Development and Implementation of Automated Notarial Data Management System

Aldrin A. Balansay [1], Janilie B. Bano [1], Mery Ann Bernales [1], Meriane G. Luchavez [1], Jose C. Agoylo Jr. [1]

[1] *BSIT, Southern Leyte State University – Tomas Oppus Campus, Southern Leyte, Philippines*

Abstract **– The Automated Notarial Data Management System presents a comprehensive overview of the development, implementation, and assessment of a digital system designed specifically for notarial offices. The system used Agile Software Development which is more appropriate for the completion of the system. The features of the new system include file upload and download functionalities, file sharing, folder creation, deletion, renaming, and viewing. The system evaluation focused on efficiency, usability, and reliability based on a survey conducted among office staff. The implementation results showcase improved workflow and document organization within the notary office, increasing efficiency and client satisfaction.**

Keywords **– notarial data, agile software development, notary office, file sharing, folder creation.**

DOI: 10.18421/SAR73-09
https://doi.org/10.18421/SAR73-09

Corresponding author: Jose C. Agoylo Jr.,
BSIT, Southern Leyte State University – Tomas Oppus Campus, Southern Leyte, Philippines
Email: jagoylo@southernleytestateu.edu.ph

Received: 30 July 2024.
Revised: 05 September 2024.
Accepted: 10 September 2024.
Published: 27 September 2024.

1. Introduction

In today's ever-changing legal landscape, notary public offices serve an important role in checking and authenticating various legal documents such as contracts, deeds, and affidavits. Despite their importance, traditional paper-based document management systems in notary offices are often labor-intensive, error-prone, and inefficient due to the substantial volume and complexity of legal documents processed daily [6], [9], [4].

Although many still prefer the tangible nature of physical signatures and stamps, the potential for digital tools to enhance notarial processes is increasingly recognized. According to [2], highlights the importance of integrating software to enhance efficiency and organization within the notarial landscape. The gradual shift towards digital systems is seen not merely as a departure from tradition but as an evolution that enriches the notarization process. [8]) advocate for the inclusion of digital signatures and technological tools, proposing that such advancements could lead to more efficient document analysis and processing. Empirical studies support the transformative potential of electronic document management systems in notary public offices, indicating significant improvements in workflow efficiency and error reduction [6]. The transition from handwritten signatures to digital authentication represents a shift in mindset, acknowledging that technology can amplify the strengths of traditional practices [8]. Despite these benefits, the adoption of electronic systems introduces challenges such as cost implications, efficiency concerns, staff training requirements, data security, privacy issues, and the need to comply with legal standards [9]. The current study builds on this foundation by proposing the Automated Notarial Data Management System. The evolution of notaries in implementing notarial activities in digital format is examined [11].

This system aims to address the inefficiencies of traditional notarial processes through features like file upload and download, file sharing, folder creation, deletion, renaming, and viewing. By utilizing digital tools, the system seeks to streamline operations, enhance organization, and improve overall workflow efficiency in notary public offices, ultimately leading to greater client satisfaction and more reliable notarial services.

The implementation of this system is timely, given the increasing demand for more efficient and reliable notarial services. By leveraging technology, the Automated Notarial Data Management System aspires to prevent errors, reduce processing times, and enhance the accuracy and security of document management in notary public offices. The main objective of this research is to identify problems faced in the existing manual notarial processes, to design and develop an Automated Notarial Data Management System with comprehensive file management capabilities, and to evaluate the developed system

2. Theoretical Framework of the Study

Figure 1. The theoretical framework of this project centers on addressing challenges faced by notary public offices through the integration of electronic document management systems. It acknowledges the difficulties posed by manual paper-based methods in handling legal documents, which often lead to inefficiencies and errors. In the digital era, these challenges are exacerbated by the volume and complexity of legal documents, coupled with stringent legal requirements. The project aims to leverage electronic systems to enhance efficiency, accuracy, and operational precision in managing documents. By doing so, it seeks to redefine notarial services by setting new standards for document management within the modern legal landscape.

