PAAW: PORTABLE ASSISTANT FOR ANIMAL WELFARE, A DECISION SUPPORT SYSTEM FOR THE PROVINCIAL VETERINARY SERVICES OFFICE OF NUEVA VIZCAYA

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ABSTRACT

The Portable Assistant for Animal Welfare (PAAW) is an innovative support system designed for the Provincial Veterinary Services Office of Nueva Vizcaya. Developed using the MERN stack (MongoDB, Express, React, Node.js), PAAW is a single-page progressive web application (PWA) designed to enhance operational efficiency across core divisions, including livestock and poultry development, animal healthcare and management, regulatory and monitoring, and administrative functions. The system was created following the Rapid Application Development (RAD) methodology, emphasizing iterative prototyping to ensure a user-centered, responsive, and functional platform. PAAW integrated several key features, including streamlined data collection, offline access via CSV export, and data visualization with Chart.js, enabling users to analyze and manage information efficiently. Its architecture leveraged cloud storage, providing flexible data handling and ensuring seamless functionality across desktop and mobile users. The system was evaluated by 13 participants, comprising four administrative personnel, seven operational staff from various divisions, and two IT experts. Their feedback confirmed that PAAW effectively addresses the practical needs of its users. An ISO 25010:2015 assessment was conducted, yielding an overall mean score of 4.40, which indicates a high degree of compliance with the quality characteristics outlined in the standard. This result demonstrates that PAAW meets its specified requirements and delivers a robust, efficient solution for veterinary service operations.

Keywords: Animal welfare, decision support system, veterinary services, MERN stack, progressive web application

RATIONALE

In today's world, technology is a fundamental part of daily life, integrated into nearly every aspect of our activities. One reason technology, regardless of discipline, has been a focus for professionals and stakeholders is that it makes daily activities more convenient, saving time and enhancing quality of life (Simplilearn, 2022). IT is essential to modern business and organizational operations because it enables automated data-handling procedures that increase productivity, promote efficiency, and grant competitive advantage, especially in the marketplace. The development and integration of information systems (IS) that use digital technologies to simplify data administration, facilitate decision-making, and maximize operational effectiveness have been prompted by the increasing reliance on IT in contemporary business operations.

Information systems are essential to decision-making because they provide decision-makers with fast, accurate, and relevant information. These systems aid in the collection, processing, and display of data to facilitate sound decision-making. Organizations can use information systems to streamline decision-making processes, increase productivity, reduce uncertainty, and ultimately achieve their strategic objectives (Khalid, 2019). Information systems (IS) highlight the importance of using data to inform decisions in the current corporate environment. This is a crucial technique for staying competitive and succeeding in the market, particularly for businesses that don't see the value in information systems.

This study is critical for the PVSO of Nueva Vizcaya, the Provincial Veterinary Services Office, since it marks the transition from outdated paper-based processes to modern digital solutions. By embracing technology, the office can streamline administrative operations, improve data management and analysis, foster employee cooperation, and increase overall efficiency and productivity. These digital advancements lead to a more efficient, well-organized, and accurate operational process, which significantly enhances PVSO's productivity and service quality.

