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Findly: A Centralized Web-Based Lost and Found Portal for Structured Item Recovery

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Abstract. Lost and found management in college campuses and public spaces is frequently handled through informal channels such as WhatsApp groups, social media posts, notice boards and word of mouth. Although these channels support quick communication, they do not provide a persistent, searchable or accountable record of reports. Important information can become buried, duplicate reports can appear, and a person who has found an item may have no systematic way to connect it with the person who lost it. Ownership verification is also a concern because a photograph or general description alone is not always sufficient evidence of rightful ownership. FINDLY is a centralized web-based Lost & Found Portal proposed to organize the complete recovery lifecycle. The system follows the workflow REGISTER → REPORT → DISCOVER → MATCH → NOTIFY → VERIFY → RECOVER. Users can create lost or found reports containing category, description, location, date and photograph. Listings can be searched and filtered, while a multi-factor matching process can compare keywords, category, location, date and photo-related information to identify potential relationships. Notifications draw attention to possible matches, while a claim and ownership-verification stage separate matching from the final handover decision. Administrative moderation supports approval, rejection, duplicate flagging and dispute handling. Recovered items are marked as resolved so that the recovery lifecycle has an explicit endpoint. The project focuses on organizing fragmented information rather than relying on a single automated algorithm. The supplied project documentation provides the functional design, data model, implementation plan and test plan for the proposed system. Quantitative metrics presented in this paper are explicitly illustrative prototype values and should be replaced with measured project results before final submission.

Keywords: Lost and Found, FINDLY, Web Portal, Search, Matching, Ownership Verification, Notifications, Admin Moderation, Campus Information System

I. INTRODUCTION

The loss of personal belongings is a common practical problem in educational institutions, workplaces, transport facilities and public spaces. A student may lose a wallet, identity card, notebook, electronic accessory or another personal object inside a campus. At the same time, another student or staff member may find the same object but have no dependable way to identify its owner. In many environments, both sides communicate through informal methods rather than through a dedicated information system.

The project documentation identifies WhatsApp groups, social media, notice boards and word of mouth as common channels for lost-and-found communication [1-2]. These approaches can provide immediate visibility, but they do not guarantee persistence, structured search, systematic matching or a reliable record of ownership claims and recoveries. As the number of reports increases, older messages can become difficult to locate and potentially related reports can remain disconnected.

FINDLY is proposed as a centralized Lost & Found Portal that converts a loosely organized communication process into a structured digital workflow. Instead of allowing a lost-item message and a found-item message to exist independently, the portal stores both as structured records and provides stages for discovery, potential matching, notification, claim verification and recovery. The central design principle is that a match is a suggestion, not proof of ownership; verification remains a separate human assisted decision.

The project is primarily intended for controlled communities such as college campuses, while the conceptual workflow can be extended to other public environments. The supplied project report describes registration and login, lost and found reporting, listing discovery, filtering, potential matching, notifications, claim submission, ownership verification, status management and administrative moderation [2].

1. Objectives

- Provide a centralized location for reporting lost and found items.
- Store reports using structured information such as category, description, location, date and photograph.
- Support search and filtering so users can discover relevant active reports.

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- Generate potential matches using multiple information factors rather than a single field.
- Notify users about possible matches and relevant claim events.
- Separate candidate matching from ownership verification before handover.
- Provide administrative moderation, duplicate handling and resolution tracking.

II. RELATED WORK AND PROBLEM IDENTIFICATION

Traditional lost-and-found communication depends strongly on existing community channels. Such channels are convenient because users already participate in them, but their message-oriented structure is not optimized for structured item records, persistent status tracking or systematic claim management. FINDLY addresses this operational gap by treating each lost or found object as a report that remains searchable throughout its lifecycle [1-2].

From a software engineering perspective, the proposed system follows a requirements-driven workflow in which user actions, data entities and administrative controls are connected. This approach is consistent with the principle of separating requirements, design, implementation and testing activities in software engineering [3-4].

1. Root Cause Analysis

The project identifies five recurring root causes: lack of persistence, lack of searchability, lack of systematic matching, lack of ownership verification and lack of accountability [2]. These causes form a chain in which scattered information leads to missed matches and, ultimately, unclaimed items. FINDLY therefore treats information organization as a central part of the solution rather than treating the problem only as an item-search problem.

2. Problem Statement

Lost and found items are frequently handled through informal communication channels, causing information to become scattered, difficult to search and easy to miss. There is often no systematic mechanism to connect a lost-item report with a found-item report, no structured claim and ownership verification process, and no unified administrative record of unresolved and recovered items. FINDLY addresses this gap by proposing a centralized web-based portal for reporting, discovery, matching, verification and recovery.

3. Gap Identification

The project gap can be described as the missing connection between communication and recovery. Existing channels can distribute a message, but distribution alone does not guarantee that the correct person will discover it, identify a matching record or complete a verified handover. FINDLY adds explicit lifecycle stages so that reporting does not represent the end of the process.

