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WEB-ACCESS VETERINARY APPOINTMENTS AND PET PRODUCT SHOPPING WITH ONLINE PAYMENT SERVICES

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Abstract: The operational landscape for veterinary care and pet product retail is often characterized by fragmented, manual processes for scheduling, inventory, and payments. This fragmentation generates significant operational inefficiencies, high administrative overhead for clinics, and an inconvenient experience for pet owners seeking timely access to care and products. This capstone project addresses these limitations by developing a comprehensive, integrated web-based platform. This centralized system unifies veterinary appointment management, a full-featured e-commerce pet shop, and secure online payment services into a single digital interface. The platform includes an optimized module to automate scheduling and minimize administrative tasks for clinics, while the integrated pet shop facilitates organized product sales and online checkout, effectively expanding market reach beyond traditional in-store constraints. The platform's robustness and user-centric design were rigorously validated through controlled Alpha and Beta testing phases. Performance was assessed quantitatively against five crucial

metrics: effectiveness, efficiency, user satisfaction, risk reduction, and context coverage. The evaluation yielded a high overall rating of 3.7 ('Very Satisfied'), confirming the system's strong functional performance and suitability for real-world deployment. The study concludes that this consolidated platform is highly effective in modernizing and streamlining the entire ecosystem of pet care and commerce. The successful validation establishes a valuable reference for future system enhancements, including integrating an AI chatbot and a color-selection feature.

Keywords: Veterinary Appointment System, Pet Product E-commerce, Online Payment Services, Web-based Platform, System Integration, ISO/IEC: 25010.

I. INTRODUCTION

Digital technology's quick development has changed how services are provided in a number of sectors, including logistics, healthcare, and retail. The potential of digital integration to improve service delivery in the veterinary care and pet commerce sectors is becoming increasingly apparent. Although many traditional systems handle pet product retail, veterinary appointments, and payment processing independently, combining these tasks into a single digital platform offers a chance to increase productivity, decrease misunderstandings, and provide users with more convenience (Prihandi & Usriyanah, 2019; Widmar et al., 2020). However, despite these advancements, there is still limited implementation of a fully integrated system that unifies these services into a single platform, resulting in fragmented user experiences and operational inefficiencies.

Prihandi and Usriyanah (2019) highlighted the inefficiencies inherent in manual processes and the limited reach of traditional in-store-only pet supply retailers. Their study revealed that the absence of e-commerce integration hinders customer accessibility and reduces promotional effectiveness. This study responds to those issues by offering an online platform that supports virtual window shopping, product categorization, monthly sales tracking, and online transactions to expand market reach and enhance operational efficiency.

Balasooriya et al. (2022) emphasized the importance of web-based applications for effective time and resource management, particularly in sectors rapidly shifting toward digitalization. They noted a scarcity of veterinary systems that offer online appointment functionality. Their research underscores the need for a user-friendly veterinary booking system. This study addresses that need by allowing clients to schedule veterinary services online, select specific services, and view available veterinarians, thereby minimizing delays and reducing the need for back-and-forth communication.

Widmar, Slipchenko, and Wang (2020–2021) investigated consumer trends in online pet product purchases. While their work focused on digital preferences in buying pet food, it did not explore synergies with other pet care services. This disconnection between e-commerce and veterinary care limits user experience, as users must rely on separate platforms for related services.

In response to these identified limitations, the researchers proposed to develop a Web-Access Veterinary Appointments and Pet Product Shopping with Online Payment Services system. The purpose of this study is to integrate veterinary appointment scheduling, pet product shopping, and secure online payment services into a single web-based platform. By doing so, the study aims to enhance accessibility, improve operational efficiency, and provide a more seamless and convenient experience for pet owners, veterinary clinics, and pet product retailers.

Objectives of the Study

The main objective of this capstone project was to develop and implement a Web - Access Veterinary Appointments and Pet Product Shopping with Online Payment Services to enhance accessibility, efficiency, and user satisfaction for veterinary clinics, pet product sellers, and pet owners.

Specifically, the study aimed to:

1. Develop a system that will:
a. Integrate veterinary appointment scheduling;
b. Provide a web-based pet product shopping module;
c. Integrate online payment services;
d. Display analytics that tracks the total sales every month;
e. Display the availability of all veterinarians; and;
f. Provide easy navigation and filtering options for each product category.
1. Determine the quality of the developed application based on the IT experts' testing using the ISO/IEC 25010:2011 Software Quality Model Criteria.
2. Determine the quality in use of the developed system in terms of effectiveness, efficiency, satisfaction, freedom from risk, and context coverage.

