Article

Web system for the process of Document Management in Municipalities.

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Abstract: This study addresses the modernization of the management of document procedures in Municipalities, using artificial intelligence to overcome the challenges of traditional paper management. In this context, the objective of the research is to design and implement a web system based on artificial intelligence to modernize the management of documentation in the District Municipality of Pueblo Nuevo in Chincha. The development began with planning, where the collection of data and user stories was carried out and roles were assigned to the work team, the implementation where user stories were grouped based on their needs and priorities, a simple code based on the HTML language was used, then the review and adaptation, where a detailed analysis of each comment and suggestions from users was made to identify possible improvements and we ended with the launch phase where the final product was delivered. Since the implementation of this web-based document management system for municipalities, a notable improvement in administrative efficiency has been observed. This is reflected in a significant streamlining of documentation and evaluation processes, facilitating a faster response to citizen requests. In addition, the ability of municipal officials to view, evaluate and approve documents in a centralized manner has optimized decision-making, promoting a more effective and transparent management of municipal resources. This work contributes to the development of a more efficient and accessible municipal document management, promoting a transparent and participatory administration of administrative and legal resources in diversified urban environments. It enhances the capacity of municipal officials to manage critical documents for urban planning and community development in an integrated and sustainable manner.

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1. Introduction

Many companies today use manual recording and document maintenance processes that take time. These manual processes also run the risk of resulting in lost or damaged documents. In the global context, documentation is an important element of the administrative action of organizations, in public and private higher education institutions, there are problems with the classification and management of archives that generate

legitimacy problems due to poor document management (Bedia, 2022) (Calderón et al., 2023) .

The documents of an organization are important so it is important to have full control of all the documentation such as security, fast and accurate search of the documents, also a backup if any problem occurs. (Romero, 2019)

In Peru, the use of information technologies in public administration and document archiving has not been implemented in its entirety, nor on the desirable scale, on the contrary, they are being coupled at a slow pace, thus making it necessary to gradually increase the use of information technologies in these processes, in order to reduce the distance with international advances. as do the countries of Colombia, Costa Rica or Brazil through their national archives. In the same way, it is revealed that in the public administration there is a lack of infrastructure and national budget to provide the storage, maintenance and preservation of digital archives that are going to be created or those already (Viloria, 2023) existing. Organizations, due to the volume of documents they currently handle, must have policies, procedures, good practice guides or standards that establish guidelines. For the management of documentation, in different formats, the executing organization or those linked to it must develop the document management process in a coordinated manner within its Document Management System (DMS). Within these nomenclature, document management policies stand out as one of the most popular and comprehensive tools (Díaz et al., 2022) .

As a result of the increased volume of information, organizations face several challenges when it comes to collecting, transforming, and visualizing data. This situation entails the need for new approaches to analyze their data sources in order to achieve the goal of maximum profit, making use of all the resources and tools that support the strengthening of decision-making both inside and outside the organization. Decision-making does not depend only on the experience of the person who makes them; It also requires the proper use of the data and the results of the full analysis, taking into account all

relevant factors to produce a positive impact (Hinojosa, 2023) .

Currently, there is abundant information flowing in organizations and government institutions, document management plays a leading role in the correct functioning of these; in turn, they mark the beginning for the implementation of systems that meet the information needs of their users, from a selection, disposition, search and retrieval of their documentary sources according to their needs (Briones, 2019) . Records management encompasses a set of operations committed to the search for economy and efficiency in the production, maintenance, use and final destination of documents throughout their life cycle, that is, from the moment of their conception to their entry into archival institutions. For this reason, the analysis of the state of document management at the present time is inseparable from the identification of the risks they face as a result of the management of information that provides evidence of their organizational activities (Loor et al., 2021) .

Document management comprises the set of technologies, standards and methods that enable the company to manage the circulation of documents during their life cycle. This may involve using manual procedures or implementing advanced technologies to improve performance, functionality, and efficiency in this management. (Prince, 2019)

Some of the benefits offered by well-managed documentation are its contribution to transparent accountability and the construction of an organizational documentary heritage. Document management policies present aspects and considerations for optimal Document Management. They ensure the availability of documentation and information used as proof of the activities carried out by institutions The implementation of digital transformation not only implies improvements in efficiency through the adoption of new technologies, strategic models, tools and faster decision-making, but also has a positive impact on customer engagement and satisfaction. This translates into increased profits and a

higher return on investment. (Díaz et al., 2022). (Peralta, 2021)

Local mayors' offices receive a large number of documents every month. These documents are received, processed, sent and tracked manually by records at the front desk and in each department, resulting in considerable loss of time, affecting the quality of service to users and causing delays in locating documents. This generates frustration and concern among users. (Albornoz et al., 2022)

The diagnosis and previous studies carried out have provided valuable information on the current situation of the company's document management system. The need to improve the efficiency, collaboration and accessibility of the system has been identified, as well as user perceptions and suggestions for its improvement have been collected.

