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Research Article

DEVELOPING AN ELECTRONIC DOCUMENT MANAGEMENT SOLUTION TAILORED FOR LOCAL AREA NETWORK (LAN) DEPENDENT ORGANIZATIONS

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ABSTRACT

The paper discusses the design and development of an electronic document management system (EDMS) that prepares documents for sharing and information dissemination. EDMS has to do with capturing, storing, indexing, retrieval, and disposal of documents. The electronic document management system process starts by converting paper document into digital record to efficiently store and organize document in standardized file structure and format, promoting a paper waste reduction in reproducing the document. The EDMS provided an easier way of sharing information with different stakeholders and securing documents according to standardized compliance rules. The developed system has also improved the accessing of vital documents by users since there is real-time information distribution of information and easy searching and retrieving of needed documents.

KEYWORDS

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confidentiality; authorization; accountability; integrity; authenticity; reliability; Document management; E-governance; Sustainability.

INTRODUCTION

In today's digital age, organizations require swift and precise dissemination of information to their stakeholders. With the prevalent use of computers, documents are predominantly created electronically, and duplicates are made for distribution. However, reproducing large quantities of documents can significantly inflate operational expenses [1]. Enter the Electronic Document Management System (EDMS), a remedy to this dilemma. EDMS facilitates the creation, uploading, and sharing of documents among various users [2], [3]. Its adoption across sectors like universities [4], government [5], municipalities [6], and businesses has demonstrated notable reductions in operational costs, heightened workflow efficiency, and enhanced collaboration among stakeholders. Leveraging EDMS, documents become readily accessible, searchable, and retrievable in real-time, enabling multiple users to collaborate simultaneously on shared documents, thereby fostering seamless communication and coherence across various documents [7], [8]. The incorporation of EDMS within an organization holds the promise of transforming information management and sharing practices [9].

The integration of Electronic Document Management Systems within government operations has yielded significant administrative efficiencies. EDMS grants access to real-time information through its document storage, retrieval, workflow management, auditing, search, and publishing functionalities [10]. Moreover, the adoption of EDMS has led to cost reductions for organizations by curtailing expenditures on paper documents and minimizing the time overhead for generating and distributing information. This transition towards digital document management has instigated a shift in organizational culture and contributed to heightened revenue streams [11], [12].

Efficient document management is vital for any organization, serving purposes such as record-keeping, communication, and decision-making [13], [14]. Despite the existence of electronic document management systems, many lack integration and fail to meet organizational demands. In response, a novel office system has been developed, offering practical and efficient man-machine interfaces, integrated facilities, effective database management techniques, and support for various data types [15]. This system provides robust and reliable services for document creation, editing, deletion, and searching, ensuring users can access and manage their documents effortlessly [16].

Furthermore, implementing electronic document management systems in educational institutions has proven beneficial, particularly for students and faculty. This system streamlines

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communication regarding theses, leading to more efficient time usage. By saving time and simplifying processes, students and faculty can focus on other tasks, boosting overall productivity [17].

A streamlined document management system is essential for organizational efficiency. Research focuses on designing and developing an electronic document management system that simplifies document preparation, sharing, dissemination, and archiving. EDMS encompasses capturing, storing, indexing, and retrieving documents, enhancing user access and information retrieval. It transforms paper documents into digital records, stored in a standardized structure, reducing paper waste and improving document organization. Additionally, the system facilitates secure information sharing with stakeholders, ensuring compliance with regulations. By providing real-time information access, EDMS saves time and enhances user efficiency, contributing to overall organizational productivity.

METHOD

The electronic document management system was designed and developed using the rapid application development (RAD) methodology, as illustrated in Figure 1. This methodology comprises four phases: requirements planning, system design, construction, and cutover, all executed in an agile and iterative manner [18], [19]. Involving end-users in the development process from the planning stage enabled effective integration of their requirements and feedback into the system, leading to a solution that met their needs and expedited development [20], [21]. The RAD methodology facilitated a user-centered approach, ensuring efficient and effective system development.