II. MATERIALS AND METHODS

The descriptive developmental technique, which is the methodical study of designing, creating, and carefully evaluating programs, procedures, and products that must meet standards or criteria, was employed by the researcher.

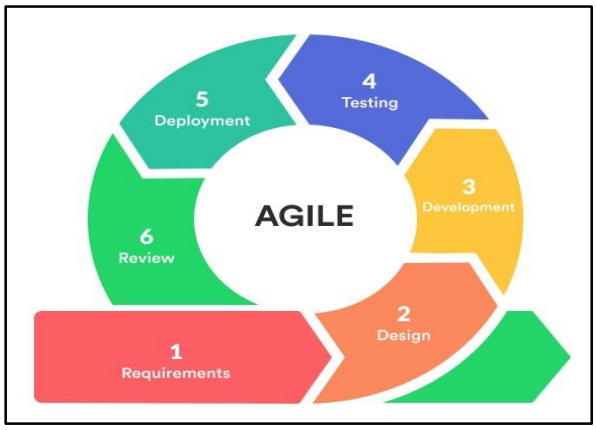

Figure 1. *Software Development Life Cycle*

Figure 1 shows the methodology used in the development of the proposed system. The researcher used process models of the System Development Life Cycle known as the Agile Approach Model. The approach model anticipates changes and allows for much more flexibility than traditional methods. The process involves breaking down each project into prioritized requirements and delivering each individual within an iterative cycle.

Requirements. The researchers interviewed pet owners, clinic staff, and pet shop managers to find out what features the system should have. They focused on how users could easily book appointments, buy pet products, and pay online safely.

Design. After gathering the information, the researchers designed a simple and user-friendly system. This included the website layout, database for storing information, and how users will move through the site (booking, shopping, and payment).

Development. During this phase, the actual website was built. The appointment scheduling feature, shopping cart for pet products, and payment system were created. Developers made sure it would work on computers.

Testing. Before launching, the team tested everything to make sure it worked properly. They checked if the booking system, product shopping, and payments worked as planned. Any bugs or problems found were fixed right away.

Deployment. After initial internal testing, the system was uploaded to a staging server for review. Testing and feedback were conducted exclusively by the programmer, project members, and advisers to identify major bugs, assess usability, and prepare the system for future pilot testing with actual users.

Review. Even after launching, the system was regularly checked and improved based on user feedback to make sure it stays helpful and easy to use.

Data Gathering and Procedures. In particular, semi-structured interviews and theme analysis were used by the researchers to collect and analyze data. Participants' in-depth interviews were conducted as part of the procedure in order to obtain comprehensive insights and viewpoints. After transcribing and coding the interview material, the researchers did a thematic analysis to find recurring themes and patterns.

III. RESULTS AND DISCUSSION

After thorough evaluation of the experts and respondents, the following are discovered:

Table 1. *Level of User Acceptability in terms of Web-Access Veterinary Appointments and Pet Product Shopping with Online Payment Services*

Criteria	Mean	Interpretation
The system can Integrate veterinary appointment scheduling.	4.0	Strongly Agree
The system can Provide a web-based pet product shopping module	4.0	Strongly Agree

The system can Integrate online payment services	4.0	Strongly Agree
The system can Display analytic that tracks the total sales every month	3.7	Strongly Agree
The system can Display the availability of all veterinarians and;	4.0	Strongly Agree
Grand Mean	**3.9**	**Very Good**

Table 1 shows that in terms of Web-Access Veterinary Appointments and Pet Product Shopping with Online Payment Services, the system's ability to integrate veterinary appointment scheduling has a mean of 4.0, which is interpreted as Strongly Agree, indicating that users find the scheduling feature efficient and highly functional. The capability to provide a web-based pet product shopping module also scores a mean of 4.0, interpreted as Strongly Agree, suggesting that users perceive the online shopping experience as convenient and reliable. Integrating online payment services records a mean of 4.0, likewise interpreted as Strongly Agree, demonstrating that users view the payment process as secure and seamless. Displaying analytics that track total sales every month has a mean of 3.7, interpreted as Strongly Agree, implying that while the feature is useful, there is still room for enhancement in presenting sales insights. The system's ability to display the availability of all veterinarians attains a mean of 4.0, interpreted as Strongly Agree, showing that users appreciate the accessibility of real-time veterinarian information. Providing easy navigation and filtering options for each product category also achieves a mean of 4.0, interpreted as Strongly Agree, reflecting smooth and user-friendly browsing. Overall, the system attains a grand mean of 3.9, which is interpreted as Strongly Agree, suggesting that the Web-Access Veterinary Appointment and Pet Product Shopping System is effective and well-received, delivering reliable features that support appointments, online shopping, and digital payment services for pet owners.