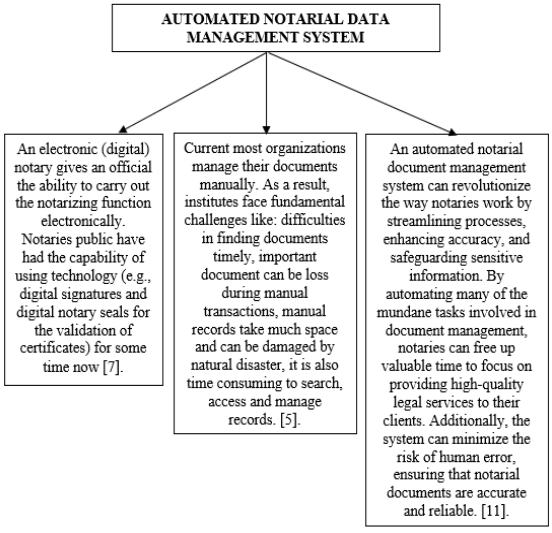


Figure 1.Theoretical Framework

3. Methodology

Agile software development methodologies, as highlighted by [1]; offer substantial benefits in addressing the dynamic requirements of modern IT projects. These methodologies' adaptability, transparency, continuous learning, and customer-centric approach result in improved software quality, faster delivery times, and better alignment with user expectations. Agile principles facilitate seamless document management in the specific case of the Automated Notarial Data Management System notary office. The system's advanced database is a centralized repository, ensuring easy access and efficient administration. Its intuitive dashboard empowers users to manage files effortlessly, enhancing workflow efficiency for legal practitioners and representing a significant advancement in notary public document management. The materials used in this study are 2 laptops, 1 acting as the administrator and the other 1 acting as the user in terms of managing the system. A pilot test was conducted in both offices. The research focused on implementing the Automated Notarial Data Management System in Southern Leyte, Eight (8) participants, selected strategically from both offices, provided insights through a questionnaire using a five-point Likert scale and an adapted evaluation form from ISO 25010. Data analysis using the Weighted Mean statistical tool ensured a comprehensive understanding of the system's impact across different organizational contexts.

Figure 2. The system architecture model is the model that conceptually specifies the system's vision, structures, and behavior. In other terms, system architecture is the representation and description of how a system functions and connects with other system components in general. The entire system comprises components and subsystems that all work together to form the system that it should be in the first place. The architectural layout of this system canters on a central database, serving as the core repository for all les. The admin possesses comprehensive control, with the ability to create or upload files, establish organized folders, and share files. Faculty members, meanwhile, have functionalities tailored to their needs, including file uploads and folder creation. This design ensures an efficient flow of information and file management, maintaining a centralized database for reliable storage and retrieval while providing distinct functionalities for admin and faculty members.

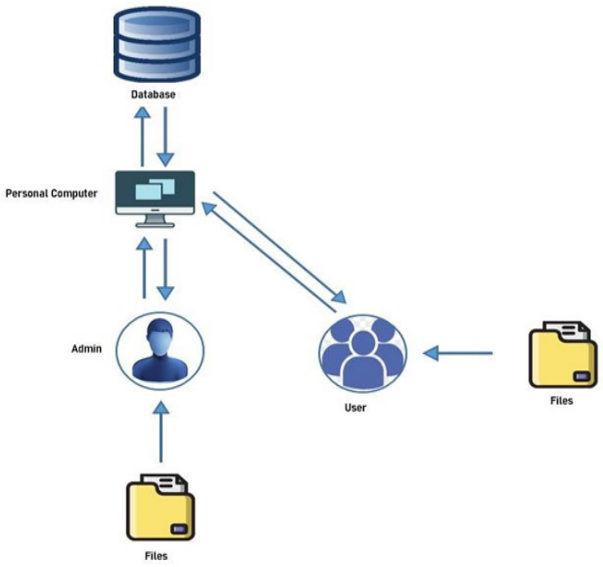


Figure 2. Architectural Layout

Figure 3. Displays the use case diagram that illustrates an admin's actions, including uploading files, logging in, creating folders, adding new users, sharing files, updating personal information, and removing files. Faculty members can perform similar actions such as uploading files, logging in, creating folders, deleting files, sharing files with other users, and updating personal information.

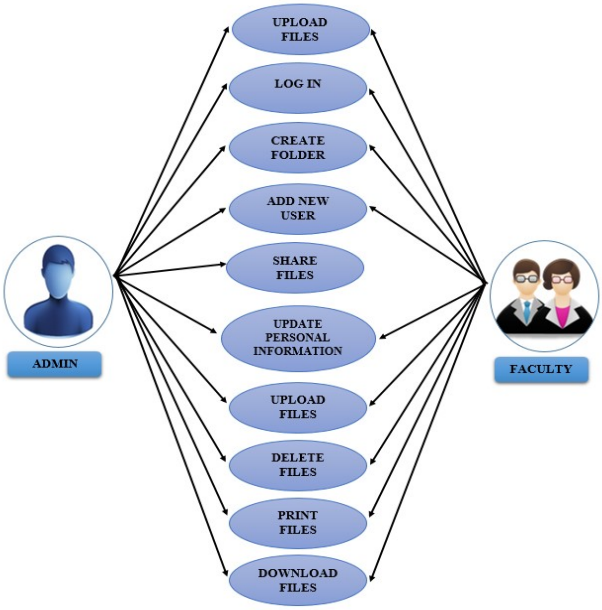


Figure 3. Use Case Diagram

4. Results and Discussion

Assessment of Existing System

Table 1. Existing System

Existing System	Frequency	Percentage
Automated	0	0%
Manual	8	100%

Table 1 reveals that 100% of the respondents indicated that the current process is conducted manually concerning the notarization and segregation of crucial documents.