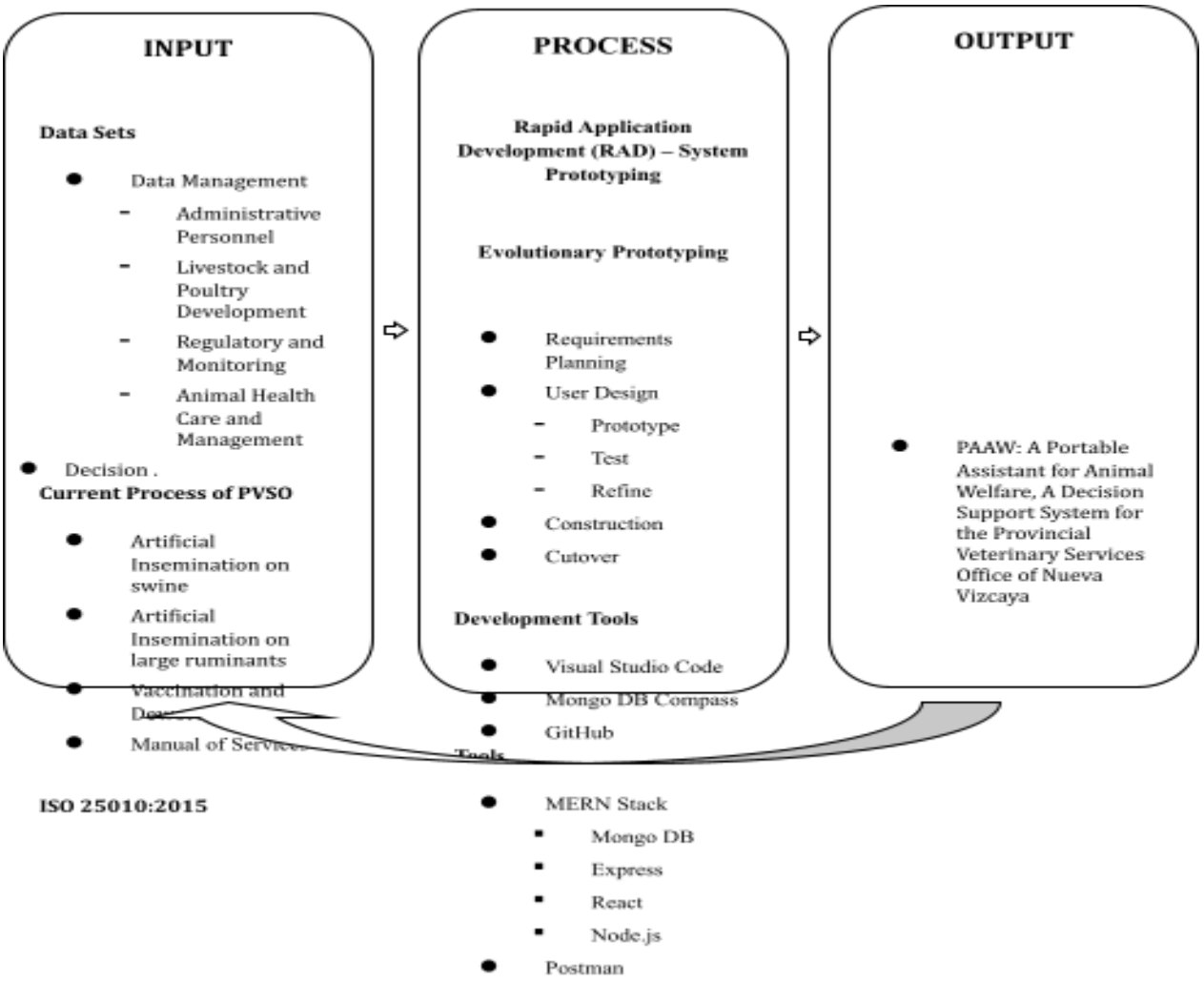
The study provides significant insights and recommendations to the PVSO administration, assisting them with strategic planning and resource efficiency. The administration can make policy and program implementation decisions based on the study's findings, thereby establishing clear objectives and priorities. By implementing the study's recommended procedures and documentation requirements, the administration may enhance accountability and transparency within the office, thereby increasing public trust and confidence in its operations.

To the Staff of the Provincial Veterinary Services Office of Nueva Vizcaya, moving away from paper-based processes offers significant potential to streamline workflows and save employees' time. Embracing digital solutions allows employees to focus on providing high-quality services rather than getting bogged down by administrative duties. This change not only increases productivity but also creates a more efficient and dynamic work environment, enabling employees to better serve the community.

The Nueva Vizcaya community is greatly impacted by the system's deployment. The system improves the community's capacity to care for its livestock by making veterinary services more readily available and effective. By fostering the expansion and sustainability of the agricultural industry, this advancement not only improves the health and welfare of animals but also enhances the region's overall economic development.

The researchers developed a Veterinary System for the Provincial Veterinary Service Office of Nueva Vizcaya, known as PAAW: Portable Assistant for Animal Welfare, which represents a significant advancement from manual, paper-based processes to a computerized recording system. PAAW aims to enhance animal welfare practices and operational efficiency within the office through several key features. It streamlines patient registration procedures, reducing errors and increasing efficiency in capturing and managing patient data. Additionally, PAAW transitions client record management from paper-based files to digital databases, improving data accessibility and facilitating seamless communication among veterinary staff. The system includes a decision-support component that provides real-time access to clinical guidelines and treatment protocols to inform evidence-based decision-making.

