workplace and authorized agencies (Zuliyanti, 2021).

Although changing how technology is used can lessen the effects of digital preservation methods, this is not a sustainable practice model on its own. Examining the assumptions and motivations that underpin present practice is necessary to move toward ecologically sustainable digital preservation. The researchers propose explicitly integrating environmental sustainability into digital preservation practice by altering cultural heritage professionals' paradigms of evaluation, permanence, and availability of digital content. This builds on Goldman's challenge to current practices for digital authenticity and uses Ehrenfeld's sustainability framework (Pendergrass et al., 2021).

Effectiveness of Digital Archiving System in terms of Security

O'Meara L. (2019) wrote computer security software on both coasts of the US, at the MITRE corporation and then at One Secure. After spending some time gaining a broader understanding of business in the Santa Clara University MBA program, she flung herself into the world of web application development. Today her web and mobile development consulting company, Plum Flower Software, is based out of Music City, USA. BETTS (2020) stated that the database technology lets no programmers create, store and retrieve information quickly and easily.

On the other hand, as per the difference of data privacy and security data security refers to the protection against the threats of potential unauthorized data forgery or access and data privacy refers to how many could access the said data or are there specific authorizations to be conducted before having to access a data (HIV Gov. 2018).

Also, according to Hedbert (2018), privacy is deemed as the ability for sensitive information to be protected and to be not easily unidentifiable, which can also be related to data security.
According to Qiuhui X. et al., (2021) stated that despite institutions and organizations' ignorance of the security status of electronic records preservation, electronic records have recently gained more significance in China. The largest city in central China, Wuhan, serves as a case study for research into the security of electronic record preservation.

Effectiveness of Digital Archiving System in terms of Storage Capability

According to P.L. Bradshaw et. al. (2018) transformation will significantly influence the design of storage systems. Beyond the need to store traditional transactional data, there is now an additional demand to retain information over extended periods. This system is anticipated to possess the capability to safeguard data for decades, implement effective policy-driven data management, and facilitate seamless search and access, irrespective of data content or location.

Furthermore, ata center infrastructure is changing to become software-defined and programmable as part of a revolutionary shift in the IT sector. This change promotes agile deployment and adaptable data center architectures by enabling continuous provisioning and optimization of IT resources based on declarative workload specifications. Traditional data center management faces issues as a result of this transformation, notwithstanding its advantages. In this context, the storage component is the main emphasis of this article, which examines opportunities and challenges in software-defined settings. It looks at how software-defined storage (SDS) is currently being implemented, presents a fresh framework for SDS advancement, and investigates how SDS, SDC, and SDN interact with one another. The research highlights the significance of comprehensive orchestration and shows how cooperative optimization raises the overall effectiveness and efficiency of software-defined environments (A. Alba et al., 2020).

On the other hand, people are storing enormous volumes of data in the cloud more and more, which presents efficiency issues for traditional storage systems. Underutilization and low storage capacity result from the mismatch between CPU demand and storage. Replication and other traditional data security techniques are not space-efficient, and the distinct distribution of data object sizes might lead to excessive random writes or high request rates. Baidu tackles these issues by using an ARM-based customized small server design that uses erasure coding for data protection instead of replication. They also suggest a novel design that divides metadata and data management to improve coding and storage efficiency. The resultant system, Atlas, supports Baidu's storage service and demonstrates a high degree of scalability, dependability, and cost-effectiveness (C. Lai et al., 2019).

Synthesis

It was observed that the fast pace of the paper processing and the level of work in offices are both significantly affected by the employees' awareness about the use of digital archiving system which Zahara and Salim (2022) emphasized the necessity for further studies to address this gap. As collectively defined by Agrawa et.al (2020), Anene et.al (2020), Momoti et.al (2020) and Chawan et.al (2018), digital archiving system has a significant role in monitoring, safe keeping, and retrieval of the digital documents, information sources, and resources in a database thus, proper management of these records is vital; wherein according to Suresh (2021) is called a knowledge-based digital library.

Wartman (2022) discussed that good archiving system improves the quality of inventory related to sustainability, security, and storage capability whereas the awareness of employees as to its duration, accessibility and usage is essential to enhance efficiency and effectiveness of the digital archiving system.

Theoretical Framework

The researchers have used Rogers Everett's DOI theory, by modifying the factors in the 'Diffusion of Innovations Model' to prove the mentioned factors such as the respondents' Awareness and the Effectiveness of Digital Archiving System. Additionally, the subfactors of both factors are also put into mind as potential variables that can affect the proper implementation of digital archiving systems among the select offices. The subfactors of Respondents' Awareness being; the Duration, Accessibility, and Usage. Under usage are Frequency and Deployment. The subfactors that are under Effectiveness of Digital Archiving Systems are; Sustainability, Archive Security, and under Storage Capability are Offline and Online to measure the effectiveness of the digital archiving systems of the selected offices. The selected offices are: the Office of the Accountant, the Provincial Budget Office and the Provincial Treasurer's Office in the Provincial Government of Laguna.

Additionally, the researchers also used the Technology Acceptance Model, developed by Davis, which

is a widely used model to explain how users come to accept and use technology. It posits that perceived ease of use and perceived usefulness are key factors influencing an individual's intention to use a system. In the context of digital archiving systems, respondents' awareness may affect their perceived usefulness and ease of use, thereby influencing the system's effectiveness.

Conceptual Framework

Respondents' level of awareness on the digital archiving system refers to attributes that describe the current knowledge of the respondent about the digital archiving system. This study used duration, accessibility and usage, under usage there are two subfactors; frequency and deployment. Duration refers to the period of time that the system is being used. Accessibility is the amount of authority accessible to the respondents and Usage is used to describe how the system is used in certain conditions. Offices in this study refers to the selected offices in the Provincial Government of Laguna. It consists of three offices: (a) Treasury Office, (b) Budget Office, and (c) Office of the Provincial Accountant.

