Design and Evaluation of a User-Centered Interface for a Barangay Veterinary Appointment System

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ABSTRACT

Barangay veterinary services still use the manual process of scheduling appointments. This may cause appointment conflicts, missing records, and long waiting times for pet owners and their animals. In response, we designed a mobile-first interface, "Vets That Matter," in Figma based on Human-Computer Interaction (HCI) and User-Centered Design (UCD) principles, and evaluated it using task-based activities, a modified 4-point SUS-style questionnaire, and open-ended feedback from 52 participants. Results showed an average task completion rate of 91.83%, with completion rates ranging from 90.38% to 92.31%; 195 of 208 task-difficulty ratings (93.75%) were Easy or Very Easy; and the average modified SUS-style score was 68.59/100 (SD = 20.97). Overall, participants found the interface easy to use, organized, and easy to understand. However, onboarding and automated notifications may be considered in future refinements to improve guidance and appointment-related information.

Keywords: User-Centered Design (UCD), Human-Computer Interaction (HCI), Barangay Veterinary Appointment System, Usability Evaluation, Modified SUS-style Questionnaire

INTRODUCTION

Human-Computer Interaction (HCI) is the study of the interaction between humans and computers and digital systems and is concerned with the design of user interfaces that are intuitive and easy to use. As more healthcare centers, businesses, and government offices use online appointment systems, a user-friendly interface is essential to improve efficiency and reduce errors. But there are some veterinary practices that still use traditional methods such as paper records, walk-in registration and verbal appointments. Scheduling conflicts, lost records, and long waits for pet owners can occur as a consequence. In the Philippines, barangays hold vaccination, deworming, and other animal welfare programs to promote responsible pet ownership. But for barangay workers and veterinary staff, managing numerous appointments manually can be a hassle. A well-designed interface will facilitate appointment booking through clear instructions, simple navigation, and an organized layout, applying Human-Computer Interaction (HCI) and User-Centered Design (UCD) principles. Usability testing can identify areas for improvement before building the system. This study therefore aims to design and evaluate a user-centered interface for the Barangay Veterinary Appointment System through task-based activities, questionnaire responses, and participant feedback.

LITERATURE REVIEW

According to Aziz et al. (2021) and Ali and Chen (2022), well-organized appointments can make services more accessible, reduce wait times, and improve the overall scheduling experience. [2] In a similar study, Kampe (2024) explained that an online veterinary appointment can make it easier for users to book consultations, provide pet information and select a veterinarian. In conclusion, these studies suggest that a well-designed appointment user interface can make veterinary services more convenient, efficient, and easier for users to access. [3].

Moreover, it is revealed that medical appointment applications with a user-friendly design increase efficiency, decrease interaction time, and improve user engagement (Yousif, 2025. [4] Yousif, 2024). [5] Hsiao and Chen

found that the way scheduling information is presented can affect users' satisfaction, information retrieval, and performance. In sum, the findings indicate that appointment systems should be easy and intuitive to use and allow for efficient scheduling. [6]

Rajendra et al. (2024) [7] and A'ang et al. (2020) demonstrated that the use of a user-centered design approach could enhance the usability, satisfaction, and acceptance of digital interfaces. [8] Similarly, Diana and Mufida (2026) found that designing based on the users' needs can increase navigation and the overall user experience. These studies demonstrate that knowing the users' needs is important for developing more usable and effective interfaces. [9]

Sylvain and Noémie (2023) argued that the design of interactive systems should take into account the needs of the users. [10] Moreover, Caterina and Solange (2024) [11], Wahyu and Egia (2024) also highlighted the significance of user's involvement and feedback in developing better interfaces. The studies suggest that involving users in the design and evaluation process may result in more inclusive, usable, and responsive interfaces. [12]

Kimberley and Bernardo (2025) highlighted the use of digital technology in improving veterinary management and service delivery. [13] Judielyn et al. (2026) and [14] and Muhammad and Ruhaya (2025) similarly found that digital veterinary systems can improve appointment management, organization, and operational efficiency compared with manual processes. These studies support using digital systems to make veterinary services more organized and efficient. [15]

Blancaflor et al. (2024) found that a digital veterinary platform can make veterinary services more accessible and easier to use. [16] Bucao et al. (2023) and James et al. [17] (2026) also showed that digital systems can improve appointment management, clinic operations, and access to veterinary information. These studies show that digital veterinary platforms can deliver animal health services in a more organized, user-friendly way. [18]

Diego et al. (2025) found that integrating different veterinary services into one digital system can improve data organization, usability, and user satisfaction. The study shows that combining veterinary services in a single platform can make information and service management more organized for users. This supports the present study's consideration of an integrated interface for barangay veterinary appointment services [19].

