

Software for Mobile App Development: Stray Cattle Challenges

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Abstract –In many urban areas, stray cattle on roads have become a common problem. They can block traffic, create safety risks for drivers and people walking on the roads, and also make city areas less clean. Because smartphones are now widely used, mobile applications can help people report such situations more easily. The study proposes a simple mobile application through which citizens can inform authorities about the presence of stray cattle in their area. After a report is sent, municipal officials can check the information and take action if required.

The system also includes basic user authentication and uses Firebase cloud storage so that the data can be stored and managed safely [5], [7]. Apart from this, technologies such as the Internet of Things (IoT) and digital monitoring tools can support better tracking of animals in city areas [3].

Citizen reporting platforms can also make communication between public and authorities smoother, which may help them respond to problems faster [1], [2]. Overall, the proposed system tries to provide an easier way for citizens to report issues while helping authorities manage stray cattle more effectively and improve public safety in urban areas [6].

Key words: Mobile Application Development, Stray Cattle Management, Smart City Solutions, Firebase Database, Citizen Reporting System, Urban Problem Management, Mobile Computing.

1. INTRODUCTION

In recent years, the issue of stray cattle on roads has become common in many cities as well as rural areas. It is very normal to see cows sitting in middle of the road or moving freely near traffic. Because of this, vehicles sometimes slow down and traffic movement gets disturbed. Drivers may suddenly stop or change direction to avoid hitting the animal, which can create risky situations on the road.

Many people face this problem while travelling every day. Apart from traffic disturbance, there are possibilities of road accidents if animals suddenly come in front of vehicles. This situation is not only unsafe for drivers and pedestrians, but it can also harm the animals themselves.

Another difficulty is that authorities do not always know the exact places where these stray cattle are found. Even if people notice the problem, there is usually no simple way for them to report it immediately. Because of this, the information does not always reach the concerned authorities on time.

To make this process easier, this project focuses on developing a mobile application that allows citizens to report stray cattle on roads. When a citizen sees such a situation, they can open the application, take a photo of the animal and upload it with the location details.

The application is developed using Android Studio and the data is stored in a cloud database using Firebase. By collecting this information from different users, the system can help authorities get a better idea about the locations where stray cattle are frequently seen. This can support better monitoring and management of the problem.

2. BODY OF PAPER

2.1 Literature Review

Many researchers have worked on different systems that use mobile applications to report public problems. In several studies, mobile apps were developed so that people can easily inform authorities about issues they see around them. For example, some applications allow users to report problems such as damaged roads, waste management issues, or safety concerns in public places.

Most of these systems work in a simple way. Users can take a photo of the problem and send it along with the location information. This helps authorities

understand where the issue is happening and take the required action.

In many research works, cloud technology is used to store and manage the data collected from users. Platforms like Firebase are commonly used because they make it easier to store information and access it when needed. They also support real-time data updates, which helps in managing reports more efficiently.

These studies show that mobile technology can play an important role in solving real-life problems. By allowing people to report issues directly through mobile applications, communication between the public and authorities becomes faster and more effective.

2.2 Existing System

At present, in many places there is no proper system to report stray cattle on roads. When people see animals sitting or walking on the road, they usually inform local authorities in a manual way, such as telling someone from the local office or municipality. In many cases, people do not report the issue at all and simply ignore it. Because of this, the authorities often do not get clear or accurate information about where the stray cattle are located. Sometimes the information reaches them very late, and by that time the animals may have already moved to another place. Due to the lack of a proper reporting system, managing this problem becomes slow and difficult. As a result, stray cattle continue to appear on roads and the situation is not monitored effectively.

2.3 Proposed System

To solve the problems discussed earlier, this project proposes a mobile application that helps users report stray cattle in an easy way. The main idea of the system is to allow people to quickly share information when they see stray animals on the road.

In this application, a user can open the app and take a photo of the stray cattle using the mobile camera. Along with the image, the application also captures the location of that place. This helps in identifying the exact area where the animal is present. After that, the information is uploaded and stored in a cloud database.