As digital transformation progresses, companies are increasingly switching to paperless document archiving systems. Documents are worked on and managed electronically, for instance with document management systems (DMS), while files and documents are stored securely using archiving software. (Joseph, 2023)

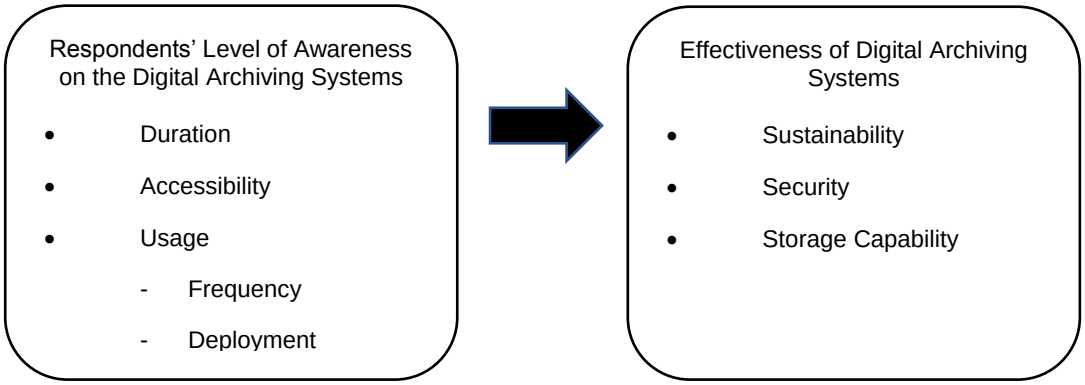

Figure 1. Research Paradigm

Figure 1 illustrates the conceptual framework of the study. The framework consists of independent and dependent variables. The independent variable is the level of awareness on digital archiving system with its sub-variables; Duration, Accessibility and Usage while the dependent variable is the Level of Effectiveness of Digital Archiving System, which includes sub-variables; sustainability, archive security and storage capability. The researchers propose a framework of technology adoption that includes demographic profile and the characteristics that affect how adaptable digital archiving is since the researchers believe that it is a complicated issue that is influenced by many aspects. The researchers have used Rogers Everett's DOI theory, by modifying the factors in the 'Diffusion of Innovations Model' to prove the mentioned factors such as the respondents' Awareness and the Effectiveness of Digital Archiving System.

III. RESEARCH METHODOLOGY

Research Design

The researchers used the descriptive-correlational method to identify the relationship between the respondents' level of awareness and the effectiveness of digital archiving systems in the selected offices of the Provincial Government of Laguna. The descriptive method seeks to correctly and methodically describe a population, circumstance, or phenomenon. It can respond to inquiries about what, when, where, when, and how, but not why. On the other hand, correlational research focuses on the collection of numerical data or statistical analysis. Data were acquired through questionnaires. This approach focused on obtaining statistical data in order to generalize it across populations and provide details on a specific phenomenon.

Research Locale

The study was administered at the Provincial Government of Laguna, P. Guevara St., Brgy. Poblacion I, Santa Cruz, Laguna. The respondents to the study came from the selected offices of the Provincial Government, particularly the Office of the Provincial Accountant, the Provincial Budget Office, and the Provincial Treasurer's Office. The study was performed through the distribution of questionnaires in their respective offices. The researchers chose the place of implementation because it would give them the needed

information for the study.

Population of the Study

For this study, the researchers sorted out the employees based on their experience in using archiving system. The number of employees per selected offices of the Provincial Government of Laguna were fifteen (15) from the Budget Office, twenty (20) from the Provincial Treasury Office, and twenty (20) from the Office of the Provincial Accountant, for a total of fifty-five (55) respondents.

The technique utilized for the study is the total population sampling wherein the researchers treated the total population of respondents who were selected because they have the applicable knowledge and first-hand job experience of digital archiving that is related to the questions stated in the survey form. According to Glen (2023), when the target group is small and distinguishable by an exceptional and well-defined trait, total population sampling is actually utilized. It works best in situations when the population as a whole is manageable, as in a well-defined subsection of a larger population.

Research Instruments

The research instrument used in this study for gathering necessary information and collecting data was in the form of survey-questionnaire via Google Forms and was broken down in two (2) parts.

The objective of the initial part is to provide the respondent with a transparent basis for their evaluation on their level of awareness on the digital archiving through the use of half of the questionnaire. The data acquired here will be used to interpret on how well the digital archiving system worked for the selected offices. The final phase was a survey evaluation checklist which contains the questions about the respondents' level of awareness such as duration, accessibility and usage while on effectiveness the variables will be measured on its sustainability, security, and storage capability.

Table 1. The Likert Rating Scale is used in determining the quantity of the level of awareness on the digital archiving system responses from the chosen respondents.

Scale	Range	Remarks	Verbal Interpretations
4	3.26 – 4.00	Strongly Agree	Very High Awareness
3	2.51 – 3.25	Agree	High Awareness
2	1.76 – 2.50	Disagree	Low Awareness
1	1.00 – 1.75	Strongly Disagree	Very Low Awareness

The scale above represented the response of the employees based on their level of awareness of the digital archiving system. Four (4) being the highest signifies that the current digital archiving system is performing up to the set standards and one (1) being the lowest implies that the digital archiving systems should be upgraded.

Table 2. The Likert Rating Scale is used in determining the quantity on how effective the digital archiving system of the responses from the chosen respondents.

Scale	Range	Remarks	Verbal Interpretation
4	3.26 – 4.00	Strongly Agree	Highly Effective
3	2.51 – 3.25	Agree	Moderately Effective
2	1.76 – 2.50	Disagree	Effective
1	1.00 – 1.75	Strongly Disagree	Not Effective

The scale above represented the response of the employees based on how effective their digital archiving system was. Four (4) being the highest signifies that the current digital archiving system is performing up to the set standards and one (1) being the lowest implies that the digital archiving systems should be upgraded.