Galverio et al. (2026) established that the process of transferring the service delivery process within the barangay from using paper-based means to utilizing a digital platform could increase efficiency and facilitate transactions for the users. [20] Likewise, Lim (2022) demonstrated that using a digital barangay management system could provide appointment and information management services while making it easier for constituents to access that information. [21]

Another aspect of the delivery of digital services relating to animals is effective communication. Robert (2026) noted that digital platforms can serve as a channel for pet owners and the community to connect when they need animal-related services. [22] Open access to veterinary information is important for public awareness and participation (Airish et al., 2021). To summarize, the research proves that veterinary interfaces should be service-oriented and should display the information in a concise and user-friendly way. [23]

The study showed that a web-based appointment system makes it easier to book appointments, check doctor information, and manage patient records. It supports the present research by showing how a user-friendly appointment system can improve scheduling and record-keeping for barangay veterinary services. [24]

The study showed that AI can help hospitals manage appointments better and reduce missed appointments. It supports the present research by showing the importance of easy-to-use appointment systems that improve patient experience and service efficiency. [25]

METHODOLOGY

Research Design

The researchers conducted a descriptive usability evaluation guided by User-Centered Design (UCD) principles and prototyping.

UCD is a design methodology that focuses on understanding the needs, preferences, experiences, and expectations of the intended users and incorporating that understanding in the design process.

The research methodology was chosen to ensure that the proposed interface is comprehensible, accessible, and user-friendly to pet owners and barangay staff. The numerical part of the research involves structured surveys to evaluate usability, efficiency, and user satisfaction. The qualitative portion aims to deepen understanding of the numerical results through participants' remarks, recommendations, and experiences. Task results and participant feedback were used to identify areas for further refinement.

Research Environment and Participants

This research was conducted in a local Barangay Veterinary Office in the Philippines. This office offers a variety of veterinary services such as consultation, vaccination, deworming, and other animal health programs. The cohorts included the following categories:

Pet Owners: Residents who currently avail, or may avail, of barangay veterinary services for their pets.

Barangay Veterinary Staff: Personnel who assist pet owners, manage schedules, and maintain veterinary service records.

Barangay Veterinarians: Veterinary professionals who provide consultations, treatments, and supervise medical records.

Faculty Professors: IT and Computer Science faculty who provide expert heuristic evaluation on the interface design and functionality.

Research Instruments

The investigators developed a concept for the proposed interface and evaluated it using the following instruments:

Interface Prototypes

The investigators created interactive prototypes and high-fidelity wireframes in Figma to depict the complete user experience of the Barangay Veterinary Appointment System (Vets That Matter). The mobile-first design uses a clear visual hierarchy, touch targets, and structured sequential workflows. Cognitive load and accessibility conformance were not directly measured in this evaluation.

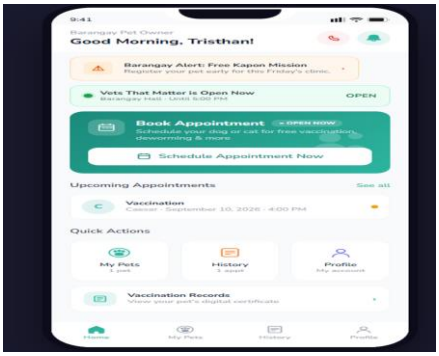


Figure 3.1. Main Home Dashboard and Service Access Interface

The home screen is the main navigation point for the user. It features a visible scheduling prompt, a clinic-status indicator, sections for pet records and past appointments, and an upcoming appointment summary card. The prototype has a six-step booking wizard: choose a pet, choose a service type, choose a veterinarian, choose a date, choose a time slot, and review the summary. The final step leads to the confirmation screen shown in Figure 3.2.



Figure 3.2. Appointment Confirmation and Reference Number Interface

The reservation confirmation prototype displays a validation badge, a sample reference code (e.g., REF-2026-00142), and a summary of the selected service, veterinarian, date, and time. This prototype was used as the environment for task-oriented usability assessments in Section IV.

Evaluation Task Sheet

Participants were given a task sheet with typical scenarios to complete using the prototype, such as finding the schedule, booking an appointment, and checking details.

Quantitative Instrument - Usability Assessment Questionnaire

After completing the task, the participants were asked to complete a modified 4-point System Usability Scale (SUS) questionnaire to assess the user-friendliness, clarity, efficiency and consistency of the interface. The "neither" option was deliberately removed to ensure definitive user responses.

4. Qualitative Instrument - Open Feedback

The assessment form included an open-ended question that allowed participants to share suggestions, comments, and recommendations to identify specific areas for improvement.

