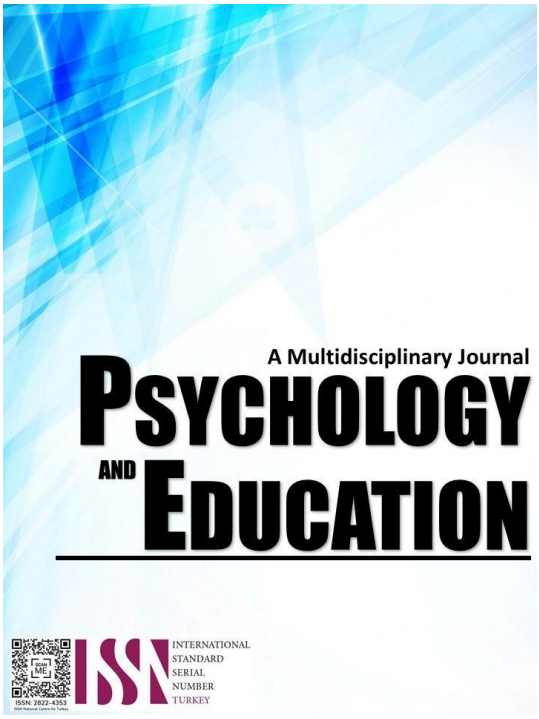
PAWFECT HOME: AN ONLINE STRAY ANIMAL REPORTING, SHELTERING, AND PET ADOPTION PLATFORM



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Research Article

PawFect Home: An Online Stray Animal Reporting, Sheltering, and Pet Adoption Platform

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Abstract

Annually, over 7.6 million pets are abandoned, including about 3.4 million cats. A significant number of these animals are placed in shelters as a result of human-induced factors such as abandonment, poor living conditions, and rejection. This exceeds the animal shelter's capabilities to rescue and adequately care for strays due to congestion. This circumstance impacts both the physical and mental well of the animals, underscoring the necessity of resolving the stray animal issue. In the absence of adequate intervention, the population of stray animals will persist in increasing, thereby exerting pressure on shelter resources and jeopardizing animal welfare. The study, PAWFECT Home: An Online Stray Animal Reporting, Sheltering, and Pet Adoption Platform, aimed to develop an accessible and user-friendly system to improve pet adoption, stray animal reporting, and sheltering. Utilizing the Scrum Methodology, the development process followed structured phases, including Planning, Design, Development, Testing, Review, and Deployment. Key components of the system included database normalization, Data Flow Diagrams, Use-Case Diagrams, Entity-Relationship Diagrams, and Wireframes, ensuring efficiency and scalability. The platform was built using web technologies such as PHP and XAMPP for database management. To assess the system's effectiveness, IT professionals, shelter representatives, pet owners, and end-users participated in a structured evaluation. The system was evaluated based on ISO 25010 standards for functionality, usability, security, and performance efficiency, and evaluated using the Technology Acceptance Model (TAM) to measure user perception and ease of use. Results demonstrated an overall excellent rating, with a mean score of 4.72 based on ISO 25010 and 4.52 based on TAM, indicating high reliability, efficiency, and user acceptance. These findings affirm that PAWFECT Home is a valuable tool in promoting responsible pet ownership and enhancing community engagement in animal welfare.

Keywords: *pawfect, web-based animal adoption, online system, animal care, stray animals*

Introduction

The increasing population of stray and abandoned animals poses significant challenges globally. In the United States alone, approximately 6.5 million companion animals enter shelters each year, with nearly equal numbers of cats (3.3 million) and dogs (3.2 million) (Shelter Animals Count, 2024). Globally, the World Health Organization (WHO) estimates that the stray dog population exceeds 200 million, with many of these animals at risk of disease, starvation, and abuse (World Health Organization, 2010). Contributing factors to this growing population include abandonment, overbreeding, lack of sterilization programs, and inadequate enforcement of animal welfare policies.