Data Gathering

The researchers wrote a letter of approval to ask permission to conduct the study in the selected offices of the Provincial Government of Laguna. After the letter of approval is signed, the researchers proceed to gather data from the selected respondents with most experience in using the digital archiving system at selected offices of the Provincial Government of Laguna. The questionnaires were distributed to the selected offices of the respondents, which are the Office of the Provincial Accountant, the Provincial Budget Office, and the Provincial Treasurer's Office at the Provincial Government of Laguna. The researchers provided assistance to the inquiries raised by the respondents. The researchers gave the selected respondents the questionnaires. The results were taken after the survey was conducted and thank the employees who participated in the survey. After

collecting all data, the researchers, with the help of a statistician tabulated and tallied the survey. The results served as a basis for researchers to determine the respondents' level of awareness and the effectiveness of the digital archiving system in the selected offices of the Provincial Government of Laguna.

Treatment of Data

To interpret the data effectively, the researcher will employ the following statistical treatment: The percentage, weighted mean, and standard deviation are the tools used to interpret data.

1.) Weighted Mean

The weighted mean is the average number of respondents according to the duration, accessibility and usage. This will be used to determine the respondents' level of awareness on the digital archiving system.

2.) Standard Deviation

The standard deviation is used to calculate confidence intervals, which provide a range of values within which the true population parameter is likely to lie. The standard deviation is used in conjunction with the sample size and the desired level of confidence to construct confidence intervals. These will be used to determine the adaptability of digital archiving for the selected offices of the Provincial Government of Laguna and to analyze and interpret the data that will be gathered from the respondents.

In determining how aware the respondents are of the effectiveness of the digital archiving system in selected offices of the Provincial Government of Laguna, both mean and standard deviation were used to present the gathered data from the respondents. The mean was used because it is the most common measure of central tendency and refers to the average value of a group of numbers. The mean is calculated by adding together all the numbers and dividing them by the total number of values; the result is the mean. It is determined using its formula by dividing the total number of scores by the sum of all the scores in the distribution. On the other side, the data received from the respondents will be presented using the standard deviation. The standard deviation was used in conjunction with the mean to summarize the continuous data. The process of getting the standard deviation involves first getting the mean of the data set. Next, take the differences and square them. Then find the variance, which is the average of the squared differences. Lastly, calculate the square root of the variance, which is the standard deviation.

IV. RESULTS AND DISCUSSION

This chapter presents, analyses, and interprets the data gathered that determined the relationships between the respondents' level of awareness and the effectiveness of digital archiving systems.

Level of Awareness on the Digital Archiving System

To determine the level of awareness on the digital archiving system in terms of duration, accessibility, usage-frequency and deployment-frequency, the data were treated statistically using the mean and standard deviation.

Duration

Table 3 shows the level of awareness on the digital archiving system in terms of duration. Also shows the statements, mean, standard deviation and remarks.

Table 3. Level of Awareness on the Digital Archiving System in terms of Duration

INDICATORS	*MEAN*	*SD*	*Remarks*	*Verbal Interpretation*
They are knowledgeable about the time-related considerations in the digital archiving system.	3.54	0.50	Strongly Agree	Very High Awareness
They are familiar with the historical timeline and milestones related to the implementation of the digital archiving system.	3.21	0.59	Agree	High Awareness
They are well-informed of the time frame involved in the digital archiving system.	3.25	0.51	Agree	High Awareness
The duration for which the digital archiving system has been in place is clear to them.	3.41	0.56	Strongly Agree	Very High Awareness

OVERALL	3.35	0.43	Very High Awareness

Respondents *strongly agree* that they are knowledgeable about the time-related considerations in the digital archiving system, with the highest mean score (M=3.54 and SD=0.50). Likewise, they *strongly agree* that the duration for which the digital archiving system is clear to them, with a mean score (M=3.41, SD=0.56).
On the other hand, they claimed that they are familiar with the historical timeline and milestones related to the implementation of the digital archiving system, with the lowest mean score of responses with (M=3.29, SD=0.59), and was interpreted as *agree*.
Finally, it was found out that the level of awareness on the digital archiving system in terms of duration attained a weighted mean score of 3.35 and a standard deviation of 0.43, which means that the respondents have *very high awareness* with the Digital Archiving System in terms of duration.
The awareness among the respondents stems from the specific criteria guiding their selectio.., ,primarily centered around the nature of their employment and their active involvement with the Digital Archiving System. These individuals have been chosen for their roles, suggesting a level of expertise and familiarity with the intricacies of their professional responsibilities.
The study reveals that participants have a high level of understanding of the duration-related aspects of the Digital Archiving System. They are knowledgeable about time-related considerations and operational duration, with a mean score of 3.41. They also agree with historical timelines and milestones related to the system's implementation. The overall weighted mean of 3.35 indicates a wide understanding, with a slightly lower awareness of historical timelines and milestones.
In support of this study, according to Odenthal, et al. (2020), digital archiving is the database-supported, long-term and secure storage of digital data that can be reproduced at any time. If information is stored for more than 10 years, this is referred to as digital long-term archiving. The mentioned literature is used to express that the data stored in digital archiving systems can be used in the future if needed. The findings also state that they know the reason and the processes done, so the Digital Archiving Systems function properly.

Accessibility

Table 4 shows the level of awareness on the digital archiving system in terms of accessibility. Also shows the statements, mean, standard deviation and remarks.

