

A Smart and Integrated Animal Rescue Application for Efficient Incident Reporting

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Abstract: *Animal rescue and welfare represent a significant issue in both urban and rural settings. Conventional methods for reporting incidents involving animals are often ineffective and lack timely communication. This paper introduces a comprehensive Android-based application designed for animal rescue, which effectively connects users with rescue organizations. The application is divided into two components: a user application and an administrative application. The user application enables individuals to report incidents by taking photographs, selecting relevant categories, and automatically transmitting their location to the administration. Additional functionalities include a module for pet shops featuring rescued animals, user profile management, donation capabilities through Razorpay, and real-time chat assistance. The administrative application streamlines incident management, provides real-time navigation to incident sites, handles pet adoption requests, tracks donations, and offers user support. This research emphasizes the technological framework, implementation strategies, and the potential benefits of such an integrated solution in improving animal welfare and rescue efforts.*

Keywords: Animal rescue, Android application, Real-time incident reporting.

I. INTRODUCTION

Animal rescue and welfare represent critical issues on a global scale, as evidenced by the prevalence of animal abuse, abandonment, and accidents that necessitate prompt action. Conventional rescue methods often depend on outdated and inefficient communication channels, resulting in prolonged response times. However, the emergence of mobile technologies presents a valuable opportunity to utilize digital solutions that can enhance and accelerate the rescue process.

This document presents an innovative and cohesive Android application aimed at improving animal rescue efforts. The application consists of two primary elements: a user application and an administrative application. The user application enables individuals to report animal-related incidents effectively, incorporating functionalities such as automatic location sharing, image capture, categorization of incidents, and the ability to provide detailed descriptions. The pet shop feature facilitates the adoption and sale of rescued animals, while the donation integration assists non-governmental organizations in maintaining their rescue initiatives. Furthermore, real-time chat support fosters enhanced communication between users and administrators.

The administrative application offers an extensive dashboard that facilitates the management of rescue requests, categorization of incidents, navigation to incident sites via Google Maps, processing of pet adoption inquiries, monitoring of donations, and direct communication with users. The intended system seeks to improve the efficiency and effectiveness of animal rescue operations, thereby decreasing response times and promoting better welfare outcomes for animals in distress.

II. METHODOLOGY

The creation of the Animal Rescue Application was executed through a systematic methodology that integrated user-focused design, real-time data management, and effective backend operations. The initiative was segmented into two main components: a User Application and an Admin Application, each fulfilling specific functions to enhance the



processes of rescue, adoption, and support. The User Application empowers individuals to report emergencies by selecting the nature of the incident, uploading relevant images, providing descriptions, and submitting their current location, which is automatically retrieved via the Google Maps API. This mechanism guarantees that essential information regarding the incident, including the user's identity and location, is promptly relayed to the Admin Application, thereby minimizing response times and enhancing the effectiveness of animal rescue efforts. Additionally, the pet shop module within the User Application allows users to browse rescued animals available for adoption, effectively connecting NGOs with prospective adopters. The application also incorporates a donation feature, integrated with Razorpay, enabling users to securely contribute funds to animal welfare organizations. Moreover, a help and support function was established to promote real-time communication between users and administrators, ensuring swift responses to inquiries and concerns related to rescue operations, pet adoptions, and donations.

The Admin Application was developed to effectively handle reported incidents, oversee pet adoption requests, and track donation activities. When an incident report is submitted, the admin interface organizes cases according to the nature of the emergency, including accidents, pet abuse, cow slaughter, snake intrusions, and forest fires, which facilitates efficient filtering and prioritization. A key component of the admin panel is the integration of Google Maps navigation, providing rescuers with accurate directions to the incident site, thereby ensuring prompt response. The admin also has direct communication options to contact users who reported incidents, enabling real-time verification and coordination. Furthermore, the application features a pet management module, allowing for the addition of newly rescued animals into the system for adoption. Users wishing to adopt can submit their requests, which are subsequently reviewed and processed by the admin. The donation management system offers a centralized platform to monitor funds received from users, promoting transparency and accountability in financial dealings. Additionally, a real-time chat feature has been incorporated to facilitate smooth communication between admins and users, providing immediate assistance for rescue coordination, adoption inquiries, and general support.

The development process adhered to an agile methodology, prioritizing iterative enhancements, the incorporation of feedback, and comprehensive testing to guarantee a reliable and user-centric system. The frontend of both applications was developed using Android Studio with Java, utilizing XML for user interface design, while the backend was organized with Firebase and MySQL to ensure secure data storage and retrieval. The Google Maps API was instrumental in facilitating location tracking and navigation, thereby improving the precision of incident reporting. For the donation module, the integration of Razorpay's API enabled smooth and secure transaction processing. The application's database was designed to effectively manage user information, incident reports, pet adoption records, donation transactions, and chat logs, ensuring both scalability and data protection. Security protocols, including data encryption, authentication measures, and access controls, were established to safeguard user privacy and uphold system integrity. A series of testing phases were executed, encompassing unit testing, integration testing, and user acceptance testing, to detect and rectify potential issues, enhance performance, and improve the overall user experience.

III. LITERATURE SURVEY

The increasing emphasis on animal welfare and rescue initiatives has spurred the creation of various technological solutions designed to enhance rescue operations, accelerate response times, and improve the management of rescued animals. Numerous research studies have investigated diverse methodologies, such as IoT-based tracking systems, AI-powered image recognition, mobile applications, and real-time GIS-based rescue frameworks. A significant number of these studies highlight the necessity of automating the rescue process through the incorporation of location-based tracking, real-time alerts, and effective communication channels between users and rescue teams. Nevertheless, many current solutions are deficient in providing a centralized system that consolidates incident reporting, pet adoption, donation management, and real-time assistance, which this research intends to rectify.