Shelters play a critical role in animal welfare, offering temporary refuge, medical treatment, and opportunities for adoption. However, overcrowding has become a persistent issue, exacerbated by rising intake rates and limited adoptions. Research highlights that over 75% of pet surrenders occur for "human reasons," such as financial hardship, eviction, or life transitions, rather than behavioral issues of the pets themselves (Human Animal Support Services, 2023). This is consistent with findings from Powell et al. (2022), who found that economic strain and housing instability were major predictors of pet relinquishment during crises such as the COVID-19 pandemic.

The overcrowding of shelters has raised concerns about the physical and psychological well-being of animals. Prolonged stays in confined environments can lead to stress-related behaviors, anxiety, and depression among shelter animals (Normando et al., 2006). Moreover, shelters often face financial and staffing limitations that impede their ability to deliver adequate care (Weiss et al., 2015).

In response, digital platforms for pet adoption have emerged as effective tools to streamline the adoption process. These platforms allow users to view detailed profiles of adoptable animals, including images, personality descriptions, and health status. Research shows that visual presentation significantly impacts adoption likelihood; for instance, Brown et al. (2013) found that animals with high-quality, direct-eye-contact photos were adopted more quickly than others. Online platforms thus provide an accessible, user-friendly way to match prospective adopters with suitable pets, thereby enhancing adoption outcomes.

The proposed platform, PAWFECT Home, supports the achievement of several United Nations Sustainable Development Goals (SDGs) through its comprehensive approach to animal welfare, public health, and community engagement. First, it aligns with SDG 3: Good Health and Well-being by helping to reduce the number of stray animals, thereby minimizing the risk of zoonotic disease transmission. Diseases such as rabies, which causes approximately 59,000 human deaths globally each year, are primarily spread through stray dogs (Hampson et al., 2015). By facilitating sheltering and vaccination, the platform plays a role in promoting healthier environments for both animals and humans. Additionally, the initiative contributes to SDG 11: Sustainable Cities and Communities by helping to manage urban stray populations, which can improve community safety, sanitation, and quality of life in public spaces.

Moreover, PAWFECT Home supports SDG 15: Life on Land by protecting stray and abandoned animals from harm and contributing

to biodiversity through responsible sheltering and rehabilitation. The platform also promotes multi-sector collaboration in line with SDG 17: Partnerships for the Goals, by connecting local shelters, nonprofit organizations, municipalities, and communities. These partnerships are critical to the long-term success of animal welfare strategies and digital adoption systems. Lastly, it addresses SDG 2: Zero Hunger by reducing the number of animals forced to scavenge for food in urban or rural areas, ensuring instead that they receive adequate nutrition through shelter services. By aligning with these SDGs, PAWFECT Home not only contributes to animal welfare but also plays a vital role in fostering healthier, more humane, and more sustainable communities.

Research Questions

This study aimed to create a website for shelters to create easy way to access different shelters. Specifically, it aimed to:

1. Assess the developed system on the ISO 25010 standard in terms of the following:
    1.1 portability;
    1.2 functional suitability;
    1.3 security;
    1.4 usability;
    1.5 compatibility;
    1.6 maintainability;
    1.7 reliability; and
    1.8 performance efficiency?
2. Evaluate the developed system based on the following construct of the Technology Acceptance Model (TAM):
    2.1 perceived usefulness;
    2.2 perceived ease of use;
    2.3 attribute towards using; and
    2.4 intention to use?

Methodology

Research Design

The developers of PAWFECT Home: An Online Stray Animal Reporting, Sheltering, and Pet Adoption Platform utilized a quantitative research methodology. This approach enabled the collecting and statistical analysis of numerical data, allowing for objective measurement of variables and generalization of findings across the target population. Quantitative research methodically gathers and examines numerical data to discern trends, evaluate hypotheses, and facilitate data-driven decisions (Bhandari, 2020).