Table 4. Level of Awareness on the Digital Archiving System in terms of Accessibility

INDICATORS	*MEAN*	*SD*	*Remarks*	*Verbal Interpretation*
They are aware of any challenges or obstacles faced by the office when trying to access the digital archiving system.	3.48	0.57	Strongly Agree	Very High Awareness
They are the digital archiving system highly accessible for retrieving necessary information.	3.54	0.54	Strongly Agree	Very High Awareness
They understand the accessibility features of the digital archiving system.	3.52	0.60	Strongly Agree	Very High Awareness
They are knowledgeable about the accessibility options and tools in the digital archiving.	3.59	0.56	Strongly Agree	Very High Awareness
OVERALL	3.53	0.44		Very High Awareness

Respondents *strongly agree* that, they are knowledgeable about the accessibility options and tools in the digital archiving, with the highest mean score (M=3.59 and SD=0.56). Likewise, they *strongly agree* that they find the digital archiving system highly accessible for retrieving necessary information. with a mean score (M=3.54, SD=0.54).
On the other hand, they claimed that they are aware of any challenges or obstacles faced by the office when trying to access the digital archiving system, with the lowest mean score (M=3.48, SD=0.57), and was interpreted as *strongly agree*.
Finally, it was found out that the level of awareness on the digital archiving system in terms of accessibility attained a weighted mean score of 3.53 and a standard deviation of 0.44, which means that the respondents have *very high awareness* with the Digital Archiving System in terms of accessibility.

The participants in the survey exhibit a heightened level of awareness, stemming from the deliberate selection of individuals with prior experience in utilizing the system. This heightened awareness among respondents is a key factor in the survey's reliability and validity, as it ensures that those providing input possess a firsthand understanding of the system.

The study reveals a high level of awareness among participants about the accessibility of the Digital Archiving System. Participants acknowledged challenges faced in accessing the system, with a mean score of 3.48. They also agreed on the system's high accessibility for retrieving information. Participants also expressed a strong understanding of the system's accessibility features and available options. The overall mean score of 3.53 suggests a positive perception of the system's accessibility.

This observation resonates with a related study by Crabtree, J. et al. (2020) as information and communication technology has become pervasive in our society, we are increasingly dependent on both digital data and repositories that provide access to and enable the use of such resources. Repositories must earn the trust of the communities they intend to serve and demonstrate that they are reliable and capable of appropriately managing the data they hold. Accessibility can also be related to security as the only people that have access to the system are the trained employees that are capable of operating the software and certain software or information are only available to a few that have been granted access to it.

Usage with regards to Frequency

Table 5 shows the level of awareness on the digital archiving system in terms of usage with regards to frequency. Also shows the statements, mean, standard deviation and remarks.

Table 5. **Level of Awareness on the Digital Archiving System in terms of Usage with regards to Frequency**

INDICATORS	*MEAN*	*SD*	*Remarks*	*Verbal Interpretation*
They are familiar with how frequently the digital archiving system is utilized within our office.	3.59	0.56	Strongly Agree	Very High Awareness
They frequently use the digital archiving system.	3.57	0.57	Strongly Agree	Very High Awareness
They are aware of the regularity of usage of the digital archiving system.	3.52	0.57	Strongly Agree	Very High Awareness
They are knowledgeable about the regular usage patterns and frequency in the digital archiving system.	3.54	0.57	Strongly Agree	Very High Awareness
OVERALL	3.55	0.47		Very High Awareness

Respondents *strongly agree* that they are familiar with how frequently the digital archiving system is utilized within our office, with the highest mean score (M=3.59 and SD=0.56). Likewise, they *strongly agree* that they frequently use the digital archiving system, with a mean score (M=3.57, SD=0.57).

On the other hand, they claimed that they are aware of the regularity of usage of the digital archiving system, with the lowest mean score of responses with (M=3.52, SD=0.57), and was interpreted as *strongly agree*.

Finally, it was found out that the level of awareness on the digital archiving system in terms of usage with regards to frequency attained a weighted mean score of 3.55 and a standard deviation of 0.47, which means that the respondents have *very high awareness* with the Digital Archiving System in terms of usage with regards to frequency.

The selected employees for this task were specifically chosen based on their prior experience and proficiency in utilizing the relevant systems. It was ensured that each individual in the designated group had previously engaged with the mentioned systems, thus guaranteeing a level of familiarity and expertise.

The study reveals a high level of awareness and agreement among participants regarding the frequency of the Digital Archiving System's usage in the office. Participants reported familiarity with the system's usage frequency, actively using it, and being aware of its regularity. The overall mean score of 3.55 suggests a strong consensus on the system's usage patterns and frequency, indicating robust awareness and engagement.

Crabtree et.al (2020) emphasized that the increasing dependency on the digital data requires the trust of the communities they tend to serve, that they are reliable and capable of appropriately managing the data they hold;

in which according to Amaechi et, al (2021) that some of this data is intended for long preservation. In connection to the results of the study, the level of awareness of the frequency of use of digital archiving systems is crucial for the efficient management and preservation of digital assets which the respondents are fully aware of based on their responses as supported by the study of Chiueh & Lu (2021), various redundancy techniques are used to protect data integrity. With the number of possible interactions done to the system in a short period of time. There also should be security measures that make it so that there is no accidental unintended change done to the system.

Usage with regards to Deployment

Table 6 shows the level of awareness on the digital archiving system in terms of usage with regards to deployment. Also shows the statements, mean, standard deviation and remarks.

Table 6. **Level of Awareness on the Digital Archiving System in terms of Usage with regards to Deployment**

INDICATORS	*MEAN*	*SD*	*Remarks*	*Verbal Interpretation*
They are actively involved in the deployment process of the digital archiving system in our office.	3.36	0.59	Strongly Agree	Very High Awareness
They are aware of the deployment processes associated with the digital archiving system.	3.45	0.60	Strongly Agree	Very High Awareness
They are familiar with the key steps and strategies involved in the deployment of the digital archiving system.	3.39	0.56	Strongly Agree	Very High Awareness
They are aware of how to access the system.	3.70	0.50	Strongly Agree	Very High Awareness
OVERALL	3.47	0.44		Very High Awareness

Respondents *strongly agree* that they are aware of how to access the system, with the highest mean score (M=3.70 and SD=0.50). Likewise, they *strongly agree* that they are aware of the deployment processes associated with the digital archiving system, with a mean score (M=3.45, SD=0.60).

