Veterinary Clinic Management System

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Abstract: This study aims to address the inefficiencies in FurCare Veterinary Clinic's manual record-keeping and disconnected systems, which leds to scheduling conflicts, poor inventory tracking, and inaccessible pet records. The clinic's reliance on manual record-keeping and disconnected software led to persistent scheduling conflicts, ineffective inventory tracking, and difficult access to pet medical histories. The primary objective was to design and implement a centralized, web-based solution to automate core tasks and unify data management across two branches. Developed iteratively using the Agile methodology, the system leverages a robust tech stack including PHP, MySQL, and Bootstrap for the frontend, integrated with the PhilSMS API for timely communication. Designed for administrators, veterinarians, staff, and pet owners, its essential functionalities encompass online appointment scheduling, automated SMS reminders, digital medical records, and real-time inventory tracking. These integrated features successfully streamline workflows, enhance data accuracy, and significantly improve the overall quality of service delivery. Evaluation showed major improvements in speed, accuracy, and user satisfaction, achieving a high 86.5 usability score. The system proved very effective based on testing and user feedback. In conclusion, it successfully modernized the clinic's operations, with potential for a mobile app, expansion of inventory management, improvement or addition of features in the future.

Keywords: Appointment Scheduling, Centralized, Inventory Tracking, Manual Record-Keeping, Scheduling Conflicts, SMS Reminders, Veterinary Clinic And Web-Based.

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I. INTRODUCTION

Technology plays a vital role in modern veterinary clinics, with many adopting digital tools like Veterinary Clinic Management Systems to enhance operations. These systems centralize tasks such as tracking pet health records, managing appointments, and improving communication. Information Technology enhances efficiency by securely storing data, simplifying record retrieval, and automating scheduling and inventory tracking. Without a unified system, clinics face challenges like inconsistent data, scheduling conflicts, and inefficiencies, particularly when relying on paper records (Junaedi et al., 2020). Digitalization improves workflow efficiency, reduces stress for veterinarians and pet owners, and enhances service quality (Diez, Renner, & Ózsvári, 2023). To solve these problems, this study proposes the Veterinary Clinic Management System, which will store records in one place, automate scheduling by making sure that time slots that are already reserved by one pet owner are unavailable for others, and track supplies to reduce the shortages of items and medications and also track the medication's expiration date.

Managing pet services across multiple locations requires an efficient record-keeping system. Some veterinary clinics still use paper records or separate systems, which may result in difficulties in organizing and retrieving information. According to Jamil, Yassin, and Ali (2023), writing data on paper carries the risk of loss and makes retrieving pet medical information time-consuming, leading to inefficiencies in veterinary clinics. Without a centralized system, staff may need more time to access pet records and inventory data, which could affect daily operations.

The Veterinary Clinic Management System will be designed to centralize records, allowing pet owners to schedule appointments online while enabling veterinarians and staff to retrieve important records efficiently. According to Cervantes (2024), veterinary appointment scheduling software allows pet owners to conveniently schedule appointments at any time, reducing scheduling conflicts and improving overall clinic efficiency. By incorporating automated scheduling and reminders, the system aims to support timely pet care. This system is intended to assist pet

business owners, veterinarians, clinic staff, and pet owners by improving record organization, inventory and appointment management, which may enhance efficiency and service quality.

The FurCare Veterinary Clinic, which operates two branches in the city, one in J.R Borja Extension and the other one is in Zone 7 Canitoan both located in Cagayan De Oro City, has been selected as the target beneficiary for this project. The clinic provides veterinary care, pet grooming, and pet supply retail and currently uses manual record-keeping and separate software solutions to manage its operations, which may present challenges in maintaining data consistency, scheduling, and inventory tracking across multiple locations. This clinic was chosen because it is an example of a multi-branch pet service provider managing operations in different locations. Implementing the Veterinary Clinic Management System is intended to automate processes, improve accuracy, enhance efficiency, and optimize service delivery.