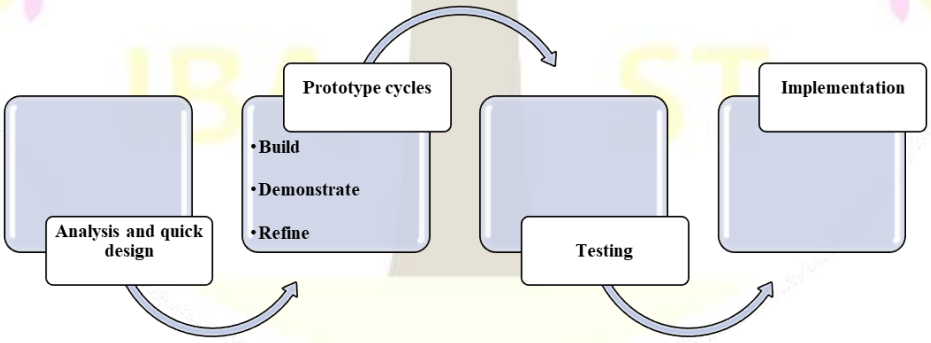

Figure 1. Rapid application development model

Analysis and quick design. The process flow of the electronic document management system is depicted in Figure 2. It commences with the receipt of an internal document necessitating distribution to all employees or offices. The records office stamps and logs the document before scanning it to generate a digital file. Essential details like date, reference number, file

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number, confidentiality level, author, and disposal date are recorded by the EDMS. Subsequently, this information is stored, and the digital file is uploaded onto the system for dissemination to authorized users. Utilizing the EDMS enables easy viewing and downloading of the document by relevant users, thereby streamlining the information dissemination process.

Testing and implementation. Rigorous testing was conducted on the electronic document management system to evaluate its functionality, user interface, and performance. These tests were carried out in a simulated environment, providing valuable insights into the system's strengths and weaknesses. The test results confirmed that the system fulfilled stakeholder requirements and expectations, offering a swift, efficient, and secure means to manage and distribute documents within the organization. Following the successful testing phase, the EDMS was implemented at a university and has since become the standard tool for document management within the institution. Employees have embraced the system, leading to enhanced work efficiency and reduced operational costs associated with document management and dissemination.