On the other hand, they claimed that they are actively involved in the deployment process of the digital archiving system in our office, with the lowest mean score of responses with (M=3.36, SD=0.59), and was interpreted as *strongly agree*.

Finally, it was found out that the level of awareness on the digital archiving system in terms of usage with regards to deployment attained a weighted mean score of 3.47 and a standard deviation of 0.44, which means that the respondents have *very high awareness* with the Digital Archiving System in terms of usage with regards to duration. According to most Respondents of the survey, they were either involved with the deployment or are aware of the process done during the deployment of the system granting them awareness to the Deployment of the system.

Table 4 shows a high level of awareness among participants regarding the Digital Archiving System's deployment. Participants expressed strong involvement, awareness, familiarity with key steps, and knowledge of accessing the system. The weighted mean of 3.47 suggests a consistent level of awareness, indicating a well-informed user base for effective utilization and successful integration within the office environment.

This observation resonates with a related study by Jurasovic et al. (2019) highlighting that deploying and maintaining software in a distributed system involves various tasks such as software delivery, remote installation, and configuration adjustments. To relate this literature to the study. Most employees were present or were involved in the deployment of the Digital Archiving System. Others that were not involved or were present were given training or made aware of processes and protocols necessary.

Effectiveness of Digital Archiving System

To determine the level of the effectiveness of digital archiving systems in terms of sustainability, security and storage capability, the data were treated statistically using the mean and standard deviation.

Sustainability

Table 7 shows the level of the effectiveness of digital archiving systems in terms of sustainability. Also shows the statements, mean, standard deviation and remarks.

Table 7. **Level of the Effectiveness of Digital Archiving Systems in terms of Sustainability**

INDICATORS	*MEAN*	*SD*	*Remarks*	*Verbal Interpretation*

The current archiving system is environment friendly, ensuring enough energy supply.in the future.	3.13	0.97	Agree	Moderately Effective
The system supports the organizational goals.	3.36	0.92	Strongly Agree	Highly Effective
The system enhances values and cultural heritage.	3.36	0.82	Strongly Agree	Highly Effective
The system ensures safety and free from health hazards.	3.45	0.78	Strongly Agree	Highly Effective
OVERALL	3.32	0.74		Highly Effective

Respondents *strongly agree* that the system ensures safety and free from health hazards, with the highest mean score (M=3.45 and SD=0.78). Likewise, they *strongly agree* that the system supports the organizational goals, the respondents also *strongly agree* that the system enhances values and cultural heritage, with a mean score (M=3.46 SD=0.92 and SD=0.82).

On the other hand, they claimed that the current archiving system is environment friendly, ensuring enough energy supply in the future, with the lowest mean score of responses with (M=3.13, SD=0.97), and was interpreted as *strongly agree*.

Finally, it is found out that the level of the effectiveness of digital archiving systems in terms of sustainability attained a weighted mean score of 3.32 and a standard deviation of 0.74, which means that the Digital Archiving System is *highly effective* in terms of sustainability. The Digital Archiving System is effective and sustainable due to it functioning well and being in accordance to the selected offices of the Provincial Government of Laguna's goals.

The findings presented in Table 5 provide a comprehensive evaluation of the Digital Archiving System's perceived effectiveness in sustainability was evaluated by respondents. They agreed that the system is environmentally friendly, aligns with organizational goals, enhances values and cultural heritage, and ensures safety. The highest level of agreement was for the safety assurance. The weighted mean of 3.32 indicates a well-informed perception of the system's effectiveness in sustainability. The results suggest the system is a valuable and sustainable asset within the organizational framework.

Building upon the assertions made by Astri (2020) regarding the facilitation of record management through electronic filing, it becomes evident that as technology continues to advance, the implementation of technological solutions, such as databases, is essential for achieving greater accessibility and efficiency in dynamic archives management, as emphasized by Jacqueline Thomas (2018). The presented related literature is used to emphasize on how sustainability of systems should be tackled. As the technology used in different programs advance, the system should still be capable of handling processes years in the future with standard requirement of the Provincial Government of Laguna.

Security

Table 8 shows the level of the effectiveness of digital archiving systems in terms of security. Also shows the statements, mean, standard deviation and remarks.

Table 8. Level of the Effectiveness of Digital Archiving Systems in terms of Security

INDICATORS	*MEAN*	*SD*	*Remarks*	*Verbal Interpretation*
The system protects digital materials from inadvertent or deliberate changes in information.	3.41	0.68	Strongly Agree	Highly Effective
The system ensures compliance with any legal and regulatory requirements.	3.63	0.65	Strongly Agree	Highly Effective
The system provides audit trail to satisfy accountability requirements.	3.21	0.82	Agree	Highly Effective
The system protects the authenticity of digital materials.	3.32	0.83	Strongly Agree	Moderately Effective
OVERALL	3.42	0.52		Highly Effective

Respondents *strongly agree* that the system ensures compliance with any legal and regulatory requirements, with the highest mean score (M=3.63 and SD=0.65). Likewise, they *strongly agree* that the system acts as a deterrent to potential internal security breaches, with a mean score (M=3.54 SD=0.66).

On the other hand, they claimed that the system provides audit trail to satisfy accountability requirements, with the lowest mean score of responses with (M=3.21, SD=0.82), and was interpreted as *agree*.

Finally, it is found out that the level of the effectiveness of digital archiving systems in terms of security attained a weighted mean score of 3.42 and a standard deviation of 0.52, which means that the Digital Archiving System is *highly effective* in terms of security.

The Digital Archiving System is said to be effective in terms of Security as it has not experienced any breaches and has not allowed people with no authority to create any unnecessary changes that may alter important files within the system.

The results outlined in the provided table offer a comprehensive evaluation of the Digital Archiving System's efficacy in information integrity, compliance, accountability, authenticity, and security was evaluated by participants. They found the system to be highly effective in protecting digital materials from inadvertent and deliberate changes, ensuring compliance with legal and regulatory requirements, providing an audit trail for accountability, protecting the authenticity of digital materials, and acting as a strong deterrent to potential internal security breaches. The system's effectiveness in these areas was deemed consistent and well-informed, with participants expressing confidence in its capabilities to protect, comply, account for, and secure digital assets.