Currently in the public administration the Document Management System is being promoted, however, there is no analysis to measure the intention of use or acceptance of the systems in the public administration and specifically of the Document Management System. (Reyes, 2022)

One of the challenges of this study during the implementation of the web system was the collection of contract documentation. This was due to the fact that on the platforms used by the entity there were not all the necessary documents in a complete manner. As a solution, the collaborators who had prepared these documents were asked to provide them (Chavarriaga et al., 2021).

Each year the system must be updated and include a tool for generating reports, which allows and will allow the company to monitor and evaluate the performance of its operations more effectively.

Since it has not yet decided on a sufficient intelligent system for effective document management, it is possible to take advantage of the development of new technologies.

Therefore, in order to enhance document-related procedures, this study suggests the introduction of a document management system. This enables comprehensive and secure management of

the flow of information, improves the speed and efficiency of document processing, builds confidence in operations, and ensures reliability by efficiently tracking from the beginning to the end of the document process. In addition, it provides real-time monitoring of the status of documents and ensures the satisfaction of both internal and external users.

This project proposes to develop a technological system based on a web platform connected to a database, which will significantly optimize document management. This solution will simplify the documentation process, allowing employees to perform their tasks efficiently and hassle-free. The database serves as a central repository to store all documents, thus ensuring their availability in real-time and eliminating the possibility of data loss. In addition, the system allows control over the information entered, allowing the exhaustive monitoring of each document procedure and will also be accessible from any device with an internet connection, which gives flexibility to employees to work from anywhere, whether from a desktop computer, laptop or a mobile device.

2. Method

2.1. Scrum Methodology

The implementation of a study on agile practices in software development facilitates the selection of the most appropriate methodology for the organization, planning and supervision of the systems development process, ensuring its quality. In Peru, projects similar to the analysis of methodologies such as Scrum and XP have been carried out, such as the design and deployment of a document management web system using these methodologies (Manobanda et al., 2020) . SCRUM was implemented as a software development methodology, which is a software development procedure that allows a disciplined approach to the assignment of tasks and responsibilities within a development project (Toledo et al., 2023) .

For the development of the Web System, the phases or rules that are applied through 4 specific structural activities were respected, as illustrated in Figure 1.

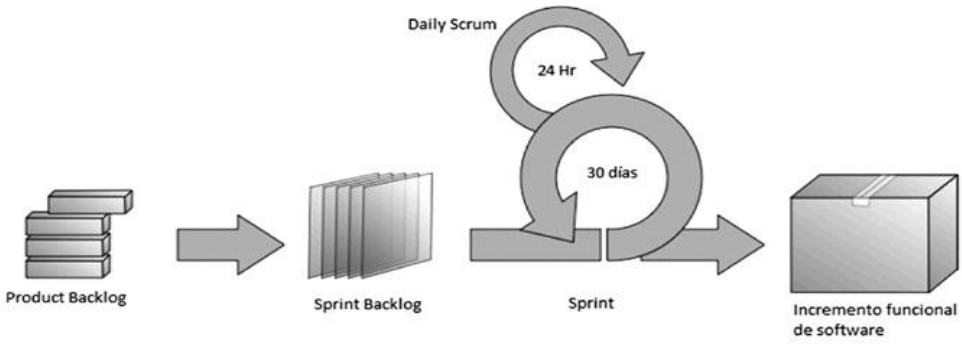


*Figure **1**: SCRUM Methodology Processes*

2.1.1. Planning Phase:

During this phase, data collection on the current procedure of the document processing was carried out through work sessions with the user of the document reception department. In addition to this compilation, an evaluation of the project was carried out, where specific roles were established and assigned such as:

- Scrum Master
- Product Owner
- Project Team
- Los stakeholders clave

In addition, high-level user stories (epic) were elaborated and the product backlog and the duration of each iteration (sprint) were defined in detail, it was also necessary to make a requirements survey in which mostly qualitative information is obtained on the operation of the system expected by the customer. Each Sprint will take place over a period of one month. The functionalities of each Sprint were defined in collaboration with the Scrum team and the president of document procedures, who provided detailed information on the challenges of the office (García et al., 2021) . Daily Scrum events will provide opportunities to synchronize progress, identify potential roadblocks, and adjust the approach as needed.