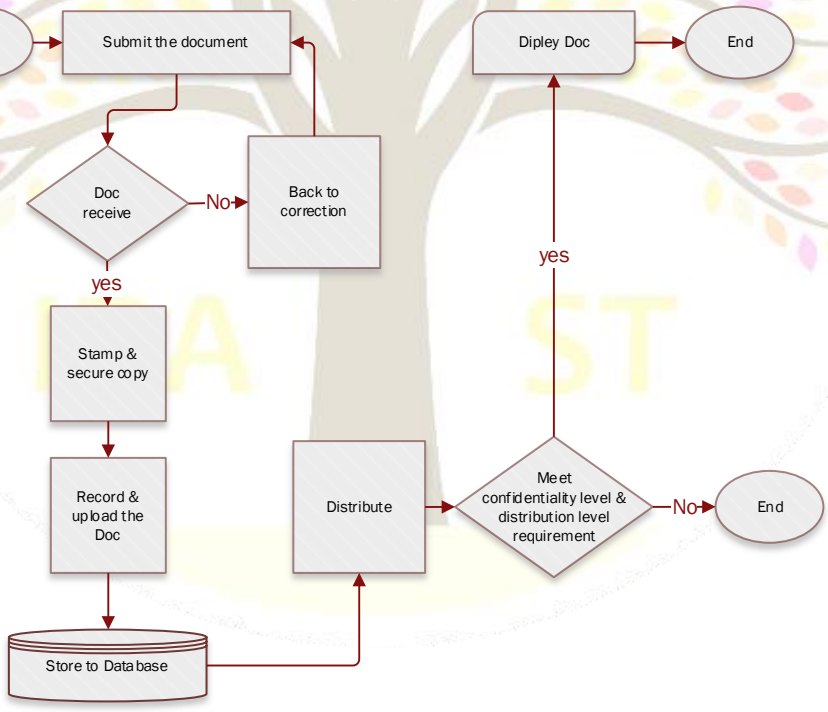

Figure 2. Process of the electronic document management system

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Figure 3 illustrates that the system operates within a local area network (LAN) environment. The EDMS application is installed on employees' workstations for receiving and viewing distributed documents, while the application software is centrally stored on a file server for easy updates. The database server acts as the central repository for all digitally converted documents, securely storing important records and ensuring easy access for authorized users. Implementing the EDMS significantly enhances the efficiency of document management and dissemination processes, resulting in increased productivity and reduced operating costs.

Evaluation. The effectiveness of the developed EDMS was evaluated through user acceptance testing (UAT). This evaluation aimed to ascertain whether the system met the requirements and expectations of end users. The assessment utilized the International Organization for Standardization (ISO) 9126 software evaluation questionnaire, a widely recognized standard for measuring software quality in terms of functionality, efficiency, reliability, and usability [22], [23]. End users were asked to rate the system using a Likert scale, as depicted in Table 1. Pilot testing and trial runs were also conducted to provide hands-on experience for respondents and further assess the system's performance.

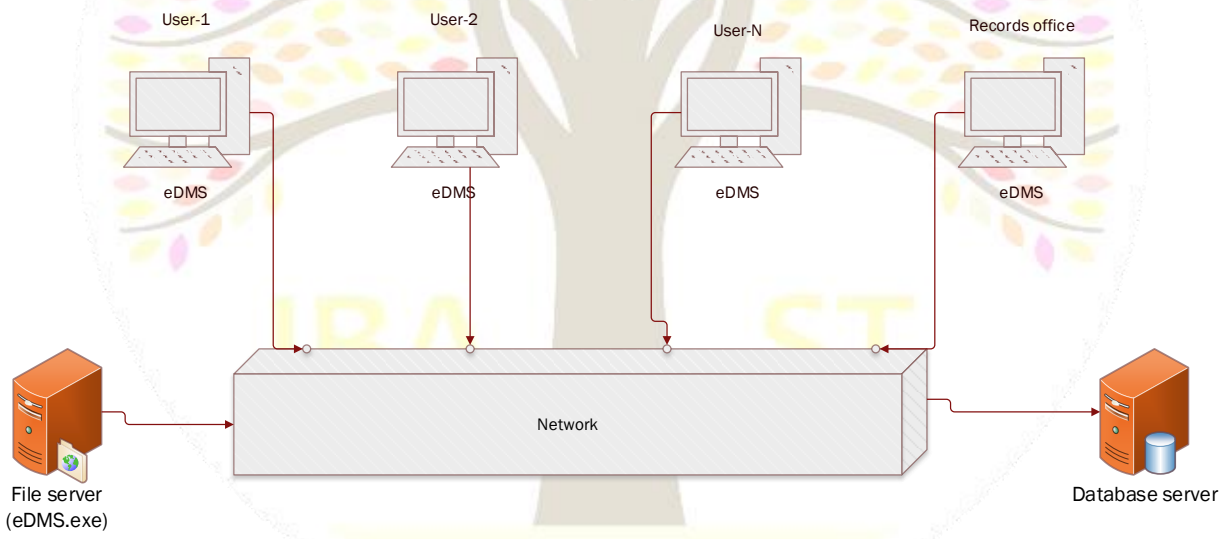

Figure 3. Network set-up for EDMS

MEAN VALUE	WEIGHT	VERBAL INTERPRETATION
1.00–1.50	1	Poor
1.51–2.50	2	Good
2.51–3.50	3	Satisfactory
3.51–4.50	4	Very satisfactory
4.51–5.00	5	Outstanding

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RESULTS AND DISCUSSION

The use-case diagram of the electronic document management system depicted in Figure 4 illustrates the core functionalities and actors within the system. These include the document viewer, document distribution, and document storage modules. The document viewer enables users to perform actions such as viewing, bookmarking, searching, and filtering documents, facilitating quick access to required information.