Figure 1
Conceptual Framework



Statement of the Problem

This capstone project, "PAAW: A Portable Assistant for Animal Welfare," aimed to address operational challenges faced by the Provincial Veterinary Services Office (PVSO) of Nueva Vizcaya. The goal was to modernize the PVSO's record-keeping and operations with a digital support system. This system helped streamline data management, improve the accuracy of field reports, and enhance the monitoring and control of livestock diseases. The project addressed the issues of the current paper-based system, which caused delays, errors, and inefficient resource management. By implementing a digital solution, the aim was to streamline administrative tasks and provide useful information to support better decision-making in animal welfare and public health. The study began in the 2nd semester of S.Y. 2023-2024 with the writing of the rationale and research methodology and continued into the 1st semester of S.Y. 2024-2025 for data gathering and system development. This was expected to be completed by December 2024, thus spanning from January to December. This study sought to answer the following questions:

1. What is the current problem of the Provincial Veterinary Service Office (PVSO) based on their current practices in terms of their:

A. Data Management
   - Administrative Personnel
   - Livestock and Poultry Development
   - Regulatory and Monitoring
   - Animal Health Care and Management
B. Decision-making on the gathered data from
   - Field reports,
   - Inventory reports

2. What system could be developed to solve those problems?
3. What is the extent to which the PAAW decision support system complies with ISO 25010?
   A. Functional Suitability
   B. Performance Efficiency
   C. Compatibility
   D. Usability
   E. Reliability
   F. Security
   G. Maintainability, and Portability

METHODOLOGY

Research Design

The research entitled "PAAW: Portable Assistant for Animal Welfare, a Decision Support System for the Provincial Veterinary Services Office of Nueva Vizcaya" used a mixed-methods approach combining descriptive and developmental methods. Descriptive methods were used to gather comprehensive data on the current challenges faced by the Provincial Veterinary Service Office (PVSO) of Nueva Vizcaya and to evaluate the completed system. In contrast, developmental methods focused on using a developmental model to ensure proper system development. Both of these approaches were used to gather data and to develop and evaluate the system.

Research Locale

The Provincial Veterinary Services Office of Nueva Vizcaya (PVSO) offers a wide range of essential services to support livestock health and farming in the province. By focusing on livestock quality and health, PVSO aims to improve farming productivity and enhance the agricultural sector. These services play a crucial role in helping farmers maintain healthy livestock, which benefits both the local economy and the overall quality of farming practices in the region. A key service provided by PVSO is artificial insemination for swine and large farm animals, such as cattle. This advanced breeding technique enables farmers to produce livestock with improved genetic traits, resulting in healthier, higher-quality animals. Artificial insemination is a cost-effective way to enhance breeding programs and increase genetic diversity, thereby strengthening regional livestock populations. Healthier, more resilient animals benefit not only individual farms but also raise the overall quality of livestock in Nueva Vizcaya. Additionally, PVSO offers vaccination and deworming programs to protect animals from diseases and parasites. These preventive programs help keep the livestock population healthy and productive, which is essential to farmers' incomes and to the agricultural industry as a whole. PVSO also issues health certificates for animals being transported to other provinces to ensure they meet the required health standards. This certification allows farmers to move their livestock safely and smoothly across regional borders, supporting local farmers while ensuring high standards of animal health and safety. The research locale is located on the 3rd floor of the agriculture building, Capitol Compound, Bayombong, Nueva Vizcaya. This locale was our

primary client, and it was essential for developing and testing the decision support system. The study tailored the project to the PVSO's needs, addressing their challenges and benefiting animal welfare in the region.

Research Participants

The participants in this study were carefully selected through purposive sampling, specifically employees of the PVSO of Nueva Vizcaya, to represent a diverse range of stakeholders engaged in its operations. The age qualification for the study participants was set between 24 and 60 years old. This range was selected to ensure a variety of experiences and perspectives and to identify any age-related vulnerabilities that might affect the PVSO's operations and effectiveness. These stakeholders encompass key personnel from distinct divisions, including administration, livestock and poultry development, regulatory and monitoring, and animal health care and management. By including representatives from each division, the study aimed to provide comprehensive insights into the PVSO's functions, challenges, and strategies, thereby facilitating a complete understanding of its operations and informing effective decision-making.