Herbert (2018), stated that privacy is deemed as the ability for sensitive information to be protected and to be not easily unidentifiable. This related literature reiterates that Digital Archiving Systems' privacy should be taken seriously and should be a top priority as those files in the archive can be used for future referencing to documents that are currently in circulation.

Storage Capability

Table 9 shows the level of the effectiveness of digital archiving systems in terms of storage capability. Also shows the statements, mean, standard deviation and remarks.

Table 9. Level of the Effectiveness of Digital Archiving Systems in terms of Storage Capability

INDICATORS	*MEAN*	*SD*	*Remarks*	*Verbal Interpretation*
The system allows access to certain documents by providing a unique username and password.	3.39	0.73	Strongly Agree	Highly Effective
The system gives authentication to users who accessed the documents.	3.41	0.68	Strongly Agree	Highly Effective
The system prevents hackers from intercepting sensitive company information and financial data.	3.45	0.66	Strongly Agree	Highly Effective
The system requires multiple levels of control to protect information.	3.41	0.73	Strongly Agree	Highly Effective
OVERALL	3.42	0.56		Highly Effective

Respondents *strongly agree* that the system prevents hackers from intercepting sensitive company information and financial data, with the highest mean score (M=3.45 and SD=0.66). Likewise, they *strongly agree* that the system gives authentication to users who accessed the documents, and the system requires multiple levels of control to protect information, with a mean score (M=3.41 SD= 0.68 and SD=0.73).

On the other hand, they claimed that the system allows access to certain documents by providing a unique username and password and the system ensures that data storage and protection are free from viruses, with the lowest mean score of responses with (M=3.39, SD=73 and SD=0.78), and was interpreted as *agree*.

Finally, it is found out that the level of the effectiveness of digital archiving systems in terms of storage capability attained a weighted mean score of 3.42 and a standard deviation of 0.56, which means that the Digital Archiving System is *highly effective* in terms of storage capability.

The Digital Archiving Systems' Storage capability is deemed effective as it satisfies the needs that are set by the Provincial Government of Laguna and has not created issues that may arise from lack of Storage Capability.

The results from Table 7 provide a comprehensive assessment of the Digital Archiving System's effectiveness in storage capability was assessed by participants, focusing on access control, authentication, cybersecurity, and virus protection. Participants strongly agreed on the system's ability to grant access to documents through unique usernames and passwords, providing authentication for users, preventing unauthorized access, and ensuring cybersecurity measures. They also emphasized the importance of multiple levels of control for protecting information and the system's assurance of a virus-free environment. The results suggest the Digital Archiving System is a reliable solution for storing and safeguarding sensitive information, with high user confidence.

A. Alba et al., (2020) have stated data center infrastructure is changing to become software-defined and programmable as part of a revolutionary shift in the IT sector. This change promotes agile deployment and adaptable data center architectures by enabling continuous provisioning and optimization of IT resources based on declarative workload specifications. The literature used in this context is to emphasize the need for Digital Archiving System instead of physical storage as it is more space efficient and allows for better storage possibilities that can be safer compared to physical storages.

Test of Significant Relationship between the Respondents' Level of Awareness and the Effectiveness of Digital Archiving Systems

To test the significant relationship between the respondents' level of awareness and the effectiveness of digital archiving systems in terms of sustainability, security and storage capability, they were treated statistically using Real Statistics Data Analysis Tools using the Pearson correlation coefficient.

Table 10. Test of Significant Relationship between the Respondents' Level of Awareness and the Effectiveness of Digital Archiving Systems in Terms of Sustainability

Level of Awareness	Digital Archiving Systems	r-value	Degree of Correlation	p-value	Analysis
Duration	*Sustainability*	0.375**	Low Positive Correlation	0.004	*Significant*
Accessibility		0.321**	Low Positive Correlation	0.015	*Significant*
Usage-Frequency		0.304**	Low Positive Correlation	0.022	*Significant*
Usage-Deployment		0.375**	Low Positive Correlation	0.004	*Significant*

**. Correlation is significant at the 0.05 level (2-tailed).

The correlation coefficients measure the strength and direction of the relationship between the respondents' level of awareness and the effectiveness of digital archiving systems in terms of sustainability. A positive correlation indicates that as respondents' level of awareness, the effectiveness of digital archiving systems in terms of sustainability also tends to increase.

A correlation coefficient of 1 indicates a perfect positive correlation, while a coefficient of -1 indicates a perfect negative correlation.

The correlation coefficients in Table 8 are all positive and significant at the 0.05 level (2-tailed). This suggests a low positive relationship between the respondents' level of awareness and the effectiveness of digital archiving systems in terms of sustainability across all the variables.

The results presented in Table 8 demonstrate a comprehensive analysis of the relationship between respondents' awareness of digital archiving systems and their sustainability effectiveness. Correlation coefficients were used to measure the strength and direction of this relationship across variables like duration, sustainability, accessibility, usage-frequency, and usage-deployment. The results show a low positive correlation, suggesting that as awareness increases, the effectiveness of digital archiving systems in promoting sustainability increases. The findings highlight the importance of awareness in influencing the effectiveness of digital archiving systems in promoting sustainability, with efforts to increase user awareness potentially contributing to its sustainability.

Along with technology development, dynamic archives management must use technology to make archive management more accessible and faster. This technology-based archive management is called electronic archiving. The electronic filing makes it easier for employees to manage records (Astri, 2020). The Test of Significant Relationship between the Respondents' Level of Awareness and the Effectiveness of Digital Archiving Systems in Terms of Sustainability showed that there is a significant relation of Respondents' level of awareness and the Sustainability. The related literature states that for the Digital Archiving System to be Sustainable it must be able to keep up with current technological trends.