The reliance on manual processes suggests potential inefficiencies and room for improvement in streamlining document management procedures. This manual approach is consistent with the literature's findings on the labor-intensive nature of traditional notarial practices and the associated inefficiencies [10], [9], [4]. Transitioning to an automated system could significantly enhance efficiency, accuracy, and reliability in handling notarial documents [8].

Assessment of the problem is encountered by the existing process in the Notary Public office.

Table 2.Problems Encountered by Respondents

PROBLEMS ENCOUNTERED	Response (n=8)					Weighted Mean	Interpretation
	5	4	3	2	1		
1. The manual notary process lacks a clear and standardized workflow.	5	2	1			4.50	Strongly Agree
2. The manual process of the office contributes to delays in managing notarized documents.	4	2	2			4.25	Strongly Agree
3. Locating specific files manually is a time-intensive task	4	4				4.50	Strongly Agree
4. The manual process requires repetitive actions that consume a significant amount of time.	4	1	3			4.13	Mostly Agree
5. Assessing document templates for notarization purposes is difficult.	3	3	2			4.13	Mostly Agree
Average						4.30	Strongly Agree

Legend: 5.00-4.21 Strongly Agree 4.20-3.21 Mostly Agree 3.20-2.61 Agree 2.60-1.81 Slightly Agree 1.80-1.0 Disagree

Table 2 reveals that the Respondents (N=8) highlighted several issues with manual notary processes, with the overall "Strongly Agree" interpretation (average weighted mean = 4.30) suggesting significant challenges. Key problems include the lack of a standardized workflow (weighted mean = 4.50), delays in document management (weighted mean = 4.25), time-intensive file location (weighted mean = 4.50), and repetitive actions consuming significant time (weighted mean = 4.13).

These findings align with literature emphasizing inefficiencies and potential errors in traditional paper-based systems [10], [9], [4], and underscore the need for adopting automated systems to enhance efficiency and organization [8].

• Features of Automated Notarial Data Management System

Figure 4. The design interface of the Automated Notarial Data Management System. In which contains the Users and Admin Log-in interface.