Administrative: The Administrative division serves as the pillar of the organization and is responsible for managing and coordinating its administrative functions. Within this division, the Administration Division maintains the organization's integrity, efficiency, and effectiveness.

Livestock and Poultry Development: This division is dedicated to advancing and improving livestock and poultry activities within the province. It is developing the growth and sustainability of the agricultural sector by focusing on the development and management of livestock and poultry resources. The division, comprising roles such as farm workers and administrative aides, is actively involved in supporting a wide range of activities related to animal husbandry, breeding, and production. Responsibilities within this division include providing technical assistance to farmers, implementing breeding programs to improve genetic stock, and advocating for the adoption of best practices in livestock and poultry management.

Regulatory and Monitoring: This division is responsible for overseeing and enforcing regulations pertaining to livestock and poultry production. Key roles within this division include veterinarians and farm workers who perform a variety of essential tasks. They conduct thorough farm inspections to ensure compliance with health and safety standards, conduct disease surveillance to monitor and prevent outbreaks, and address regulatory issues as they arise. Additionally, these professionals are involved in issuing necessary permits or licenses for animal-related activities, ensuring that all practices meet the required legal and ethical standards. Their work is crucial in maintaining the integrity and safety of the livestock and poultry industries.

Animal Health Care and Management Division: This division is dedicated to the health and welfare of animals within the province. It comprises veterinarians and administrative staff who provide a comprehensive range of veterinary healthcare services, including diagnosis, treatment, and disease prevention. Their responsibilities include administering regular vaccinations and health screenings and implementing quarantine measures to control the spread of infectious diseases. Additionally, the division is actively involved in promoting animal welfare and encouraging responsible pet ownership through public education and community outreach programs.

Software Development

The adoption of the Rapid Application Development (RAD) methodology is a practical approach to developing PAAW, a portable assistant for animal welfare and a decision support system for the provincial veterinary services office of Nueva Vizcaya. This methodology allows developers to swiftly iterate and update software without having to start from scratch. This

helps ensure the final product is of higher quality and meets end-users' needs (Kissflow, 2024). The RAD methodology, which prioritizes user participation, iterative development, and rapid prototyping, is a process-oriented approach that aims to deliver high-quality, fast software. As such, it serves as an appropriate foundation for the creation of PAAW. Though frequently mistaken for a specific model, the idea behind RAD is that treating software projects like clay rather than steel allows them to be tested and refined rather than going through the detailed planning and design phases associated with traditional development models (OUTSYSTEMS, 2024).

RESULTS AND DISCUSSION

Section 1. Current Problem of the Provincial Veterinary Service Office (PVSO) Based on Their Current Practices

1.1 Data Management

a. Reliance on Paper-Based Systems

According to the respondents, the Provincial Veterinary Services Office (PVSO) still relies mostly on paper-based methods for managing service requests, record-keeping, and reporting. Clients must come to the office in person to fill out and sign forms for various services, which slows the process, makes it more difficult, and increases the risk of mistakes. This system also adds more work for the staff, causing delays and requiring requests to be processed more efficiently, reducing these issues.

b. Manual Data Entry and Record-Keeping

Another major problem, as reported by the respondents, is the manual process used for entering data and creating reports. Many reports, such as inventory, utilization, inspection, and accomplishment reports, are done manually using Microsoft Excel. This approach is time-consuming and often results in human errors, such as incorrect data entry or calculation errors, which can affect report accuracy and slow decision-making.

c. Difficulty in Finding and Accessing Information

It is also challenging to quickly find and access important documents. The current system relies on storing printed forms and reports, making it hard to quickly find critical information, especially in urgent situations. This lack of an organized digital system slows the PVSO's ability to respond to problems and increases staff workload. A more effective digital system is needed to quickly store and retrieve data.

d. Delays in Analyzing Data and Reporting

The current manual processes also delay data analysis and report creation. After field activities, data have to be manually collected, recorded, and analyzed, which slows down the whole reporting process. This delay affects the PVSO's ability to provide timely insights and take necessary actions. An automated system for collecting and analyzing data would make the office more responsive.

e. High Administrative Workload Due to Manual Processes

Manual handling of documents adds a heavy workload to PVSO staff. Tasks like keeping records, compiling reports, and managing requests are all done by hand, which takes a lot of time and effort. This heavy workload prevents the team from focusing on more important tasks and reduces overall productivity. An automated, integrated system could help streamline these tasks, reduce workload, and improve service delivery.