The document management procedure begins when the individual presents his or her file to the person in charge of the reception at the entrance desk, who channels it to the corresponding department. A manual registration is carried out by assigning a code to each document, a stamped and signed receipt is provided as proof of receipt. This process ensures adequate follow-up of each procedure, guaranteeing the integrity and security of the documentation.

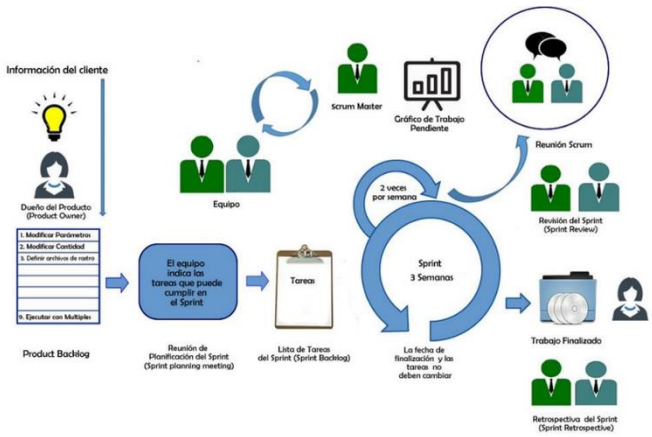


Figure 2: SCRUM Methodology Sequence

2.1.1.1. Process Analysis

On January 29, 1965, the district of Pueblo Nuevo was created through Law No. 15414, in the mandate of the President of the Republic, Fernando Belaunde Terry. Pueblo Nuevo District is one of eleven districts of the Chincha Province in the Ica Department, Peru.

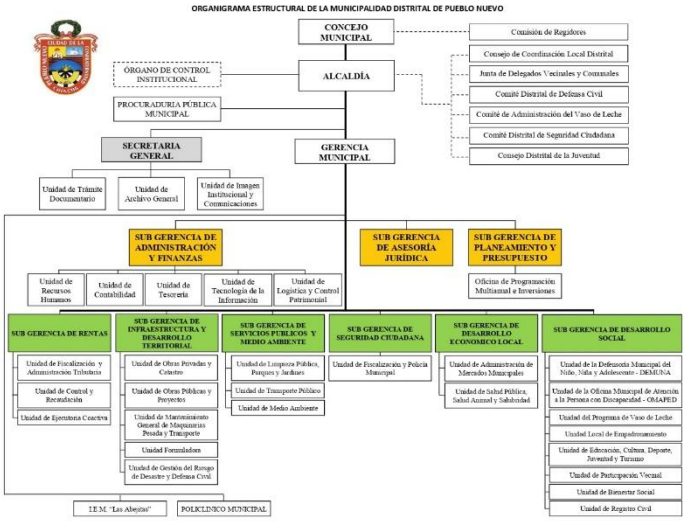


Figure 3 : Organizational chart of the District Municipality of Pueblo Nuevo

In this phase, the analysis of the documentation process of the District Municipality of Pueblo Nuevo will be described

Strengths	Weaknesses
Established Process: The paper-and-pencil document process is often well-established and familiar to municipal staff, which can contribute to more efficient execution. Physical document control: By using physical documents, there is greater control over the location and handling of documents, which can reduce the risk of loss or unauthorized access. Offline access: Physical documents do not rely on internet connectivity or electronic devices, ensuring that staff can access information even in areas with limited access to technology.	Error-prone: The manual process of processing documents is more exposed to human error, such as lost documents, illegible writing, or omitting important information. Lengthy processing time: Processing paper documents tends to be slower and requires more time for physical movement between different departments or areas of the municipality.

Opportunities	Threats
Partial automation: Even if the process is manual, there are opportunities to automate certain parts of the process, such as the use of pre-printed stamps or standardized forms to streamline information capture. Progressive digitization: The opportunity can be taken to initiate a progressive digitization process, starting with the implementation of document management systems to reduce reliance on paper and improve efficiency.	Vulnerability to loss and damage: Physical documents are subject to risks such as loss, deterioration, or damage from causes such as fire, flood, or theft, which could compromise the integrity of the information. Inefficiency and lack of scalability: As the number of documents and the demand for services increases, the manual process can become increasingly inefficient and difficult to manage, which can negatively affect the quality and speed of the service offered.

