
Project Proposal: Adoption Website Development with CRUD Functionality

Ricard Oosthuizen DV200

---

1. Problem Statement

- **Problem**: Many animals in shelters await adoption, yet the process is often inefficient, with outdated or manual systems that delay animals finding suitable homes.

- **Significance**: This project will create a streamlined, easy-to-use adoption website, allowing potential adopters to create accounts, browse pets, and submit adoption applications. The platform will also allow shelters to manage pets effectively, improving adoption rates.

---

2. Target Audience

- **Primary Users**:
    - **Potential Adopters**: Individuals or families looking to adopt pets.
    - **Shelter Administrators**: Shelter staff managing pet profiles and adoption applications.

- **Benefit**: Adopters experience a user-friendly, efficient search and application process. Shelter administrators can manage pet profiles, adoption applications, and user accounts within one platform.

---

3. Technology Stack

- **Chosen Stack**: MERN Stack (MongoDB, Express.js, React.js, Node.js).
    - **MongoDB**: Database for storing user accounts, pet information, and adoption records.
    - **Express.js**: Handles backend logic and CRUD operations.
    - **React.js**: Frontend framework for a smooth, responsive user interface.
    - **Node.js**: Backend environment, allowing for scalable server operations.

- **Deployment**: AWS and Google Cloud for reliable, scalable deployment.
- **Justification**: The MERN stack offers a seamless development flow, making it ideal for building full-stack applications with dynamic, real-time data handling.

---

4. Application Features

- **Core Features**:
  - **User Registration & Login**: Secure account creation with hashed password storage.
  - **Create Pet Profiles**: Shelter staff can add, update, and delete pet profiles with details like breed, age, and adoption status.
  - **Adoption Applications**: Users can browse pet profiles and submit applications, with CRUD operations supporting application management.
  - **Delete Accounts and Pets**: Admins can delete accounts and pet profiles as necessary.

---

5. Database Design

- **Database Structure**:
  - **Users**: Includes fields for `UserID`, `Username`, `Password` (hashed), `Email`, and `Role` (user or admin).
  - **Pets**: Contains fields such as `PetID`, `Name`, `Breed`, `Age`, `Description`, and `Availability`.
  - **Admin**: Stores `AdminID`, `Username`, and `Password` (hashed).
- **Relationships**:
  - Adoption applications link users to pets, tracking which pets are being adopted by which users.

---

6. User Interface and Experience

- **UI Design**:
  - A simple, warm interface with a cream and light brown palette to create a welcoming experience.
  - Clear, organised dashboards for adopters and shelter staff, facilitating easy profile and application management.

---

7. Security Considerations

- **Potential Risks**:
  - Data breaches (protecting user credentials).
  - Risks of SQL injection and XSS attacks if inputs aren’t validated.

- **Mitigation Strategies**:
    - Secure login with validation, hashing for passwords.
    - Prepared statements and validation to prevent injection attacks.
    - Proper session management to secure accounts.

---

8. Project Timeline

- **Weeks 1-2**: Develop the basic user interface and essential pages.
- **Weeks 3-4**: Design the database schema and create relationships.
- **Weeks 5-6**: Build frontend and backend functionality with CRUD operations for user accounts and pet profiles.
- **Weeks 7-8**: Final integration, feature testing, and security validation.

---

9. Challenges and Risks

- **Security Challenges**: Implementing secure login, validating user data, and mitigating risks like SQL injection.
- **Mitigation**: Regular security testing, secure password storage, and vulnerability assessments.

---

10. Conclusion

- This pet adoption website will make the adoption process efficient and accessible, helping more animals find safe homes. The platform addresses a real-world need, improving adoption processes for shelters and adopters while prioritizing security and user experience.