1.2 Decision-Making on the Gathered Data

a. Field Reports

Each division, Livestock and Poultry Development, Regulatory and Monitoring, and Animal Health Care and Management, collects detailed information through their fieldwork. This data provides insights into various aspects, including animal production efficiency, regulatory compliance, and animal health status. Decision-makers rely on this data to formulate strategies, address issues, and improve operational effectiveness across the division. However, the current manual process of compiling and validating these field reports can lead to delays and errors, potentially compromising the accuracy and timeliness of decisions and, in turn, the effectiveness of programs and services. Therefore, there is a significant need for an automated system that not only streamlines data entry and consolidation but also ensures decision-makers have access to accurate, timely information, thereby enhancing overall decision-making at the PVSO.

b. Inventory Reports

Effective decision-making at the PVSO relies on accurate and timely inventory data. The two primary inventory reports, the Monthly Inventory and Utilization Report and the IT Equipment Inventory Report, provide essential information on the stock levels and condition of supplies and equipment. This data helps guide decisions related to ordering supplies, managing stock levels, and maintaining equipment.

The current inventory data management process in Microsoft Excel can lead to inaccuracies due to manual data entry and tracking. Errors in these reports can result in poor decision-making, such as understocking or overstocking items and mismanagement of IT equipment. To improve decision-making, it is crucial to ensure inventory data is accurate and up to date. An automated inventory management system could enhance the accuracy of inventory records, streamline data entry, and provide real-time insights, thereby supporting better resource allocation and more effective operational planning.

Section 2. System Developed to Solve this Problem

To better manage and streamline field reports at the PVSO, PAAW was designed to enhance field report management by providing a system for remote data entry via digital forms that align with existing document formats. This approach allows field workers to enter information directly from the field, reducing errors and speeding up the reporting process. The system includes a centralized database that securely stores all collected data, ensuring easy retrieval and protection against data loss. To further support efficient operations, PAAW offers a permission management system tailored to each division's specific needs, controlling data access based on user roles. It also enables the printing of forms and efficiently handles various requests, providing a system designed to manage field activities and improve overall operational effectiveness at the PVSO.

PAAW provides a system to streamline client form management. It enables software distribution to clients and remote data entry via digital versions of preexisting request forms. Clients can submit these forms based on the specific services they require, ensuring that all necessary information is accurately captured. Once submitted, PAAW facilitates the distribution of filled-out and approved request forms to the relevant divisions for further processing. All data is securely stored in a centralized database, ensuring easy access, efficient management, and protection against data loss.

To improve inventory management, the PAAW automated the handling of requisition forms. This meant that requests for new supplies or adjustments were processed electronically rather than through manual forms. By automating these requisition forms, PAAW streamlined the recording and tracking of inventory needs, reducing errors and saving time. Additionally, all inventory data, including information from the Monthly Inventory and Utilization Report, was stored in a centralized database. This centralized storage made it easy to access and manage inventory records, ensuring data accuracy and up-to-date status. The automated system helped maintain proper stock levels and ensured efficient resource use across the PVSO. PAAW streamlined monthly report consolidation by automating the data combination from field reports. This automation replaced the manual effort required to aggregate and format data from various divisions, reducing time and potential errors. With automated data consolidation, PAAW ensured that all relevant information was accurately compiled into a single, comprehensive report. Data from the consolidated reports was stored in a central database, providing an organized and easily accessible repository for all monthly reports. This central storage facilitated efficient data management and allowed for quick retrieval of historical data, which was essential for trend analysis and reporting. Additionally, PAAW supported the printing of finalized reports, enabling the production of hard copies for distribution or further review. This integrated approach enhanced the accuracy and efficiency of report consolidation, delivering timely, reliable insights to the PVSO.

Section 3: What is the extent to which the PAAW decision support system complies with ISO 25010

The developed PAAW job posting and matching application was evaluated using ISO 25010 Software Quality Standards. This evaluation assessed the system's adherence to criteria such as functional suitability, performance efficiency, compatibility, usability, reliability, security, maintainability, and portability. The assessment focused on confirming that the application effectively meets functional requirements, performs efficiently, is compatible across different platforms, provides a user-friendly experience, maintains high reliability and security, is easy to maintain, and demonstrates portability.