The FurCare Veterinary Clinic faces significant operational challenges due to its reliance on manual record-keeping and disconnected software solutions, leading to inefficiencies in scheduling, data management, and inventory tracking. The absence of a centralized system may contribute to inconsistent pet histories, difficulty retrieving past records, and potential risks related to data loss and privacy. Manual appointment scheduling and reminders contribute to scheduling conflicts and overbooking, while time-consuming report generation delays decision-making. Additionally, inefficient inventory tracking leads to overstocking or shortages of essential veterinary supplies. These issues cause operational inefficiencies, wasted resources, and a poor client experience. Implementing the Veterinary Clinic Management System is expected to centralize operations, improve data accuracy, scheduling, and optimize inventory management, which may contribute to better efficiency and service delivery.

The Veterinary Clinic Management System will be designed to enhance appointment scheduling, record management, client communication, billing, and inventory tracking in veterinary clinics. By replacing manual record-keeping with a centralized, automated system, the solution aims to improve data accuracy, accessibility, and overall clinic operations across multiple branches. According to Johnson et al. (2021), Information Technology has become a key tool for collecting, storing, and distributing information, making it essential for managing veterinary healthcare data efficiently.

This system will integrate online scheduling, automated SMS reminders, digital consent forms, inventory and medication tracking, billing and payment processing, vaccination tracking, and multi-branch data synchronization. According to Barnes (2022), electronic records eliminate legibility-based challenges which can be a serious liability for any veterinary practice. Centralized electronic medical record systems help improve pet data management, increase efficiency, and reduce errors caused by missing or incomplete information. Applying these principles to veterinary clinics, an automated system will provide real-time access to pet medical histories. Additionally, features such as automated scheduling, inventory tracking, and billing automation will assist in managing daily operations.

The Veterinary Clinic Management System will utilize MySQL for secure storage and efficient management of pet records, client data, and transactions. It will feature automated scheduling to prevent conflicts, SMS reminders via PhilSMS to reduce no-shows, and cloud synchronization for real-time updates across branches. Security measures like role-based access and encrypted logins will safeguard sensitive information. Additional functionalities include digital consent forms, vaccination tracking, billing/payment processing, and inventory management which will only include Medicines, Vaccines and Pet Foods to prevent shortages. The system will be built with PHP for backend logic, MySQL (phpMyAdmin) for the database, and a frontend combining JavaScript, HTML, and CSS with Bootstrap ensuring responsive design.

This study aims to develop and implement a Veterinary Clinic Management System that will improve efficiency, accuracy, and service quality in FurCare Veterinary Clinic by automating processes and centralizing data management. Specifically, this study aims to.

To develop an online appointment system to prevent double booking and scheduling conflicts.

- To implement an automated SMS reminder system for appointments and vaccinations schedules.
- To generate automated reports to assist staff in tracking sales, treatments, and appointments.
- To develop an inventory and medication tracking system to identify supply shortages, expiration date and overstocking.
- To ensure real-time data synchronization across multiple branches for better access to pet medical records.
- To enhance pet medical record management by providing a secure and organized system for easy retrieval.
- To conduct testing and evaluation to assess the system's effectiveness and reliability.

II. RELATED WORK

This chapter provides a comprehensive review of related literature and studies to guide the development of the Veterinary Clinic Management System. It examines eleven selected studies, four local and seven international, to explore how existing veterinary systems are designed, what technologies and methods they use, and which features are commonly implemented. These studies are grouped and compared based on their development methodologies, particularly Structured and Agile approaches, allowing the identification of best practices, common limitations, and areas for improvement. The synthesis will consolidate these findings to highlight unresolved gaps and justify how Veterinary Clinic Management System addresses them,

ensuring the proposed system is both innovative and necessary.

The proposed Veterinary Clinic Management System will be designed using native PHP and MySQL (managed via phpMyAdmin) for backend data processing and storage, chosen for their reliability and scalability. The frontend combines HTML, CSS, JavaScript, and Bootstrap for responsive design, with React.js (via CDN) enhancing user interaction. Philsms integrates SMS reminders to reduce missed appointments, a gap identified in prior studies. While PHP and MySQL ensure broad compatibility, they may require optimization for high-traffic clinics, and React.js's CDN dependency limits offline functionality.