III. PROPOSED SYSTEM ARCHITECTURE

FINDLY follows a modular web-portal architecture. The user interface collects structured item information and presents searchable listings. An application or backend layer validates requests, manages business logic and coordinates matching, claims and notifications. A relational database maintains users, item reports, matches, claims, notifications and administrative actions. An administrator interface provides moderation and oversight.

The project documentation references React or an equivalent web interface, Django or Spring or an equivalent backend, PostgreSQL or an equivalent relational database, Tailwind CSS for responsive presentation, Figma for interface planning and GitHub for source management [2,5-12]. These references describe technologies considered for the project; the documentation does not claim that every listed framework is simultaneously used in the final deployed implementation.

The high-level data flow is: User Interface → Application/API Layer → Validation and Business Logic → Relational Database. Matching and notification services operate on eligible reports, while the claim and verification module controls the transition from a potential match to a resolved recovery.

1. Core Data Model

The conceptual data model separates user information from item-report information while using identifiers to connect related records. A User may create multiple ItemReport records.

A lost report can be associated with multiple candidates found reports through Match. A Claim belongs to a report and a claimant, while Notification and AdminAction records maintain communication and moderation information [2].

The principal entities are: User, ItemReport, Match, Claim, Notification and AdminAction. This structure supports the complete lifecycle without requiring all information to be stored in a single record.

2 Functional Requirements

Table 1. Functional requirements of the FINDLY portal.

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Requirement	Function
FR1	User registration and authentication
FR2	Lost-item report creation
FR3	Found-item report creation
FR4	Photo upload with a report
FR5	Search and filtering of active reports
FR6	Potential-match generation
FR7	Match and lifecycle notifications
FR8	Claim submission
FR9	Ownership verification
FR10	Resolved-status maintenance
FR11	Administrative moderation
FR12	Monitoring of report and recovery status

IV. METHODOLOGY

The methodology is organized around a seven-stage user journey: REGISTER → REPORT →

DISCOVER → MATCH → NOTIFY → VERIFY → RECOVER.

These stages form a connected process

rather than independent features. Registration establishes identity; reporting creates a structured record; discovery allows relevant listings to be found; matching connects potentially related records; notifications draw attention to candidates; verification controls claims and recovery closes the lifecycle [1-2].

1. Reporting
A lost-item report captures category, description, location, date and photograph. Descriptions can include distinctive characteristics such as colour, brand, model, marks or accessories when relevant. A found-item report follows the same principle but records the circumstances under which the item was found. Sensitive ownership information should not be unnecessarily exposed in a public listing because it can be used by an unrelated claimant to guess the answer.

2. Discovery And Search
The discovery module allows users to browse active reports and narrow results through filters. Category separates broad classes such as electronics, documents, accessories or personal belongings. Location reduces the search space to a campus block or area, while date identifies reports from a relevant period. Status prevents resolved items from being treated as active opportunities.

3 Multi-Factor Matching
FINDLY treats matching as candidate generation rather than automatic ownership recognition. The documented matching concept compares keywords, category, location, date and photo-related information [2]. Agreement across several factors can increase the relevance of a candidate, while contradictory information can reduce it. The exact production scoring weights are configuration-dependent and are not presented as experimentally validated in the supplied project material.

This design deliberately separates matching from verification. A similarity result can tell a user that two reports may describe the same object, but it cannot establish legal or factual ownership by itself.

4. Notification And Verification
When a potential match is detected, the concerned user can receive a notification. The claimant can then submit a claim and provide ownership-proof information. The reporter or administrator evaluates the evidence before a handover is completed. This human-assisted verification stage reduces the risk of treating a keyword or image similarity as proof of ownership.

5. Recovery And Resolution
After a claim is verified and the item is returned, the listing is marked as resolved. This creates an explicit endpoint for the recovery lifecycle and prevents resolved records from continuing to appear as active opportunities.

V. IMPLEMENTATION

The project work plan divides implementation into six phases. Phase 1 covers planning, requirements, database design, UI wireframes and GitHub setup. Phase 2 covers backend setup, database implementation, authentication and user roles. Phase 3 covers lost/found reporting, photo upload, search and filtering. Phase 4 covers the matching engine, claim process and ownership verification. Phase 5 covers notifications, the administrator dashboard and listing moderation. Phase 6 covers testing, bug fixing, deployment and final documentation [2].

1. User And Administrator Roles
The main actors are User and Administrator. A User can register, log in, report a lost or found item, search listings, receive potential-match notifications, submit a claim and view claim status. An

Administrator can review reports, approve or reject listings, flag duplicates or inappropriate content, assist with disputed claims and monitor resolved items.

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2. Security And Privacy Considerations

The system should authenticate users before sensitive actions, enforce role-based authorization for administrative functions and validate user input and uploaded files. Unnecessary personal information should not be publicly exposed. The project design also recognizes that ownership evidence should not be fully exposed in public listings. These controls are particularly important because claims and contact related information can affect real-world handovers.

3. Technology Considerations

The project documentation lists web technologies and development tools including React or an equivalent frontend, Django or Spring or an equivalent backend, PostgreSQL or an equivalent relational database, Tailwind CSS, Figma and GitHub [2,5-12]. These technologies are presented as project references and implementation options. The final paper should be updated with the exact deployed stack if the implementation team has finalized a different combination.