Table 1 : SWOT of the documentary processing process of the Municipality of Pueblo Nuevo.

2.1.1.2. Product Backlog

The Product Backlog is the list of all the requirements and final features that the customer wants the system to have. This Backlog is managed and created by the client together with the help of the Scrum Master. The Scrum Master assigns an estimated cost to complete each requirement, which will contribute to the total value of the product.

Story Identifier ID	NAME	DESCRIPTION

RF01	Autentication del gestor administrativo	The system must allow the administrative manager to log in using a valid email and password to access the document management features.
RF02	Verification of new documents	The system must allow the administrative manager to verify all new documents received.
RF03	Document review and management	The system must provide the administrative manager with the ability to review and manage the documents received.
RF04	Generation of tracking code	After the customer completes and submits their documentation, they will be provided with a unique tracking code. This code will be used to allow the customer to track the status of their application in the system.
RF05	Preparation of documents by clients	The system should allow customers to prepare documents by entering personal information, describing their request, and attaching additional files as needed.
RF06	Intuitive user interface	The system should have an easy-to-understand and easy-to-use user interface for easy navigation and use of the available features.
RF07	Data Security	The system must implement appropriate security measures to protect the personal information and documents stored in the database from unauthorized access and malicious manipulation.

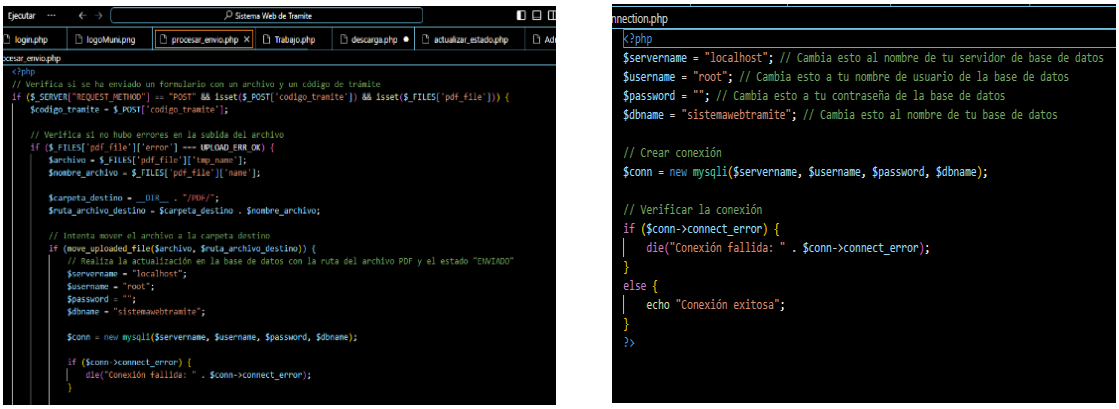
RF08	Registration in the database	The system must have a database that records all the requested documentary procedures
RF09	Attach attachments to files	The system must allow the client to attach documents or attachments when making their documentation
RF10	Show processing status	The system will be able to show the customer the status of their documents.

Table 2 : List of initial product or functional requirements of the system

2.1.2. Implementation Phase (Sprint):

The Sprints were planned, which consist of grouping a set of user stories with their respective estimates and priorities. Each Sprint will take place over a period of one month. The functionalities of each Sprint were defined in collaboration with the Scrum team and the president of document procedures, who provided detailed information on the needs and challenges of the office (García et al., 2021) .

We are going to develop the priority functionalities of the system. To do this, we use languages such as PHP for server logic and HTML for creating user interfaces in the Visual Studio development environment. During the Sprint, you work closely together to write and test code iteratively, ensuring that interfaces meet customer requirements. Incremental delivery of functionalities is prioritized, allowing for early feedback and ongoing adjustments to ensure the quality and value of the final product.