- Systems using structured methodologies, such as Veterinary Online Appointment System (Rosmani & Mokhtar, 2023) and the WEB-Based Veterinary Clinic (Chua et al., 2024), providestable appointment scheduling and record management but lack scalability and features like inventory tracking and multi-branch support. Though highly usable, these systems are difficult to update due to their rigid design. Similarly, Leong's (2023) Veterinary Clinic Management System incorporated key clinic functions but remained incomplete, requiring further enhancements. Other structured approaches, such as Yeow and Kamaludin's (2023) Pet Care Management System, efficiently handled grooming and boarding reservations but lacked medical record tracking.

- Structured systems like Veterinary Online Appointment System (Rosmani & Mokhtar, 2023) and the WEB-Based Clinic (Chua et al., 2024) efficiently manage appointments and records but lack flexibility for updates, leading to missing features like inventory tracking, multi-branch support, and digital consent forms (Leong, 2023). The Pet Care Management System (Yeow & Kamaludin, 2023) is limited to grooming and boarding, making it unsuitable for full veterinary operations. Similarly, the Structured Veterinary Clinic Management System by Jaffar and Zin (2021), despite its detailed planning, falls short in automation, cloud access, and vaccination tracking, restricting scalability. Meanwhile, systems built with Agile methodologies, including VETGO (Blancaflor et al., 2024) and Pet Health Management System (Ahmad & Salamat, 2023), focused on modularity and user feedback, improving adaptability. Pet Health Management System streamlined operations but relied on local backups, limiting scalability. PawHub (Blancaflor et al., 2023) demonstrated telehealth potential but omitted essential clinic management features such as billing and inventory tracking. Similarly, TerraVet (Llaneta et al., 2022) provided vaccination tracking but lacked automated billing and inventory management. While Agile systems are flexible, they often overlook comprehensive clinic operations.

- Agile systems like VETGO, Pet Health Management System, PawHub, TerraVet, and the Dogs Health Care Management System enable fast updates and user-driven improvements, focusing on consultations and vaccine tracking. However, they often lack key clinic functions PawHub excludes inventory management, Pet Health Management System relies on local backups, VETGO lacks automation, and the Dogs Health Care Management System is limited to canine care. TerraVet supports digital health records but lacks billing and inventory tracking. These limitations highlight the need for creating the Veterinary Clinic Management System, which integrates essential veterinary management features into one comprehensive platform.

- Structured systems like Veterinary Online Appointment System and the WEB-Based Clinic follow step-by-step development, ensuring stability but limiting updates, leading to missing features like inventory tracking and multi-branch support. Agile-based systems like Pet Health Management System, PawHub, and TerraVet, built in smaller iterations, adapt based on user feedback, enabling features like vaccination tracking and teleconsultations. However, they often lack billing, inventory, or cloud storage. While structured models offer reliability and Agile methods enhance flexibility, neither fully address veterinary clinic needs. Our Veterinary Clinic Management System bridges this gap by integrating the strengths of both approaches into a comprehensive solution.

The review of related studies highlights that while many systems address essential clinic functionalities like appointment scheduling and client record management, several limitations persist. These include the absence of inventory tracking, lack of scalability for multi-branch operations, missing features like vaccination reminders, and a general lack of cloud-based synchronization. Systems using structured methods offer reliability but are rigid in enhancement, whereas Agile systems provide flexibility but occasionally lack depth in functionality.

The Veterinary Clinic Management System employs Agile methodology (Ahmad & Salamat, 2023) to address operational gaps identified in the comparison of studies through iterative improvements. Many existing systems, such as the WEB-Based Veterinary Clinic (Chua et al., 2024), lack multi-branch support, leading to data inconsistencies and workflow challenges for clinics operating across multiple locations. Additionally, Pet Health Management System (Ahmad & Salamat, 2023) and TerraVet (Llaneta et al., 2022) fail to provide comprehensive inventory management, resulting in medication shortages or overstocking that disrupts clinic operations. Designed for FurCare Clinic's core services, Veterinary Clinic Management System enhances grooming with automated scheduling, enhances boarding through automated late pickup billing, centralizes checkup records across branches, and manages vaccinations with smart reminders and Inventory tracking system. This adaptive approach resolves inefficiencies in current systems while maintaining seamless clinic workflows through continuous user feedback integration

The system will be built with PHP and MySQL for backend operations, following the successful implementation of similar technologies in the WEB-Based Veterinary Clinic (Chua et al., 2024), which demonstrated strong user satisfaction. The frontend will use HTML, CSS, JavaScript,

and Bootstrap for responsiveness. Additionally, PhilSMS will enable automated appointment reminders, improving communication and reducing missed bookings.