The application is developed using Android Studio and Firebase is used to store and manage the data. The interface of the app is designed to be simple so that users can report the issue without any difficulty.

On the other side, the admin can access the reported information through the system and check the details submitted by users. Based on this information,

authorities can take the necessary steps to handle the situation.

The overall system architecture includes four main parts: the user side (front end), the admin panel, the server or back end, and the database. These components work together to collect, store, and manage the reports, making the system easier and more organized.

2.4 System Architecture

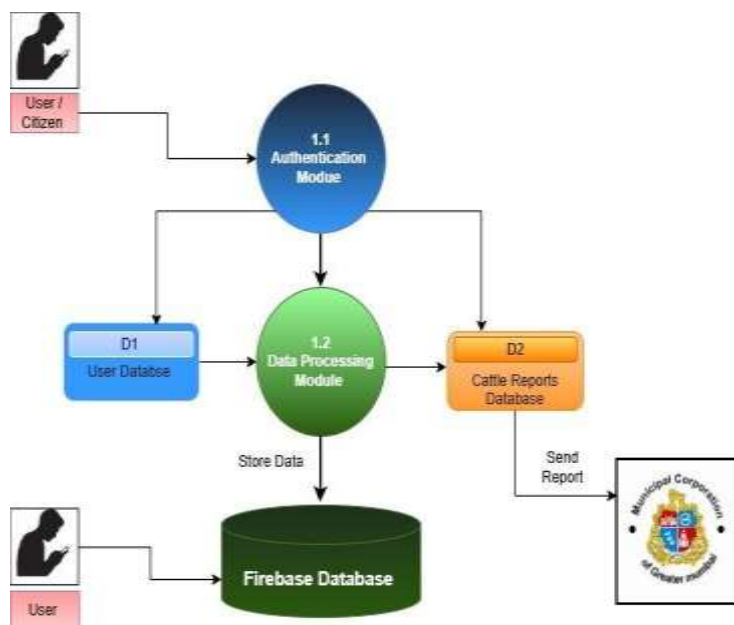


Figure.2.4.1 System Architecture

The system architecture of the proposed mobile application is designed to make the process of reporting stray cattle simple and organized. The system mainly includes the user side, authentication module, data processing module, databases, and the municipal authority that receives the reports.

First, the user or citizen interacts with the mobile application. When a person notices stray cattle on the road, they can open the application and report the issue. The app provides a simple interface where the user can log in and submit the report.

After that, the request goes to the Authentication Module (1.1). This module checks the user's login details and verifies the identity of the user. Only registered users are allowed to access the system and submit reports. This helps in maintaining security and avoiding false reports.

Once the user is verified, the information is sent to the Data Processing Module (1.2). This module works as the main part of the system. It receives the data from

the user, checks the information, and prepares it for storage in the database.

The system uses two main databases. The User Database (D1) stores the details of users such as their registration and login information. The Cattle Reports Database (D2) stores the reports submitted by users, including the image and location of stray cattle.

All the collected information is finally stored in the Firebase Database, which acts as the cloud storage of the system. Firebase helps in storing the data securely and allows the information to be accessed when required.

After the data is stored, the report is sent to the municipal authorities so that they can review the information and take the necessary action regarding stray cattle on roads.

2.5 Advantages:

1. Safer Roads for People:-Stray cattle on roads is a common problem in many places. Sometimes animals suddenly come in front of vehicles, which can lead to accidents. With this system, people can quickly inform authorities about such situations. Once the report is received, the responsible team can visit the location and move the cattle away from the road. This helps in making roads safer for drivers as well as pedestrians.

2. Simple Reporting Process:-The application is designed in a way that anyone can use it without confusion. If a person sees stray cattle nearby, they just need to open the app, take a picture, and send the report with the location. The whole process takes only a short time and does not require special technical skills.

3. Quick Flow of Information:-In the traditional method, complaints were often delayed because people had to call offices or visit departments. In this system, the report goes directly to the admin panel once it is submitted. Because of this, the authorities receive the information much faster and can start working on the problem sooner.