The document distribution module empowers the system administrator to manage document distribution to employees and offices. This includes tasks like creating, updating, deleting, and disposing of document records. The document storage module serves as a secure repository for storing and saving scanned files received from the records office. It acts as the centralized hub for documents within the system.

Overall, this use-case diagram provides a comprehensive overview of the EDMS, aiding users in understanding its functionalities and the benefits it offers.

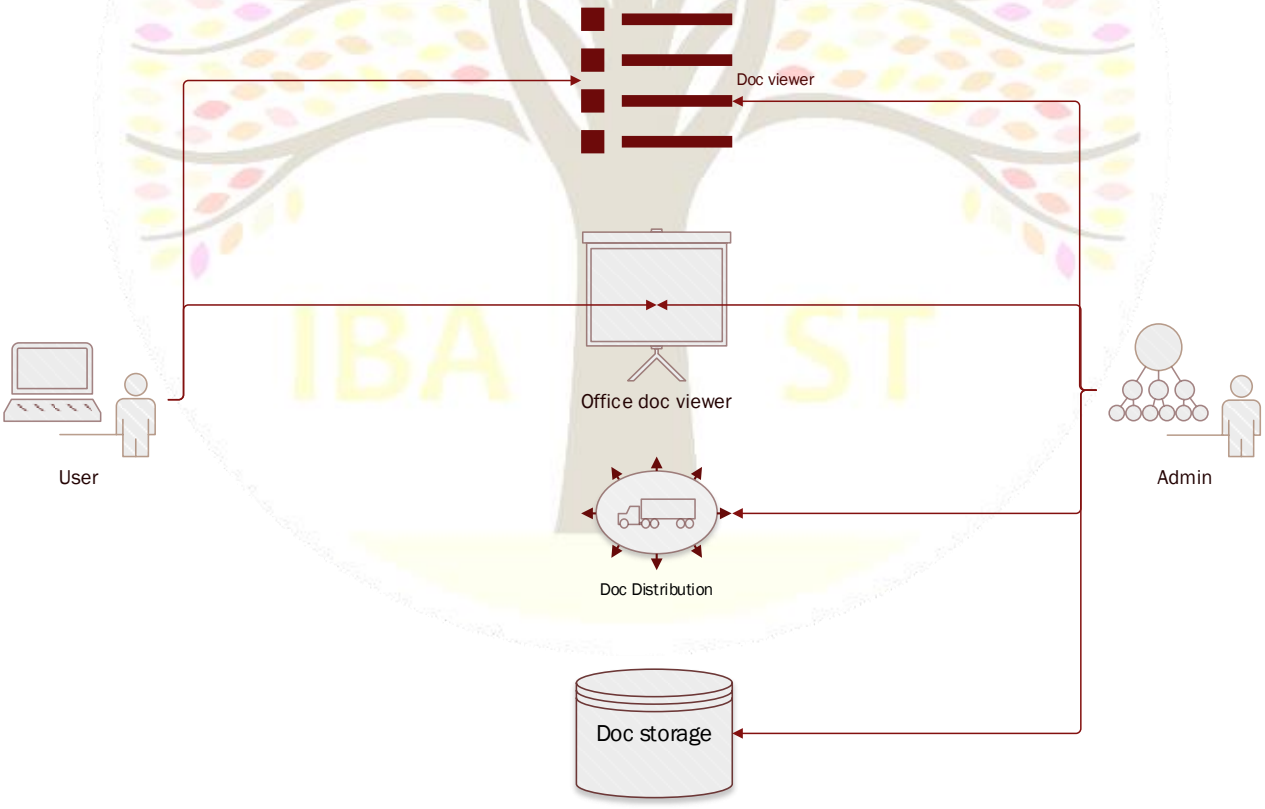

Figure 4. Use-case diagram of the EDMS

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CONCLUSION

This research outlined the design, development, and deployment of an electronic document management system tailored for LAN-based organizations. The system's objective was to streamline office workflow by electronically capturing, indexing, storing, and retrieving documents, consequently minimizing paper waste. Additionally, the EDMS offered an effective and secure method for sharing information with various stakeholders, ensuring compliance with standardized rules and regulations. Given the successful implementation and favorable evaluation outcomes, the EDMS can serve as a blueprint for organizations operating within established local area networks seeking to establish their own document management systems.

REFERANCE

1. Pappel, V. Tsap, I. Pappel, and D. Draheim, "Exploring e-services development in local government authorities by means of electronic document management systems," in Communications in Computer and Information Science, vol. 947, pp. 223–234, 2019, doi: 10.1007/978-3-030-13283-5_17.