To ensure systematic development of the Veterinary Clinic Management System, the implementation will be guided by standardized software modeling approaches. Use-Case Diagrams will define role-based functionalities (Mukhlis et al., 2023), Data Flow Diagrams (DFDs) will map clinic workflows (Jaffar & Zin, 2021), and Entity-Relationship Diagrams (ERDs) will establish database structures (Jaffar & Zin, 2021).

III. METHODOLOGY

This chapter outlines the methodology employed in developing the Veterinary Clinic Management System. We adopt the Agile methodology, an iterative and flexible approach that enables continuous refinement based on user feedback and evolving requirements. This methodology aligns with our goal of addressing the challenges identified in Chapter 1 by prioritizing adaptability and incremental improvements. Studies like Ahmad and Salamat (2023) support this approach, demonstrating its effectiveness in developing veterinary management systems through incremental improvements and user involvement. In particular, Ahmad and Salamat (2023) stated that "With the word agile it means that the model will be flexible and adaptable that any change that will be happening in the develop of the system can be handle without much difficulty" (p. 1018). The Agile methodology figure is adapted from the study of Ahmad and Salamat (2023), this reflects our development approach for the Veterinary Clinic Management System.

In the requirements gathering phase, the proponents will conduct multiple in-depth interviews with the veterinary clinic administrator to identify their operational challenges and needs. To efficiently manage the Veterinary Clinic Management System requirements, ClickUp will enhance task organization, workflow tracking, and document integration. Strong project management platform enhances system development in iterative environments (Pasarič & Pušnik, 2022), requirements gathering. The expected output of this phase is a Software Requirements Specification, which documents all functional and non-functional requirements derived from the interviews. As emphasized by IEEE (2011), the Software Requirement Specification is vital for scope control and validation, preventing misalignment and feature creep. By adhering to this structured approach, the Veterinary Clinic Management System project ensures that user feedback directly informs system design, aligning with the agile methodology's emphasis on adaptability and continuous refinement.

The Design phase transforms the Software Requirement Specification into a comprehensive technical blueprint for the Veterinary Clinic Management System through modular system design and visual modeling. Following agile principles, modular system design splits the system into independent components, enabling flexible updates and scalability for multi-branch operations. To illustrate user interactions, Use-Case Diagrams will define role-based functionalities, ensuring clarity in stakeholder activities (Mukhlis et al., 2023). Data Flow Diagrams will map clinic workflows, such as user registration and appointment scheduling (Jaffar & Zin, 2021). Entity-Relationship Diagrams will establish database structures, ensuring data integrity and proper system functionality (Jaffar & Zin, 2021). For design implementation, Figma will facilitate UI prototyping, providing an interactive workspace for interface refinement. Lucidchart will facilitate conceptual modeling, aiding in Entity-Relationship Diagram and system architecture visualization. MySQL Workbench will ensure database reliability through schema design and integrity enforcement while maintaining cost-efficient development. The system design phase will produce several key deliverables. Use-Case Diagrams will define user interactions, ensuring clear functionality mapping. Data Flow Diagrams will outline essential workflows like registration and appointment booking for efficient processes. Entity-Relationship Diagrams will structure data relationships to maintain consistency. Figma will facilitate User Interface prototyping, refining usability, while Lucidchart will visualize system architecture for logical development. MySQL Workbench schemas will ensure database integrity and reliable data management.