Table 2. *Level of User Acceptability In terms of determining the quality of the developed system based on ISO/IEC 25010:2011 Systems and Software Quality Requirements and Evaluation (SQuaRE) Quality Model.*

Criteria	Mean	Interpretation
Functional suitability	3.8	Very Satisfied
Performance efficiency	3.7	Very Satisfied
Compatibility	3.8	Very Satisfied
Usability	3.3	Satisfied
Reliability	3.4	Very Satisfied
Security	3.4	Very Satisfied
Maintainability	3.1	Satisfied
Portability	3.5	Very Satisfied
Grand Mean	**3.5**	**Very Good**

Table 2 shows the result of the IT Experts' feedback in determining the quality of the Web-Access Veterinary Appointments and Pet Product Shopping with Online Payment Services based on the characteristics set in the ISO/IEC 25010:2011 Systems and Software Quality Requirements and Evaluation (SQuaRE) Quality Model.

In terms of functional suitability, it was rated with a mean value of 3.78, which is interpreted as Very Satisfied, indicating that the system generally meets its intended functional requirements. Concerning

performance efficiency, it was rated with a mean value of 3.75, which is interpreted as Very Satisfied, suggesting that the system performs its operations efficiently with acceptable speed and resource use. As to compatibility, it was rated with a mean value of 3.78, which is interpreted as Very Satisfied, reflecting that the system can effectively operate alongside other systems and platforms.In regard to usability, it was rated with a mean value of 3.33, which is interpreted as Satisfied, implying that users can navigate and interact with the system with reasonable ease. In terms of reliability, it was rated with a mean value of 3.44, which is interpreted as Very Satisfied, showing that the system performs consistently under expected conditions. As to security, it was rated with a mean value of 3.44, which is interpreted as Very Satisfied, indicating that user data and transactions are reasonably protected. About maintainability, it was rated with a mean value of 3.11, which is interpreted as Satisfied, reflecting that the system can be maintained and updated effectively. Lastly, in terms of portability, it was rated with a mean value of 3.50, which is interpreted as Very Satisfied, showing that the system can be adapted or transferred to different environments with moderate effort.Generally, in terms of determining the quality of the developed system based on ISO/IEC 25010:2011 Systems and Software Quality Requirements and Evaluation (SQuaRE) Quality Model, the system has a grand mean of 3.51, which has an interpretation of Very Satisfied, indicating a positive assessment of the system's overall quality across various aspects.

Table 3. Level of User Acceptability in Terms of the usability of the developed system in terms of usefulness, satisfaction, ease of use, and learning.

In Terms of usefulness, satisfaction, ease of use, and learning	**MEAN**	**Verbal Interpretation**
Effectiveness	3.7	Very Satisfied
Efficiency	3.7	Very Satisfied
Satisfaction		
Usefulness	3.7	Very Satisfied
Trust	3.7	Very Satisfied
Pleasure	4.0	Very Satisfied
Comfort	3.0	Satisfied
Freedom from risk		
Economic risk mitigation	3.3	Satisfied
Health and safety risk mitigation	4.0	Very Satisfied
Context coverage		
Context completeness	3.7	Very Satisfied
Flexibility	4.0	Very Satisfied
Grand Mean	**3.7**	**Very Good**

Table 3 shows the result of the IT Experts' feedback on the Web-Access Veterinary Appointments and Pet Product Shopping with Online Payment Services in terms of usefulness, satisfaction, ease of use, and learning.

In terms of effectiveness, it was rated with a mean value of 3.7, which is interpreted as Very Satisfied, indicating that the system generally achieves its intended objectives. Concerning efficiency, it was rated with a mean value of 3.7, which is interpreted as Very Satisfied, suggesting that the system performs operations in a reasonable time and with acceptable resource use.