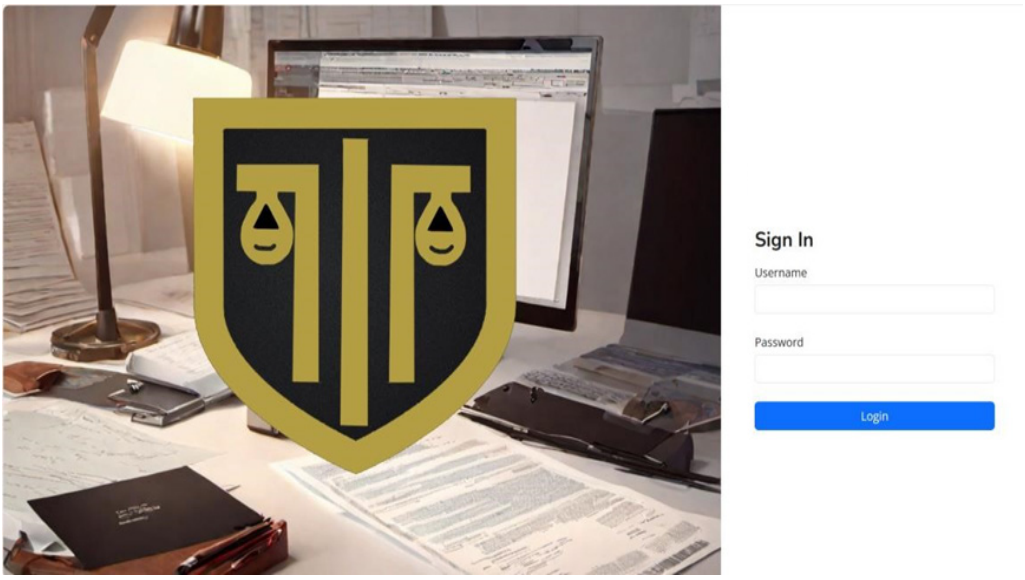
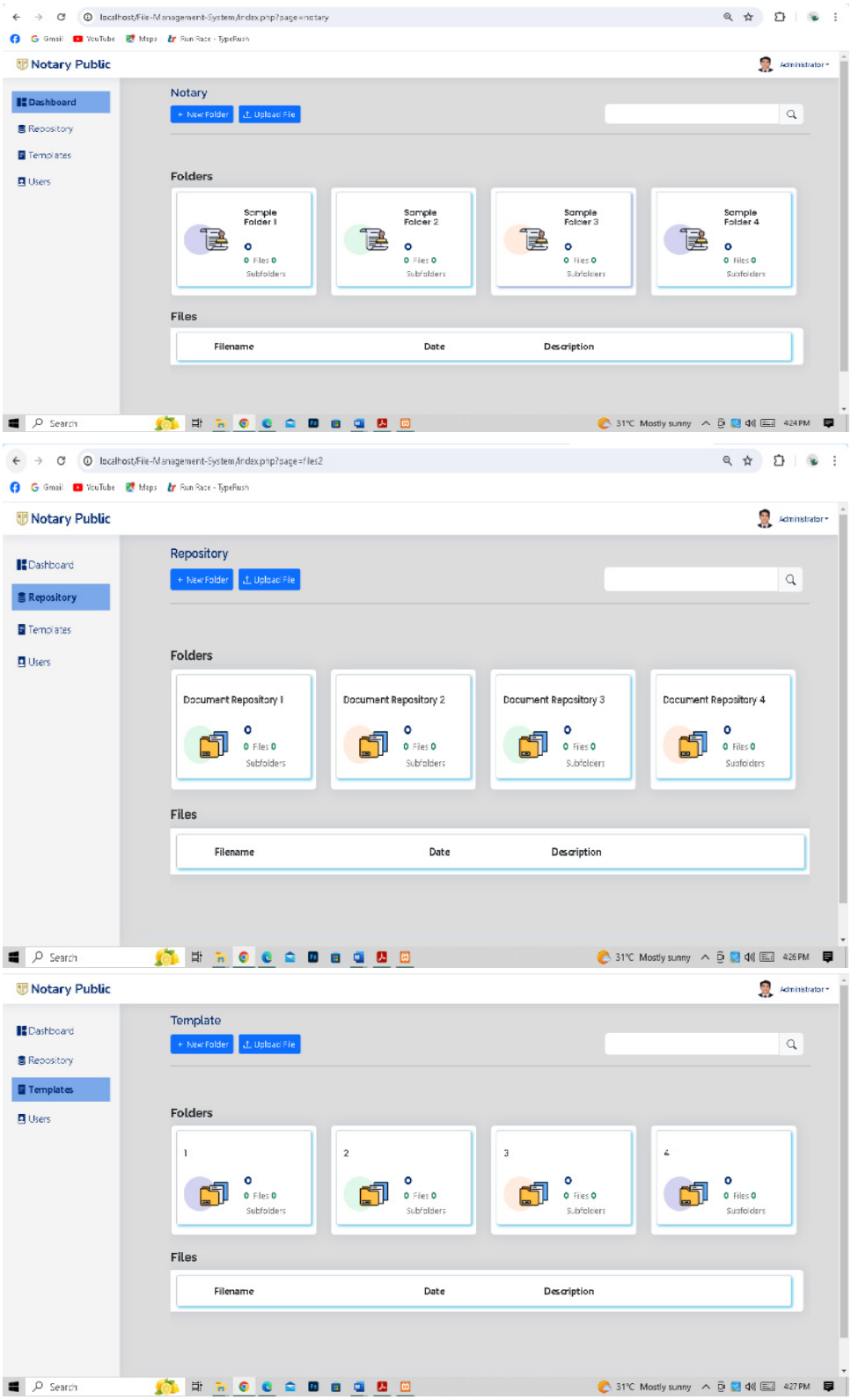


Figure 4. Log-in Interface

Figure 5. This is the main interface of the Administrators' dashboard, logs, template, repository, and users' management page.