Table 1
Functional Suitability

	Mean	Descriptive Equivalent	Interpretation
Functional Suitability			
Functional completeness	4.71	Very Great Extent	The measure described in the item is compliant to a very great extent or OUTSTANDING
Functional correctness	4.47	Very Great Extent	
Functional appropriateness	4.35	Very Great Extent	

Functional completeness measures the extent to which a system or software covers all specified tasks and user objectives. In this case, the rating of 4.71 suggests that the system is compliant to a very great extent in fulfilling all specified tasks and user objectives. This is a positive indication that the system is comprehensive in addressing user needs.

In summary, these results indicate that the system being evaluated performs exceptionally well in terms of functional completeness, correctness, and appropriateness, with ratings all above 4 on the provided scale. These high ratings reflect a system that effectively meets user needs, delivers accurate results, and is well-suited for its intended purpose.

Table 2
Performance Efficiency

	Mean	Descriptive Equivalent	Interpretation
Performance Efficiency			
Time Behavior	4.47	Very Great Extent	The measure described in the item is compliant to a great extent up to very great extent.
Resource utilization	4.12	Great Extent	
Capacity	3.88	Great Extent	

Performance efficiency measures how effectively a system operates within the specified time, resource, and capacity limits. In this case, a rating of 4.47 for time behavior suggests that the system is compliant to a very great extent with time-related performance requirements. A rating of 4.12 for resource utilization indicates a great extent of efficiency in managing resources effectively, while a score of 3.88 for capacity reflects a great extent of compliance in handling workloads.

In summary, these results suggest that the system performs well in terms of performance efficiency, particularly in time behavior, with good resource and capacity management.

Table 3
Compatibility

	Mean	Descriptive Equivalent	Interpretation
Compatibility			
Co-existence	4.47	Very Great Extent	The measure described in the item is compliant to a very great extent or OUTSTANDING
Interoperability	4.41	Very Great Extent	

Compatibility measures how well a system interacts with other systems or software within its environment. A rating of 4.47 for co-existence suggests that the system is compliant to a very great extent, operates effectively alongside other systems, and reflects outstanding performance. Similarly, a rating of 4.41 for interoperability indicates compliance to a very great extent, demonstrating the system's ability to exchange and utilize information efficiently.

In summary, under the overarching theme of compatibility, the table results demonstrate a system that excels in both co-existence and interoperability. Ratings for both dimensions surpass the four-point threshold, indicating robust compatibility. These findings imply that the system can operate efficiently in shared environments and communicate effectively with other components or systems, fostering seamless interactions and data exchange.

Table 4
Usability

	Mean	Descriptive Equivalent	Interpretation

Usability			
Appropriateness recognizability	4.53	Very Great Extent	The measure described in the item is compliant to a very great extent or OUTSTANDING
Learnability	4.41	Very Great Extent	
Operability	4.71	Very Great Extent	
User error protection	4.41	Very Great Extent	
User interface aesthetics	4.53	Very Great Extent	
Accessibility	4.53	Very Great Extent	

Usability measures how effectively a system supports users in achieving their goals. A rating of 4.53 for appropriateness, recognizability, user interface aesthetics, and accessibility indicates strong compliance, ensuring clarity, visual appeal, and inclusivity. Learnability and user error protection, both rated 4.41, highlight ease of learning and reliable error prevention. The 4.71 rating for operability indicates exceptional user control.

In summary, the table results indicate a system that excels in multiple dimensions. High ratings across all dimensions suggest that the system is user- centric, appropriately aligned with user needs, easy to learn and operate, and aesthetically pleasing. Furthermore, it accommodates a diverse user base and provides robust error protection.

Table 5
Reliability

	Mean	Descriptive Equivalent	Interpretation
Reliability			
Maturity	4.35	Very Great Extent	The measure described in the item is compliant to a very great extent or OUTSTANDING
Availability	4.53	Very Great Extent	
Fault Tolerance	4.47	Very Great Extent	
Recoverability	4.35	Very Great Extent	

Reliability measures the system's ability to perform consistently under specific conditions. A rating of 4.35 for maturity and recoverability suggests the system is compliant to a very great extent, demonstrating stability and the ability to recover from failures effectively. A 4.53 rating for availability reflects outstanding system uptime, while a 4.47 rating for fault tolerance highlights its ability to handle errors without failure.