Data Gathering Procedure

Data gathering was conducted in three main stages: Needs Assessment and Planning: The researchers evaluated existing manual appointment procedures to identify challenges such as scheduling difficulties and unclear information. This determined the necessary features for the prototype. Interface Design and Prototyping: The proposed interface was designed in Figma. Wireframes and interactive prototypes were developed according to identified user needs and UCD principles. Usability Evaluation: Selected participants evaluated the prototype. The researchers observed task completions and noted difficulties. Afterward, participants answered the usability questionnaire and provided qualitative feedback.

Data Analysis

Task-completion rates and questionnaire responses were summarized using descriptive statistics, while open-ended comments were grouped into recurring themes.

Qualitative comments were analyzed by grouping recurring ideas and suggestions into broad themes, such as ease of navigation and suggested features, to complement the quantitative findings. A single comment could be assigned to more than one theme.

RESULTS AND DISCUSSION

In this section, the results of the usability assessments conducted on the User-Centered Interface for Barangay Veterinary Appointment System prototype are presented. Fifty-two respondents assessed the prototype. The results include information about the assessed participants and open-ended comments, including task completion and difficulty ratings and modified SUS usability scores.

Response ratings to evaluation statements were recorded using a 4-point Likert scale: 1, Strongly Disagree; 2, Disagree; 3, Agree; and 4, Strongly Agree. A neutral response option was not offered. The four-point scale used in this evaluation differs from the five-point scale used in the System Usability Scale (SUS). Usability ratings are reported here in a modified SUS format.

A. Profile of the Participants

The evaluation included 52 participants, categorized by sex, participant type, and prior experience with online scheduling systems.

Table 4.1. Distribution of Participants by Sex

Sex	Frequency	Percentage
Male	31	59.62%
Female	18	34.62%
Prefer not to disclose	3	5.77%

Thirty-one respondents (59.62%) identified as male, 18 (34.62%) as female, and 3 (5.77%) preferred not to disclose.

Table 4.2. Distribution of Participants by Participant Type

Participant type	Frequency	Percentage
Pet owner	42	80.77%
Veterinary staff	6	11.54%
Veterinarian	2	3.85%
Faculty	2	3.85%

Most participants were pet owners (42; 80.77%). Veterinary staff accounted for 6 participants (11.54%), while veterinarians and faculty each accounted for 2 participants (3.85%).

Table 4.3. Previous Experience with Online Appointment or Booking Systems

Previous experience	Frequency	Percentage
Yes	30	57.69%

No	22	42.31%

Thirty participants (57.69%) reported previous experience with an online appointment or booking system, whereas 22 participants (42.31%) had no prior experience.

B. Task-Based Assessment

Participants evaluated four core tasks. Completion was recorded as successful or not successful, and task difficulty was rated Very Easy, Easy, Difficult, or Very Difficult.

Table 4.4. Task Completion Results

Task	Evaluated activity	Successful	Not successful	Success rate
Task 1	Locate the option to schedule a new veterinary appointment	47	5	90.38%
Task 2	Complete the appointment booking form	48	4	92.31%
Task 3	Review details, submit the request, and locate confirmation/reference	48	4	92.31%
Task 4	Return to the home/dashboard and view newly scheduled appointment details	48	4	92.31%

47 out of 52 participants (90.38%) successfully completed Task 1, while 5 (9.62%) did not complete this task. Tasks 2, 3, and 4 all achieved a success rate of 92.31% (48 out of 52). The arithmetic mean of the four task-completion rates was 91.83%.

Table 4.5. Perceived Ease of Task Completion

For Task 1, 46 out of 52 respondents (88.46%) rated the activity as Easy or Very Easy. For Tasks 2 and 3, 50 respondents (96.15%) rated each activity as Easy or Very Easy. For Task 4, 49 respondents (94.23%) gave these ratings.

Task	Very Easy	Easy	Difficult	Very Difficult	Easy/Very Easy (n)	%
Task 1	21	25	4	2	46	88.46%
Task 2	21	29	1	1	50	96.15%
Task 3	26	24	1	1	50	96.15%
Task 4	26	23	1	2	49	94.23%

Overall, 195 of 208 task-difficulty ratings (93.75%) were Easy or Very Easy. The results suggest that most participants could complete the intended booking tasks within the prototype; they do not establish the effectiveness of a deployed appointment service.

C. Modified SUS-Style Results

The questionnaire contained ten statements adapted from the System Usability Scale (SUS). The table reports the raw item means and adjusted means calculated from all 52 participant responses. Positive statements (Q1, Q3, Q5, Q7, Q9) were adjusted as response minus one, while negative statements (Q2, Q4, Q6, Q8, Q10) were adjusted as four minus response. Each adjusted item ranges from 0 to 3.