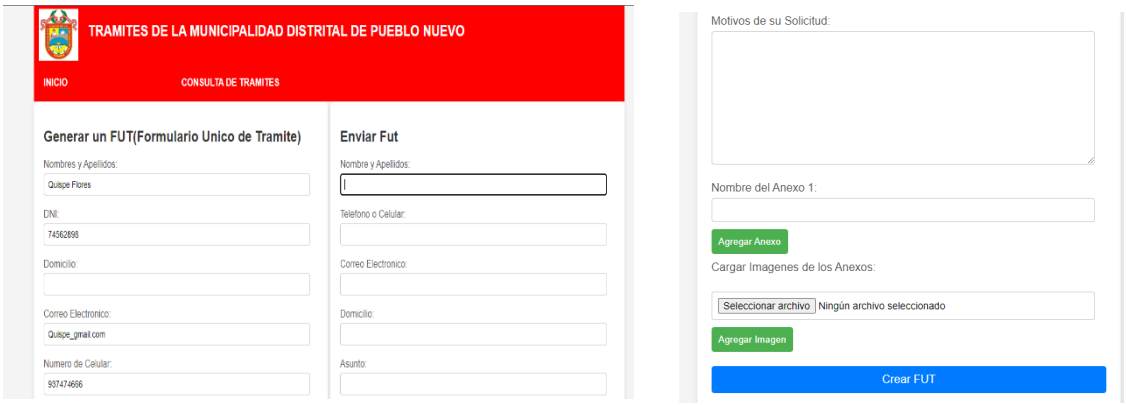


(a) (b)

Figure 3: Web system coding and database connection.

2.1.3. Sprint Review and Retrospective:

In this phase we will analyze in detail the increase in the product delivered at the end of each iteration, as well as collect comments and suggestions from end users and stakeholders. In addition, internal reflection is carried out in the Scrum team to identify areas for improvement and opportunities for optimization in the interface development processes. This iterative and adaptive approach allows for continuous adjustment and improvement of the work done, ensuring an agile response to changes in project requirements and needs.



(a) (b)

Figure 4: Main interface for the documentation process.

2.1.4. Launch Phase:

In this last phase we will carry out a series of key activities to ensure the success of the project. In addition to sending the final deliverables, which comprise the software developed during the Sprint, areas of improvement and lessons learned are identified. This close-out process also includes documenting achievements, preparing training materials for end-users, and coordinating launch activities, such as internal and external communication about the availability of the new system.

3. Results

3.1. Presentation of the Documentation Control Interface

Figure 5 provides a concise and attractive visual representation of key information related to the tracking of documentary procedures carried out by the user. You can see the new, rejected and receiving procedures In this graphic interface it allows you to manage the documentary procedure through the integration of a Web System.

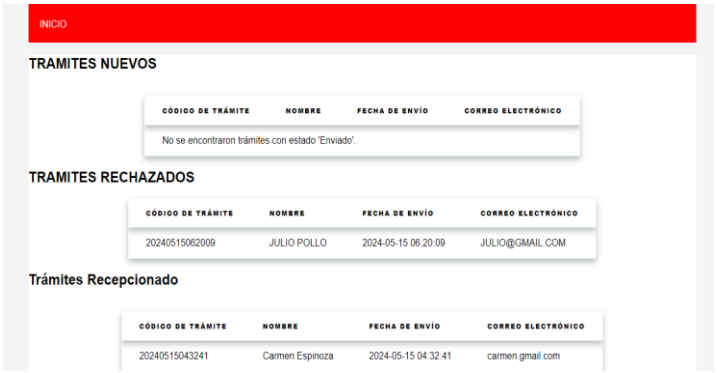


Figure 5: Document Processing Tracking Interface

3.2. Query Interface Presentation

Figure 6 shows the process of (a) queries by the user and (b) a view of the status of procedures. Initially, the service begins with the use of a search engine, typing the user's procedure code or email.

(a) (b)

Figure 6: Document Processing Query Interface

3.3. Introducing the System Database

Figure 7 provides a visual representation of the system's database where each documentation made by customers can be seen.

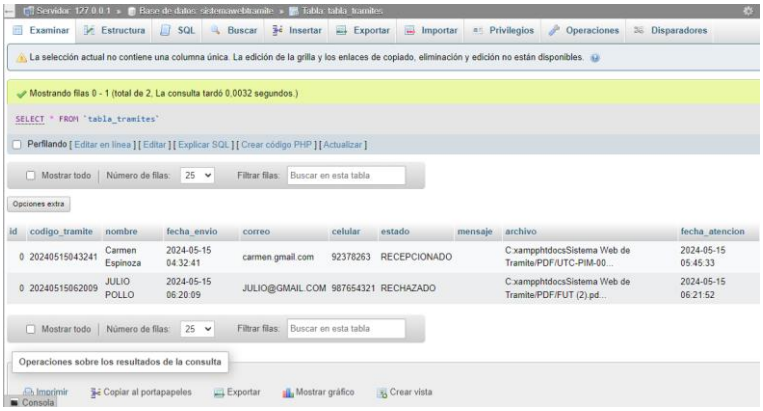


Figure 7: Documentation Log Database

3.4. Documentary FUT Presentation

Figure 8 provides a visual representation of the preparation of what would be the documentary FUT for the user to send to the system.