The Development phase transforms design artifacts into a functional Veterinary Clinic Management System using Agile iterative sprints. The frontend combines HTML/CSS and Bootstrap for responsive layouts. JavaScript handles client-side validation and interactivity. The backend will use PHP and MySQL for secure role-based access control (admin/vet/staff/client), leveraging PHP's native MySQL support and scalability for dynamic web applications (Sotnik et al., 2023). Prepared statements prevent SQL injection, ensuring data security. Key integrations will include PhilSMS API, a cloud communication platform that enables the creation of SMS reminders and One-Time Pin functionality for user authentication and secure access to the system, which will address core communication needs in the project by allowing messaging between web interfaces and users (Issa & Touma, 2021, p. 11). The platform's security measures further ensure compliance with data protection requirements. Hostinger, a cloud infrastructure provider, was utilized for reliable system hosting and scalability. Its user-friendly interface, simple deployment process, and affordable pricing will make it a practical choice for developing systems like veterinary management platforms (Pikkuhookana & Soini, 2023, pp. 50–51). By phase completion, deliverables include a deployable system build with all functional modules, a test database populated with anonymized clinic data, and API documentation for PhilSMS and Hostinger integrations. These outputs directly feed into the Testing phase, where unit tests will validate modules against the System Requirement Specification, and user acceptance tests will confirm compliance with clinic workflows documented in Chapter 1.
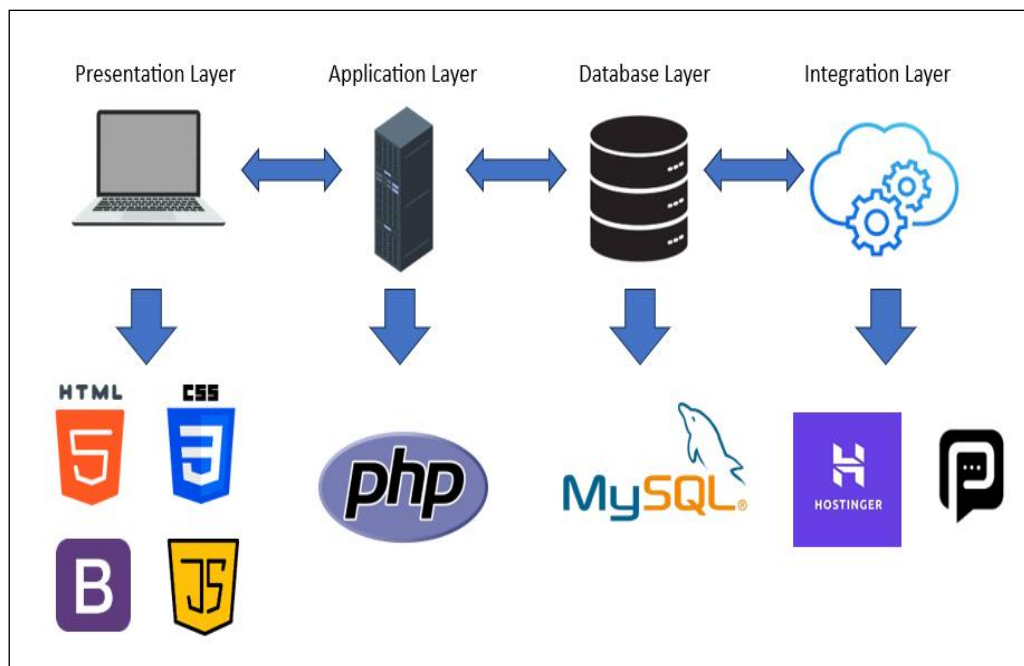
Fig. 1. Architectural Design

The Veterinary Clinic Management System will be using a four-layer architecture: Presentation, Application, Database, and Integration. The Presentation Layer (HTML, CSS, JavaScript, Bootstrap) handles the user interface. The Application Layer (PHP) processes system logic. The Database Layer manages clinic data, while the Integration Layer connects external services like PhilSMS for SMS and Hostinger for cloud hosting. A typical case involves a pet owner scheduling an appointment through the system, which is stored in the database and triggers an automated SMS reminder via Philsms.