A descriptive developmental technique was employed to thoroughly analyze the platform's design and development processes. This method enabled comprehensive observation and documenting of each phase, ensuring the platform's functionality corresponded with user needs determined by survey analysis. Descriptive research emphasizes the documentation of features and processes without dictating precise methodologies, capturing the attributes of outcomes as they evolve (Elakoui, 2024).

Participants

The study included 50 respondents, including 10 IT professionals who utilized the ISO 25010 questionnaire to evaluate the technical aspects of the website, 10 individuals from animal shelters who provided insights into the platform's relevance to shelter operations, 10 pet owners or "Fur Parents" who provided feedback on user experience and functionality, and 20 end-users from the community of Guimba who completed the TAM questionnaire to assess the platform's usability and overall acceptance. This diverse group contributed to the collection of comprehensive feedback on the website's performance, usability, and efficacy, thereby guaranteeing that it satisfied the requirements of all stakeholders.

Reseaerch Instrument

The proponents utilized questionnaires to assess the effectiveness of PAWFECT Home: An Online Stray Animal Reporting, Sheltering, and Pet Adoption Platform.

The proponents provided questionnaires to the respondents based on ISO 21050 to evaluate the PAWFECT Home Website. These questionnaires were designed to assess the website's relevance, suitability, performance, usability, security, functionality, purpose, portability, efficiency, and maintainability. The responses were measured on a five-point scale: 1 – poor, 2 – fair, 3 – good, 4 – very good, and 5 – excellent.

Procedure

Two phases were implemented in this investigation: consultation and assessment. The development phase was conducted in accordance with the Scrum Model, which employs a structured methodology that commences with observation, analysis, and planning and is subsequently followed by design, build, testing, review, and launch. Before progressing to the subsequent phase, this cycle guarantees that each phase is satisfactorily concluded, with continuous enhancements following each review. This phase involved the evaluation

of the PawFect Home: An Online Stray Animal Reporting, Sheltering, and Pet Adoption Platform by IT Professionals, Pet Owners, and End-Users from the Guimba community. In the evaluation, the proponents demonstrate the respondents' utilization of the website. We have considered the suggestions and recommendations that have been submitted to enhance the Pawfect Home.

Data Analysis

The proponents analyzed the data from the respondents using the established criteria as a scoring guide. To enhance the website's functionality and user-friendliness, a qualitative rating system was applied, aiming to encourage more positive feedback. Based on the rubric ratings, the website's quality was assessed: a high rating reflects a positive evaluation and good quality, while a low rating indicates poor quality and an unsuitable user experience.

Table 1 shows the rubric used to assess the PAWFECT Home Website.

Table 1. *Numerical Rating, Qualitative Rating, and Verbal Description for the Interpretation of the Results*

Numerical Rating	*Qualitative Rating*	*Verbal Description*
4.20 –5.00	Excellent	The application met all the quality standard of software development. No or very minimal modification is required.
3.40 –4.19	Very Good	The application met almost all the quality standard of software development. Minimal modification is required.
2.60 –3.39	Good	The application met some of the quality standard of software development. Some revisions are required.
1.80 –2.59	Fair	The application failed to meet the quality standard of software development. Major revisions are required.
1.00 –1.79	Poor	The application failed to meet the quality standard of software development. Needs to be redone to serve its purpose.

Ethical Considerations

The study was conducted in accordance with ethical research standards. The respondents' participation is entirely voluntary, and they are not under any obligation to comply. They are free to decline at any time without incurring any penalties. The respondents of this study were provided with a consent form that outlined the purpose of the study and the terms of confidentiality once they consented to continue. Proponents will have exclusive access to the data collected, and only aggregate data will be reported. All data will be handled with the utmost confidentiality.

