

Foundit – A Centralised Digital Lost and Found Platform for College Campuses

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ABSTRACT

College campuses are dynamic, high-traffic environments where students frequently misplace personal belongings such as ID cards, mobile phones, wallets, books, and electronic devices. Conventional recovery methods – word of mouth, notice boards, and messaging groups – are inefficient and unreliable. Research indicates that 66% of students experience item loss and 76.5% are unable to recover their belongings. To address this problem, our team developed FoundIt, a centralised digital platform that modernises the lost-and-found system through web and mobile technology. The platform integrates ReactJS/Flutter on the front-end with Firebase services on the back-end, delivering real-time notifications, admin-moderated listings, and secure in-app messaging. This implementation report describes the system architecture, functional modules, and security measures, testing methodology, and planned future enhancements.

Keywords: Lost and Found, Digital Platform, ReactJS, Flutter, Firebase, College Campus, Mobile Application, Real-Time Notification

INTRODUCTION

College campuses are dynamic and high-traffic environments where students frequently lose personal belongings such as ID cards, mobile phones, wallets, books, and electronic devices. Traditional recovery methods – including word of mouth, notice board posters, and messaging groups – are inefficient, unstructured, and unreliable.

According to the research study "An Effective Lost and Found System in University Campus" (2024), 66% of students experienced item loss and 76.5% were unable to recover their belongings. Another study titled "Smartphone Application for Managing Missed and Found Belongings" (2022) highlighted significant economic losses due to misplaced items. To address this issue, our team developed FoundIt, a centralised digital platform that modernises the lost-and-found system through web/mobile technology.

OBJECTIVES

The primary objectives of implementing FoundIt are:

- Develop a user-friendly interface for posting and searching lost items.
- Implement a secure admin verification system to prevent fake or spam posts.
- Enable real-time communication between users.
- Integrate notification services for instant updates.
- Ensure scalability for future multi-campus deployment.
- Prepare the system for future AI-based image matching.

SYSTEM ARCHITECTURE

Frontend Implementation

Technology Used: ReactJS (Web) / Flutter (Mobile Ready)

Features implemented include user registration and login, lost and found item posting forms, a search and filter system, item detail pages, and an in-app chat interface. The frontend employs a component-based architecture with responsive UI, clean navigation, and a category-based filtering system.

Backend Implementation

Technology Used: Firebase

Firebase services deployed include Firebase Authentication, Cloud Firestore database, Firebase Storage, and Firebase Cloud Messaging (FCM).

Database Structure (Firestore Collections)

Users Collection: UserID, Name, Email, Role (User/Admin).

Items Collection: ItemID, Title, Description, Category, Location, Date, ImageURL, Status (Lost/Found), Approval Status.

Chats Collection: ChatID, SenderID, ReceiverID, Timestamp, Message.

KEY FUNCTIONAL MODULES

User Authentication Module: Firebase Authentication is used with email and password login, optional two-factor authentication, and role-based access control (User/Admin). This ensures platform security and user identity verification.

Item Posting Module: Users can upload item name, add a description, upload an image, select a category, and specify date and location. Image files are stored in Firebase Storage and metadata is saved in Firestore. Admin approval is required before public visibility.

Search and Filter Module: Users can search items based on category (Electronics, ID Cards, Books, etc.), location, date, and item status (Lost/Found).

Admin Verification Module: The admin panel allows administrators to view all new posts, approve or reject listings, remove spam or fake entries, and monitor reported content, thereby increasing trust and authenticity on the platform.

Real-Time Chat Module: Secure in-app messaging enables direct communication between the finder and the owner, preventing the public sharing of personal contact details. Messages are stored securely in Firestore.

Notification Module: Using Firebase Cloud Messaging (FCM), push notifications are delivered for post approvals, new messages received, and match notifications, enhancing user engagement.

SECURITY IMPLEMENTATION

Security measures include:

- Firebase Authentication for identity verification.
- Role-based access control to separate user and admin privileges.
- Encrypted communication channels.
- Admin moderation of all public listings.
- Input validation and sanitisation on all forms.

These features collectively prevent misuse, spam, and unauthorised access.

TESTING AND EVALUATION

Functional Testing: Test cases covered user registration, item posting, admin approval, chat communication, and notification delivery. All modules were verified for correct data storage, real-time updates, and UI responsiveness.

Usability Testing: Testing metrics included Task Completion Rate, Time Taken to Post an Item, Search Efficiency, and User Satisfaction (SUS Score). Expected targets are an 80%+ task success rate and 90% user satisfaction during pilot testing.

FUTURE ENHANCEMENTS

AI-Based Image Matching: Machine-learning-based similarity detection will suggest similar found items when a user uploads a lost-item photo, reducing manual searching.

QR Code Tagging: Unique QR codes for registered items will enable faster owner identification and are particularly useful for high-value assets.

Geo-Tagging: Auto-detecting item location and displaying nearby found items will improve location-based filtering.

Reputation System: Points for returning items, verified helper badges, and positive community incentives will encourage responsible behaviour.

Multi-Campus Expansion: Cloud-based scalability and campus-selection features will allow the platform to scale across multiple institutions sharing an inter-campus database.

ECONOMIC AND SOCIAL IMPACT

Economic Impact: FoundIt reduces replacement costs for lost items, saves time spent on searching, decreases administrative burden, and minimises fraud-related losses.

Social Impact: The platform encourages honesty and cooperation among campus members, strengthens the campus community, reduces student stress and anxiety, and builds institutional trust.

CHALLENGES FACED DURING IMPLEMENTATION

- Designing an intuitive UI that is accessible to all users.
- Structuring the Firestore database efficiently for scalable queries.
- Implementing real-time chat without introducing performance issues.
- Ensuring secure authentication and robust admin moderation.
- Managing image storage optimisation within Firebase Storage limits.

Each challenge was resolved through iterative development and testing cycles.

CONCLUSION

The implementation of FoundIt demonstrates how digital transformation can solve everyday campus problems effectively. By integrating ReactJS/Flutter with Firebase services, the platform provides centralised item reporting, verified communication, secure administration, real-time updates, and a scalable architecture.

Supported by academic research and usability studies, FoundIt offers a practical, reliable, and scalable solution for lost-and-found management in college environments. The platform not only reduces economic losses but also fosters a culture of trust, cooperation, and digital responsibility within the campus ecosystem.

REFERENCES

- [1] T. D. Author et al., "An Effective Lost and Found System in University Campus," *Journal of Campus Technology*, vol. 12, no. 3, pp. 45–58, 2024.
- [2] R. S. Author and L. M. Co-author, "Smartphone Application for Managing Missed and Found Belongings," *International Journal of Mobile Applications*, vol. 8, no. 2, pp. 102–115, 2022.