The Testing Phase rigorously evaluates the Veterinary Clinic Management System using the functional system build, test database, and API integrations delivered from the Development Phase as primary inputs. The testing process begins with functional testing to verify core features such as appointment scheduling, pet medical records management, and inventory tracking. Clinic administrators and staff will test system workflows to ensure alignment with daily operations, while veterinarians validate the accuracy and accessibility of pet records. Pet owners participate by booking appointments and evaluating automated reminders for clarity and responsiveness. The Conduct of Functional Testing was performed to systematically verify that every module and feature of the system operates according to the defined requirements. This process involved preparing detailed test cases, identifying the expected results, executing each scenario, and recording the actual output to determine whether the functions behaved as intended. Functional Testing ensured that core processes were fully validated and free from critical defects prior to deployment. In addition to functional verification, the Conduct of the System Usability Scale (SUS) assessment was carried out to evaluate the overall usability of the system from the end users' perspective. The SUS consists of a ten-item questionnaire rated on a five-point Likert scale. To compute the SUS score, odd-numbered items are scored by subtracting 1 from the user's rating, while even-numbered items are scored by subtracting the rating from 5. The adjusted scores are then summed and multiplied by 2.5 to obtain a final usability score ranging from 0 to 100.

The deployment phase, marking the transition from development to live clinic operations, builds on pilot testing where representative veterinary professionals, administrative staff, and pet owners validate the Veterinary Clinic Management System design and functionality, leading to necessary refinements before full deployment. The cloud-based system will be accessible through internet connectivity via web browsers on both Windows and Mobile devices and will be installed across FurCare Clinic's two branches, with Hostinger's synchronization enabling real-time data sharing between locations. The Proponents will perform final security audits and optimize network infrastructure to guarantee system reliability and data protection during the transition. The parallel rollout will deploy the system simultaneously across the two branches while integrating PhilSMS for automated reminders and configuring role-specific access. Post-deployment support channels will be established to ensure smooth adoption, all in coordination with clinic management to minimize operational disruptions. This approach guarantees a fully functional system that meets specified requirements while maintaining alignment with daily veterinary workflows.

The Review Phase evaluates the Veterinary Clinic Manangement System's operational performance and user satisfaction after deployment. Clinic staff and pet owners will provide feedback through structured interviews, assessing system reliability, efficiency gains, and usability compared to previous manual processes.

IV. RESULTS & DISCUSSION

The results and discussion of the Veterinary Clinic Management System (VCMS) developed using the Agile methodology. The chapter evaluates system effectiveness through requirements analysis, system design, development, functionality testing, and usability assessment.

Findings from the requirements gathering phase identified major inefficiencies in manual clinic operations, including slow record retrieval, scheduling conflicts, billing errors, and poor inventory tracking. These issues guided the design of a centralized, role-based system architecture that integrates appointment scheduling, medical records, billing, inventory management, and reporting.

The system was successfully implemented with functional modules tailored for pet owners, staff, veterinarians, grooming technicians, and administrators. Functionality testing confirmed that core features—such as user authentication, appointment management, medical record updates, billing, inventory monitoring, and report generation—performed accurately and reliably according to system requirements.
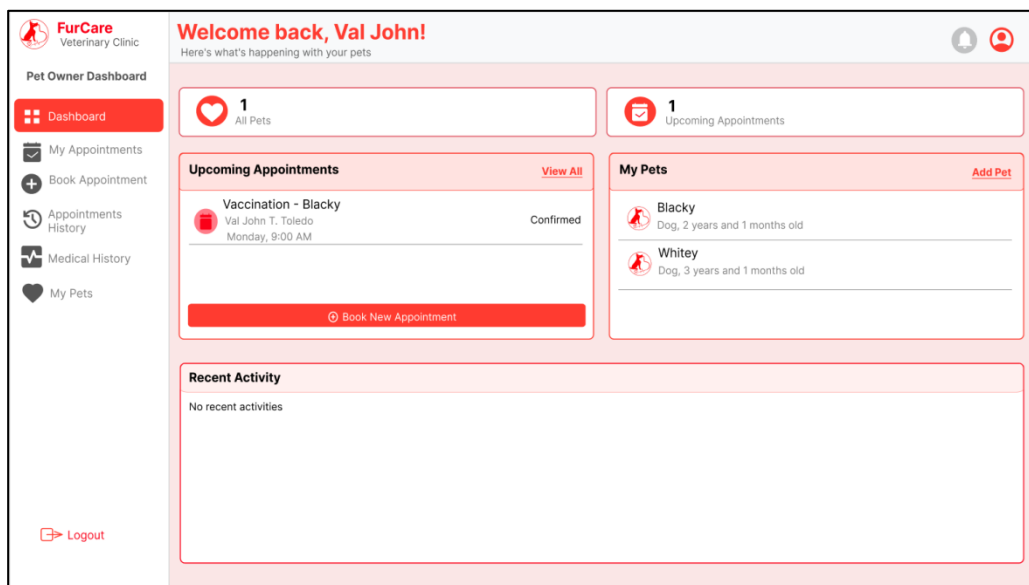