Results and Discussion

Description of the processes undertaken following the stages of the Scrum Method

Analyze and Plan

Observing, analyzing, and planning are crucial steps in developing the PAWFECT HOME website for animal shelters and stray animals. The aim is to use modern information technology to address issues in animal shelters, creating a significant impact on both communities and animals (Hassan et al., 2020). The proponents identified key features for the PAWFECT HOME website by gathering information from animal shelters and stakeholders, as well as analyzing the needs of stray animals. This stage is vital for determining the direction of the project and ensuring alignment with the goal of making a meaningful impact (Borges et al., 2021).

Design

An idealized version of a website's design should consider its intended use, ensuring it is accessible and user-friendly. The PAWFECT HOME webpage was designed to be user-friendly and accessible to everyone, ensuring it meets the needs of animal shelters and the communities they serve, providing easy navigation and access for all users (Borges et al., 2021).

Build

To achieve the desired results, the development process began with thorough analysis, planning, and design stages. The website was then developed incrementally, focusing on creating each page and function step by step to ensure the website met its objectives effectively (Hassan et al., 2020).

Test

After development, it is crucial to test the website's operations and features to identify any issues or non-functioning aspects, ensuring that both internal and external integrations work as intended and provide a seamless user experience (Nguyen & Le, 2021).

Review

Testing provides valuable feedback, which is essential for refining the website. This feedback helps identify areas for improvement and guides the creation of new features, ensuring the website continuously evolves to meet user needs (Borges et al., 2021).

The proponents used the feedback from testing to refine the PAWFECT Home website. They focused on improving areas that needed attention and creating new features based on the results, ensuring the website was continually enhanced to meet the needs of its users

Launch

Following comprehensive testing and review, the website was launched in a fully operational state for the target animal shelter. Ongoing maintenance was implemented to ensure optimal performance and to enhance the website's functionality, ensuring it meets its full potential and delivers sustained value to users and the community (Hassan et al., 2020).The proponents launched the PAWFECT Home website after thorough testing and review, ensuring it was fully operational for the target animal shelter. Ongoing maintenance was implemented to optimize the website's performance and continuously enhance its features, ensuring it reaches its full potential and continues to meet the needs of the users and the community.

Figure 1. *Scrum Model*

Table 2. *The results on the evaluation made on the technical qualities using ISO 25010 of the System*

Descriptive	*Mean*	*Verbal Description*
Functional Suitability	4.65	Excellent
Reliability	4.76	Excellent
Portability	4.50	Excellent
Usability	4.62	Excellent
Performance Efficiency	4.72	Excellent
Security	4.83	Excellent
Compatibility	4.85	Excellent
Maintainability	4.79	Excellent
Over-All Mean	4.72	Excellent

Legend: 4.20-5.00, Excellent; 3.40-4.19, Very Good; 2.60 3.39, Good;1.80-2.59, Fair; 1.00-1.79, Poor

The assessment of PAWFECT HOME, based on the ISO/IEC 25010 standard, indicates that the system performs very well across many quality parameters, attaining a notable overall mean score of 4.72. This score indicates the system's strong performance in functional appropriateness, dependability, portability, usability, performance efficiency, security, compatibility, and maintainability. Such complete perfection signifies that PAWFECT HOME is a robust, user-centric, efficient, secure, and easily maintenance system, prepared to provide an exceptional user experience and adapt successfully over time.

The ISO/IEC 25010 standard delineates a comprehensive framework for evaluating software product quality, including attributes such as functional appropriateness, performance efficiency, compatibility, usability, dependability, security, maintainability, and portability (ISO/IEC 25010:2023). PAWFECT HOME's elevated ratings in these characteristics highlight its conformity with globally acknowledged quality standards.

Amsel et al. (2019) highlight the necessity of creating software that meets user needs while reducing environmental effect within the realm of sustainable software engineering. This method is consistent with the tenets of sustainable development, which promote fulfilling current demands without compromising the capacity of future generations to satisfy their own (UNWCED, 2019). By excelling in the quality attributes specified in ISO/IEC 25010, PAWFECT HOME not only satisfies present user requirements but also establishes itself as a sustainable solution capable of adapting to future difficulties.