Table 11. Test of Significant Relationship between the Respondents' Level of Awareness and the Effectiveness of Digital Archiving Systems in Terms of Security

Level of Awareness	Digital Archiving Systems	r-value	Degree of Correlation	p-value	Analysis
Duration	*Security*	0.368**	Low Positive Correlation	0.005	*Significant*
Accessibility		0.373**	Low Positive Correlation	0.004	*Significant*
Usage-Frequency		0.385**	Low Positive Correlation	0.003	*Significant*
Usage-Deployment		0.529**	Medium Positive Correlation	<.001	*Significant*

**. Correlation is significant at the 0.05 level (2-tailed).

The correlation coefficients measure the strength and direction of the relationship between the respondents' level of awareness and the effectiveness of digital archiving systems in terms of security. A positive correlation indicates that as respondents' level of awareness, the effectiveness of digital archiving systems in terms of security also tends to increase.

A correlation coefficient of 1 indicates a perfect positive correlation, while a coefficient of -1 indicates a perfect negative correlation.

The correlation coefficients in Table 9 are all positive and significant at the 0.05 level (2-tailed). This suggests a low and medium positive relationship between the respondents' level of awareness and the effectiveness of digital archiving systems in terms of security across all the variables.

The results presented in Table 9 examine the relationship between respondents' awareness and the effectiveness of digital archiving systems, focusing on security. The analysis uses correlation coefficients to measure the strength and direction of this relationship. The results show a positive and significant relationship between awareness and the security-related effectiveness of digital archiving systems. As awareness increases, the effectiveness of digital archiving systems tends to rise. However, the relationship between awareness and security effectiveness is stronger in usage-deployment, emphasizing the importance of user awareness in enhancing security.

Hedbert (2018) emphasized the need for sensitive information to be protected and to be not easily unidentifiable, such as the digital assets of the Provincial Government of Laguna. The relationship is strengthened by the study of Chiueh & Lu (2021) which stated that various redundancy techniques are used to protect archived data from human error or malicious attacks, signifying that the more the intended users are aware to the technicalities of the digital archiving system, the more the security is enhanced. Test of Significant Relationship between the Respondents' Level of Awareness and the Effectiveness of Digital Archiving Systems in Terms of Security measured that there is a significant relation between the Respondents' level of awareness and the Effectiveness of Digital Archiving Systems in terms of Security. In accordance to this, Hedbert stated that the need for information to be protected and to be not so easily unidentifiable. This is so that any malicious attempts to leak classified government documents are going to be stopped and allow for better safekeeping of information of the people.

Table 12. Test of Significant Relationship between the Respondents' Level of Awareness and the Effectiveness of Digital Archiving Systems in Terms of Storage Capability

Level of Awareness	Digital Archiving Systems	r-value	Degree of Correlation	p-value	Analysis
Duration	*Storage Capability*	0.270**	Low Positive Correlation	0.043	*Significant*
Accessibility		0.317**	Low Positive Correlation	0.017	*Significant*
Usage-Frequency		0.226**	Low Positive Correlation	0.093	*Not Significant*
Usage-Deployment		0.401**	Medium Positive Correlation	0.002	*Significant*

**. Correlation is significant at the 0.05 level (2-tailed).

The correlation coefficients measure the strength and direction of the relationship between the respondents'

level of awareness and the effectiveness of digital archiving systems in terms of storage capability. A positive correlation indicates that as respondents' level of awareness, the effectiveness of digital archiving systems in terms of storage capability also tends to increase.

A correlation coefficient of 1 indicates a perfect positive correlation, while a coefficient of -1 indicates a perfect negative correlation.

According to the p-value in Table 10, the respondents' level of awareness in terms of duration, accessibility, and usage-deployment was *significant* at the 0.05 level (2-tailed), while usage-frequency was *not significant*. This suggests a low and medium positive relationship between respondents' level of awareness and the effectiveness of digital archiving systems in terms of storage capability across all the variables.

Specifically, respondents' level of awareness in terms of duration, accessibility, and usage-deployment shows a *significant* and, low and medium positive correlation with effectiveness of digital archiving systems in terms of storage capability. This implies that as respondents' level of awareness in terms of duration, accessibility, and usage-deployment increases, there is a effectiveness of digital archiving systems in terms of storage capability.

On the other hand, respondents' level of awareness in terms of usage-frequency shows a *not significant* and, low and medium positive correlation with effectiveness of digital archiving systems in terms of storage capability. This implies that there is no relationship between respondents' level of awareness in terms of usage-frequency and digital archiving systems in terms of storage capability

According to P.L. Bradshaw et. al. (2018) transformation will significantly influence the design of storage systems. Beyond the need to store traditional transactional data, there is now an additional demand to retain information over extended periods. This system is anticipated to possess the capability to safeguard data for decades, implement effective policy-driven data management, and facilitate seamless search and access, irrespective of data content or location. Test of Significant Relationship between the Respondents' Level of Awareness and the Effectiveness of Digital Archiving Systems in Terms of Storage Capability has gathered that the Respondents' Level of Awareness is significant to the Effectiveness of Storage Capability. In a literature done by P.L. Bradshaw the transformation of Storage from Physical Storages to Digital Storages can result into better retainment of data that can be stored and not be degraded for decades.

V. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter presented the summary of findings, conclusions based on findings and recommendations drawn from the conclusion. The findings of the study were ordered according to the specific sub-problems stated in the first chapter.

Summary of Findings

This study intended to bridge the gap with regard to the effectiveness of digital archiving system in the selected offices of Provincial Government of Laguna through integrating the responses of the intended users as to their level of awareness and to test the significant relationship between the respondents' awareness and the effectiveness of digital archiving systems.

The researchers used a descriptive-correlational method. Data needed are gathered through the distribution survey-questionnaire via Google Forms and was broken down in two (2) parts. The instruments used were checklist and Likert scales. The researchers utilized the statistical treatment of the data gathered and collected in order to attain the objectives.