In summary, within the domain of reliability, the table shows a system that excels across multiple dimensions. High ratings across all dimensions suggest that the system is reliable under normal operation, consistently available, resilient in the face of faults, and capable of effective data recovery.

Table 6
Security

	Mean	Descriptive Equivalent	Interpretation
Security			
Confidentiality	4.76	Very Great Extent	The measure described in the item is compliant to a very great extent or OUTSTANDING
Integrity	4.53	Very Great Extent	
Non-repudiation	4.47	Very Great Extent	
Accountability	4.56	Very Great Extent	
Authenticity	4.65	Very Great Extent	

Security measures the system's ability to protect sensitive data and ensure trustworthiness. A rating of 4.76 for confidentiality indicates outstanding protection of sensitive information. The 4.53 rating for integrity reflects strong data consistency, while non-repudiation (4.47) ensures accountability for actions. A 4.56 rating for accountability highlights effective tracking of user actions, and a 4.65 rating for authenticity ensures the system verifies user identities to a very great extent.

In summary, within the domain of security, the table results depict a system that excels in multiple dimensions. High ratings across all dimensions suggest that the system effectively protects data confidentiality and integrity, supports non- repudiation, maintains accountability, and ensures the authenticity of user identities.

Table 7
Maintainability

	Mean	Descriptive Equivalent	Interpretation
Maintainability			
Modularity	4.24	Very Great Extent	The measure described in the item is compliant as it ranges to great extent up to very great extent
Reusability	4.41	Very Great Extent	
Analyzability	4.29	Very Great Extent	
Modifiability	4.41	Very Great Extent	
Testability	4.06	Great Extent	

Maintainability measures the ease with which a system can be maintained and updated. A rating of 4.24 for modularity reflects compliance to a very great extent, indicating the system's components are well-organized for maintenance. Reusability (4.41) and modifiability (4.41) highlight the system's ability to adapt and reuse components effectively. Analyzability (4.29) shows that the system is easily analyzed for maintenance needs. A rating of 4.06 for testability indicates a great extent of ease in testing the system.

In summary, within the domain of maintainability, the table results indicate that the system performs well across multiple dimensions. While there is room for improvement in modularity, the system excels in reusability, analyzability, modifiability, and testability.

Table 8
Portability

	Mean	Descriptive Equivalent	Interpretation
Portability			
Adaptability	4.29	Very Great Extent	The measure described in the item is compliant to a great extent up to very great extent
Installability	4.35	Very Great Extent	
Replaceability	4.18	Great Extent	

Portability measures the system's ability to operate across different environments. A rating of 4.29 for adaptability indicates strong compliance, reflecting the system's ability to adjust to different conditions. Installability (4.35) shows the system can be easily installed in various environments. A rating of 4.18 for replaceability reflects a great extent of compliance, suggesting the system can be replaced or updated with relative ease.

In summary, within the domain of portability, the table results show a system that excels in all three dimensions. High ratings across these dimensions suggest that the system is highly adaptable to changing environments and technologies, can be easily installed and uninstalled, and serves as a suitable replacement for other software products in the same environment.

CONCLUSIONS AND RECOMMENDATIONS

Conclusion

The researchers conclude that addressing the current challenges PVSO faces in managing field reports, client forms, and inventory requires implementing an automated solution. The system developed addresses the inefficiencies and mistakes caused by manual processes. It allows field workers and clients to enter data directly through digital forms, reducing errors and speeding up the reporting process. The system also automates inventory tracking and consolidates reports, storing all data securely in one place for easy access. It includes permission management to control who can access sensitive data based on roles. By improving data accuracy and streamlining operations, this approach helped the PVSO manage resources more effectively, improve decision-making, and enhance overall service delivery. The researchers conclude that the system is compliant with ISO 25010:2015 based on the results of the system assessment.

Recommendations

Based on the conclusions above, here are some suggestions/recommendations:

1. Expand the scope to include collaboration with municipal agriculture offices (MAGROs).
2. Develop an API to allow integration between PAAW and a future MAGRO system for animal industry management.
3. Utilize TypeScript in coding to streamline development and maintain ease of understanding for future developers.
4. Enhance the charting and analysis features for more comprehensive data insights.
5. Reduce the number of forms by creating custom forms for the system in coordination with PVSO and removing any duplicate forms.

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