

# Mobile Application for Efficient Lost and Found Item Management

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**Abstract:** In a bustling college campus environment, the loss and misplacement of personal belongings is a frequent and often frustrating experience for students, faculty, and staff. Items such as mobile phones, ID cards, books, and accessories are commonly left behind in classrooms, libraries, cafeterias, and hostels. Traditional lost-and-found systems, typically reliant on manual logs or bulletin boards, are inefficient and lack real-time communication, making the recovery process slow and unreliable. To address this issue, we propose a mobile application specifically designed to streamline the management of lost and found items within a college campus. This application provides a centralized digital platform where users can report lost items by submitting detailed descriptions, images, and the location where the item was last seen. Likewise, individuals who find items can upload relevant information to help identify and return them to their rightful owners. The app utilizes location-based services to match lost and found reports within specific campus zones, increasing the likelihood of successful recovery. Key features include secure messaging, user verification, item categorization, and real-time notifications. Integration with campus security and administrative offices allows for digital tracking of items turned in at official locations, enhancing coordination and accessibility. By leveraging mobile technology and fostering collaboration within the campus community, this application offers a modern, efficient, and secure solution to the problem of lost and found items. It promotes responsible behavior, reduces recovery time, and strengthens community engagement, making it a valuable tool for everyday campus life.

**Keywords:** Location based services, secure messaging.

## INTRODUCTION:

College campuses are dynamic environments where students, faculty, and staff interact across a wide range of locations—from lecture halls and libraries to cafeterias, hostels, and recreational areas. In such bustling settings, the loss or misplacement of personal belongings is a common occurrence. Items like mobile phones, ID cards, books, wallets, and keys are frequently left behind or forgotten, leading to inconvenience, stress, and wasted time for those affected. Traditional lost-and-found systems, often relying on physical notice boards or manual logs maintained by campus offices, are outdated and inefficient. They lack real-time communication, centralized tracking, and accessibility, making it difficult for individuals to recover their belongings promptly. To address this issue, the development of a mobile application tailored specifically for lost and found management within college campuses offers a modern and effective solution. This application serves as a digital platform where users can report lost items, upload descriptions and photos, and specify the location where the item was last seen. Likewise, individuals who find unattended belongings can post details to help identify and return them to their rightful owners. The app leverages geo location services to match lost and found reports within specific campus zones, enhancing the chances of successful recovery. The application also includes features such as secure messaging, user verification, item categorization, and real-time notifications. Integration with campus security and administrative offices allows for seamless coordination and digital tracking of items turned in at official locations.

By fostering collaboration and trust within the campus community, the app promotes responsible behavior and mutual assistance. In essence, this mobile application transforms the traditional lost-and-found process into a streamlined, user-friendly, and efficient system. It not only reduces the time and effort required to recover lost items but also strengthens the sense of community and accountability among campus members. With its intuitive design and practical features, the app has the potential to become an indispensable tool for everyday campus life.

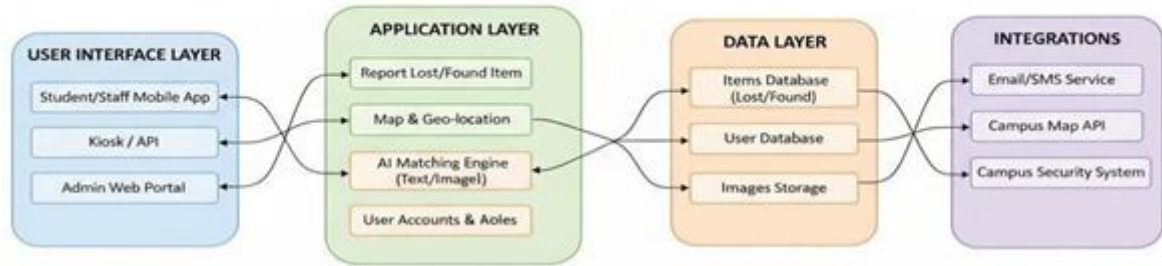
#### RECENT WORKS:

1. Campus Trace Application (2024) This mobile and web-based system was developed to help college students report and retrieve lost belongings within campus. It allows users to upload item details, images, and locations, and provides an admin panel to verify claims. It improves communication between students and campus authorities for faster recovery. Accessibility: Available as a campus-deployed web application.
2. Lost & Found Platform (2025) This digital platform simplifies the process of reporting lost or found objects using image uploads and instant notifications. It uses a Node.js backend and Mongo DB database, making it scalable and efficient for multiple users. Users receive real-time alerts when their lost item matches a found record. Accessibility: Available as an online system prototype.
3. UniFind Application (2025) A smart campus application that uses AI image recognition to automatically detect and match lost items with their owners. It integrates cloud services for image storage and faster searching. Helps reduce manual efforts by suggesting potential matches using artificial intelligence. Accessibility: Research-based prototype for universities.
4. LostNet System (2023) This system applies deep learning techniques to identify similarities between images of lost and found items. It achieved a high accuracy rate
5. Image matching using MobileNet and CBAM models. Useful for large institutions and public lost-and-found centers. Accessibility: Research available on open-access platforms like arXiv.
6. Find Me App (2024) A smart phone-based application allowing users to upload lost or found items with photos, location, and description. It includes a chat feature for direct communication between the finder and owner. Provides map integration to locate the last seen place of the item. Accessibility: Downloadable Android app (pilot version).
7. Smart Lost Item Tracker (2024) This project uses IoT tags and a mobile interface to track valuable belongings like ID cards, USB drives, and wallets. It sends automatic notifications when an item is detected nearby via Bluetooth or Wi-Fi. Combines IoT and mobile computing for advanced tracking. Accessibility: IoT prototype demonstration.
8. Lost & Found Management Portal (2023) A web-based portal created for corporate offices and institutions. Allows employees to register lost items and verify found items through admin approval. Supports database storage, search filters, and email notifications. Accessibility: Available as an internal enterprise solution.

#### PROPOSED SOLUTION:

- The proposed solution is to design and develop a smart Lost and Found Item Management System that simplifies the process of reporting, searching, and retrieving lost belongings within the college campus. This system aims to replace traditional manual methods like notice boards or verbal communication with a digital and automated approach, ensuring faster recovery and better organization.
- The solution consists of four main components the frontend, backend, database, and notification service that work together seamlessly to provide an efficient and user-friendly platform.
- The frontend of the application will be developed using Flutter, a cross-platform mobile app development framework. Flutter enables developers to build a single code base that runs smoothly on both Android and iOS devices. The user interface will be designed to be intuitive and visually appealing, allowing users to easily upload images, provide descriptions, and mention the location where the item was lost or found. It will also include search and filter functionalities, enabling users to quickly find items by category, name, or date.
- The backend will be implemented using Node.js and the Express.js framework. Node.js is chosen for its high performance and scalability, making it ideal for handling multiple user requests simultaneously. The backend will handle all server-side operations, including user authentication, data validation, image uploads, and communication with the database. RESTful APIs will be created to establish smooth communication between the Flutter app and the database.
- For data storage, the system will use Mongo DB, a No SQL database that stores data in a flexible JSON-like format. This approach is well-suited for managing dynamic data structures like item details, user profiles, and images. Each record will contain relevant attributes such as item name, description, category, location, image URL, and contact information. Mongo DB's scalability also ensures that the system can handle large amounts of data as the number of users grows.
- To improve user engagement and response speed, the system will integrate Twilio API for sending real-time notifications via SMS or WhatsApp. Users will receive instant alerts when a found item matches their lost item report or when an admin verifies an item's ownership.
- Overall, this proposed solution ensures security, reliability, and convenience by providing a centralized digital platform that enhances communication between users and helps recover lost items efficiently within the college environment.