4. Exact Location Details:-The system uses the GPS feature available in smartphones. When a report is sent, the exact location of the stray cattle is recorded automatically. This makes it easier for the municipal team to find the place without spending extra time searching for it.

5. Reports Are Stored Safely:-All the details sent by users are saved in the database. This includes the image of the animal, the location, and the time when the report

was made. Keeping this information helps the admin review older reports and understand how often the issue happens in certain areas.

6. Helps Authorities Understand the Problem

Better:-When many reports are collected from different locations, it becomes easier to see which areas have more stray cattle. This information can help the authorities plan better solutions and manage the situation more effectively.

7. Saves Time for Everyone:-People no longer need to go to government offices to make complaints. They can simply use their phone to send the report. This saves time for citizens and also allows authorities to receive information quickly.

8. Supports Modern City Management:-The system makes use of digital tools such as mobile applications, GPS services, and cloud databases. Using these technologies helps cities manage everyday problems in a smarter and more organized way.

2.6 Future Scope:

The Stray Cattle Management System can be improved more in the future. Right now the system mainly allows people to report stray cattle using a mobile application. Users can take a photo and upload it with the location. This helps authorities know where the animal is seen. In the future, more features can be added to make the system better and more useful.

One possible improvement is a notification system. When a user sends a report, the authorities can get an alert immediately. Because of this, they can respond faster and take action without much delay.

Another improvement could be the use of Artificial Intelligence. The system may be able to check the uploaded images and identify whether the animal is actually a cow or not. This can reduce wrong reports and make the system more reliable.

In the future, the application may also include a tracking feature. This can help authorities see which areas report stray cattle more often. By studying this information, they can find the places where the problem happens frequently.

The system can also use identification methods for animals, like tags or special numbers for cattle. This will help authorities recognize specific animals and understand how often they appear in different places.

Another future possibility is connecting the system with smart city platforms and municipal systems. This can help different departments share information easily and work together.

The application may also be expanded to other cities and rural areas. If the system is used in many places, it can help manage the stray cattle problem on a larger scale.

Overall, with some improvements and better technology, the Stray Cattle Management System can become a useful tool for controlling stray cattle, improving road safety, and helping cities manage this issue more effectively.

3. CONCLUSIONS

The problem of stray cattle on roads is increasing in many urban areas and it often creates traffic issues and safety risks. In this project, a mobile application is proposed to help report such situations in a simple and practical way. The main idea of the system is to allow citizens to easily share information when they see stray cattle on the road. This creates a connection between the public and municipal authorities so that the issue can be noticed and managed more quickly.

The application uses basic modules such as authentication, data processing, and cloud storage to handle the reports submitted by users. Firebase is used to store the information, which helps in keeping the data organized and accessible when required. Because of this structure, the system can collect reports from different users and maintain them in a central database.

By using this approach, the reporting process becomes easier and faster compared to the traditional methods. Authorities can review the reports and take action when necessary. In this way, mobile technology can help support better monitoring of stray cattle and improve overall road safety.

In the future, the system can be improved by adding more features. For example, automatic GPS location detection, better image support for identifying animals, and notification alerts for authorities could be included. These improvements may make the system more useful and help in managing stray cattle problems more effectively.

ACKNOWLEDGEMENT

We would like to express our sincere gratitude to everyone who supported and guided us during the completion of this project titled **“Stray Cattle Management System.”** This project would not have

Been possible without the help, encouragement, and guidance of several people.

First, we would like to thank our respected project guide for providing valuable guidance, constant support, and helpful suggestions throughout the development of this project. Their knowledge and encouragement helped us complete our work successfully.

We are also thankful to our department and college authorities for giving us the opportunity to work on this project and for providing the necessary resources and facilities required during the project development.

We would also like to thank our friends and classmates who supported us, shared their ideas, and helped us during different stages of the project.

Finally, we express our sincere thanks to our families for their continuous support, motivation, and encouragement throughout our academic journey.

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