2. A. T. R. Rosa, I. V. Pustokhina, E. L. Lydia, K. Shankar, and M. Huda, "Concept of electronic document management system (EDMS) as an efficient tool for storing document," Journal of Critical Reviews, vol. 6, no. 5, pp. 85–90, 2019, doi:10.22159/jcr.06.05.14.
3. N. L. Adam, M. A. H. C. Mansor, M. F. Pauzi, and S. C. Soh, "Document and event record management system: a prototype," in 2022 IEEE 12th Symposium on Computer Applications and Industrial Electronics (ISCAIE), 2022, pp. 223–227, doi:10.1109/ISCAIE54458.2022.9794525.
4. M. Akcay, I. Ardic, and S. Sen, "Document management system," in 2019 3rd International Symposium on Multidisciplinary Studies and Innovative Technologies (ISMSIT), Oct. 2019, pp. 1–7, doi: 10.1109/ISMSIT.2019.8932959.
5. M. J. A. Shobaki, S. S. A. Naser, M. Khair, I. Kassab, and S. S. A. Naser, "The reality of the application of electronic document management system in governmental institutions-an empirical study on the palestinian pension agency," International Journal of Engineering and Information Systems, vol. 1, no. 2, pp. 1-14, 2017.
6. S. V. Koptyakova, E. G. Zinovyeva, and T. V. Maiorova, "Development and deployment of automated electronic document management system in municipal units," in Journal of Physics: Conference Series, vol. 1333, no. 7, Nov. 2019, doi: 10.1088/17426596/1333/7/072034.
7. E. Mohamad, R. Jaafar, O. Novareza, N. Akramin, and B. Mohamad, "Enhancing electronic document control approval process through a verification stage," in International Conference on Design and

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Concurrent Engineering 2019 and Manufacturing Systems Conference 2019, 2019, no. September. [Online]. Available: https://www.researchgate.net/publication/335985435