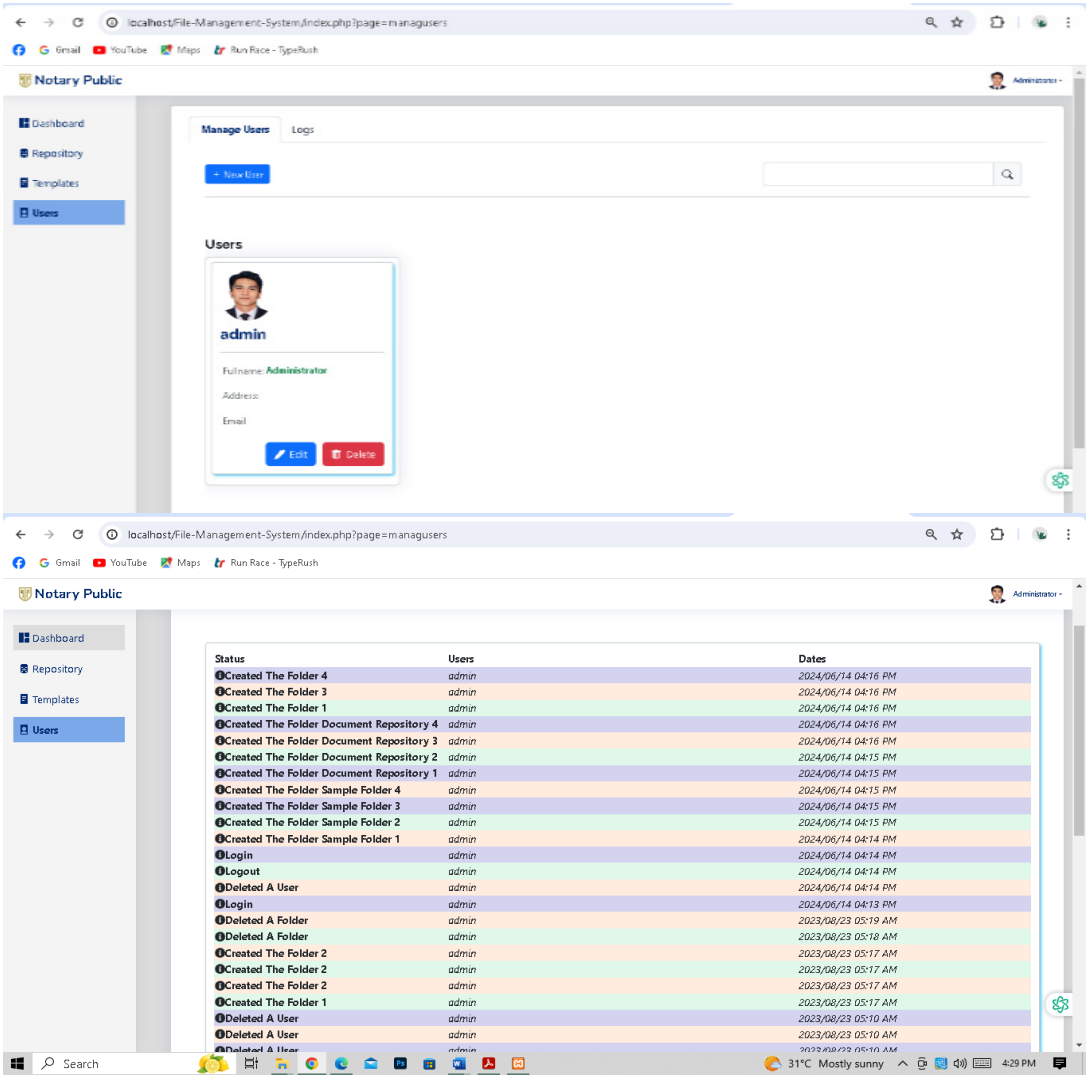
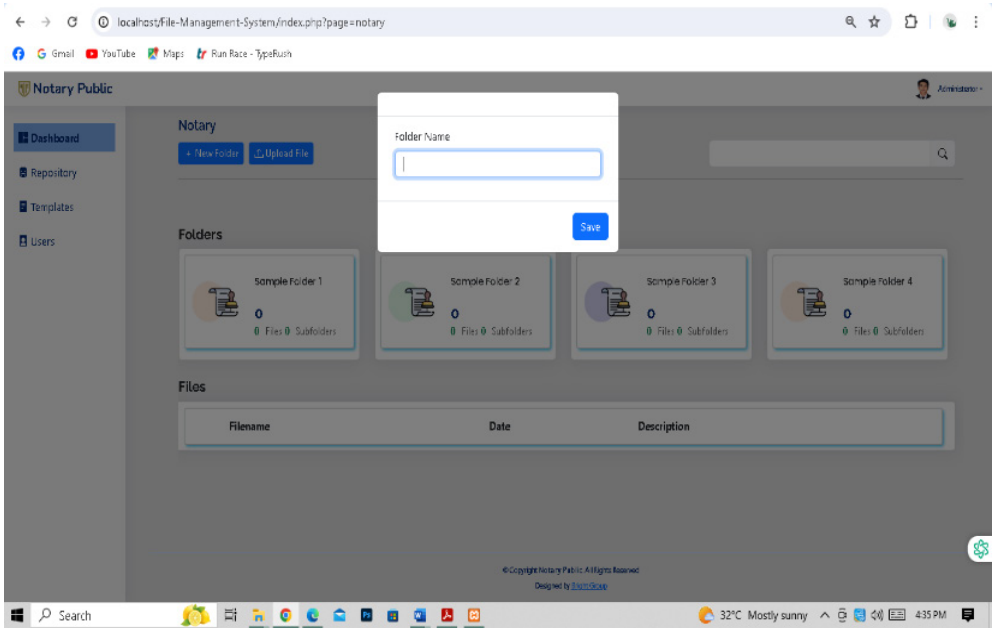