The advocates of PAWFECT HOME contend that the system's exceptional performance in all quality attributes, demonstrated by an overall mean score of 4.72, underscores its dependability, efficiency, security, interoperability, and maintainability. These qualities combined enhance the system's appropriateness for prolonged utilization and its potential for future adaption

Table 3. *The results on the assessment made on the Technology Acceptance Model of the System*

TAM CONSTUCT	*Mean*	*Verbal Interpretation*
Perceived Usefulness	4.51	Excellent
Perceived Ease of Use	4.61	Excellent
Intention of use	4.52	Excellent
Attitude Toward Use	4.56	Excellent
Over-All Mean	4.55	Excellent

Legend: 4.20-5.00, Excellent; 3.40-4.19, Very Good; 2.60 3.39, Good;1.80-2.59, Fair; 1.00-1.79, Poor

The table shows that PAWFECT HOME has an overall mean score of 4.55 in the Technology Acceptance Model (TAM), indicating excellent performance. The system excels in perceived usefulness, perceived ease of use, intention of use, and attitude toward use, demonstrating that users find it highly useful, easy to use, and are likely to adopt it with a positive attitude.

According to Al-Emran and Granić (2021), recent advances in technology acceptance models (TAM) have focused on extending the model to predict user behavior in various contexts, such as metaverse-based learning platforms and mobile data services. These studies highlight the continued relevance and adaptability of TAM in understanding technology adoption.

The proponents believe that PAWFECT HOME shows excellent results in the Technology Acceptance Model (TAM), with an overall mean score of 4.55. The system is perceived as highly useful, easy to use, and has a positive impact on users' intention to use it, indicating strong acceptance and a favorable attitude toward its adoption.

Conclusions

This study's findings confirm the efficacy and quality of the PAWFECT HOME website as a digital solution for promoting pet adoption and mitigating stray animal concerns. The system was developed utilizing the Agile Scrum framework, according to a systematic and iterative development process encompassing analysis, planning, design, testing, review, and deployment. This methodology facilitated a flexible and adaptive development cycle that included feedback from users and stakeholders to perpetually update and enhance the system.

The system was evaluated using the ISO/IEC 25010 quality model and achieved an overall mean score of 4.72, indicating outstanding performance across all measured attributes. These encompass functional appropriateness, performance efficiency, dependability, usability, security, compatibility, maintainability, and portability. These results indicate that PAWFECT HOME is a resilient, scalable, user-focused, and secure system that provides a superior experience while being flexible for future expansion and enhancement.

The system was assessed not just for its technical performance but also for the Technology Acceptance Model (TAM), achieving an overall mean score of 4.55. The website received good ratings in perceived utility, perceived ease of use, intention to use, and user attitude. These results demonstrate that users acknowledge the platform's worth and are inclined to embrace and endorse it, indicating robust acceptance and favorable response.

In light of these findings, many solutions are suggested to inform future development and optimize the system's capabilities. Incorporating features such as AI-driven pet pairing, real-time pet availability updates, geolocation-based stray animal reporting, and a section for success stories might improve user engagement and adoption results. The establishment of an educational hub would furnish essential information on responsible pet ownership, animal welfare, and the advantages of adoption, so enhancing the user experience and elevating community consciousness. Third, enhancing collaborations with other animal shelters, local groups, educational institutions, and government agencies might bolster outreach, augment the platform's exposure, and enhance its efficacy. It is advisable that the PAWFECT HOME website undergoes ongoing development and maintenance to guarantee long-term efficacy, sustainability, and conformity with changing user requirements and technical progress.

The PAWFECT HOME website has shown itself to be a superior, user-endorsed, and durable digital platform. Its robust performance in quality and acceptability metrics highlights its potential as an essential instrument for animal welfare advocacy and digital transformation in community-based adoption frameworks.

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