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CSE371 Database System

Pet Adoption and Shelter Management System

1. Introduction

The Pet Adoption and Shelter Management System is a comprehensive software solution designed to facilitate the efficient and organized management of pet adoption and shelter operations. The system aims to connect shelters, staff, potential adopters, and pets, providing a user-friendly platform for pet adoption and associated tasks. This project document outlines the scope of work, project requirements, and a performance analysis plan for the successful development and deployment of this system.

a. Scope of Work

The scope of work for the Pet Adoption and Shelter Management System encompasses the following aspects:

b. System Objectives

- To create a user-friendly interface for shelter staff to manage shelter profiles, staff members, and pet profiles.
- To enable prospective adopters (Adopters) to submit adoption applications and track their status.
- To streamline the adoption process by allowing shelter staff to review applications and manage approvals.
- To facilitate document management for pet profiles, including images and relevant documents.
- To provide a robust search and viewing feature for visitors to find and view adoptable pets based on various criteria.
- To implement authentication and authorization mechanisms for user accounts, ensuring access control based on roles.
- To offer notifications and alerts for important events, such as application approvals and pet availability updates.
- To generate reports and statistics for shelter managers to make informed decisions.
- To ensure data privacy and compliance with relevant regulations.

2. Project Requirements

The project requirements are outlined in the following section, detailing the features and functionalities to be implemented:

1. Shelter Management:

Allow shelter managers to create and manage shelter profiles.

Include shelter details such as name, location, contact information, and staff members associated with the shelter.

2. Staff Management:

- Enable staff members to register profiles and associate with a particular shelter.
- Staff profiles should include name, role, and contact information.

3. Pet Management:

- Allow staff to add, edit, and manage pet profiles available for adoption.
- Pet profiles should include pet details, such as name, species, breed, age, gender, health status, behavior, description, and images.

4. Adoption Process:

- Allow prospective adopters to submit adoption applications.
- Include application details such as adopter's name, contact information, and application status (e.g., pending, approved).
- Enable shelter staff to review applications, approve or reject them, and create adoption records to track the adoption process.
- Each adoption record should specify the adopted pet and the adopting family.

5. Document Management:

- Support the attachment of documents to pet profiles, such as images, medical records, and other relevant files.
- Associate each document with a pet and specify its type.

6. Search and Viewing:

- Allow visitors to search for available pets based on criteria like species, breed, age, and shelter location.
- Enable visitors to view pet profiles, including images and descriptions.
- Implement filters for sorting and viewing pets based on attributes like house-training, vaccinations, or spaying/neutering status.

7. Authentication and Authorization:

- Support user accounts for shelter staff, adopters, and administrators.
- Implement authentication mechanisms to control access based on roles and permissions.

8. Notifications:

Provide notifications and alerts to users for important events, such as application approval notifications for adopters and updates on pet availability.

10. Data Privacy and Compliance:

- Ensure compliance with data privacy regulations, safeguarding user and pet data.
- Implement data backups and recovery mechanisms to protect against data loss.

11. Scalability and Performance:

Design the database schema and system architecture to accommodate a growing number of pet profiles and adoption records.

3. Performance Analysis

After the project is complete, it's crucial to test the system's performance, primarily focusing on searching and viewing adoptable pets.

Search and Viewing:

- Stress testing will evaluate the system's response to a significant number of visitors searching for adoptable pets.
- Performance metrics will measure response times and throughput when users are browsing pet profiles.

Performance Metrics and Optimization:

- You will measure critical performance metrics for this feature, including response times and throughput
- In Java, you can use various libraries and frameworks for load testing and performance monitoring, such as Apache JMeter, Gatling, or custom scripts using concurrency and data generation. The key is to simulate and measure the system's performance under various conditions
- Incorporate your optimization suggestions into the report to improve the performance and scalability of the search and viewing feature.

4. Guidelines

- You should work in groups of four students.
- Use Java or Angular and SpringBoot for application development.
- You are required to provide a database generation script (SQL files), the source code of the application. You are required to submit a detailed report containing the following:
- The database ERD diagram in a readable format (Simple MySQL generation needs to be adjusted to become user-readable).
- Detailed analysis of all the triggers, procedures, indices, database tuning, and concurrency/transaction control measures done throughout the project. You need to provide justification for any choices you made.
- The results from the performance analysis part and your suggestions to improve it.
- Sample screenshots of your program demonstrating most of the functionality