8. S. Jordan, S. S. Zabukovsek, and I. S. Klancnik, "Document Management system – a way to digital transformation," Our economy, vol. 68, no. 2, pp. 43–54, 2022, doi: 10.2478/ngoe-2022-0010.
9. T. Mandicak, P. Mesaros, M. Spisakova, and A. Kanalikova, "Exploitation of document management systems in construction industry," IOP Conference Series: Materials Science and Engineering, vol. 1252, no. 1, p. 012077, 2022, doi: 10.1088/1757899x/1252/1/012077.
10. D. Zybin, A. Kalach, A. A. Rogonova, A. Bashkatov, and M. Klementeva, "Structural and parametric synthesis of a document management system," Modern Innovations, Systems and Technologies, vol. 1, no. 4, pp. 24–30, 2021, doi: 10.47813/2782-2818-2021-1-4-24-30.
11. R. Zhang, Y. Yang, and W. Wang, "Research on document digitization processing technology," MATEC Web of Conferences, vol. 309, p. 02014, Mar. 2020, doi: 10.1051/matecconf/202030902014.
12. M. K. Ugale, S. J. Patil, and V. B. Musande, "Document management system: A notion towards paperless office," in 2017 1st International Conference on Intelligent Systems and Information Management (ICISIM), 2017, pp. 217–224, doi:10.1109/ICISIM.2017.8122176.
13. S. V. Kruchinin and E. V Bagrova, "Systems of electronic document management in Russian Education. Pros and Cons," in 2019 International Conference "Quality Management, Transport and Information Security, Information Technologies" (IT QM IS), Sep.2019, pp. 628–630, doi: 10.1109/ITQMIS.2019.8928315.
14. V. L. Orlov and E. A. Kurako, "Electronic document management systems and distributed large-scale systems," in 2017 Tenth International Conference Management of Large-Scale System Development (MLSD), Oct. 2017, pp. 1–5, doi:10.1109/MLSD.2017.8109665.
15. R. Waszkowski, M. Kiedrowicz, T. Nowicki, and K. Worwa, "Access control management in administrative office with RFID tagged documents," Proceedings - 2017 4th International Conference on Mathematics and Computers in Sciences and in Industry, MCSI 2017, vol. 2018-Janua, 2018, pp. 244–251, doi: 10.1109/MCSI.2017.48.
16. A. Mahmood, I. T. Okumus, and A. Makalesi, "Design and implementation of an electronic document management system," Mehmet Akif Ersoy Universitesi Uygulamalı Bilimler Dergisi, vol. 1, no. 1, pp. 9-17, 2017.
17. T. V. Khronusova, S. V. Kruchinin, and E. V. Bagrova, "Implementation of Electronic Document Management in Russian Education. Quality Assessment," in 2019 International Conference "Quality Management, Transport and Information

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OCLC – 1368736135

Security, Information Technologies" (IT&QM&IS), 2019, pp. 608–610. doi: 10.1109/ITQMIS.2019.8928356.

18. R. Delima, H. B. Santosa, and J. Purwadi, "Development of Dutatani Website Using Rapid Application Development," IJITEE (International Journal of Information Technology and Electrical Engineering), vol. 1, no. 2, pp. 36-44, 2017.

19. L. Almazaydeh, M. Alsafasfeh, R. Alsalameen, and S. Alsharari, "Formalization of the prediction and ranking of software development life cycle models," International Journal of Electrical and Computer Engineering (IJECE), vol. 12, no. 1, pp. 534–540, Feb. 2022, doi:10.11591/ijece.v12i1.pp534-540.

20. C. Radulescu, L. M. Cirţina, and D. Radostin, "Rapid prototyping technologies - advantages and disadvantages," in Scientific Conference with International Participation "The Future of Education, Learning, Technology, Opportunities", 2021, pp. 136–142.

21. S. Saeed, N. Z. Jhanjhi, M. Naqvi, and M. Humayun, "Analysis of software development methodologies," International Journal of Computing and Digital Systems, vol. 8, no. 5, pp. 445–460, 2019, doi: 10.12785/ijcds/080502.

22. E. Budiman, M. Wati, J. A. Widians, N. Puspitasari, M. Firdaus, and F. Alameka, "ISO/IEC 9126 quality model for evaluation of student academic portal," Proceeding of the Electrical Engineering Computer Science and Informatics, vol. 5, no. 5, 2018, pp. 16–18, doi: 10.11591/eecsi.v5i5.1670.

23. 23. L. A. Corvera and U. O. Cagas, "Design and development of a syllabus template system - a syllabus management tool," Asia Pacific Journal of Multidisciplinary Research, vol. 8, no. 3, pp. 10–18, 2020.