Figure 5. Administrators' dashboard, logs, template, repository, users' Management Page

Figure 6. This is the user interface for Folder creation, Upload files, Folder renaming & deletion, and File deletion.



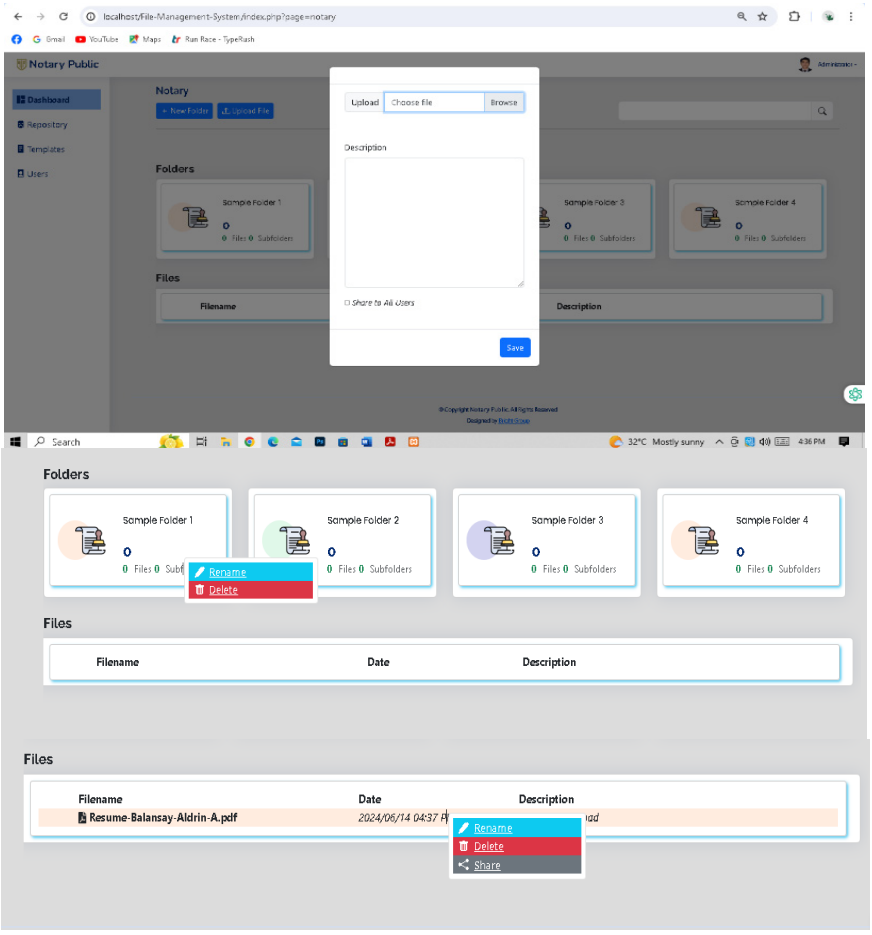


Figure 6. User interface for Folder creation, Upload file, Folder renaming & deletion, and File deletion

The new features of the system enabled it to satisfy the notarial office. The system performs at the highest level and can accommodate large data files. It is easy to search different files, save, and print them automatically.

Thus, the system is secured hence they only used LAN networks so that security of the files and information were secured.