FORMULARIO UNICO DE TRAMITE

Solicito: Acta Civil

Señor alcalde de la municipalidad distrital de pueblo nuevo:

Yo Carlos Martínez Pérez, identificado(a) con D.N.I. N° 75747973, domiciliado(a) en Calle Maria Parado de Bellido, natural de Cañete, ante su despacho me presento y digo:

DETALLES DE LA SOLICITUD:

Estimados Sres. del Registro Civil,

Por medio de la presente, yo, Carlos Martínez Pérez, con documento de identidad número 75747973, y domiciliado en Calle 123, Colonia Centro, en la Ciudad de Ejemplo, solicito formalmente el registro de matrimonio de mi esposo José González López, y el mío, ocurrido el día 10 de junio de 2024, según los siguientes detalles:

Tipo de Evento: Matrimonio
Nombres de los Contrayentes: Carlos Martínez Pérez y José González López
Fecha del Evento: 10 de junio de 2024

Figure 8: Preparation of documentary FUT

4. Discussion

As cities experience a rapid urbanization process, they face crucial challenges in managing resources, increasing efficiency, and improving the quality of life for their residents. In this context, the convergence of artificial intelligence (AI) emerges as a key factor in addressing these challenges and for the creation of systematized and intelligent environments. (Garcia et al., 2021)

Figure 5 eloquently presents how implementation not only positively impacts efficiency, but also improves strategic decision-making and raises the quality of document services in the context of smart cities. This monitoring system provides a comprehensive view of critical data, facilitating deep and quick insights into the information, allowing analytics to significantly influence overall performance. The controls and monitoring of procedures have also undergone changes, and some of the innovations that the market was offering have been introduced, in order to increasingly improve efficiency in production in order to also offer the user a better customer service, which requires investment, and, therefore, those aspects that represent the greatest improvement must be prioritized. A fast and simple interface will be essential to be able to carry out

all these functions, and under it the algorithm must run, giving clear results of what has been obtained. The (López, 2023). This finding is aligned with previous research (Goudsmit et al., 2022) that highlights that documentary control goes through various stages that are influenced both by advances in database indexing and by the use of advanced search tools. In the current context of Information and Communication Technologies (ICT), it is crucial to address the organization, representation, retrieval and efficient use of documents to optimize their management and ensure their accessibility in professional and administrative environments. The dissemination of documents through digital platforms and document management systems has revolutionized the way information is accessed and handled. In this digital environment, it is essential to analyze how accurate document representation and metadata quality directly impact the effectiveness of document access and management.

This approach also explores initiatives aimed at improving documentary control, including the development of standards and methodologies that ensure the accuracy and reliability of documentary information. This is critical to ensure the integrity of records and facilitate informed decision-making within organizations. To advance in the implementation of effective standards and in the adoption of new technologies that improve document management, it is essential to promote continuous research and ensure that the results are available to enrich this crucial field in the digital age. (Vieira et al., 2023)

Overall, document control systems are an essential tool that positively impacts the efficiency, strategic decision-making and quality of urban services, making them valuable resources for smart city planners and managers. Likewise, the organization must continuously improve, for this it must establish, document, implement and maintain a quality system and to achieve these indicators it is necessary to implement standards that can support the work carried out in the different areas. (León, 2019) The document tracking and control system focuses on collecting essential data from both users and files, including details such as creation and modification dates. This allows you to generate

detailed statistics about the flow of documents in and out of your organization at specific intervals. This tool not only improves management and efficiency in document management, but also contributes to optimizing access control and fluidity in the handling of critical information. In addition, it facilitates the identification of areas for improvement in document processes, ensuring accurate registration and an agile response to user demands, avoiding delays and optimizing response time to peaks in demand. (Arley et al., 2019)

Figure 6 clearly illustrates how implementing a user query system not only strengthens operational efficiency, but also sharpens strategic planning and raises service quality in professional environments. This access control and user tracking system provides a comprehensive view of essential data, facilitating quick and deep understanding of the information. This allows the analyses carried out to have a significant impact on global management and ensure an agile response to user needs, improving the experience and optimizing the available resources. User satisfaction through a system of effective consultations is essential to evaluate and improve the quality of the service. The ability to meet and exceed user expectations is a key indicator of perceived service quality. This approach encompasses various aspects such as interpersonal interaction during the consultation, the relevance of the content provided, the effectiveness of the care process, and the overall organization that impacts the user experience. A well-designed consultation system not only facilitates user satisfaction by meeting their needs and expectations, but also contributes to strengthening the relationship between the user and the service provided. The feedback obtained through these consultations makes it possible to identify areas for improvement within the care process and optimize the available resources to provide a more efficient and satisfactory service (Febres et al., 2020) .