Table 4.6. Raw and Adjusted Mean Scores for Modified SUS-Style Statements

Item	Statement	Raw mean	Adjusted mean
Q1	I would like to use this system frequently to set appointments for my pet.	3.38	2.38
Q2	I found the system unnecessarily complex and complicated.	2.29	1.71
Q3	I found the system very simple and easy to use.	3.44	2.44
Q4	I think I would need the help of another person or an expert to use this system.	2.31	1.69
Q5	I found the different features and pages of this system well-connected and organized.	3.21	2.21
Q6	I thought there were too many confusing or conflicting parts in this system.	2.38	1.62
Q7	I imagine that most people would learn to use this system very quickly.	3.42	2.42
Q8	I found the system heavy, frustrating, or awkward to use.	2.10	1.90
Q9	I felt confident and at ease while using the system.	3.38	2.38
Q10	I needed to learn a lot of things before I could figure out how to use this system.	2.19	1.81

D. Overall Modified SUS-Style Score

The overall modified SUS-style score was 68.59 out of 100 (sample SD = 20.97 across participants). The questionnaire used a four-point scale rather than the standard five-point SUS scale, so the result should be interpreted as a study-specific measure and should not automatically be classified using standard SUS adjective ratings or percentile grades.

E. Qualitative Analysis of Participants' Responses

The spreadsheet contained 34 nonblank feedback entries. Twelve entries consisting of nonresponses or variations of "None" were excluded, leaving 22 entries for review. Comments were grouped into recurring themes. Because an individual comment could address more than one topic, theme counts are non-exclusive.

Table 4.7. Summary of Qualitative Feedback Themes

Theme	Comments containing theme	Interpretation
Positive usability	12	Comments described the prototype as easy, user-friendly, simple, convenient, or easy to use.
Organization and clarity	4	Participants described the prototype as organized, clean, clear, or straightforward.

No major difficulty	4	Several respondents reported no issues or difficulties, or stated that the instructions were clear and easy to follow.
Onboarding/guidance	1	One respondent suggested adding an onboarding page for newly registered users.
Notifications	1	One respondent suggested adding notifications.
Dashboard/appointment information	2	Comments suggested clearer appointment- or veterinarian-related information and features.
Cancellation/appointment rules	1	One comment raised cancellation/minimum-time and related appointment-rule considerations.
Visual/interaction enhancements	2	Suggestions included refining the dynamic-island area and adding more interface animations.

Participants noted strengths in simplicity, organization, and ease of navigation. Improvement suggestions focused on onboarding, notifications, clearer appointment information, cancellation rules, and selected visual or interaction elements.

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

A. Summary of Findings

This study used Human-Computer Interaction (HCI) and User-Centered Design (UCD) methodologies to develop and evaluate a digital scheduling platform for barangay veterinary services. The prototype was evaluated by fifty-two people, mainly pet owners (80.77%), including veterinary staff, veterinarians, and academic experts. Task-completion rates ranged from 90.38% to 92.31%, averaging 91.83% across the four tasks. A total of 195 of 208 task-difficulty ratings (93.75%) were Easy or Very Easy. The modified SUS-style score was 68.59 out of 100 (SD = 20.97). Users appreciated the logical design, easy navigation, and user-friendliness of the prototype. Some improvements were recommended for the onboarding process, notification feature, and presentation of appointment instructions.

B. Conclusion

The findings suggest that the proposed Barangay Veterinary Appointment System interface was generally usable among participants who evaluated the Figma prototype. Completion rates for the four tasks ranged from 90.38% to 92.31%, and 93.75% of task-difficulty ratings were Easy or Very Easy. Participant feedback also described the prototype as simple, organized, and easy to navigate. However, these results reflect a prototype evaluation and do not establish that an implemented system would reduce actual scheduling conflicts, waiting times, record errors, or cognitive load. The sample consisted mainly of pet owners, with fewer veterinary staff and veterinarians. The results should therefore be interpreted within the scope of the prototype and the participants who evaluated it. Further evaluation using a functioning system and a larger group of veterinary personnel is recommended before drawing conclusions about operational effectiveness.

C. Recommendations

Drawing from the task results and participant feedback, the following recommendations are proposed for the next iteration of the interface:

1. Onboarding Guide: Provide a brief step-by-step guide for first-time users, particularly those who are unfamiliar with online appointment booking. The guide should explain pet registration and the appointment process.

2. Appointment Details: Clearly display the selected veterinary service, veterinarian information, appointment date and time, and applicable cancellation or rescheduling rules before the user submits a request.

3. Interface Feedback and Notifications: Refine visual animations and status indicators where they help users understand system feedback. Consider timely appointment notifications in a future implementation, while avoiding unnecessary visual distractions.

4. Future Development: Complete and test a functioning version of the system in a real service setting. Any future integration with barangay resident or veterinary health records should use appropriate access controls and privacy safeguards.

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