• Evaluation of the Developed System

Table 3. Efficiency of the Newly Developed System

Attributes	Response (n=8)					Weighted Mean	Interpretation
Efficiency	5	4	3	2	1		
1. The Automated Notarial Data Management System significantly speeds up the management of notarial documents.	3	4	1			4.25	Very Efficient
2. The system operates efficiently.	2	4	2			4	Mostly Efficient
3. The system efficiently processes tasks without delays.	2	4	2			4	Mostly Efficient
4. The system responds to queries promptly.	4	2	2			4.25	Very Efficient
5. The software utilizes resources efficiently.	3	4	1			4.25	Very Efficient
Average						**4.15**	**Mostly Efficient**

Legend: 5.00-4.21 Fully Functional 4.20-3.21 Mostly Functional 3.20-2.61 Functional 2.60-1.81 Slightly Functional 1.80-1.0 Not Functional

Table 3 reveals that the Automated Notarial Data Management System has been highly regarded for its efficiency, receiving an average weighted mean of 4.15, indicating it is mostly efficient. This evaluation is rooted in several key attributes of the system. Firstly, respondents noted that the system significantly speeds up the management of notarial documents, with a weighted mean of 4.25. This acceleration can be attributed to the streamlined processes that reduce the time required for handling and processing documents. The system's operational efficiency, rated with a weighted mean of 4.00, reflects its ability to handle multiple tasks seamlessly, reducing the bottlenecks often encountered in manual processes. Additionally, the system's ability to process tasks without delays, also rated at 4.00, ensures that tasks are completed promptly, thus maintaining a steady workflow. The system's prompt response to queries, which received a weighted mean of 4.25, enhances user experience by providing immediate access to necessary information. Lastly, the system's efficient utilization of resources, with a weighted mean of 4.25, indicates optimal performance without overburdening the system's capabilities. These findings support the literature emphasizing the role of software in enhancing the efficiency of notarial practices [2], [3]. The incorporation of such a system not only reduces the time spent on document management but also minimizes human error, leading to more reliable and consistent outputs [5].

Table 4. Reliability of the Newly Developed System

Attributes	Response (n=8)					Weighted Mean	Interpretation
Reliability	5	4	3	2	1		
1. The system reliably manages extensive notarial data without problems.	5	1	2			4.38	Very Reliable
2. The system consistently and reliably conducts searches and presents notarial data as required.	5	2	1			4.50	Very Reliable
3. The system runs smoothly without regular technical errors.	3	5				4.38	Very Reliable
4. The system is available and accessible when needed.	3	2	3			4	Mostly Efficient
5. The system is reliable for storing notarial data.	3	3	2			4.13	Mostly Efficient
					Average	**4.28**	**Very Efficient**

Legend: 5.00-4.21 Fully Functional 4.20-3.21 Mostly Functional 3.20-2.61 Functional 2.60-1.81 Slightly Functional 1.80-1.0 Not Functional

Table 4 reveals that the reliability of the Automated Notarial Data Management System is also highly regarded, with an average weighted mean of 4.28, indicating it is very reliable. This aspect is critical for notarial practices where accuracy and consistency are paramount.

The system's ability to reliably manage extensive notarial data, rated at 4.38, demonstrates its capacity to handle large volumes of data without compromising performance. This is particularly important in notarial offices that deal with numerous documents daily. The system's consistent and reliable conduct of searches and presentation of notarial data, with a weighted mean of 4.50, ensures that users can trust the system to deliver accurate and timely information. Smooth operation without regular technical errors, also rated at 4.38, highlights the system's robustness and stability, essential for maintaining continuous operations. While the system's availability and accessibility were rated slightly lower at 4.00, it still indicates that the system is mostly efficient in this regard. Lastly, the system's reliability in storing notarial data, with a weighted mean of 4.13, underscores its effectiveness in maintaining data integrity and security. These results align with studies highlighting the transformative potential of electronic document management systems in notary public offices [5], [10]. The system's reliability ensures that notarial practices can operate smoothly and efficiently, with minimal disruptions and maximum accuracy.

Table 5. Usability of the Newly Developed System

Attributes	Response (n=8)					Weighted Mean	Interpretation
Usability	5	4	3	2	1		
1. The system can quickly complete tasks.	1	5	2			3.86	Mostly Usable
2. The system responds promptly to user inputs.	2	4	2			4	Mostly Usable
3. The end-user can easily use the system's features.	3	4	1			4.25	Very Usable
4. The system provides clear instructions for data inputs.	4	2	2			4.25	Very Usable
5. The system is easy to navigate.	4	2	2			4.25	Very Usable
					Average	**4.13**	**Mostly Usable**

Legend: 5.00-4.21 Fully Functional 4.20-3.21 Mostly Functional 3.20-2.61 Functional 2.60-1.81 Slightly Functional 1.80-1.0 Not Functional

Table 5 reveals that the usability of the Automated Notarial Data Management System has been evaluated as mostly usable, with an average weighted mean of 4.13. This evaluation reflects several dimensions of user interaction with the system. The system's ability to complete tasks quickly, with a weighted mean of 3.86, indicates that while it is generally efficient, there may be room for improvement in optimizing task completion times. The prompt response to user inputs, rated at 4.00, enhances the user experience by reducing waiting times and increasing overall satisfaction.