The implementation of a system of queries by users for document tracking is crucial to optimize document management. This approach not only seeks to improve efficiency in the retrieval and use of information, but also to ensure that users can effectively

access relevant documents. Assessing user satisfaction with this system helps identify areas for improvement, such as accessibility, organization, and clarity of the information provided. The implementation of quality management tools can be essential to ensure that the system adequately responds to the needs of users, thus contributing to more effective document management (Pérez et al., 2019) .

The system of queries by the user on their documentary procedures is based on the capacity of the databases to facilitate the efficient retrition of information. Through structured queries, users can access data relevant to their document processes, ensuring the accuracy and relevance of the information retrieved through the use of indexes and keywords to optimize results. In the context of information systems, attribute queries are essential to perform specific analyses on layers of information, providing answers to key questions for strategic and operational decision-making (Sosa et al., 2023) . User queries about documents are based on the collection and analysis of data about the preferences and needs of the population. This approach allows us to understand how users search for information on various web platforms, from general search engines to specific academic content. Analyzing online search behavior not only facilitates the identification of emerging topics of interest, but also the evaluation of the relevance and accessibility of the available information. This process is essential to improve the efficiency and effectiveness of document search and access services in the digital age (Bojo et al., 2021) .

Figure 7 highlights the implementation of a database for a document management system highlights the importance and significant benefits of an intelligent digital platform. This system centralizes and streamlines access to key information, facilitating the creation of accurate and detailed records. Similar to the field of healthcare and medical records, artificial intelligence plays a crucial role in applying advanced data processing techniques to improve efficiency and organization in document management.

We can define databases as the storage of a set and collection of organized data and the relationships that exist between them that belong to a specific organization and common purpose. Although some authors also define it as a collection of information organized and presented to serve a specific purpose or also define it as an archive of interrelated, collected data that satisfies the information needs of a given community of users. The need to improve efficiency and care has driven the development of automated information systems (Bedolla et al., 2024) .

A database is crucial in the context described because it centralizes and organizes the information necessary to efficiently manage access and security of personnel in companies. It allows you to automate processes such as check-in, facial recognition, and tracking intrusion attempts, improving operational efficiency and ensuring the rapid availability of critical data. In addition, it provides the necessary tools to implement robust security measures, such as data encryption and access control, ensuring the protection of sensitive information against external and internal threats (Rojas et al., 2022) . The importance of databases is highlighted in auditing as a crucial process to ensure the security, integrity, and quality of stored information. In the digital age, where digitalization has led companies to handle large volumes of data within these databases, auditing becomes a vital mechanism to identify threats, vulnerabilities and errors in data management. This systematic and documented process not only verifies compliance with minimum security requirements, but also provides the opportunity to quickly address any identified issues (Guevara et al., 2023) . It also highlights that a database is crucial in the protection of organizations' critical information against various cyber threats. By hosting organized and directly accessible data, databases act as a critical control point for implementing security measures such as robust audits, access controls, and anomaly detection. Identifying and mitigating threats such as SQL injections, malware, and privilege abuse depend on the database's ability to store information securely and facilitate the implementation of solutions such as a SIEM (Security Information and Event Management), which

monitors and alerts on suspicious activity. In summary, a well-managed database not only ensures the integrity and availability of data, but also strengthens the resilience of organizations to potential attacks and vulnerabilities in their information systems (Vela, 2023) .

Figure 8 highlights the creation of virtual procedures through the implementation of a database for a document management system, highlighting its importance due to the significant benefits provided by an intelligent digital platform. This system centralizes and streamlines access to key information, facilitating the creation of accurate and detailed virtual procedures. Artificial intelligence plays a crucial role in applying advanced data processing techniques, improving efficiency and organization in the management of virtual procedures.