1. Extent of the Respondents' Awareness on the Digital Archiving Systems.

The results revealed that the majority of respondents are fully aware of all of the above-mentioned statements. The extent of respondents' awareness of the digital archiving system in terms of duration acquired an overall mean score of 3.35 (Fully Aware) and a standard deviation of 0.43. Similar results were obtained from the digital archiving system System in terms of accessibility with an overall mean score of 3.53 (Fully Aware) with a standard deviation of 0.44. Additionally, results from the digital archiving system in terms of usage with regards to frequency got the highest overall mean score of 3.55 (Fully Aware) and a standard deviation of 0.47. Furthermore, awareness on the digital archiving system in terms of usage with regards to deployment obtained an overall mean score of 3.47 (Fully Aware) and a standard deviation of 0.44. Also, the majority of respondents strongly agreed to all of the statements regarding awareness on digital archiving systems, yielding an overall mean score of 3.48 (Strongly Agree) and standard deviation of 0.45.

2. Extent of the Effectiveness of the Digital Archiving Systems

The sustainability of the company's digital archiving system was highly effective, as evidenced by a mean score of 3.32 and a standard deviation of 0.74. The department adeptly employed suitable devices for archiving data, and the system's sustainability was supported by the resources of the Provincial Government of Laguna. Similarly, the participants demonstrate a comprehensive understanding of the company's digital archiving security, as indicated by a weighted mean score of 3.42 and a standard deviation of 0.52. The system is

observed to be exceptionally proficient in safeguarding digital assets from both unintentional and intentional alterations. It ensures adherence to legal and regulatory mandates, offers an accountable audit trail, preserves the authenticity of digital materials, and serves as a robust deterrent against potential internal security breaches. Moreover, digital archiving in terms of storage capability is effective, as evidenced by a weighted mean of 3.42 and a standard deviation of 0.56. The findings indicate that the Digital Archiving System is a dependable and trustworthy solution for storing and protecting sensitive information, instilling a high level of confidence among users.

3. Test of Significant Relationship between the Respondents' Level of Awareness and the Effectiveness of Digital Archiving Systems in Terms of Sustainability

Correlation coefficients were used to measure the strength and direction of this relationship across variables like duration, sustainability, accessibility, usage-frequency, and usage-deployment. The results show a low positive correlation, suggesting that as awareness increases, the effectiveness of digital archiving systems in promoting sustainability increases. The findings highlight the importance of awareness in influencing the effectiveness of digital archiving systems in promoting sustainability, with efforts to increase user awareness potentially contributing to its sustainability.

4. Test of Significant Relationship between the Respondents' Level of Awareness and the Effectiveness of Digital Archiving Systems in Terms of Security

The analysis uses correlation coefficients to measure the strength and direction of this relationship. The results show a positive and significant relationship between awareness and the security-related effectiveness of digital archiving systems. As awareness increases, the effectiveness of digital archiving systems tends to rise. However, the relationship between awareness and security effectiveness is stronger in usage-deployment, emphasizing the importance of user awareness in enhancing security.

5. Test of Significant Relationship between the Respondents' Level of Awareness and the Effectiveness of Digital Archiving Systems in Terms of Storage Capability

The respondents' level of awareness in terms of duration, accessibility, and usage-deployment was significant at the 0.05 level (2-tailed), while usage-frequency was not significant. This suggests a low and medium positive relationship between the respondents' level of awareness and the effectiveness of digital archiving systems in terms of storage capability across all the variables.

Specifically, respondents' level of awareness in terms of duration, accessibility, and usage-deployment shows a significant and, low and medium positive correlation with effectiveness of digital archiving systems in terms of storage capability. This implies that as respondents' level of awareness in terms of duration, accessibility, and usage-deployment increases, there is an effectiveness of digital archiving systems in terms of storage capability.

On the other hand, respondents' level of awareness in terms of usage-frequency shows a not significant and, low and medium positive correlation with effectiveness of digital archiving systems in terms of storage capability. This implies that there is no relationship between respondents' level of awareness in terms of usage-frequency and digital archiving systems in terms of storage capability.

Conclusion

Based on the data gathered by the researchers during the time of conducting the Study, the researchers have concluded the following:

1. The respondents are completely aware of the digital archiving system's duration, accessibility, and usage in terms of deployment and frequency.
2. The digital archiving system is highly effective in terms of sustainability, security, and storage capability.
3. The level of awareness and the effectiveness of digital archiving systems in terms of sustainability shows low positive correlation. Additionally, the level of awareness and the effectiveness of digital archiving systems in terms of security also shows a low positive correlation.

However, the relationship between awareness and security effectiveness is stronger in usage-deployment, emphasizing the importance of user awareness in enhancing security.

Moreover, the level of awareness and the effectiveness of digital archiving systems in terms of storage capability shows a low positive correlation. On the other hand, respondents' level of awareness in terms of usage-frequency shows a not significant and, low and medium positive correlation, which implies that there is no relationship between respondents' level of awareness in terms of usage-frequency and digital archiving systems in terms of storage capability.

Thus, there is a significant relationship between the respondents' level of awareness and the effectiveness of digital archiving systems of the selected offices in the Provincial Government of Laguna.

Recommendations

After arriving with the conclusions of the study, these are some recommendations that the researchers offer:

- It is suggested for future researchers to find other variables that may correlate with digital archiving systems in terms of storage capability.
- It is highly recommended for future researchers to create a digital archiving system to apply the findings of the study for further improvement of the digital archiving system.
- With the only authority that can actually implement any change on the systems used within the PGL is the MISO. Results of this study can be used to further narrow down on the things that they need to work on, to accommodate the needs of each office that will implement the system.
- To gain understanding and proficiency in adjusting to digital archiving. The employees need to undertake a training seminar aimed at acquiring the necessary skills, strategies, and insights related to the transition from traditional to digital archiving practices. Since the employees undertaken the seminar, they will be able to use the archiving system efficiently.

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