The system's ease of use for end-users, with a weighted mean of 4.25, highlights its intuitive design and user-friendly interface, making it accessible even to those with limited technical expertise. Clear instructions for data inputs, also rated at 4.25, ensure that users can navigate the system with ease and perform tasks accurately. Lastly, the system's ease of navigation, with a weighted mean of 4.25, further supports its usability by allowing users to find and access necessary features and information without difficulty. This supports the integration of user-friendly digital tools in notarial functions, enhancing overall workflow efficiency [7], [8]. By prioritizing usability, the system ensures that users can perform their tasks efficiently and effectively, leading to higher productivity and user satisfaction.

5. Conclusion

The development and implementation of the Automated Notarial Data Management System marks a significant step forward in tailored document management solutions for this specific practice. Implemented under an exclusive agreement, the system is uniquely designed to meet the specific needs of the users, optimizing notarial processes and enhancing workflow efficiency. This development aims to enhance service quality, offering increased convenience for clients and ensuring a user-friendly and secure system exclusively. Positive feedback from various stakeholders, including the chief of staff, legal staff, head, and clients, underscores the system's effectiveness and acceptance in improving document management processes. Overall, the development of the Automated Notarial Data Management System demonstrates strong characteristics in terms of functionality, efficiency, reliability, and security, making it a valuable utility model for notary public offices, especially in the digital age.

References:

[1]. Agoylo, J. J. C., Espinosa, B. R., Noval, N. V., & Paler, M. A. T. (2024). Dynamic Cloud-Based Voting System. *Ignatian International Journal for Multidisciplinary Research, 2*(5), 1447–1470. Doi: 10.5281/zenodo.11202961

[2]. Mirzadjanovna, K. M. (2023). Notaries and Digital Work: Issues of Staff Training and Improving Qualifications in Modern Digital Technologies. *The American Journal of Political Science Law and Criminology, 5*(12), 38-43. Doi:10.37547/tajpslc/Volume05Issue12-07

[3]. Boella, G., Di Caro, L., & Leone, V. (2018). Semi-Automatic Knowledge Population in A Legal Document Management System. *Artificial Intelligence and Law, 27*, 227 - 251. Doi:10.1007/s10506-018-9239-8

[4]. Putra, F. M. K. (2021). Characteristics of Notary Deeds for Transactions Through Electronic Media. *Norma, 17*(3), 1-14. Doi:10.30742/nlj.v17i3.1091

[5]. Miksa, T., Oblasser, S., & Rauber, A. (2021). Automating research data management using machine-actionable data management plans. *ACM Transactions on Management Information Systems (TMIS), 13*(2), 1-22. Doi:10.1145/3490396

[6]. Koptyakova, S. V., Zinovyeva, E. G., & Maiorova, T. V. (2019). Development and deployment of automated electronic document management system in municipal units. In *Journal of Physics: Conference Series, 1333*(7), 072034. IOP Publishing. Doi:10.1088/1742-6596/1333/7/072034

[7]. Haga, S., & Omote, K. (2022). Blockchain-based autonomous notarization system using national eid card. *IEEE Access, 10*, 87477-87489. Doi:10.1109/ACCESS.2022.3199744

[8]. Ruiz, M., Román, C., Garrido, A. L., & Mena, E. (2020). uAIS: An Experience of Increasing Performance of NLP Information Extraction Tasks from Legal Documents in an Electronic Document Management System. In *ICEIS*, 189-196. Doi:10.5220/0009421201890196

[9]. Panfilova, T., Tynchenko, V., Kukartseva, O., Kozlova, A., & Glinscaya, A. (2024). Modernization of electronic document management and systems analysis processes using an automated platform. In *E3S Web of Conferences, 549*, 09018. EDP Sciences. Doi:10.1051/e3sconf/202454909018

[10]. van Dinter, R., Catal, C., & Tekinerdogan, B. (2021). A decision support system for automating document retrieval and citation screening. *Expert Systems with Applications, 182*, 115261. Doi:10.1016/j.eswa.2021.115261

[11]. Aminov, I. I. (2019). The role of Russian notaries in ensuring digital security of civil circulation. In *International Scientific and Practical Conference on Digital Economy (ISCDE 2019),* 549-552. Atlantis Press. Doi:10.2991/iscde-19.2019.164