Communicating reports to family members becomes a fundamental challenge. It is crucial to establish effective protocols to ensure this process in a consistent and timely manner. Implementing a virtual document management system facilitates the accurate creation and distribution of these reports, ensuring that the information reaches the recipients effectively. The intelligent digital platform centralizes and streamlines access to relevant data, allowing efficient and organized management of virtual procedures. This not only improves operational efficiency, but also strengthens the quality of communication between institutions and family members, ensuring more effective and satisfactory care in situations that require detailed and updated information virtually. Reporting becomes a critical challenge. It is crucial to establish effective protocols to ensure this process in a consistent and timely manner. Implementing a virtual document management system facilitates the accurate creation and distribution of these reports, ensuring that the information reaches the recipients effectively. The intelligent digital platform centralizes and streamlines access to relevant data, allowing efficient and organized management of virtual procedures. This not only improves operational efficiency, but also strengthens the quality of communication between institutions, ensuring more effective and satisfactory care in situations that require detailed and

updated information virtually (Taype et al., 2021) (García et al., 2021).

It is essential to ensure that virtual reports are complete, clear and accurate to maintain their validity and reliability. This involves following rigorous writing and publishing standards, as well as encouraging critical review of these documents (Quispe et al., 2021).

5. Limitations and future work

Despite the success of the proposed document processing system, several limitations were identified both in its evaluation and in its initial design. The analysis of the system did not adequately consider comparison with an equivalent control group, which could have reduced the robustness of the conclusions. However, measures were put in place to simulate an environment without the intervention of the automated system, providing an indication of how the process would have worked manually. During the testing phase of the system in several municipal offices, unexpected fluctuations in document processing times were observed, which affected the average efficiency recorded during the first three months of implementation. These unplanned variations were not initially considered in the estimation of the system's response times. To mitigate these types of challenges, regular system performance checks were established in all test areas. Initially, the system performance review was scheduled on a weekly basis using algorithms designed to identify bottlenecks and optimize workflows. This made it possible to obtain a periodic and updated view of the status of the procedures in all the dependencies. As the burden of paperwork increased and demands for services intensified, daily reviews were implemented to ensure optimal management of resources and avoid significant delays. In addition to the internal challenges identified, there were external factors that affected the performance of the system, such as the availability of human resources in each dependency and the variability in response times of external suppliers. These aspects influenced document processing times in a similar way to the impacts observed on shipment handling in the DMM example. Despite these limitations, the implementation of the web document processing system proved to be more efficient than the manual methods previously used. A significant reduction in average document processing times was achieved, especially in the units with the highest workload. Likewise, improvements were observed in the management of the documentary inventory before and after its distribution, although it is recommended to continue collecting data to validate these preliminary results. For future work, the implementation of document management

systems based on blockchain or other types of technologies to guarantee the integrity and security of municipal documents could be explored, ensuring an immutable and transparent record of each transaction and modification. In addition, more intuitive and adaptive user interfaces could be developed, using artificial intelligence and machine learning technologies to personalize the user experience and improve efficiency in searching and retrieving information. It would also be relevant to investigate the use of emerging technologies such as augmented reality to facilitate visualization and collaboration on complex documents, such as urban plans or historical records. Another crucial aspect would be the integration with IoT (Internet of Things) systems for automated data capture and interoperability with other administrative systems, promoting more integrated and efficient management in municipalities.

6. Conclusions

- The implementation of the web system for document management in the District Municipality of Pueblo Nuevo, using the SCRUM methodology, represents a significant advance towards administrative modernization and the improvement of public services. This project has proven to be effective in optimizing internal processes, reducing response times and increasing transparency in municipal management.
- The use of SCRUM as a development methodology has facilitated the iterative and continuous delivery of functionalities, adapting flexibly to emerging needs and requirements throughout the development cycle. This has allowed an agile response to changes and greater satisfaction of both internal users and citizens who use the municipality's services.
- In addition, the system has strengthened the security and integrity of documentary information, ensuring secure and efficient access for all authorized users. The digitization of document procedures has simplified administrative procedures and improved the user experience, promoting more active and conscious community participation in public affairs.
- Despite the challenges faced during the implementation process, such as staff training and integration with existing systems, the project has laid the groundwork for future improvements and expansions of the system. It is recommended

to continue strengthening staff training, improve interoperability with other municipal systems and explore new technologies that can further optimize document and administrative management in the municipality.

- The web system for document management under the SCRUM methodology has been fundamental to promote efficiency, transparency and modernization in the District Municipality of Pueblo Nuevo, providing a solid basis for the continuous development and improvement of public services offered to citizens.

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