Fig. 2. High Fidelity Pet Owner Dashboard

Figure 2 shows the Pet Owner Dashboard of the Veterinary Clinic Management System, which uses a clean white and coral-red interface to organize pet care information. The left sidebar provides quick access to core features like appointment booking and medical history, while the main header displays a personalized greeting and notification alerts.

The center of the dashboard features high-level summary cards for the total number of pets and upcoming appointments, followed by a dedicated section for managing scheduled visits and a list of registered pets. A "Recent Activity" feed at the bottom concludes the overview, allowing users to track completed check-ups and clinic interactions at a glance.
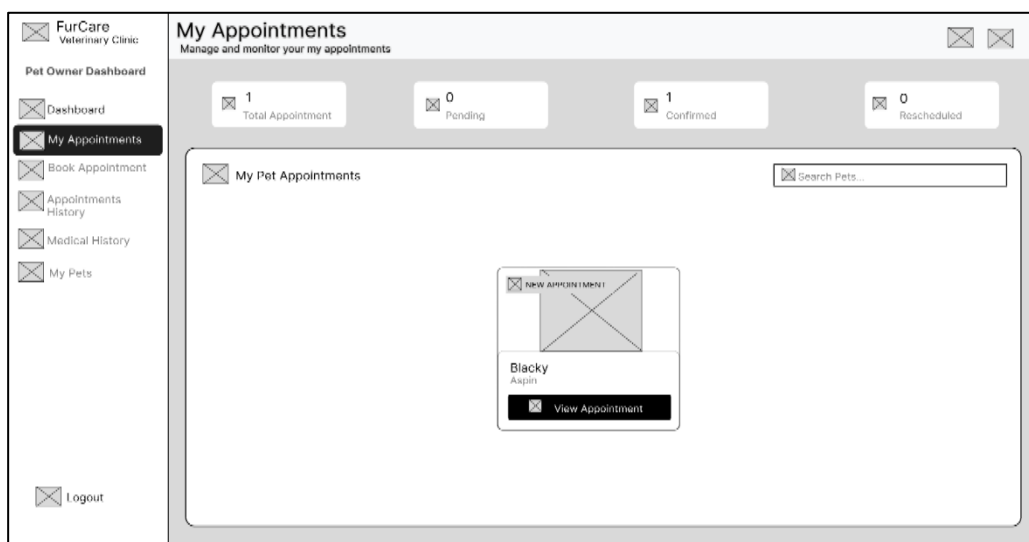

Fig. 3. Low Fidelity List Of Pet Appointment

Figure 3 presents the My Appointments page, featuring a top row of four summary cards that track total, pending, confirmed, and rescheduled visits. The "My Pet Appointments" section includes a search bar for filtering records and individual pet cards. Each pet card displays the animal's name and breed with a "View Appointment" button for quick access to specifics. This layout allows pet owners to monitor and manage their scheduled clinic visits effectively.

```
1   try {
2         $upcoming_list_query = "
3             SELECT
4                 a.appointment_id,
5                 a.appointment_date,
6                 a.appointment_time,
7                 a.status,
8                 p.pet_id,
9                 p.pet_name,
10                p.pet_image,
11                s.service_type,
12                CONCAT(ppl.people_first_name, ' ', ppl.people_last_name) as staff_name
13            FROM tbl_appointments a
14            JOIN tbl_pets p ON a.pet_id = p.pet_id
15            JOIN tbl_services s ON a.service_id = s.service_id
16            LEFT JOIN tbl_people ppl ON a.employee_id = ppl.person_id
17            WHERE p.person_id = :client_id
18            AND a.appointment_date >= :today
19            AND a.status = 'Confirmed'
20            ORDER BY a.appointment_date, a.appointment_time
21            LIMIT 3";
22        $upcoming_list_stmt = $pdo->prepare($upcoming_list_query);
23        $upcoming_list_stmt->bindParam(':client_id', $client_id, PDO::PARAM_INT);
24        $upcoming_list_stmt->bindParam(':today', $today);
25        $upcoming_list_stmt->execute();
26        $upcoming_appointments = $upcoming_list_stmt->fetchAll(PDO::FETCH_ASSOC);
27    } catch (PDOException $e) {
28        error_log("Upcoming appointments query error: " . $e->getMessage());
29        $upcoming_appointments = [];
30    }
```