As to satisfaction, including usefulness, trust, pleasure, and comfort, it was rated with a mean value of 3.7, interpreted as Very Satisfied, reflecting that users generally feel positive and comfortable while interacting with the system.

Regarding freedom from risk, which includes economic risk mitigation, health and safety risk mitigation, and environmental risk mitigation, it was rated with a mean value of 3.78, interpreted as Very Satisfied, showing that the system reasonably mitigates potential risks to users. In terms of context coverage,

including context completeness and flexibility, it was rated with a mean value of 3.85, interpreted as Very Satisfied, indicating that the system provides adequate coverage for user needs across different scenarios.

Generally, in terms of determining the usability of the developed system in terms of usefulness, satisfaction, ease of use, and learning, the system has a grand mean of 3.7, which is interpreted as Very Satisfied, indicating a positive user experience and an overall satisfactory performance of the system in supporting veterinary appointments and online pet product shopping.

IV. SUMMARY OF FINDINGS

Based on the detailed presentation, discussion, interpretation, and analysis of research findings, the following summary is hereby presented:

1. The system's effectiveness in achieving its stated aims was rated 3.7, interpreted as Very Satisfied. This indicates that the system successfully addresses the gap in integrating veterinary services and e-commerce functionalities.
2. The system received a rating of 3.7, interpreted as Very Satisfied, in terms of efficiency, indicating that processes are completed within an acceptable time and with proper resource utilization, addressing inefficiencies found in existing separate systems.
3. It was rated with sub-criteria values of 3.7, 3.7, 4.0, and 3.0 in areas of satisfaction, including usefulness, trust, enjoyment, and comfort. These results are interpreted as Satisfied to Very Satisfied, indicating that users have a positive experience and improved interaction compared to systems lacking user-centered design.
4. The system was rated with sub-criteria means of 3.3, 4.0, and 4.0 in terms of freedom from risk, including economic, health and safety, and environmental risk mitigation. These are interpreted as Satisfied to Very Satisfied, indicating that the system reduces risks and improves transaction security.
5. It was rated with sub-criteria values of 3.7 and 4.0 in terms of context coverage, interpreted as Very Satisfied, indicating that the system supports different user needs and addresses limitations of systems with restricted functionality.
6. The grand mean of 3.7, interpreted as Very Satisfied, indicates that the system provides a high level of usability, effectiveness, efficiency, and risk reduction, demonstrating the advantage of an integrated platform.
7. The recommended features of the system were evaluated by IT experts using the ISO/IEC 9126-1:25021 Software Quality Instrument. The results confirm that the system meets quality standards and addresses gaps in data management, system integration, and service delivery through a unified platform.

V. CONCLUSIONS

The result of the alpha and beta testing activities and evaluation positively proved. Therefore, the researchers concluded that:

1. The assessment results indicate that the Web-Access Veterinary Appointments and Pet Product Shopping with Online Payment Services offers quantifiable advantages to its users. The system obtained an overall rating of 3.7 (Very Satisfied), reflecting strong performance in effectiveness, efficiency, user satisfaction, risk mitigation, and context coverage.
2. The study outcomes demonstrate that a consolidated platform improves veterinary clinic operations by optimizing appointment procedures and minimizing administrative workloads.
3. The Pet shop feature supports pet product businesses in expanding their market reach by offering organized product categories, filtering options, and online checkout services, thereby overcoming the constraints of conventional in-store purchasing.

VI. RECOMMENDATIONS

The result of the alpha and beta testing activities and evaluation positively proved. Therefore, the researchers recommended the following:

1. It is highly recommended to fully integrate the system across all responsibility areas to ensure effective monitoring and evaluation of submitted documents for compliance.
2. Conduct comprehensive user training to ensure that all users, especially those with limited technical proficiency, can effectively navigate and utilize the system.
3. Integrating an AI chatbot into the entire website system is recommended to provide automated assistance, improve user support, and enhance overall system interactivity.
4. Future iterations should include a color-selection feature within the pet shop module to improve the user experience and allow for greater customization.
5. Future researchers are encouraged to utilize this study as a benchmark to further enhance and optimize similar systems and processes.

CONFLICTS OF INTEREST

The author declares that for this article she has no actual, potential or perceived conflict of interests. Financial disclosure: The research work is funded by the researcher.

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