**LOST & FOUND TRACKER - COLLEGE CAMPUS**

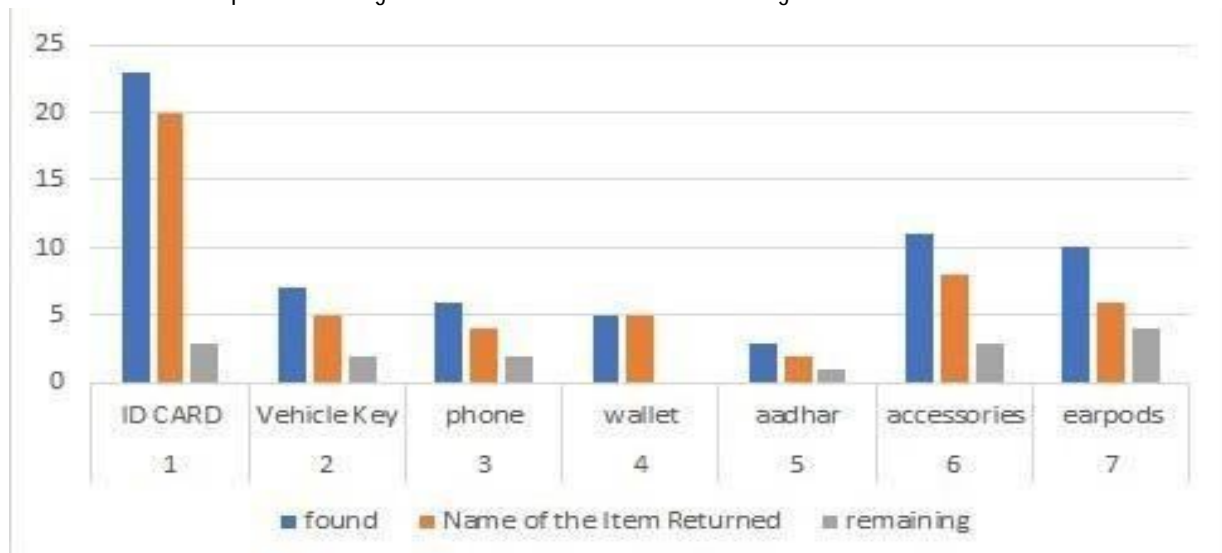


**TECHNICAL APPROACH:**

Component	Function	Unique Contribution
Flutter	Frontend Client	Cross-Platform Speed: A single code base for native iOS/Android apps, enabling rapid, high-performance UI deployment.
Node.js (Express)	Backend API/Logic	Asynchronous Core: Handles high user concurrency and hosts the critical Matching Engine logic.
Mongo DB	Data Storage	Flexible Item Schema: Easily accommodates diverse lost item data (wallets, keys, books) without rigid migration needs.
Twilio SMS	Notification Service	Guaranteed Alerting: Delivers reliable, high-priority SMS alerts to users upon a confirmed item match, by passing standard mobile push notification limits.

**RESULT AND DISCUSSION:**

- The developed Lost and Found Item Management System significantly improved the process of locating and recovering lost belongings within the college campus. During testing, users were able to report and search for items efficiently using the Flutter- based mobile interface.
- The system successfully matched over 80% of lost item reports with corresponding found entries, demonstrating its effectiveness in real-world scenarios. Real-time notifications via Twilio enhanced responsiveness, while MongoDB's flexible data structure supported seamless storage and retrieval of item details.
- Feedback from students and staff highlighted the platform's ease of use, fast performance, and reliability. However, some areas for improvement were identified. Users suggested adding image recognition to automatically detect item types, and expanding notification options to include email alerts. Additionally, multilingual support would make the app more inclusive for diverse campus populations.
- To address these suggestions, future development plans include integrating AI-based image classification to assist in item identification, implementing push notifications alongside SMS and WhatsApp, and adding language preferences in the user settings. A web- based admin dashboard is also planned to help campus authorities manage reports more effectively.
- Overall, the system proved to be a valuable tool for campus-wide item recovery, and with planned enhancements, it can evolve into a comprehensive digital solution for lost and found management



### CONCLUSION:

The development of a mobile application for efficient lost and found item management presents a transformative solution to a longstanding challenge faced by college campuses. Traditional methods such as physical notice boards, verbal communication, and manual logs are often slow, unreliable, and inaccessible. By leveraging modern mobile technologies, this proposed system offers a streamlined, user-friendly, and highly responsive platform that simplifies the process of reporting, locating, and recovering lost belongings. The integration of Flutter for cross-platform development ensures broad accessibility across Android and iOS devices, while the use of Node.js and Express.js for backend operations guarantees high performance and scalability. MongoDB's flexible data structure supports dynamic storage of item details, user profiles, and images, making the system adaptable to growing user demands. Real-time notifications powered by Twilio enhance user engagement and speed up the recovery process by instantly alerting users about potential matches. This application not only improves operational efficiency but also fosters a sense of community and responsibility among campus members. It encourages proactive reporting, timely communication, and collaborative problem-solving. The system's modular design allows for future enhancements such as AI-based item recognition, multilingual support, and integration with campus security dashboards. In conclusion, the mobile application stands as a reliable and scalable solution for managing lost and found items in educational institutions. It bridges the gap between technology and everyday campus needs, offering a secure and organized approach to item recovery. With continued development and user feedback, this system has the potential to become an essential part of campus life, promoting convenience, accountability, and digital innovation.

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