In recent years, scholars have delved into image processing methods for the identification of injured animals, employing machine learning algorithms to evaluate the severity of incidents and prioritize rescue efforts accordingly. Although these methods have yielded encouraging outcomes in controlled settings, their application in real-world situations poses challenges due to fluctuations in lighting conditions, image quality, and insufficient training data. Furthermore, investigations into GIS-based rescue models have illustrated the utility of geospatial analytics in tracking



and managing rescue operations. However, these systems frequently demand substantial computational resources and dependable internet connectivity, which restricts their use in rural or low-network regions.

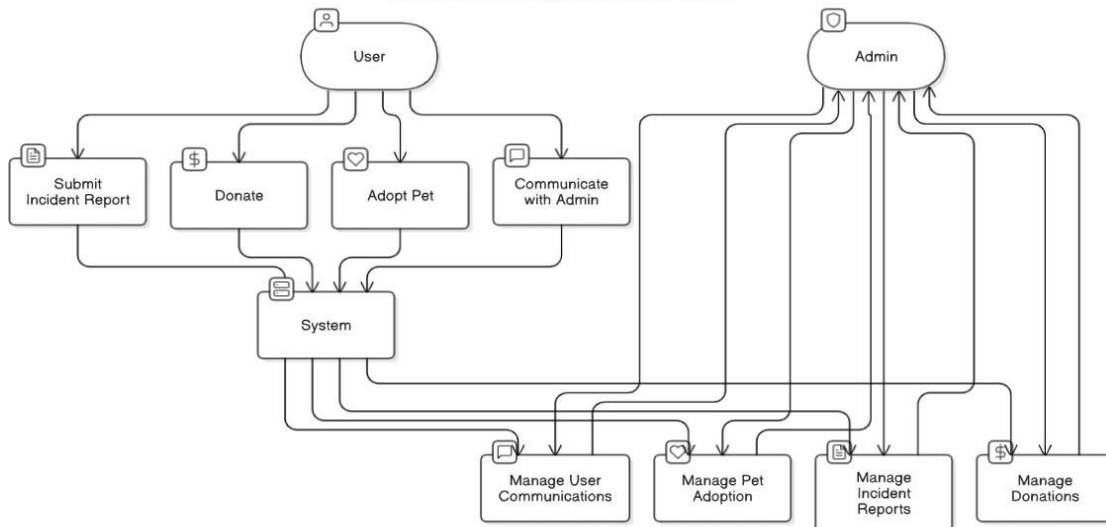
TABLE I

Paper Title	Author(s)	Methodology Used	Disadvantages
“IoT-Based Animal Rescue System”	R. Sharma, A. Gupta	IoT sensors with GPS tracking for injured animal detection	High hardware cost and dependency on IoT infrastructure
“GIS-Based Wildlife Rescue and Tracking System”	S. Verma, P. Nair	GIS and satellite data for real-time rescue monitoring	High computational requirements and limited offline functionality
“Mobile Application for Animal Rescue Using GPS”	L. Das, T. Singh	Mobile app with real-time GPS tracking for incident reporting	Lacks efficient categorization of incidents; no adoption or donation features
“Blockchain-Based Transparent Donation System for NGOs”	P. Mehta, R. Rao	Blockchain-based donation tracking for animal welfare organizations	High transaction costs and complex integration with mobile apps

IV. SYSTEM DESIGN

The Animal Rescue Application is crafted to facilitate a smooth interaction between users and administrators, enhancing the processes of animal rescue, pet adoption, donation management, and communication. The system features two primary participants: Users and Admins, each endowed with distinct functionalities. Users have the capability to submit incident reports by uploading images, selecting the incident type, providing descriptions, and automatically sharing their geographical location. These reports are subsequently directed to the admin panel for prompt action. Moreover, users can access the pet shop module, where animals in need of homes are listed for adoption, either by non-governmental organizations or the administrators. The application also allows users to securely donate funds through Razorpay integration, thereby supporting the welfare of rescued animals. Additionally, a dedicated help and support feature enables users to communicate directly with the admin for assistance.

Animal Rescue Application Flow Chart



From the administrative perspective, the system offers management of incident reports, allowing admins to filter, review, and monitor cases according to various categories. Each report contains essential information, including user



details, incident type, description, image, and location, with an option to navigate to the rescue site via Google Maps. Furthermore, admins can add newly rescued pets, handle adoption requests from users, and efficiently manage donation records. A direct communication module facilitates real-time chat between admins and users, ensuring immediate responses to inquiries and emergencies.

V. CONCLUSION

The Animal Rescue Application offers a comprehensive and technologically advanced approach to managing real-time animal rescue, adoption, and donation processes. By utilizing Android Java, Firebase, and Razorpay, the platform facilitates prompt incident reporting, secure financial transactions, and efficient pet adoption workflows. Its dual-app framework promotes effective collaboration between users and administrators, thereby improving response times and enhancing communication. Features such as location tracking, image-based incident reporting, and direct interaction between users and administrators significantly boost the effectiveness of rescue operations. Furthermore, the inclusion of a pet shop module aids rescued animals in finding new homes, thereby supporting sustainability in animal welfare. Although the system is well-developed, potential future improvements could include AI-driven incident classification, automated rescue dispatch, and blockchain-enabled donation tracking, which would further enhance its capabilities. This initiative exemplifies the transformative power of digital solutions in the realm of animal protection and emergency response, setting the stage for more intelligent and interconnected rescue systems.

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