Fig. 4 Code Snippet for Retrieving Upcoming Appointments for a Client

System usability was evaluated using the System Usability Scale (SUS). The system achieved a mean SUS score of 86.5, which corresponds to an "Excellent" usability rating and falls within the 90th percentile, indicating high user satisfaction, strong learnability, and ease of use.

Table 1. Final SUS Score Computation

Question Number	Description	P1	P2	P3	P4	P5
1	I think that I would like to use this system frequently.	4	4	4	4	3
2	I found the system unnecessarily complex.	4	4	4	1	3
3	I thought the system was easy to use	4	4	4	3	3
4	I think that I would need the support of a technical person to be able to navigate and use this system	3	3	3	3	0
5	I found the various functions in this system were well integrated.	4	4	4	4	2
6	I thought there was too much inconsistency in this system	3	3	4	3	3
7	I would imagine that most people would learn to use this system very quickly.	4	4	4	4	3
8	I found the system very cumbersome to use.	4	4	4	4	3
9	I felt very confident using the system.	4	4	4	4	3
10	I needed to learn a lot of things before I could get going with the system.	4	4	4	4	1
	Total Score:	95	95	97.5	85	60
	Overall Score:	432.5				
	Average SUS Score:	86.5				

Overall, the results demonstrate that the VCMS effectively enhances clinic efficiency, reduces manual errors, and improves service delivery. The successful functionality testing and high SUS score validate the system as a reliable, efficient, and user-friendly solution for veterinary clinic management.

V. CONCLUSION & FUTURE WORK

This study aimed to develop a Veterinary Clinic Management System for FurCare Veterinary Clinic to address problems involving manual record-keeping, scheduling conflicts, slow data retrieval, inefficient inventory tracking, and disorganized client communication. Using the Agile methodology, the project progressed through requirement gathering, system design, development, testing, deployment, and review. The system was built using PHP, MySQL, HTML/CSS/JavaScript, Bootstrap, and Philsms, integrating modules such as online appointment scheduling, pet medical records, billing, and inventory management.

Based on the results and findings, the study concludes that the objectives of developing an efficient, organized, and automated veterinary clinic management system were successfully achieved. The system's appointment module eliminated double booking, the SMS notification feature improved communication, and the inventory tracking system prevented shortages by providing accurate stock status and expiration monitoring. All core functions operated as intended, showing that the system addressed the clinic's previous challenges in record-keeping, scheduling, and inventory monitoring. Some objectives, such as expanding inventory management beyond medicines and grooming supplies, were only partially achieved due to scope limitations.

Based on the conclusions, the following recommendations are proposed:

- Include a down payment feature during appointment booking to ensure that even if a pet owner fails to attend their scheduled appointment, the clinic still secures a portion of the service fee, helping maintain operational stability.
- Automated receipt generation via email or SMS to improve service efficiency and client convenience. The receipts can be sent directly to pet owners via email or SMS immediately after a transaction.
- Develop a mobile application or mobile-friendly progressive web app to improve accessibility for pet owners and allow staff to manage operations using handheld devices.
- Expand inventory management to include all clinic items such as equipment, accessories, and retail products for a more complete resource tracking system.
- Improve integration with third-party platforms, such as payment gateways, cloud backups, or electronic health record systems, to strengthen security and long-term data storage.
- Conduct periodic system updates and evaluations to ensure continuous improvement, address emerging clinic needs,

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