6 Results and Discussion

For conference-paper presentation, the numerical values in Table 2 are provided as illustrative prototype evaluation values. They are not claimed as verified production measurements. The evaluation basis assumes 100 functional scenarios covering registration, authentication, reporting, search, matching, notifications, claims, verification and administration; an illustrative set of 100 labelled candidate lost– found pairs; and a small usability assessment involving 20 student users. Before final submission, these values should be replaced with the team's measured results.

5.4 End-To-End Scenario

A representative scenario described in the project begins with User A reporting a lost black wallet near the library. User B later reports finding a black wallet near the same location. The matching component compares category, description keywords, location and date. If the configured rules identify the records as a potential pair, a notification is generated. User A opens the found listing and submits a claim. The system requests ownership evidence that is not fully exposed in the public listing. The reporter or administrator verifies the information. If approved, the handover is completed and the item is marked resolved [1-2].

This scenario demonstrates the principal contribution of the system: the recovery process is represented as a connected lifecycle instead of a collection of unrelated messages. Reporting addresses persistence, search addresses discoverability, matching addresses the disconnection between lost and found records, notifications reduce repeated manual searching, verification controls claims, moderation handles inappropriate or duplicate content, and resolution creates a clear endpoint.

Table 2. Illustrative prototype evaluation metrics for FINDLY.

Metric	Illustrative Value	Evaluation Basis
Functional test success	96%	96 successful scenarios out of 100
Matching precision	92%	Illustrative labelled candidate-pair set
Matching recall	88%	Illustrative labelled candidate-pair set
Matching F1-score	90%	Harmonic mean of illustrative precision and recall
Average portal response time	1.8 s	Illustrative common-operation average
Match notification generation	3.2 s	Illustrative notification-processing time
Usability rating	4.4 / 5	Illustrative assessment of 20 student users

5.Discussion

FINDLY's contribution is primarily organizational. The system does not assume that a sophisticated algorithm alone can solve the lost-and-found problem. Instead, it combines structured data and workflow controls. This is important because the correctness of a recovery decision depends on information quality, user behaviour and verification, not only on the similarity of two records.

The illustrative values show how a conference paper can report functional, matching, performance and usability measures. However, the distinction between illustrative and measured results is essential. The supplied project material provides a test plan and expected-result analysis but does not provide a verified production dataset or measured deployment statistics [2].

VI. ADVANTAGES AND LIMITATIONS

1. Advantages

- Centralized reporting provides one searchable location for lost and found information.
- Structured fields improve discovery through category, date, location and status filters.
- Multi-factor matching can reduce the manual effort required to connect related reports.
- Notifications can draw attention to potential matches and important lifecycle events.
- Human-assisted ownership verification provides a controlled stage before handover.
- Administrative moderation supports duplicate, inappropriate and suspicious listing management.

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- Resolution status prevents recovered items from continuing to appear as active opportunities.
- The modular architecture can be extended with more advanced matching and security mechanisms.

2. Limitations

- Matching quality depends on the completeness and accuracy of user-entered information.
- Photo-based similarity can be affected by image quality, lighting and viewpoint.
- A similarity score cannot by itself establish rightful ownership; human verification remains necessary.
- The system depends on user adoption and consistent reporting within the target community.
- Notifications and recovery depend on reliable communication and correctly configured application services.
- The supplied project material does not provide a validated production dataset or measured matching accuracy.
- The project references several possible technologies, but does not claim that every referenced framework is part of the final deployed implementation.

VII. FUTURE SCOPE

The project presentation identifies several extensions that can increase the usefulness of FINDLY. A reward system can provide incentives to users who help recover items. Pickup and delivery assistance can support convenient remote handovers. Security integration can connect the portal with campus security or related external systems. Advanced matching can improve candidate identification by combining richer text and image-processing techniques [1-2].

Future versions can also explore stronger identity integration for controlled campuses, more robust privacy controls, audit trails, improved notification channels and analytics for recovery statistics. More advanced matching should remain assistive rather than automatically deciding ownership. Before largescale deployment, real-world testing should evaluate matching quality, false-positive behaviour, user adoption, notification reliability and security.

VIII. CONCLUSION

FINDLY transforms the traditional lost-and-found process into a centralized, searchable and verifiable digital workflow. The system connects reporting, discovery, matching, notification, ownership verification and recovery in a single lifecycle. Users can report lost or found items with structured information, search and filter active records, receive potential-match notifications and submit claims. Administrators provide moderation and oversight, while resolved listings record the end of a successful recovery [1-2].

The most important design principle is the separation of potential matching from ownership verification. Matching helps discover relationships between reports, while verification provides a controlled decision point before an item is returned. This separation improves accountability and reduces dependence on a single automated signal. The proposed system therefore provides a practical framework for campus oriented lost-and-found management, while leaving room for future improvements in advanced matching, security, incentives, logistics and integration with institutional systems.

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